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ESSAYS ON FINANCIAL CRISES AND GROWTH SURGES

Thèse présentée et soutenue publiquement le **7 Septembre 2020**
pour l'obtention du titre de Docteur en Sciences Economiques
par

Bédhat Jean-Marc ATSEBI

sous la direction de :
Pr. Jean-Louis COMBES et Pr. Alexandru MINEA

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A ma mère et mon père, Marianne et Yao ATSEBI,
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A Régina

DECLARATION

L'Université Clermont Auvergne, le CERDI et le FMI n'entendent donner aucune approbation ou improbation aux opinions émises dans cette thèse. Ces opinions doivent être considérées comme propres à leur auteur.

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RÉSUMÉ

Cette thèse étudie deux phénomènes qui ont impacté la trajectoire de développement de plusieurs pays dans le monde : les crises financières et les poussées de croissance. La première partie de cette thèse, composée de deux chapitres (chapitres 1 et 2), analyse les coûts commerciaux et les contractions économiques associés aux crises financières dans les pays en développement et émergents. Elle examine également les canaux de transmission de ces effets et le rôle de l'espace budgétaire dans la relance économique d'après crise. La seconde partie, elle aussi composée de deux chapitres (chapitres 3 et 4), analyse les déterminants des poussées de croissance et le rôle du Fonds Monétaire International dans leur initiation. Cette thèse contribue significativement à la littérature existante sur ces deux phénomènes. Le chapitre 2 étudie les effets des crises de la dette, bancaire et de change sur le commerce des biens agricoles, miniers, manufacturiers et des services dans 41 pays émergents sur la période allant de 1980 à 2018. Il révèle que les crises génèrent une baisse prononcée et persistante du commerce international (exportations et importations), portée principalement par la contraction du commerce des biens manufacturiers, et dans une certaine mesure par la baisse du commerce des services, des produits miniers, alors que les biens agricoles apparaissent plus résilients, notamment à la suite des crises de la dette. En outre, la baisse du commerce est beaucoup plus accentuée pour les crises combinées. Les crises induisent cette baisse à travers des effets de composition (la structure et la diversification du commerce), de demande (baisse de la demande de biens et services), et d'offre (baisse de l'offre du crédit, des flux de capitaux entrants et du développement financier). Le chapitre 3 étudie le rôle de l'espace budgétaire sur les effets récessifs des crises financières et la politique de relance économique dans 35 pays en développement et 56 pays émergents sur la période 1985-2017. Il montre que la disponibilité de l'espace budgétaire avant la crise génère une dualité. Dans les pays qui ont un espace budgétaire suffisant, les coûts des crises sont plus faibles voir nuls et les gouvernements mènent des politiques de relance, supportées par une hausse de la consommation, des investissements et des flux nets de capitaux. Dans les pays avec un espace budgétaire faible, les gouvernements renoncent à leurs politiques de relance et mènent des politiques de consolidations budgétaires pour accroître la soutenabilité des finances publiques ; dans ce cas, la consommation, les investissements et les flux nets de

capitaux baissent, et la récession est accentuée et persistante. Le chapitre 4 s'intéresse aux déterminants des poussées de croissance économique. Il identifie 132 épisodes de croissance soutenue dans 117 pays sur la période 1980-2010. Il montre que les améliorations de la stabilité macroéconomique et des conditions externes et dotations en ressources augmentent plus la probabilité des poussées de croissance. Elles sont suivies par les vagues de réformes structurelles, les gains d'investissements, de travail et de productivité, l'amélioration de la diversification et la qualité du commerce, et enfin par l'amélioration des facteurs institutionnels. De plus, il montre que la probabilité d'avoir des poussées de croissance augmente significativement quand les améliorations de la stabilité macroéconomique et des conditions externes et dotations en ressources interviennent, d'une part, et les autres facteurs, d'autre part. Ces deux premiers facteurs apparaissent donc comme des facteurs dominants. Le chapitre 5 évalue le rôle du FMI dans l'initiation des périodes de croissance soutenue et contribue à la littérature très controversée sur l'efficacité des politiques du FMI. Il montre que le FMI a significativement contribué à générer des périodes de croissance soutenue, notamment à travers ses programmes PRGT. Ces effets positifs ont été plus accentués dans les années 2000 et effectifs dans plusieurs pays indépendamment de leur localisation ou niveau de développement. Ces gains proviennent de l'amélioration de la stabilité macroéconomique, de l'implémentation des réformes structurelles, et de la création d'un climat favorable pour l'investissement, le travail, la productivité et les conditions externes et de dotations.

Mots clés: Coûts commerciaux; Contractions économiques; Crises financières; Espace budgétaire; Poussées de croissance; Stabilité macroéconomique; Réformes structurelles; Fonds Monétaire International

JEL Codes: F14; F4; G01; E6; H6; O1; O4

SUMMARY

This dissertation studies two phenomena that have been widespread in many countries of the world through history and have huge implications for development, namely the financial crises and growth surges. The first part, comprising two chapters (chapters 2 and 3), analyzes the sectoral trade and output costs of financial crises in the context of developing and emerging countries. It also examines the channels by which financial crises affect trade and output and assess the role of fiscal policy and space to alleviate the output costs. The second part, comprising also two chapters (chapters 4 and 5), turns our attention to the determinants of growth surges in countries and the International Monetary Fund's role in igniting growth surges. Chapter 2 studies the response of different types of trade (i.e. agricultural, mining, and manufactured goods, and services) following various types of financial crises (i.e. debt, banking, and currency crises) in 41 emerging countries over the period 1980-2018. It reveals that the collapse of total trade in the aftermath of financial crises is long-lasting and mainly driven by the fall of manufacturing trade. Also, trade in both mining goods and services declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. These trade costs are reinforced for combined crises and can be explained by compositional and structural (trade structure and diversification), demand-side (fall in demand for goods and services), and supply-side channels (disruption of financial development, fall of net capital inflows and deterioration of credit ratings). Chapter 3 studies how fiscal policy space shapes the dynamics of output losses in the aftermath of financial crises and normal recessions in a sample of 35 developing and 56 emerging countries over the period 1985-2017. It reveals that the availability of fiscal space in the aftermath of financial crises and normal recessions generates a mixed fiscal environment with different output losses of shocks. In countries with enough fiscal space, governments can enact credible fiscal policy expansion by increasing their deficit and using their fiscal space to alleviate the costs of financial crises and normal recessions. In such a situation, private consumption and investment, as well as net capital inflows, increase, which favors a rapid recovery. In countries with limited fiscal space, the story is different and painful; governments immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations, which deepens

the recessionary forces. Besides, in these countries, private consumption and investment, as well as net capital inflows, are depressed, and recovery, if any, is a distant and uncertain prospect. Chapter 4 studies the determinants of growth surges. It identifies 132 episodes of growth surges in 117 countries over the period 1980-2010 and finds that improvements in macroeconomic stability and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. Besides, it shows that countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Moreover, significant changes in macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges. Chapter 5 engages and contributes to the debate on the effectiveness of the IMF in promoting growth. It concludes that IMF-supported programs (more PRGT than GRA programs) have significantly and positively contributed to boosting medium- to long-term growth in countries, particularly in the 2000s than previous decades, and in all countries around the world, regardless of their geographical position and levels of development. It has done so by pursuing macroeconomic stability and implementing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions.

Keywords: Trade costs; Output losses; Financial crises; Fiscal policy space; Growth surges; Macroeconomic stability; Structural reforms; International Monerary Fund
JEL Codes: F14; F4; G01; E6; H6; O1; O4

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CHAPTER 1

GENERAL INTRODUCTION

1.1 Argentina, 2001 and India, 1991, two different stories

Argentina, 2001 and India, 1991, two countries, two different stories that are quite appealing for this dissertation. One illustrates the story of several countries that have gone through the detrimental consequences of crises, the other illustrates the success stories of sustained economic growth periods and their benefits in many countries.

1.1.1 The 2001 Argentina's crisis

Starting in 2001, Argentina experienced one of the worst economic crises in history. Argentina halted payments on bonds worth $81 billion in December 2001, two-third of the nation's GDP wiped out in four years, riots erupted claiming that "all of them must go!" and "we are dying of hunger!", the country had five presidents in two weeks, inflation reignited, the banking system was paralyzed, unemployment rose above 20 percent, millions of lives were impoverished, and the currency board collapses. The year running to the crisis, Argentina was praised and cited as a model of successful economic reform that has weathered the storm of the Tequila crisis. As it was common in Latin America, Argentina 2001 crisis was not rooted in large money financed deficits or hyperinflation, but in an excessive build-up of external debt and a persistent deficit of the public sector, coupled with high off-budget activities. Indeed, public debt increased at a higher pace, by 18 percentage points of GDP in the five years preceding the 2001 default, fueled by higher public deficits over the same period. With the collapse of the economy, public debt reached 152.2% of GDP and public deficit plummeted to 25% of GDP in 2002. Argentina

requested an IMF Stand-By Arrangement of $14 billion and an international support package of $40 billion and renegotiated its debt with its creditors in 2005.[1]

1.1.2 India's growth surges

Since its large economic reforms of the 1990s, India's long-term economic growth has steadily accelerated by 4.4% per year during the 1990s, and further to 6.5% per year between 2000 and 2017. Its income per capita in PPP terms was multiplied by 4.9 over this period.[2] At the same time, India's growth has become more stable and more resilient to shocks. This contributed to a significant reduction of poverty that went from around 45 to 22% between 1991 and 2012. What India did? India's success was rooted in large economic reforms towards openness and liberalization. This marked a turning point for India and its people. Following the macroeconomic crisis of 1991-92, in the same vein of the liberalization reforms of the 1980s,[3] India undertook a wave of reforms in two keys areas: industry and external trade. Its reforms encompassed deregulation of industry, tariff cuts, capital account openness, currency depreciation to boost competitiveness, liberalization of trade, banking, and NTIC sectors, and attraction of foreign direct investments. As a result of reforms, growth has accelerated the fastest in services, followed by industry. It was driven by an increasing share of investment and exports, with a large contribution from consumption, and an increase in trade diversification, labor, and total factor productivity.

Of course, these two stories far from being specific to Argentina and India have been widespread phenomena in different countries, regardless of their geographical location and levels of development. They raise questions about the causes and consequences of financial

[1] This is indeed one illustration of various financial crises that have consistently animated the lives of countries around the world since the Great depression of 1932, only to date from then. These crises include, among others, the Suez crisis of the 1950s, the Oil shocks of the 1970s, the International debt crisis of the 1980s or "lost decade", particularly in Latin America, Eastern Europe, and Africa, the Tequila crisis starting in Mexico in the mid-1990s, the Asian financial and Russian crises of the second half of the 1990s, the Global financial crisis of 2008-09, the European debt crisis, and the current Covid-19 pandemic crisis.

[2] Recall that the annual growth rate was only 0.7% per year over the period 1960-1990.

[3] With the help of multilateral institutions and strong government ownership, India quietly undertook a wave of liberalizations in the 1980s that is known as the "liberalization by stealth". First, India pursued the relaxation of import controls through the Open General Licensing (OGL), mostly accompanied by a reduction of tariffs. Having disappeared, India reintroduced in 1976 the OGL list with 79 capital goods items on it that was expanded to around 1,329 capital goods and 949 intermediate goods in 1990. Second, the liberalization consisted of the reduction of canalized imports, i.e. the reduction of the monopoly rights of the government for the import of certain items. In the 1980s, canalized non-POL (petroleum, oil, and lubricants) imports declined from 44 to 11 percent of the total non-POL imports. Third, several export incentives were introduced (e.g., in the 1985 budget, 50 percent of business profits attributable to exports were made income tax deductibles; this was extended to 100 percent in the 1988 budget.) and exchange rate policies supported the country's openness to trade. The wave of reforms in the 1980s was accompanied by unsustainable borrowing and public expenditure and rising debt and deficit that ended in a macroeconomic crisis in 1991 (e.g., external debt rose from $20.6 billion in 1980-81 to $64.4 billion in 1989-90, the share of non-concessional debt rose from 42 to 54 percent between 1985 and 1990).

crises and growth surges. This dissertation provides some answers to these questions and enriches our knowledge of financial crises and growth surges. To do so, it is divided into two parts. The first part, comprising two chapters (chapters 2 and 3), provides analyses of the sectoral trade and output costs of financial crises in the context of developing and emerging countries. It also examines the channels by which financial crises affect trade and output and assess the role of fiscal policy and space to alleviate the output costs of crises. The second part, comprising also two chapters (chapters 4 and 5), turns our attention to the determinants of growth surges in countries and the International Monetary Fund's role in igniting growth surges. It draws lessons from the past and provides some guidance on how to ignite growth surges. Moreover, it sheds light on the potential role played by the IMF in the initiation of growth surges.

1.2 Financial crises and international trade

Financial crises have generally been associated with trade contraction. Baldwin (2011) reports that global trade fell for at least three quarters only in three of the worldwide recessions that occurred between 1965 and 2008: the oil-shock recession of 1974-75, the inflation-defeating recession of 1982-83, and the Tech-Wreck recession of 2001-02. However, the "Great Trade Collapse" of 2008-09 is by far the largest trade collapse since WWII. Indeed, according to the WTO and IMF, the drop in world trade flows (around 12% of world GDP in 2009) exceeded that of world GDP (about 5% in 2009). Given the worldwide benefits of trade,[4] this severe downturn brought back into the spotlight the issue of the trade costs of financial crises. The empirical literature, despite some exceptions for exports, has converged to a strong consensus on the detrimental consequences of financial crises on trade at the macroeconomic level (Rose 2005; Ma and Cheng 2005; Martinez and Sandleris 2011; Abiad et al. 2014; Asonuma et al. 2016; Atsebi et al. 2019). At the micro-level, following the great trade collapse, several contributions explain the contraction of trade following financial crises through two mechanisms, the demand-side channel and the supply-side channel.[5] However, this literature may be developed on several grounds. First and more importantly, this literature has overlooked the cross-sectoral differences of the effects of financial crises, i.e. the differentiated costs of crises on the different types of traded goods and services. Second, most of them treat financial crises as exogenous, therefore, they may not capture a causal effect. Third, they generally analyze the effects of each

[4]Early studies by Dollar (1992); Sachs and Warner (1995); Edwards (1998), and Frankel and Romer (1999) suggest that trade increases income, a result confirmed more recently by Rodríguez and Rodrik (2000) and Feyrer (2009a,b). Besides, international trade was also found to support overall and firms productivity or real consumption, and to reduce poverty (see e.g. Bernard and Jensen 1999; Pavcnik 2002; Trefler 2004; Burstein and Cravino 2015; Edmond et al. 2015; Johns et al. 2015).

[5]See e.g. Berman and Martin (2012) and Ariu (2016) for an extensive discussion of these two channels.

financial crisis separately without controlling for other crises, therefore, they may suffer from overestimation bias since the different crises may be interrelated.

Against this backdrop, chapter 2 studies the response of different types of trade (i.e. agricultural, mining, and manufactured goods, and services) following various types of financial crises (i.e. debt, banking, and currency crises) in 41 emerging countries over the period 1980-2018. It uses a combination of impact assessment and local projections to capture a causal dynamic effect running from financial crises to the trade activity. It reveals that the collapse of total trade in the aftermath of financial crises is long-lasting and mainly driven by the fall of manufacturing trade. However, the impact of financial crises on the other types of traded goods and especially on services is far from being negligible. Trade in both mining goods and services also declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. When looking at the costs of combined crises, it shows that they exert a significant and higher decline of trade, compared to crises occurring without any other crisis in the years around. Also, financial crises exert an adverse effect on total and sectoral trade through compositional and structural, demand-side, and supply-side channels. In detail, about the compositional and structural channel, this chapter sustains that financial crises may act as an impediment of structural transformation as they hurt more manufacturing exports in countries where the share of manufacturing exports is relatively lower. Also, by diversifying their exports and partners, countries will increase their resilience to financial crises. About the demand-side channel, it shows that financial crises associated with a lower demand of goods and services from trading partners will have more adverse trade costs; therefore they can generate an unprecedented collapse of international trade when they are generalized within regions and at the global level as witnessed in the post-GFC period, which is of particular interest in this time of Covid-19 pandemic. Finally, it supports the idea that the supply-side channel is critical to understand the way financial crises shape the dynamics of international trade. When associated with a deterioration of the domestic financial development and external financial conditions, and sudden stops, financial crises will exert a significant and detrimental collapse on international trade.

1.3 Financial crises and economic growth

Financial crises have also generated long-lasting and protracted output losses in many countries (see, e.g., Kaminsky and Reinhart 1999; Bordo et al. 2003; Tomz and Wright 2007; Cerra and Saxena 2008; Reinhart and Rogoff 2009; Fatás and Mihov 2013; Borensztein and Panizza 2014; Jordà et al. 2013, 2016; Jordà and Taylor 2016; Asonuma et al. 2016; Kuvshinov and Zimmermann 2019; Trebesch and Zabel 2017; Laeven and Valencia 2018; Romer and Romer

2018; Asonuma et al. 2019; Atsebi et al. 2020). However, the size of the output collapse and the pace at which the recovery may happen crucially depend on the availability of fiscal space that is the "room in a government's budget that allows it to provide resources for the desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy" as defined by Heller (2005). Indeed, in the aftermath of the global financial crisis (GFC) of 2008-09, many governments around the world enacted large fiscal stimulus plans to boost their sagging economies. These plans were based on the Keynesian theory that sustains that deficit spending by governments can stimulate their economy by supporting the aggregate demand. This is of particular interest since the evidence of larger fiscal multipliers in recessions than in expansions. However, at the same time, many other countries were forced to implement large fiscal consolidations to dissipate fiscal sustainability issues and restore external viability, and this at the worst possible time, which exacerbated the recessionary forces of the crisis. One noticeable difference between countries that were implementing loose and contractionary fiscal policy lies in the availability of fiscal space they had in the run-up of the crisis. For instance, Romer and Romer (2018) analyze the effects of fiscal and monetary space on output dynamics in the aftermath of financial distress and show that the output losses are less than 1% when a country has both types of policy space, but almost 10% when it has neither. One of the channels is that governments can use monetary and fiscal policy more aggressively when policy space is available. However, they focus exclusively on advanced countries for which in the post-WWII, crises and recessions have been less recurrent and severe compared to developing and emerging countries. Besides, Bohn (2002) and Mendoza and Ostry (2008) show that fiscal policy tends to be on average more expansionary when government debt is low. Giavazzi and Pagano (1990); Blanchard (1993); Perotti (1999); Minea and Villieu (2010); Corsetti et al. (2012), and Ilzetzki et al. (2013) show that expansionary fiscal policy is more effective and has Keynesian effects at low levels of debt or deficit, and non-Keynesian effects in the opposite circumstances. Auerbach and Gorodnichenko (2012, 2013), and Corsetti et al. (2012) reveal that fiscal multipliers are larger during recessions and financial crises. Altogether, these papers show that fiscal policy may be more effective in alleviating the size of recessions when countries have enough fiscal space that allows them to enact stimulus packages without deterioration their fiscal position and the market sentiment.[6]

Taking stock of this existing literature, chapter 3 studies how fiscal policy space shapes the dynamics of output losses in the aftermath of financial crises and normal recessions in a sample of 35 developing and 56 emerging countries over the period 1985-2017. It builds a new index

[6]In the aftermath of the recent global financial crisis of 2008-09, there is a growing work on the fiscal multipliers when monetary space winds up at the zero lower bound on policy rates. In such circumstances, Christiano et al. (2011) find that fiscal multipliers on output exceed two or even three; see also, Woodford (2011); Erceg and Lindé (2014).

of fiscal space and applies a combination of local projections models and impact assessment to identify a causal effect. It reveals that the availability of fiscal space in the aftermath of financial crises and normal recessions generates a mixed fiscal environment with different output losses of shocks. In countries with enough fiscal space, governments can enact credible fiscal policy expansion by increasing their deficit and using their fiscal space to alleviate the costs of financial crises and normal recessions. In such a situation, private consumption and investment, as well as net capital inflows, increase, which favors a rapid recovery. In countries with limited fiscal space, the story is different and painful; governments immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations, which deepens the recessionary forces. Besides, in these countries, private consumption and investment, as well as net capital inflows, are depressed, and recovery, if any, is a distant and uncertain prospect. Just like in physics, i.e., momentum naturally winds down rather than up unless outside energy is applied, countries that neglect the right disciplines will not only fall but will slope there unless they have fiscal space that allows them to boost their economy in downturns. This chapter suggests that governments and policymakers need to be more than proactive to learn lessons from the past, fix the roof while the sun is shining, build fiscal buffers, reduce debt and deficit, increase tax base and revenues, and lock the drinks cabinet when the economy is starting to improve substantially to be able to appropriately respond to the next crisis looming on the horizon.

1.4 Financial crises and growth surges

A broad range of political and economic factors can explain why and when growth surges happen or not; one these, which is analyzed in part I, is the presence of a crisis. This is known as the “crisis-induces-reform" hypothesis. Indeed, financial crises unveil the non-performing macroeconomic policies, political, economic, and social dysfunctions of the economies, which allows considering serious and well-targeted macroeconomic and structural reforms to increase the country’s resilience to crises, but more importantly to embark on a tour of sustained growth. For instance, IMF (2019) shows that crises foster trade liberalization and, to a lesser extent, labor market and financial deregulation over the medium term. Moreover, Lora and Olivera (2004) show that collapse in domestic demand may lower opposition to trade liberalization from industries that usually rely on domestic demand. Similarly, Duval et al. (2018) finds that periods of high unemployment may increase pressure on governments to enact reforms that ease labor market regulation in the hope of boosting employment. Mian et al. (2014) show that after a financial crisis resulting from a period of deregulation, governments are inclined to re-regulate the financial sector and the economy. These results are supportive of the “crisis-induces-reform"

hypothesis and suggest that there is hope to jump-start growth in the aftermath of financial crises if the appropriate policy and reforms are undertaken. Moreover, financial crises are not the only determinant of growth surges and many others may matter.

1.5 Growth surges and its determinants

The existing literature on the determinants of growth surges is very inconclusive. Among others, Hausmann et al. (2005) concluded that investment and trade, real exchange rate depreciation, political regime changes, external factors, and economic reforms, "on the whole, [...] do a very poor job of predicting the turning points. [...] growth accelerations are caused predominantly by idiosyncratic, and often small-scale changes" and Peruzzi and Terzi (2018) pointed that "growth accelerations are extremely hard to engineer with a high degree of certainty [...] roughly 9 out of 10 instances failed to ignite a take-off". Jong-A-Pin and de Haan (2011) highlighted the important role of economic liberalizations while they found that a move toward more democracy reduces the likelihood of growth surges. Berg et al. (2012) pointed out the critical role of macroeconomic stability and trade diversification to ignite and sustain growth.

Chapter 4 attempts to reconcile the existing papers. To do so, it identifies 132 episodes of growth surges in 117 countries over the period 1980-2010 and finds that many growth determinants have a significant and positive effect on the probability of initiating growth. Specifically, improvements in macroeconomic stability and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. When looking at the two-way interactions of growth determinants, it shows that countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Besides, it reveals that significant changes in macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges. Therefore, macroeconomic policies and structural reforms work. Unfortunately, we have witnessed a significant decrease in the pace of structural reforms and an increase in deregulations leading to excessive build-up of risks in countries since the 2000s. With the recommendation of chapter 3 in mind, fix the roof when

the sun is shining,[7] countries have to engage in large reforms programs following the Covid-19 crisis to strengthen their resilience to shocks, jump-start sustained growth and reconnect with economic wealth.

1.6 Growth surges and the IMF

The International Monetary Fund (IMF) described as the “lender of last resort" or the “financial firefighter", both criticized and lauded for its effort to promote financial stability, continues to find itself at the forefront of global economic crises management.[8] As stated in the IMF's Guidelines on Conditionality (2002), “Fund-supported programs should be directed primarily toward the following macroeconomic goals: (a) solving the member's balance of payments problem without recourse to measures destructive of national or international prosperity; and (b) achieving medium-term external viability while fostering sustainable economic growth". However, lackluster growth under IMF-supported programs relative to non-program countries or periods has often been criticized as indicative of an excessive tightening bias and resulted in a perceived stigma, potentially discouraging the use of IMF financing and challenging the Fund's reputation. Meanwhile, IMF's economists argue that restoring macroeconomic stability even painful in the short-term will create the conditions for higher medium to longer-term growth. This controversy debate on the IMF's effectiveness, particularly on promoting growth, has led to several analyses in the literature. Not surprising, this literature is very inconclusive, reflecting in part significant empirical challenges involved in identifying appropriate counterfactuals and isolating the impact of programs on growth from influences of other factors, and because of varying data and methods employed by the researchers. The class of papers highlighting a positive effect of IMF-supported programs on growth encompasses, e.g. Dicks-Mireaux et al. (2000); Hutchison (2004); Atoyan and Conway (2006); Bas and Stone (2014); Bal Gündüz (2016) and Bird and Rowlands (2017). There are contradicted by Przeworski and Vreeland (2000); IEO and IMF (2002); Hutchison and Noy (2003); Barro and Lee (2005); Butkiewicz and Yanikkaya (2005); Easterly (2005) and Dreher (2006).

[7] Also, the IMF (2019) shows that “reforms take several years to deliver, and some of them [...] may entail greater short-term costs when carried out in bad times; these are best implemented under favorable economic conditions and early in authorities' electoral mandate. Reform gains also tend to be larger when governance and access to credit—two binding constraints on growth—are strong, and where labor market informality is higher—because reforms help reduce it.

[8] Historically, since its inception in 1944, the IMF has been assisting more than 150 countries through 1,300 IMF-supported programs. This includes the reconstruction of the international system payments system in the post-world war II, the transition of Former Soviet Union nations to market-based economies, and the management of the diverse crises in countries affecting by the 1970s' oil shocks, the 1980s' Latin American and African debt crises, the 1990s' Asian financial crisis, the European debt crisis in the Aftermath of the 2008-09 global financial crisis, and the 2019-2020 Covid-19 Pandemic crisis.

Knowing that chapter 4 revealed that macroeconomic stability is one of the prerequisites for growth surges, chapter 5 engages and contributes to the debate on the effectiveness of the IMF in promoting growth. It concludes that IMF-supported programs (more PRGT than GRA programs) have significantly and positively contributed to boosting medium- to long-term growth in countries, particularly in the 2000s than previous decades, and in all countries around the world, regardless of their geographical localtion and levels of development. It has done so by pursuing macroeconomic stability and designing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions. In this difficult time, in the words of the IMF's Managing Director, Kristalina Georgieva, "the IMF has secured $1 trillion in lending capacity, serving our members and responding fast to an unprecedented number of emergency financing requests—from over 90 countries so far". This is indeed a turning point for the IMF policy recommendations and its support to countries in times of hardship, and a great challenge to reinvent itself, learn from its past mistakes, and take the opportunity to contribute to economic prosperities in countries while pursuing its role of "financial firefighter".

Chapter 6 offers concluding remarks by summarizing the main takeaways of the dissertation and discussing the relevance of these analyses for the Covid-19 pandemic crisis in particular as an illustration of a possible application.

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Part I:

The Sectoral Trade and Output Costs of Financial Crises and Normal Recessions: Consequences? What role for fiscal space?

CHAPTER 2

THE SECTORAL TRADE COSTS OF FINANCIAL CRISES IN EMERGING COUNTRIES

This chapter is joint work with Jean-Louis COMBES (CERDI-UCA) and Alexandru MINEA (CERDI-UCA)

Abstract

The “Great Trade Collapse" triggered by the 2008-09 crisis calls for a careful assessment of the trade costs of financial crises. Compared with the existing literature that mainly focuses on the total trade of goods and, in the context of the recent great recession, on manufacturing trade, we adopt a more detailed perspective by looking at the response of different types of trade (i.e. agricultural, mining, and manufactured goods, and services) following various types of financial crises (i.e. debt, banking, and currency crises). Estimations performed on 41 emerging countries over 1980-2018 using a combination of impact assessment and local projections to capture a causal dynamic effect running from financial crises to the trade activity show that the collapse of total trade is long-lasting and mainly driven by the fall of manufacturing and to some extent services trade. Moreover, our findings suggest that financial crises operate through compositional and structural, demand-side, and supply-side channels. Through illustrating the differentiated effects of various financial crises on sectoral and total international trade and by investigating the channels, our analysis contributes to the general understanding of the trade effects of financial crises and provides insightful support for the design and implementation of policies aimed at coping with these effects.

Keywords: Trade Costs; Financial crises; Impact assessment; Local projections
JEL Codes: F14; F41; G01

2.1 Introduction

“Manufacture, don’t just trade. There is money in manufacturing even though it is capital intensive. To achieve a big breakthrough, I had to start manufacturing the same product I was trading on; which is commodities."

—Aliko Dangote, Nigerian businessman, philanthropist, founder and chairman of Dangote Group, an industrial conglomerate in Africa.

The recent 2008-09 crisis can be qualified as the “Great Trade Collapse" due to its profound effects on international trade.[1] Indeed, according to the WTO and IMF, the drop in world trade flows (around 12% of world GDP in 2009) exceeded that of world GDP (about 5% in 2009).

[1] Baldwin (2011) reports that global trade fell for at least three quarters only in three of the worldwide recessions that occurred between 1965 and 2008: the oil-shock recession of 1974-75, the inflation-defeating recession of 1982-83, and the Tech-Wreck recession of 2001-02. However, the “Great Trade Collapse" of 2008-09 is by far the largest trade collapse since the WWII.

Given the worldwide benefits of trade,[2] this severe downturn brought back into the spotlight the issue of the trade costs of financial crises.

By adopting a macroeconomic perspective, most existing studies focus on gravity models estimated on data of bilateral trade of goods between countries. In a panel of 150 countries, Rose (2005) finds a negative effect of debt crises on the trade between a debtor (defaulting country) and its creditors (the countries affected by the default), a result extended by Martinez and Sandleris (2011) to all trading partners of a defaulting country (i.e. both creditors and non-creditors) and confirmed more recently by Asonuma et al. (2016) in a treatment effect analysis. Such a detrimental effect on trade is equally emphasized for banking and currency crises, with some exceptions. Indeed, Ma and Cheng (2005) reveal that imports decline following both banking and currency crises, while exports decrease (increase) following banking (currency) crises. Besides, Abiad et al. (2014) conclude that debt and banking crises do not significantly affect exports, while they induce a sharp and long-lasting decline of imports. Altogether, despite some exceptions for exports, there exists a fairly strong consensus on the detrimental consequences of financial crises on trade at the macroeconomic level. However, this literature may be developed on several grounds. First, most of the existing papers use trade data only for goods and do not account for trade in services, which may have greater resilience to financial crises according to Borchert and Mattoo (2010) and Ariu (2016). Second, since financial crises are likely not exogenous, they may not capture a causal effect with the notable exception of Asonuma et al. (2016). Third, given the focus on the costs of each crisis taken separately without controlling for other crises, the effects may be overestimated since the different crises may be interrelated. Fourth and more importantly, one of the shortcomings of this literature is the lack of evidence on the cross-sectoral differences of the effects of financial crises. Indeed, the different types of goods and services have different natures (demand elasticity, reliance on external financing, use as intermediate goods, vertical linkages, etc.) that make them more or less vulnerable to financial crises.

More recently, following the great trade collapse, several contributions explain the contraction of trade following financial crises through two mechanisms, the income channel and the disruption channel.[3] Focusing on the demand side, the income channel suggests that financial crises reduce trade through their recessionary effect on income (see Reinhart and Rogoff 2009), which leads to a fall in consumption, investment, and imports. For example, Freund (2009) finds

[2]Early studies by Dollar (1992); Sachs and Warner (1995); Edwards (1998), and Frankel and Romer (1999) suggest that trade increases income, a result confirmed more recently by Rodríguez and Rodrik (2000) and Feyrer (2009a,b). Besides, international trade was also found to support overall and firms productivity or real consumption, and to reduce poverty (see e.g. Bernard and Jensen 1999; Pavcnik 2002; Trefler 2004; Burstein and Cravino 2015; Edmond et al. 2015; Johns et al. 2015).

[3]See e.g. Berman and Martin (2012) and Ariu (2016) for an extensive discussion of these two channels.

that the income elasticity of trade increased from under 2 in the 1960s to over 3.5 in recent years, meaning that nowadays trade could fall about 3.5 times more than GDP. Such a disproportionate fall of the demand, and particularly of durable and investment goods, is indeed at work following the 2008-09 great trade collapse (see e.g. Bricongne et al. 2012; Behrens et al. 2013; Eaton et al. 2016). Conversely, focusing on the supply side, the disruption channel is supported by Iacovone and Zavaka (2009); Amiti and Weinstein (2011); Minetti and Zhu (2011); Chor and Manova (2012); Zymek (2012), and Manova (2013), who insist on the role of credit conditions (for example, financial development weakness) and trade credit (for example, external finance dependency) for explaining the decline of international trade following financial crises, while Bems et al. (2011); Altomonte et al. (2014) and Ariu (2016) point out the role played by the disruption of global value chains. Although these studies focus on the within-manufacturing comparison of industries over the recent period (i.e. following the great trade collapse of 2008-09), they suggest that not all types of goods and services may be equally affected by financial crises, due to differences in their demand elasticity, external financial needs, vertical linkages through value chains, and their different perception by customers and investors.

Taking stock of the existing literature, the goal of our paper is to assess the trade costs of financial crises by adopting a sectoral perspective. Indeed, except for the aggregate trade of goods and trade in manufactured goods, the literature has so far remained fairly silent regarding the patterns of trade in agricultural or mining goods, or services, following historical financial crises. Moreover, compared with the recent literature that mainly focuses on the 2008-09 crisis, we draw upon a wide sample of 41 emerging countries over the period 1980-2018 to analyze the trade effects of several types of financial crises, namely 38 debt crises, 34 banking crises, and 36 currency crises. To treat potential endogeneity issues and provide a dynamic view of the trade costs of financial crises, we employ a novel method that combines local projections *à la* Jordà (2005) and impact assessment with the Augmented Inverse Propensity Weighted estimator. Moreover, we investigate the demand-side and supply-side channels by which financial crises affect both total and sectoral international trade. We supplement these channels by a third channel that looks at the composition and structure of the trade.

Our results are as follows. First, consistent with the existing literature, we find that aggregate exports and imports fall by 5.6 and 11 percentage points (pp.) of pre-crisis GDP following debt crises, 8.9 and 14 pp. following banking crises, and 7.7 and 9.1 pp. following currency crises, respectively, over five years.

Second, we go beyond existing studies and disaggregate trade costs by type of goods and services. We find that manufacturing goods are the most affected by financial crises. However, the impact of financial crises on the other types of traded goods and especially on services is far from being negligible. Trade in both mining goods and services (particularly after banking

crises) also declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. When looking at the costs of combined crises, we find that they exert a significant and higher decline of trade, compared to crises occurring without any other crisis in the years around.

Robust to a wide variety of specifications, including the use of alternative samples, maximum weights in the treatment models, sources and definitions of crises, and estimators, our findings are explained by (i) compositional and structural, demand, (ii) supply effects. From a compositional and structural perspective, our findings sustain that financial crises may act as an impediment of structural transformation as they hurt more manufacturing exports in countries where the share of manufacturing exports is relatively lower. Also, by diversifying their exports and partners, countries will increase their resilience to financial crises.

From a demand perspective, our findings show that financial crises associated with lower demand for goods and services from trading partners will have more adverse trade costs, particularly for manufacturing trade. Indeed, agricultural and mining goods and services may have a lower income elasticity of demand compared with manufactured goods, which makes them more resilient to crises. For instance, the demand for agricultural goods may not contract too much when income decreases, since they are often necessary for subsistence (relative to other goods that may be reduced), and they are usually low-priced; in the same vein, Borchert and Mattoo (2010) outline that the focus on the trade of goods has obscured the quiet resilience of the trade of services during the recent crisis, which may be explained according to Ariu (2016) by their lower GDP growth elasticity compared with the elasticity of exports of goods (and also by the fact that services are intangible products that cannot be stored and used as collateral for requesting financing, and essential inputs for maintaining a production activity). On the contrary, the income elasticity of demand is high for manufactured goods, and particularly for durable and investment goods: Eaton et al. (2016) show that the decline of demand for “postponable" (durable and non-durable) manufactured goods drives the overall collapse in trade, and plays a role in the contagion to other countries consistent with the findings of Levchenko et al. (2010) of a strong decline in the trade in durable and intermediate inputs following the 2008-09 crisis.

Finally, our findings support the idea that the supply-side channel is critical to understand the way financial crises shape the dynamics of international trade. When associated with a deterioration of the domestic financial development and external financial conditions, and sudden stops, financial crises will exert a significant and detrimental collapse on international trade, which is mainly driven by the fall of manufacturing and services trade. Indeed, the stronger decline in the trade of manufactured goods during periods of credit crunch or deterioration in external financial conditions associated with financial crises may be related to the fact that their production and transport rely relatively more on external finance compared with agricultural

and mining goods. Indeed, by severely limiting external finance, a credit crunch reduces firms' production and export capacities; for example, Iacovone and Zavaka (2009); Amiti and Weinstein (2011); Minetti and Zhu (2011); Zymek (2012) discuss such effects in the industry sector. Conversely, the production of agricultural and mining goods and services may require less external financing; for instance, mining goods are produced by large companies (often multinationals) that may rely on self-financing. Besides, since most global value chains concern the production of manufactured goods, the interruption of a link in an international production chain and trade credit, due to a crisis in a country, can lead to the destruction of the entire chain, and further to a larger decline of the trade of manufactured goods. Altogether, these rich and detailed results unveil the panorama of the trade costs of financial crises.

The rest of this paper is structured as follows. Section 2.2 details the methodology, Section 2.3 describes the data, Section 2.4 presents the main results, Section 2.5 analyzes their robustness, Section 2.6 discusses potential channels, and Section 2.7 concludes the paper.

2.2 Methodology

The causal effect going from financial crises to international trade is likely to be polluted by endogeneity, arising from different characteristics between countries that experience or not financial crises,[4] or from reverse causality between trade and financial crises.[5] We tackle these issues using a combined method of impact assessment methodology (IAM) and local projections (LP) *à la* Jordà (2005), following Asonuma et al. (2016); Forni et al. (2016); Jordà et al. (2016) and Kuvshinov and Zimmermann (2019), which consists of three steps. First, we estimate the likelihood of financial crises (i.e. the propensity score) based on their determinants. Second, we fit an outcome model in which changes in trade flows at each horizon scaled by pre-crisis GDP are explained by some factors. Third, we compute a semi-parametric estimator of the average treatment effect (ATE), namely the Augmented Inverse Propensity Weighted (AIPW), using the predicted propensity scores obtained from the first stage, and the observed and the potential (predicted in the second stage) values of the change in trade flows. In the following, we describe the LP model and the AIPW estimator.

[4] Tables A.3 to A.5 in section A.3.1 reveal that countries that experience financial crises present different fundamentals compared with countries that do not.

[5] The literature has by now emphasized that trade may lead to financial crises and play an important role in their contagion; see e.g. Krugman (1979); Eichengreen and Rose (1999); Glick and Rose (1999); Forbes (2001) and Ma and Cheng (2005).

2.2.1 Local projection model

LP was extensively used to estimate fiscal multipliers, the effects of fiscal consolidations, and the consequences of financial crises, see e.g. Auerbach and Gorodnichenko (2012a,b); Owyang et al. (2013); Asonuma et al. (2016); Forni et al. (2016); Jordà et al. (2016); Kuvshinov and Zimmermann (2019), and its popularity is supported by several aspects. First, being a flexible, semi-parametric method to estimate dynamic effects, it captures both the direct and indirect (i.e. through changes in fundamentals) effect of financial crises on trade. Second, LP easily accounts for a nonlinear response of trade, which may be potentially at work in our analysis devoted to the effects of financial crises. Third, it can be estimated through standard regression models, and easily combined with IAM. Based on the standard setup in the literature, we estimate the following LP model

$$\Delta y^{k}_{i,t+h} = \Lambda^{k,d,h} D^{d}_{i,t} + \Lambda^{k,b,h} D^{b}_{i,t} + \Lambda^{k,c,h} D^{c}_{i,t} + \theta^{k,h}_{L1} \Delta y^{k}_{i,t-1} + \theta^{k,h}_{L2} \Delta y^{k}_{i,t-2} + X^{x}_{i,t+h} \beta^{k,h} + \upsilon^{k}_{i,t+h} \quad (2.1)$$

for the time-horizon $h \in [\![0;5]\!]$, where $\Delta y^{k}_{i,t+h} = (y^{k}_{i,t+h} - y^{k}_{i,t-1})/GDP_{t-1} \times 100$ is the cumulative change between $t-1$ and $t+h$ in 100 times the trade flows of variable k of country i scaled by pre-crisis GDP. k denotes exports/imports of agricultural, mining, and manufactured goods, and services. $D^{d}_{i,t}$, $D^{b}_{i,t}$, and $D^{c}_{i,t}$ are dummies of debt, banking, and currency crises, respectively. These dummies equal to 1 at the start of each financial crises, and 0 in non-crises years. Their effects at each horizon h are captured through $\Lambda^{k,d,h}$, $\Lambda^{k,b,h}$, $\Lambda^{k,c,h}$, respectively. $\Delta y^{k}_{i,t-1}$ and $\Delta y^{k}_{i,t-2}$ are respectively the change in the trade flows (of trade variable k) one and two years prior to the financial crisis. Finally, $X^{x}_{i,t+h}$ is a set of control variables, and $\upsilon^{k}_{i,t+h}$ is the error term.[6]

2.2.2 The augmented inverse propensity weighted (AIPW) estimator

Our impact assessment considers that financial crises are the treatment variable, and changes in trade flows at each horizon h are the outcome variable. Simplifying the algebra by dropping the indexes k for the different dependent variables, and d, b, and c for financial crises, the average treatment effect (ATE) is defined as

$$ATE = \Lambda^{h} = \mathbb{E}[y_{i,t+h}(1) - y_{i,t-1} | D_{i,t} = 1] - \mathbb{E}[y_{i,t+h}(1) - y_{i,t-1} | D_{i,t} = 0], \forall\ h. \quad (2.2)$$

Since $\mathbb{E}[y_{i,t+h}(1) - y_{i,t-1} | D_{i,t} = 0]$ is not observable, we use a counterfactual. Under the independence assumption $[y^{\phi}_{i,t+h}(d) - y_{i,t-1}] \perp D_{i,t} | Z_{i,t}\ ; \forall\ h\ ;\ d \in \{0,1\}$, i.e. an independent

[6] We include all the dummies of the financial crises at the same time to account for their correlation and avoid a overestimated bias of financial crises. We do not include country-fixed effects as the variables are included as differences (or growth).

financial crises allocation of potential outcomes conditional on a set of covariates $Z_{i,t}$, we estimate the ATE by comparing trade in countries with and without financial crises conditional on the set of variables $Z_{i,t}$

$$ATE = \Lambda^h = \mathbb{E}[y_{i,t+h}(1) - y_{i,t-1}|D_{i,t} = 1; Z_{i,t}] - \mathbb{E}[y_{i,t+h}(0) - y_{i,t-1}|D_{i,t} = 0; Z_{i,t}] \; ; \forall \; h. \quad (2.3)$$

In this study, we use the AIPW estimator that requires estimating two models, namely the treatment and the outcome models. Regarding the former, we estimate a covariate balancing propensity score (CBPS) model, introduced by Imai and Ratkovic (2014), for each crisis on variables $Z_{i,t}$, and obtain the propensity score for country i at time t to be in the treated, $\hat{p}_{i,t} = p_1(Z_{it}; \hat{\Psi})$, and control, $1 - \hat{p}_{i,t} = p_0(Z_{it}; \hat{\Psi})$, group. Indeed, the CBPS model has several good performances over the traditional logit and probit models; it ensures the perfect balancing of covariates between the treated and control groups compared to probit and logit models, and it also limits the bias due to misspecification in the treatment model (see, tables A.3 to A.5).[7] Introduced by Rosenbaum and Rubin (1983), the propensity score is particularly appealing for our analysis to eliminate the biases between the treated and the control group, and we use weighting by propensity scores to mimic a situation where financial crises happen randomly.[8] Regarding the latter, the outcome model eq. (2.1) is estimated separately on both treated and control groups, and we predict the potential outcome $\widehat{\mathbb{E}}[y_{i,t+h} - y_{i,t-1}|D_{i,t} = d; X_{i,t}]; \; \forall \; d \in \{0, 1\}$ for the entire sample, based on the characteristics of each group. This provides the potential trade for countries in the treated (control) group if they have not (have) experienced crises, conditional on the set of control variables $X_{i,t}$.[9] Following the general expression of the AIPW provided by Lunceford and Davidian (2004), we compute the estimated ATE of financial crises on international trade for h year-horizon as

$$\widehat{\Lambda}^h_{AIPW} = \frac{1}{n} \sum_i \sum_t \left(\left[\frac{D_{i,t}(y_{i,t+h} - y_{i,t-1})}{\hat{p}_{i,t}} - \frac{(1 - D_{i,t})(y_{i,t+h} - y_{i,t-1})}{1 - \hat{p}_{i,t}} \right] - \frac{D_{i,t} - \hat{p}_{i,t}}{\hat{p}_{i,t}(1 - \hat{p}_{i,t})} \right.$$
$$\left. \times [(1 - \hat{p}_{i,t})\widehat{\mathbb{E}}[y_{i,t+h} - y_{i,t-1}|D_{i,t} = 1; X_{i,t}] + \hat{p}_{i,t}\widehat{\mathbb{E}}[y_{i,t+h} - y_{i,t-1}|D_{i,t} = 0; X_{i,t}] \right). \quad (2.4)$$

This semi-parametric estimator has the distinctive property of being the most efficient doubly robust estimators, namely, it is unbiased when at least the outcome or the treatment model is

[7] Consequently, we use the propensity score predicted using the CBPS method in the rest of the paper.

[8] Following Imbens (2004) and Cole and Hernán (2008), we truncated the maximum weight, defined by $\hat{p}_{i,t}^{-1}$ for the treated group and $(1 - \hat{p}_{i,t})^{-1}$ for the control group, to 10. In the robustness analysis we change the maximum weight to 5 and 20.

[9] Following Asonuma et al. (2016); Jordà et al. (2016), and Kuvshinov and Zimmermann (2019), we use a larger set of controls in the treatment model compared with the outcome model; indeed, Lunceford and Davidian (2004) suggests including as many variables as collected in the treatment model.

correctly specified (see e.g. Leon et al. 2003; Imbens 2004; Lunceford and Davidian 2004; Tsiatis and Davidian 2007; Wooldridge 2007; Kreif et al. 2013). Besides, compared with the inverse propensity weighted (IPW) estimator, it includes an additional adjustment term consisting of the weighted average of the two predicted potential outcomes, which stabilizes the estimator when the propensity scores get close to zero or one, and has expectation zero when either the treatment or the outcome model is correctly specified (see, Glynn and Quinn 2009). Finally, Glynn and Quinn (2009) conclude that the AIPW estimator displays comparable or lower mean square error than competing estimators when the treatment and outcome models are both properly specified and outperforms them when one of these models is misspecified.

2.3 Data, and preliminaries

2.3.1 Data

Our unbalanced panel covers 38 debt crises, 34 banking crises, and 36 currency crises in 41 emerging countries that experienced at least one of these crises during the period 1980-2018. This sample is restricted by the availability of data used in this analysis. We focus on emerging countries for several reasons. First, trade has increased more in these countries over the past decades and represents today a large proportion of world trade.[10] Second, the way international trade reacts to financial crises depends on the levels of development and the structure of trade; therefore, focusing on emerging countries increases the homogeneity of the effects of financial crises. Third, emerging countries have been more affected by all types of crises than low-income and developed countries.

Regarding financial crises, data for debt crises come from Reinhart and Rogoff (2009), data for banking crises are from Laeven and Valencia (2018), and data for currency crises are built using the definition of Frankel and Rose (1996). Debt crises are defined as the failure of the government to meet a principal or interest payment on the due date and/or the episodes of post-default debt restructuring. Banking crises are defined as events where there are signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations) and/or banking policy intervention measures in response to significant losses in the banking system. Currency crises are defined as a nominal depreciation of the local currency against trading partners' currencies of at least 25% that is also

[10] On the export side, the emerging economies' share in world trade has increased from around 19% of world exports in the early 1990s to close to 40% recently. On the import side, the share has increased from 20% to 35% over the same period.

at least a 10% increase in the rate of depreciation. Alternative definitions and sources for crises are considered in the robustness analysis.

Trade data on goods come from UN Comtrade, via the World Trade Integrated Solution (WITS)–World Bank, which provides exports and imports at the 3-digit code of the Standard International Trade Classification (SITC). We classify this disaggregated data into three types of goods, namely agricultural, mining, and manufactured goods, following the WTO classification. Compared with most studies that focus exclusively on the export of goods, we also consider the import of goods, which can improve firms' productivity and export competitiveness. Besides, we equally consider the trade of services (data comes from United Nations Conference on Trade and Development–UNCTAD), which represents as large as one-quarter of total exports and imports in our sample; besides, since they mostly concern intermediate inputs,[11] their decrease may have strong (negative) effects on the economy. Total trade is obtained by aggregating the four categories of goods and services (agriculture, mining, manufacturing, and services), and deflated by export/import prices.[12]

Finally, we consider two sets of control variables in line with the existing literature that we extend further. The first set is used in the treatment model and includes those variables that influence the likelihood of financial crises and are correlated with international trade, namely, following the related literature: (i) number of past-5 years financial crises except the one of interest, (ii) intensity of conflicts, (iii) log. of Real GDP, (iv) log. of public debt to GDP, (v) log. of domestic credit to GDP, (vi) log. of liquid liabilities to GDP, (vii) net capital inflows to GDP, (viii) log. of foreign reserves to GDP, (ix) current account to GDP, (x) financial openness index, (xi) log of trade openness to GDP, (xii) terms of trade growth, (xiii) floating exchange rate regime, (xiv) government accountability index, (xv) corruption index, (xvi) trading partners' growth, and (xvii) US interest rate on gov.'s securities. These predictors of financial crises are included one-year lagged. The second set of control variables is used in the outcome model eq. (2.1) to predict the changes in trade at each horizon h for each type of good and for services, namely: (i) the change of trade flows one and two years before the onset of financial crises, (ii) other crises, and (iii) the exchange rate regimes at horizon h.[13] The sources and summary statistics are provided in section A.1.3 and section A.2, respectively.

[11] According to Borchert and Mattoo (2010), trade in services accounts for over one-fifth of global cross-border trade, and up to one-third of exports in some large countries (including US or India); and Miroudot et al. (2009) conclude that roughly three-fourth of trade in services in OECD are intermediate inputs.

[12] The pairwise correlations between our aggregate trade dataset with existing datasets on aggregate trade (UN Comtrade or IMF Direction of Trade Statistics) are higher than 0.95. This indicates that our data are properly compiled using disaggregate trade.

[13] In the channel section, we focus on potential mechanisms by which financial crises affect international trade and include more variables in the analysis.

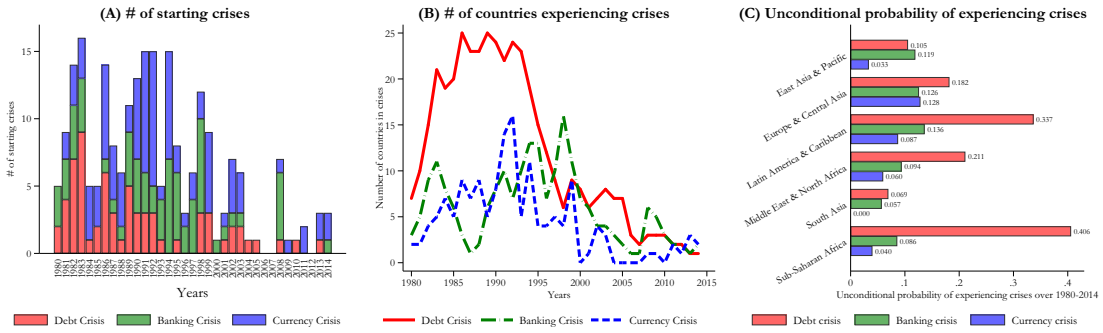
2.3.2 A preliminary look at the data

In this section, we discuss three features of financial crises: their occurrence, the connections between different types of financial crises, and their link with international trade.

2.3.2.1 The occurrence of financial crises

The evolution of financial crises during the period 1980-2014 can be summarized by the charts reported in Figure 2.1. According to (A), all types of crises are recurrent in emerging countries and occurred by clusters (e.g., the debt crises in Latin America and Africa in the 1980s, the banking and currency crises in Asia, Latin America, and Eastern Europe of the 1990s). The number of crises follows a downward trend since the beginning of the 2000s (the Great moderation period), and the 2008-09 contraction has been characterized by less incidence of debt, banking, and currency crises in emerging countries compared to advanced economies. Moreover, as shown by (B), crises are long-lasting, and emerging countries were suffering debt crises (especially in the 1980s and 1990s) more than banking and currency crises. Finally, (C) suggests that financial crises strike the economies by clusters and spread within the regions, with emerging countries in Africa, Latin America, and Middle-East being more affected by debt crises, emerging countries in Latin America, Europe, and Central Asia, and East Asia and Pacific more affected by banking crises, and countries in Europe and Central Asia, Latin and America more affected by currency crises.

Figure 2.1: Financial crises over time and by regions



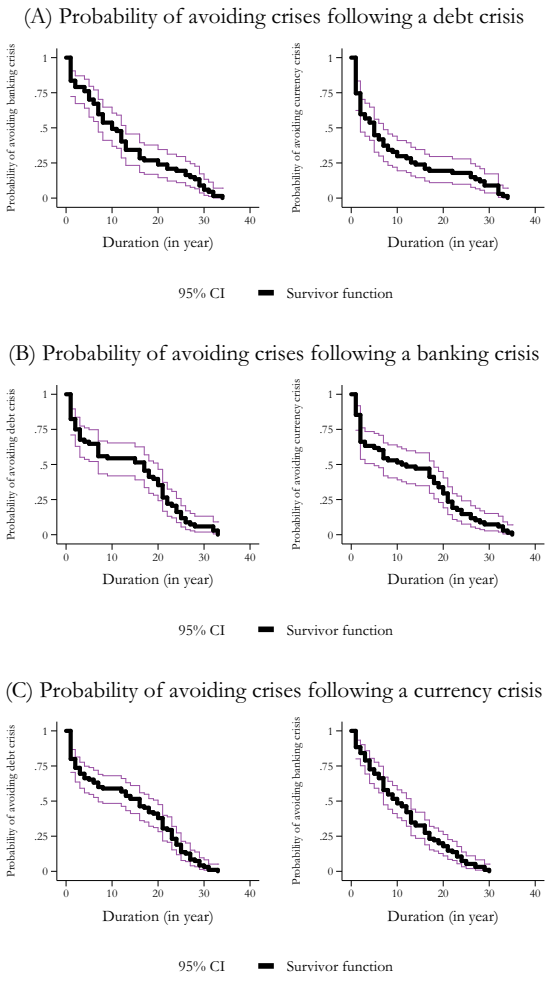
Notes: Sample: 1980-2014. Authors' calculations based on data and definitions from Frankel and Rose (1996); Reinhart and Rogoff (2009) and Laeven and Valencia (2018), World Development Indicators.

2.3.2.2 The connections between financial crises

We analyze potential connections between financial crises using the standard nonparametric Kaplan-Meier estimator. The main message of fig. 2.2 is that financial crises of a new type

occur significantly quicker after a crisis of another type: (i) after a debt crisis hits a country, a banking crisis follows in one-quarter of cases in five years, and a currency crisis in one year; (ii) after a banking crisis, a debt or currency crisis follows in one-quarter of cases in two years; (iii) after a currency crisis, a debt crisis follows in one-quarter of cases in two years, and a banking crisis in four years. Consequently, the takeaway for the design of our empirical analysis is that when estimating the effect of a crisis one should systematically control for other crises to avoid overestimating its trade costs.

Figure 2.2: Survival models of the duration between the onset of different financial crises

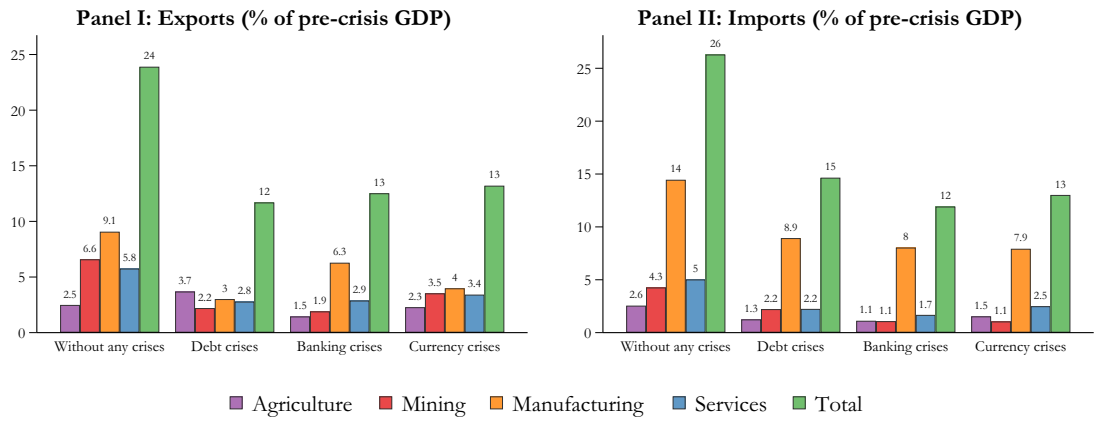


Notes: The figure plots the estimated Kaplan-Meier survival functions for the duration between the start of one type of crisis and the start of another type of crisis. The y-axis denotes the compound probability that countries avoid crises. From the top row to the bottom row, we describe the probability of avoiding crises on the y-axis following debt, banking, and currency crises, respectively. The bands are 95% confidence intervals. Authors' calculations based on data and definitions from Frankel and Rose (1996); Reinhart and Rogoff (2009) and Laeven and Valencia (2018), World Development Indicators.

2.3.2.3 Financial crises and international trade

As a foretaste of the potential trade costs of crises, fig. 2.3 plots the cumulative change of trade flows from the year before the onset of each crisis to 5-year ahead, scaled by pre-crisis GDP. The overall picture supports the collapse of international trade. Total exports and imports decline sharply during all types of financial crises (for example, exports and imports decline respectively by between 11 and 14 percentage points of pre-crisis GDP following all types of crises), mainly driven by the contraction of trade in manufactured goods, followed by the one in services, mining goods, and agricultural goods. In sum, the trade costs of financial crises seem important. However, various issues may lead to an overestimation of these costs. Consequently, we develop in the following a formal econometric analysis to provide a robust estimation of the trade costs of financial crises. Besides, it shows that trade in emerging countries consists mainly of exports and imports in manufactured goods, followed by trade in services, trade in mining goods, and finally trade in agricultural goods.

Figure 2.3: Evolution of the average international trade in financial crises



Notes: The figure plots the dependent variables of our empirical models for the horizon h=5. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year before the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. The dependent variables are plotted during debt, banking, and currency crises, and in the absence of crises. The first (second) row refers to exports (imports).

2.4 Results

2.4.1 Estimation of propensity scores

As previously indicated, the first step of our analysis is devoted to the estimation of propensity scores (PS) for each crisis. We use the CBPS model (a kind of machine learning program) which

ensures a perfect balancing of covariates between countries with and without financial crises by using an optimization process (see, Imai and Ratkovic 2014, for more details on the model and its advantages over traditional binary models).[14] Based on this model, fig. A.2 in section A.3 illustrates the smooth kernel density of the distribution of the PS for the treated and control groups, for each financial crisis. Given the high classification power, countries in the treated (control) group receive a high (low) likelihood of financial crises, while countries in the treated (control) group with PS close to zero (one) receive higher weights. Besides, fig. A.2 also shows considerable overlaps between the distributions of PS for the treated and control groups; thus, we weighted the covariates using PS.[15] As shown by tables A.3 to A.5, there are many significant differences between countries with and without countries in the unweighted sample, with less favorable macroeconomic, external and institutional conditions in countries hit by crises. More importantly, we show, according to the criteria of Rubin (2002), that weighting the covariates by the estimated PS obtained from the CBPS model perfectly eliminates the differences in covariates between the treated and the control group (which is less true for traditional pooled probit model). Since our weighting strategy mimics a situation where financial crises occur randomly, it allows us to properly identify the ATE of crises.

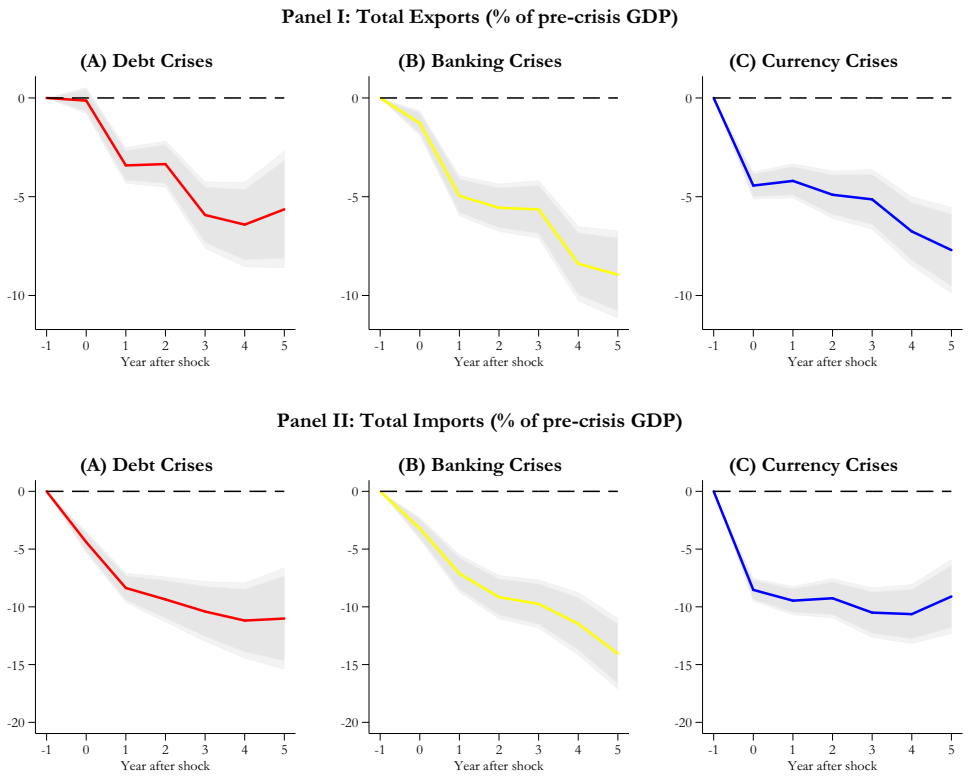
2.4.2 Financial crises and aggregated trade

We first focus on aggregated trade, namely exports and imports, and then look at the trade balance. Next, we present the sectoral trade costs of financial crises. Later, we show the robustness of our findings. Finally, we reveal the potential channels by which financial crises affect both aggregate and sectoral international trade. The ATE-AIPW estimates of the effects of financial crises on aggregated exports and imports are reported in table A.7, and their cumulative impulse responses are depicted in Panel I and II of fig. 2.4, respectively.

[14] As a benchmark, we also estimate a pooled model whose results are reported in table A.6. In a nutshell, estimations show that: the likelihood of currency crises is increasing with the occurrence of past-5 years debt and banking crises and decreasing with the level of development. Debt crises are more likely when the level of public debt, financial openness, and the US interest rate increase. Banking crises are more likely when the levels of domestic credit and trading partners' growth increase and less likely when the level of liquid liabilities increases. The likelihood of debt and currency crises is decreasing with the level of foreign reserves and increasing in countries with floating exchange rate regimes. Debt crises are less likely when trading partners' growth increases. Currency crises are less likely when trade openness increases. Besides, standard diagnostic tests reported at the bottom of the table show that our models present a large classification power (above 94%) and Area Under Receiver Operating Characteristic curve (around 0.8 or more).

[15] Following Imbens (2004) and Cole and Hernán (2008), we truncate the maximum weight to 10 to reduce the influence of outliers on our ATE estimates. In the robustness, we use a maximum weight of 5 or 20.

Figure 2.4: Cumulative trade costs over five years after financial crises



Notes: Conditional cumulative change of total exports and imports from the start of the various crises (debt, banking, and currency). Each colored path shows local projections of the cumulative change relative to the year before the onset of the crisis for years 1-5 after the onset of the crisis. These costs describe the difference in the change of trade between the treated and control groups after re-randomization using the predicted propensity scores. The thinner and thicker bands are 90% and 95% confidence intervals, respectively. The top (bottom) row refers to the costs for exports (imports).

2.4.2.1 Exports

The findings show that all types of financial crises reduce exports both on impact and cumulated over five years in countries affected by crises compared with those unaffected. As shown by Panel I of fig. 2.4, export costs are relatively small just after the occurrence of crises (except for currency crises), but then intensify and follow an L-shape. Export recovery from crises, if any, is a distant and uncertain prospect. Finally, the magnitude of this negative effect over 5 years is economically meaningful and equal to 5.6 percentage points (pp.) of pre-crisis GDP for debt crises, 7.7 pp. for currency crises and 8.9 pp. for banking crises.

2.4.2.2 Imports

Our findings confirm that imports are equally negatively affected by financial crises and do not recover over five years. As shown by Panel II of fig. 2.4, all types of crises exert significantly negative cumulated effects from the beginning of financial crises to five years later. Compared to exports, the magnitude of the adverse effects of financial crises on imports is more important and estimated at 9.1 pp. for currency crises, 11 pp. for debt crises, and 14 pp. for banking crises.

2.4.2.3 Trade balance

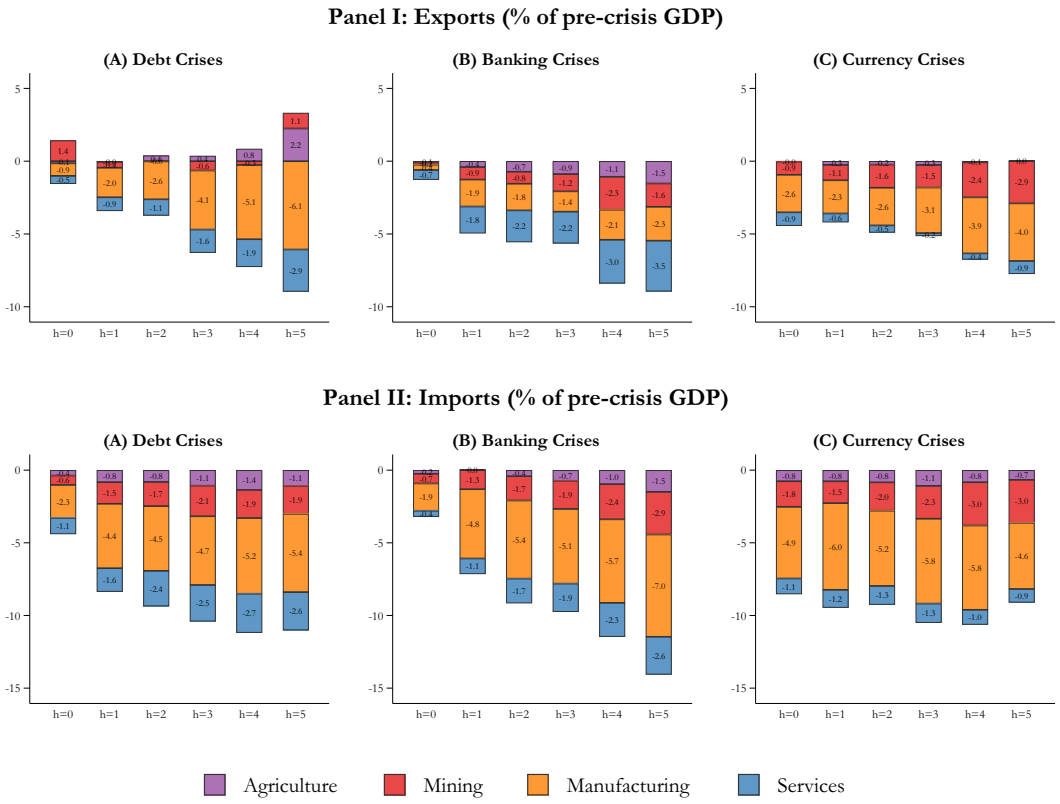
We look at the costs of financial crises on the trade balance by comparing their costs on exports and imports (see the bottom of table A.7 for the mean difference tests). We find that the trade balance increases for all years in the aftermath of debt and banking crises by more than 5 pp. of pre-crisis GDP, due to the stronger decrease in imports compared with exports. We find similar results for currency crises for the years 1-4 after the crises hit. However, currency crises are not found to significantly affect the trade balance the year 5 after their burst. Indeed, countries following crises will tend to reduce significantly imports than exports to restore or maintain their external viability.

Summing up, at the aggregated level we find that financial crises reduce both the exports and imports of countries over five years, consistent with previous empirical findings. Nevertheless, while some studies, see e.g. Abiad et al. (2014) and Kuvshinov and Zimmermann (2019), find no effect of debt and banking crises on exports, we reveal that exports sharply decline following these financial crises in line with Ma and Cheng (2005) and Asonuma et al. (2016). Conversely to Ma and Cheng (2005), we find that currency crises also decrease exports, showing that the volume effect stemming from a gain of competitiveness due to the local currency depreciation does not suffice to overcome the negative price effect. Besides, currency crises tend to be associated with sudden stops in capital inflows which are necessary to trade (see, Bordo 2006; Reinhart and Rogoff 2009; Mendoza 2010). Finally, there are several differences between crises: (i) banking crises exert the highest negative effect on both exports and imports, (ii) debt and banking crises induce a higher reduction in imports than exports, which increases the trade balance; (iii) currency crises have comparable costs on exports and imports in the year 5 after they occur. Keeping these results in mind as a benchmark, we now look at the effects of financial crises at a more disaggregated level.

2.4.3 The sectoral trade costs of financial crises

We now look at the costs of financial crises on the trade of agricultural, mining, and manufactured goods, and services. As detailed in the introduction, this is, as far as we are aware, the first analysis that disentangles the aggregate trade costs of financial crises on all categories of goods and services traded. The estimated cumulative ATE over five years for exports and imports are reported in table A.7, and Panel I and II of fig. 2.5 provide a graphical illustration, respectively.[16]

Figure 2.5: Cumulative trade costs over five years after financial crises, total and sectoral level



Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

2.4.3.1 Agricultural trade

We find that both exports and imports of agricultural goods are the least affected by financial crises. Countries that experience debt crises present larger exports of agricultural goods by

[16] To simplify the exposition, we focus more on the cumulated costs over five years (the dynamics of the costs from the onset of the financial crises until five years ahead are also presented).

2.2 pp. of pre-crisis GDP over five years, compared with countries unaffected by crises. In contrast, exports of agricultural goods are left unchanged in the aftermath of currency crises or significantly decrease by 1.5 pp. over five years after the banking crises. Regarding agricultural imports, they are significantly reduced by between 0.6 and 1.5 pp. for all types of crises. These findings suggest that trade in agricultural goods exhibits greater resilience during financial crises and can even intensify, which may signal a substitution effect in favor of agricultural goods. Such an effect may be supported by the relatively lower income elasticity of demand for agricultural goods, which may equally require less external financing to be produced and traded.

2.4.3.2 Mining trade

We reveal that, except for the positive effects of debt crises, the other financial crises significantly reduce the exports of mining goods. Indeed, five years after debt crises, exports of mining goods increase by 1.1 pp. of pre-crisis GDP. In the aftermath of banking and currency crises, exports of mining goods decrease both on impact and over the five years to reach a collapse of 1.6 pp. and 2.9 pp., respectively. After all types of crises hit the emerging countries, imports of mining goods over five years are also significantly reduced by 1.9 pp. for debt crises and 3 pp. for both banking and currency crises. Overall, the collapse of mining goods in the aftermath of financial crises is higher than the one of agriculture goods and sometimes lower sometimes higher than the one of trade in services, but more often largely lower than the collapse of the trade in manufactured goods.

2.4.3.3 Manufacturing trade

Our results point to a systematic and large reduction of the trade in manufactured goods in the aftermath of financial crises. The costs of financial crises on manufacturing exports are fairly important over five years and correspond to 6.1, 4 and 2.3 pp. of pre-crisis GDP for debt, currency, and banking crises, respectively. They are even higher for imports and equal to 4.6, 5.4, and 7 pp. for currency, debt, and banking crises, respectively. Besides, we note that except for the effects of banking crises on manufacturing exports, the collapse of manufactured trade contributes the most to the total drop of international trade in the aftermath of financial crises in emerging countries. These contributions equal to 107, 51, and 26% of the total collapse of exports for debt, currency, and banking crises, respectively, and around 50% of the total collapse of imports for all types of crises. Moreover, as manufacturing imports fall more than manufacturing exports, the adverse effects of financial crises on the trade in manufactured goods are driven by the increase in overall trade balance highlighted for debt and banking crises. These findings are consistent with previous micro-level studies using data of manufacturing

industries, including Iacovone and Zavaka (2009); Amiti and Weinstein (2011); Minetti and Zhu (2011); Chor and Manova (2012); Manova (2013); Zymek (2012) on the disruption channel, and Levchenko et al. (2010); Bricongne et al. (2012); Behrens et al. (2013); Eaton et al. (2016) on the income channel. However, despite revealing large effects of the occurrence of financial crises, the analysis of the trade of manufactured goods leaves unexplained a fairly large proportion of the trade costs at the aggregated level.

2.4.3.4 Services trade

Finally, similar to manufacturing trade, services trade is significantly reduced by all types of financial crises. We find that the trade costs of financial crises on trade in services are larger for exports and following banking crises; the costs reach 3.5 pp. of pre-crisis GDP over five years, which represents a contribution of 39% of the total export collapse. Also, exports are contracted in the aftermath of debt and currency crises by 2.9 and 0.9 pp. over five years. We find similar patterns for imports of services that are reduced by 2.6 pp. over five years following debt and banking crises and 0.9 pp. following currency crises. Therefore, compared with studies that focus on the trade of services following the global financial crises of 2008-09 (see e.g. Borchert and Mattoo 2010; Ariu 2016), we find that trade in services may also decline during crises. However, the trade of services presents a greater resilience compared with the trade of manufactured goods, except in the aftermath of banking crises, in line with the arguments of lower-income elasticity of demand and lower external financial dependence.

To summarize, our sectoral analysis reveals that manufactured traded goods are the most affected in terms of magnitude in the aftermath of financial crises. However, the impact of financial crises on the other types of traded goods and services is far from being negligible. Trade in both mining goods and services also declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. In the following sections, we present the robustness of our findings before moving to explain the channels by which financial crises exert a negative effect on total and sectoral trade costs.

2.5 Robustness

We further investigate the robustness of our findings using a wide variety of alternative samples, maximum weights in the treatment models, sources and definitions of crises, and specifications.

2.5.1 Alternative samples

2.5.1.1 The trade costs of combined financial crises

The analysis performed so far focused on the effect of each financial crisis when controlling for the other types of crises in the prediction of the potential outcome and the computation of propensity scores. Given that financial crises seem to be connected (see the previous section), we now look at the trade effects of both combined and non-combined crises. Following Glick and Hutchison (2001) and Hutchison and Noy (2005), we define a combined crisis as a crisis occurring in a two-year band around a financial crisis of another type, i.e. a combined crisis occurs at time t if another type of crisis occurs in any of the years spanning between $t-2$ and $t+2$. Similarly, a non-combined crisis is a crisis that occurs without any other crises in the years around. The results reported in table A.8 and fig. A.3 show that combined financial crises trigger more significant and of a higher magnitude aggregated and sectoral trade costs, except for imports following debt crises. Also, as shown by table A.9 and fig. A.4, the total and sectoral trade costs of non-combined financial crises are quite lower (more for exports than imports), except for imports following debt crises. Consequently, combined crises unveil more severe trade costs than non-combined crises, and studies that focus exclusively on a type of crisis without controlling for others may suffer from an overestimated bias. Finally, our benchmark findings are robust regardless of the trade costs of combined financial crises or not.

2.5.1.2 Drop the post-GFC period

We drop the post-GFC period (2008 onwards), given the collapse in international trade. The results are reported in table A.10 and fig. A.5. Removing this period leads to both qualitatively and quantitatively similar results for the total and sectoral export costs of banking crises and currency crises while the costs of debt crises are significantly reduced. Besides, while qualitatively the same, the trade costs of financial crises on total and sectoral imports have a lower magnitude.

2.5.2 Alternative maximum weights set in the treatment models

Compared to the maximum weight of 10 for our treated and control groups used in the benchmark model, we now use a maximum weight of 20 in table A.11 and fig. A.6 and 5 in table A.12 and fig. A.7. The choice of lower weights reduces the influence of country-year observations in the treated (control) group that receive a low (high) likelihood of financial crises. The results confirm the robustness of the significance and the size of the effect of financial crises on total and sectoral trade. Besides, the use of a maximum weight of 5 leads to both qualitatively and

quantitatively similar results as in our benchmark findings. In contrast, the use of a maximum weight of 20 is associated with a somewhat lower magnitude of the trade costs for some types of goods and financial crises. Overall, our main findings are robust to the choice of alternative maximum as recommended by Imbens (2004) and Cole and Hernán (2008).

2.5.3 Alternative sources and definitions of crises

We consider alternative sources and definitions of financial crises. Following Cruces and Trebesch (2013), debt crises now exclusively capture preemptive and post-default debt restructurings with private creditors (i.e. we drop restructurings with official creditors). Banking crises have the same definition but now come from the dataset of Reinhart and Rogoff (2009) (instead of Laeven and Valencia, 2018). Currency crises are redefined based on Reinhart and Rogoff (2009), namely by at least a 20% nominal depreciation of the local currency against the US dollar. Based on these new sources and definitions, we study 41 debt crises, 44 banking crises, and 69 currency crises compared to 38 debt crises, 34 banking crises, and 36 currency crises in the benchmark model. The results are reported in table A.13 and fig. A.8. They generally confirm the robustness of our findings, even if sometimes the trade costs of financial crises are lower in magnitude, especially for total and sectoral imports following debt and currency crises.

2.5.4 ATE-IPW estimator

Compared with our benchmark analysis that draws upon the Augmented Inverse Propensity Weighted (AIPW) estimator, we use the Inverse Propensity Weighted (IPW) estimator that is more popular in the existing literature. The results are presented in table A.14 and fig. A.9. They are like our benchmark findings but highlight a lower magnitude in the total and sectoral trade costs of financial crises, especially for imports.

As previously emphasized, our results are confirmed by several robustness tests. In the next section, we analyze the channels by which financial crises exert a negative effect on trade.

2.6 Channels

The existing literature on the channels by which financial crises impact international trade can be summarized into demand-side and supply-side factors. First, the demand-side argument sustains that the fall in income following crises hurts the demand of traded goods and services, especially in the aftermath of GFC (see, e.g. Freund 2009; Levchenko et al. 2010; Bems et al. 2011; Bricongne et al. 2012; Behrens et al. 2013; Eaton et al. 2016; Abiad et al. 2014; Altomonte et al. 2014; Ariu 2016). In this case, financial crises will differently affect the trade of agricultural,

mining, manufactured goods, and services, given their different income elasticity and degree of vertical linkages through global value chains. This channel may be pronounced for imports and during times of generalized financial turmoil. Second, the supply-side argument suggests that financial crises are associated with significant reductions in the availability of external and trade finance (see, e.g. Iacovone and Zavaka 2009; Amiti and Weinstein 2011; Minetti and Zhu 2011; Chor and Manova 2012; Manova 2013; Zymek 2012). Consequently, financial crises will exert different costs on the types of traded goods and services, given their different external financial needs. Overall, we believe that the two traditional channels can be supplemented by a third channel, namely the compositional and structural effect of financial crises on trade. We follow Beck (2002) and the standard assumption in international trade theory to assume that unlike agricultural and mining goods, manufactured goods exhibit increasing returns to scale. Moreover, these products are relatively more credit intensive, vertically integrated into global value chains and their income elasticity is also higher, making them particularly more vulnerable to financial crises. Similarly, as shown by Miroudot et al. (2009), trade in services are mainly intermediate inputs. They may also require higher external finance compared to primary goods; therefore, they may also suffer more from financial crises.

To assess the potential role of the different channels in shaping the trade costs of financial crises, we split our initial dummies of financial crises in two identical parts along with these variables used as proxies for the channels. We use the median of these variables at the start of each financial crisis to have enough number of observations for both groups. First, we proxy the compositional and structural channel by the share of manufactured exports in total exports, export diversification index, and trading partners diversification index the year before the crises. Second, we proxy the demand-side channel by the evolution of trading partners' growth rate over the five years following crises. Third, we proxy the supply-side channel by the evolution of financial development, gross capital inflows, and investors credit rating risks over the five years following crises.[17] The evolution of the variable x over the five years following financial crises is computed as

$$x_{t+5,t-1} = \frac{1}{5}\sum_{n=0}^{5}(x_{t+n} - x_{t+1}) \tag{2.5}$$

As in the benchmark model, we estimate treatment models for the likelihood of financial crises as well as the outcome models for the financial crises identified above or below the median of the channel variables, separately. After that, we compute the ATE-AIPW estimates of the

[17] Therefore, we can identify financial crises with and without a higher share of manufacturing exports, export diversification, trading partners diversification for the compositional and structural channel; financial crises with or without a higher trading partners' growth for the demand-side channel; financial crises with or without a higher increase of financial development, gross capital inflows, and investors' credit rating risks for the supply-side channel.

effects of financial identified above or below the median of the channel variables. For simplicity, our interpretations focus on the 5-year cumulated effects of financial crises, although we present the dynamics of the trade costs over five years.

2.6.1 The Compositional and structural channel

As previously indicated, we first analyze the costs of financial crises in countries with a higher and lower share of manufacturing exports the year before the beginning of crises. This allows us to capture the differentiated effects of financial crises in countries with different export structure. Indeed, given the previous discussion, we expect a higher adverse effect of financial crises on total and manufacturing trade (both exports and imports) in countries that predominantly export manufactured goods compared to primary goods and services. The results are reported in fig. A.10 and tables A.15a to A.15c. We find that both total, manufacturing, and services exports and imports fall more following crises in countries with a lower share of manufacturing exports. The trade of agricultural and mining goods highlights similar patterns for the two groups of countries. Consequently, countries with a higher share of manufacturing exports are more resilient to financial crises. Financial crises act as an impediment to structural transformation for countries reliant on primary goods and reinforce their comparative advantage in primary goods by disrupting more their manufacturing and services trade structure. Besides, our benchmark results, namely a total trade collapse driven by the fall of manufacturing and services trade, remain valid.

Second, we investigate the role of export diversification in shaping the trade costs of financial crises. We, therefore, create two groups of financial crises with higher and lower export diversification the year before crises. The results are presented in fig. A.11 and tables A.16a to A.16c. We find that financial crises generally lead to higher contraction of total, manufacturing, and services trade in countries with lower export diversification. These contractions are largely driven by the fall of manufacturing trade, except for exports following banking crises. Therefore, countries with a more diversified export structure will suffer less from financial crises.

Third, we study the effects of financial crises in countries with higher and lower trading partners diversification the year before crises. By doing so, we check whether having a diversified number of trading partners' help to alleviate the trade costs of financial crises. The results are shown in fig. A.12 and tables A.17a to A.17c. Except for the collapse of trade that exhibits similar trend in our two groups following banking crises, we reveal that countries with a higher diversified number of trading partners experience a lower adverse collapse of their trade in the aftermath of debt and currency crises, compared to countries trading with a smaller fraction of countries. Consequently, diversifying its partners may help to significantly reduce the trade

costs of financial crises. Finally, as previously stated, the fall of the manufacturing and services trade is leading the total trade collapse following debt and currency crises, and banking crises, respectively.

Overall, the proxy variables show that the composition of trade, its diversification in terms of exported products, and trading partners matter for the costs of financial crises on trade. We find that trade is more reduced in countries with a lower share of manufacturing exports, diversified exported products, and trading partners. These findings sustain that financial crises may act as an impediment to structural transformation as they hurt more manufacturing exports in countries where the share of manufacturing exports is relatively lower. Besides, by diversifying their exports and partners, countries will increase their resilience to financial crises.

2.6.2 The demand-side channel

We explore the demand-side channel using as a proxy the trading partners' growth. We identify two sets of financial crises with stronger and lower trading partners' growth in their aftermath and study their effects on total and sectoral trade costs, respectively. We expect higher trading partners' growth to be negatively associated with the collapse of both exports and imports (as the contraction of income may be lower in this case). We report the results in fig. A.13 and tables A.18a to A.18c. Not surprisingly, we find that financial crises when associated with higher trading partners' growth have either a milder or no adverse effect on international trade, except for banking crises. This is remarkable following debt crises for which no effect is found for both exports and imports because of a large increase of agriculture and mining exports which overcome the collapse of manufacturing and services trade, and a small fall of agriculture and services imports which is balanced by the small increase of mining imports. In the aftermath of currency crises, the higher collapse of exports and imports in countries with lower trading partners' growth is driven by the fall of all types of goods and services, mainly manufacturing and mining goods, expect for agriculture exports. In contrast, we find that banking crises lead to similar or slightly higher trade costs when associated with higher trading partners' growth.

In sum, these findings show that financial crises associated with lower demand for goods and services from trading partners will have more adverse trade costs; therefore can generate an unprecedented collapse of international trade when they are generalized within regions and at the global level as witnessed in the post-GFC period.

2.6.3 The supply-side channel

We complete our investigation of the channels by which financial crises exert a negative cost on international trade with the supply-side channel which is related to the availability of external

financing that more needed during periods of financial turmoil. We first explore the supply-side or credit channel using the evolution of financial development in the aftermath of financial crises. We create two types of financial crises with and without a higher increase in financial development and analyze their trade costs. The results are presented in fig. A.14 and tables A.19a to A.19c. Our results suggest that the evolution of financial development in the aftermath of financial crises matter for the total and sectoral trade costs of financial crises. We find that all types of financial crises associated with a lower increase or a contraction of financial development lead to a significant decline of trade compared to financial crises with expanding financial development. These findings reinforce the idea that financial crises drive the collapse of trade because of their disruptive effects on the monetary and financial sector.

Second, aside from domestic financial development, international trade also depends on the ability to issue external or trade credit from other countries or having new foreign direct investments. In addition, financial crises are very often associated with sudden stops or capital reversals (see, e.g. Bordo 2006; Reinhart and Rogoff 2009; Mendoza 2010). We, therefore, analyze the role played by the evolution of gross capital inflows in shaping the dynamics of the trade costs of financial crises. The results are shown in fig. A.15 and tables A.20a to A.20c. As expected, all types of financial crises associated with a large reduction of gross capital inflows generate a significant collapse of both total and all sectoral trade compared to crises with milder reduction or increase in gross capital inflows where the collapse is milder. This collapse of trade is driven by the fall of manufacturing exports for debt and currency crises, service exports for banking crises, and manufacturing imports for all crises. This shows that the supply-side channel is quite important when analyzing the trade costs of financial crises, particularly for the manufacturing and services trade.

Finally, we assess the role of financial crises using the evolution of investors' credit ratings risks as a proxy of the international financial conditions and costs of borrowing. We present the results in fig. A.16 and tables A.20a to A.20c. As for financial development and gross capital inflows, we reveal that financial crises when associated with a higher deterioration of investors' sentiment generally lead to a significant and detrimental collapse of total and sectoral trade, compared to crises with a somewhat lower reduction or increase in investors' credit ratings risks where sometimes no effect or milder trade contraction is found. This higher collapse is mainly driven by the fall of the manufacturing and services trade. This shows that deterioration of investors' or market sentiment in the aftermath of financial crises, and therefore, the supply-side channel, is one of the key reasons why financial crises are associated with trade collapse.

Overall, these findings support the idea that the supply-side channel is critical to understand the way financial crises shape the dynamics of international trade. When associated with a deterioration of the domestic financial development and external financial conditions, and

sudden stops, financial crises will exert a significant and detrimental collapse on international trade, which is mainly driven by the fall of manufacturing and services trade. Our paper contributes to the existing literature on the trade costs of financial crises by highlighting the differentiated sectoral trade costs of crises and their channels while focusing on the context of emerging countries.

2.7 Concluding remarks

This paper assesses the sectoral trade costs of financial crises. Compared with the existing literature that mainly focuses on the total trade of goods and, in the context of the recent great recession, on manufacturing trade, we look at the response of different types of trade (i.e. agricultural, mining, and manufactured goods, and services) following various types of financial crises (i.e. debt, banking, and currency crises). To this end, we draw upon a methodology that combines impact assessment and local projections to capture a causal dynamic effect running from financial crises to the trade activity. We also analyze the channels by which financial crises impact international trade by looking at the compositional and structural, demand-side, and supply-side channels.

While we confirm that aggregate exports and imports significantly decrease following most financial crises, our analysis reveals interesting patterns at the disaggregated level. Manufacturing goods are the most affected by financial crises. However, the impact of financial crises on the other types of traded goods and especially on services is far from being negligible. Trade in both mining goods and services also declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. When looking at the costs of combined crises, we find that they exert a significant and higher decline of trade, compared to crises occurring without any other crisis in the years around. These findings are robust to a wide variety of alternative samples, maximum weights in the treatment models, sources and definitions of crises, and estimators.

Besides, we find that financial crises exert an adverse effect on total and sectoral trade through compositional and structural, demand-side, and supply-side channels. In detail, about the compositional and structural channel, our findings sustain that financial crises may act as an impediment of structural transformation as they hurt more manufacturing exports in countries where the share of manufacturing exports is relatively lower. Also, by diversifying their exports and partners, countries will increase their resilience to financial crises. Moreover, about the demand-side channel, our findings show that financial crises associated with a lower demand of goods and services from trading partners will have more adverse trade costs; therefore they can generate an unprecedented collapse of international trade when they are generalized within

regions and at the global level as witnessed in the post-GFC period. Finally, our findings support the idea that the supply-side channel is critical to understand the way financial crises shape the dynamics of international trade. When associated with a deterioration of the domestic financial development and external financial conditions, and sudden stops, financial crises will exert a significant and detrimental collapse on international trade, which is mainly driven by the fall of manufacturing and services trade.

Consequently, our paper unveils the panorama of the trade costs of financial crises. Through illustrating the differentiated effects of various financial crises on sectoral and total international trade and by investigating the channels, our analysis contributes to the general understanding of the trade effects of financial crises in emerging countries and provides insightful support for the design and implementation of policies aimed at coping with these effects.

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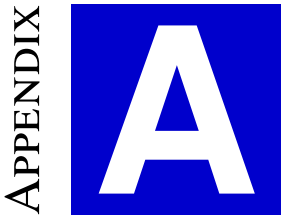
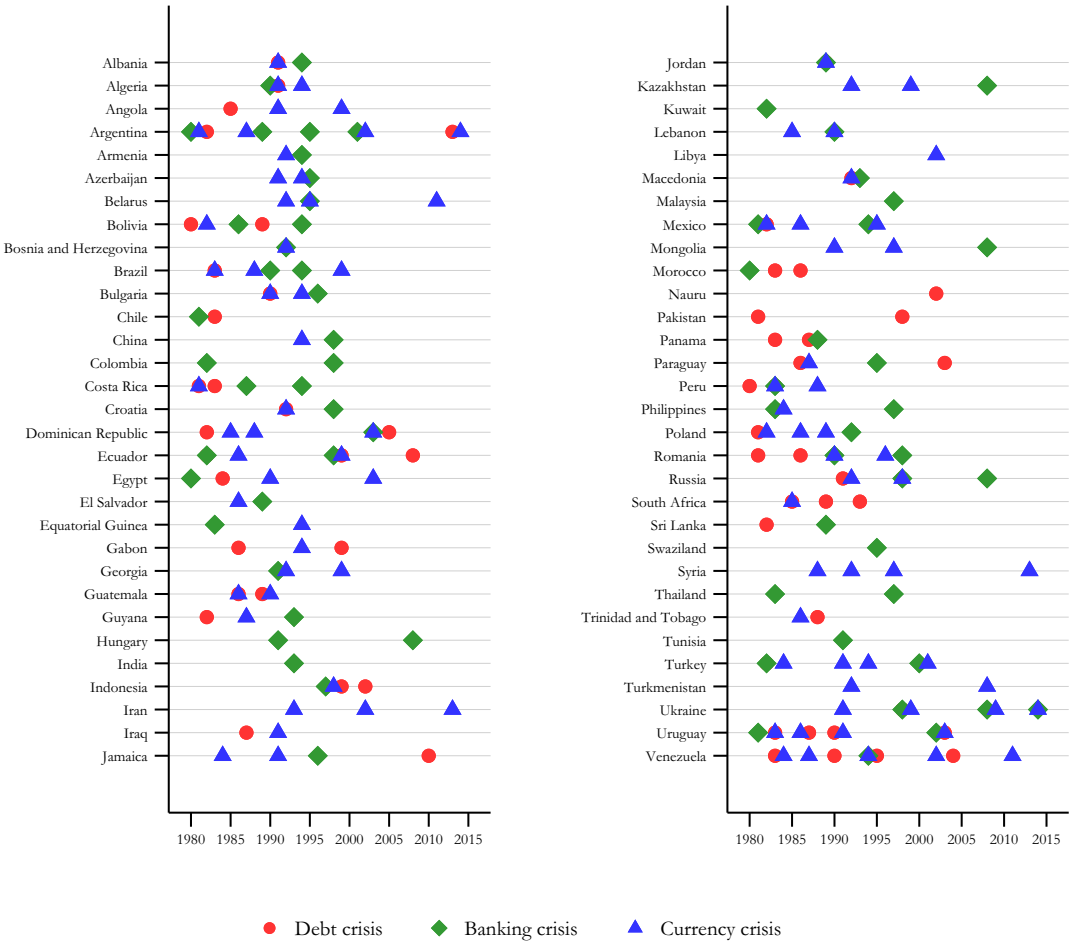


APPENDIX TO CHAPTER 2

A.1 Sample, variables descriptions and sources

A.1.1 Financial crises since 1980 in all emerging countries

Figure A.1: Sample of countries and the starting date of the various financial crises since 1980



Notes : The graph reports the starting date of the various crises since 1980 in all emerging countries

A.1.2 List of countries included in regressions analyses

Albania, Algeria, Argentina, Armenia, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, Arab Rep., Gabon, Georgia, Guatemala, Hungary, India, Indonesia, Jamaica, Jordan, Lebanon, Mexico, Morocco, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, Ukraine, Uruguay, Venezuela.

A.1.3 Data description and sources

Table A.1: Data sources and descriptions

Variables	Sources
Trade variables	
International trade in goods (agricultural, mining and manufactured goods)	World Integrated Trade Solution (WITS) code at 3-digit SITC classification
International trade in services	United Nations Conference on Trade and Development (UNCTAD)
Cumulative change of trade variables from the onset of financial crises to years 1-5 after crises, scaled by pre-crisis GDP	Authors' calculation based in WITS and UNCTAD
Financial crises	
Debt crises	Reinhart and Rogoff (2009) and Cruces and Trebesch (2013)
Banking crises	Laeven and Valencia (2018) and Reinhart and Rogoff (2009)
Currency crises	Authors' calculation based on exchange rate taken from Penn World Tables 9.0 and Bruegel datasets, and using the definition in Frankel and Rose (1996) and Reinhart and Rogoff (2009)
Other variables	
Intensity of conflicts	Major episodes of political violence (MEPV)
Log of real GDP	World Development Indicators
Log. of public debt to GDP	Global Debt Database of the IMF (Mbaye et al. (2018))
Log. of domestic credit to GDP	World Economic Outlook, IMF, and World Development Indicators, WB
Log. of liquid liabilities to GDP	Beck and Demirguc-Kunt (2009)
Net capital inflows to GDP	Authors' calculations based on the Balance of Payments and International Investment Position dataset from the IMF
Gross Capital inflows (% of GDP)	Authors' calculations based on the Balance of Payments and International Investment Position dataset from the IMF
Log. of foreign reserves to GDP	World Economic Outlook, IMF, and World Development Indicators, WB
Current account to GDP	World Economic Outlook, IMF, and World Development Indicators, WB
Financial openness index	Chinn and Ito (2008)
Log of trade openness to GDP	World Development Indicators
Terms of trade growth	Penn World Tables 9.1
Floating exchange rate regime	Authors' calculation based on Ilzetzki et al. (2017)
Government accountability index	Varieties of Democracy (V-Dem) project
Corruption index	Varieties of Democracy (V-Dem) project
Trading partners' growth	Global Economic Environment, IMF
US interest rate on gov.'s debt securities	Bank of International Settlements
Exports diversification index	Export Diversification and Quality database, IMF
Trading partners diversification index	Export Diversification and Quality database, IMF
Financial development index	Financial development index from IMF
Investors' credit ratings risks	Country Credit Ratings from the IMF

A.2 Summary statistics

Table A.2: Summary statistics for major variables

	Obs.	Mean	Sd	Min	Max
Cumulative change of total exports over 5 years (% of pre-crisis GDP)	766	19.690	20.795	-18.277	124.255
Cumulative change of agricultural mining exports over 5 years (% of pre-crisis GDP)	766	2.646	3.923	-2.543	44.719
Cumulative change of mining exports over 5 years (% of pre-crisis GDP)	766	3.291	8.324	-18.363	72.770
Cumulative change of manufacturing exports over 5 years (% of pre-crisis GDP)	766	8.362	13.009	-11.702	94.118
Cumulative change of services exports over 5 years (% of pre-crisis GDP)	766	5.392	7.282	-9.869	49.547
Cumulative change of imports over 5 years (% of pre-crisis GDP)	766	23.338	27.805	-20.333	179.063
Cumulative change of agricultural mining imports over 5 years (% of pre-crisis GDP)	766	2.228	3.039	-4.678	25.207
Cumulative change of mining imports over 5 years (% of pre-crisis GDP)	766	3.819	5.958	-10.939	34.175
Cumulative change of manufacturing imports over 5 years (% of pre-crisis GDP)	766	13.219	16.641	-20.028	102.713
Cumulative change of services imports over 5 years (% of pre-crisis GDP)	766	4.072	5.516	-4.676	40.976
Share of agricultural exports (% of total exports)	766	19.128	15.711	0.160	71.509
Share of mining exports (% of total exports)	766	17.572	21.172	0.001	95.987
Share of manufacturing exports (% of total exports)	766	34.545	21.392	0.306	86.902
Share of services exports (% of total exports)	766	28.755	19.331	2.558	90.934
Share of agricultural imports (% of total imports)	766	10.474	4.338	2.797	30.705
Share of mining imports (% of total imports)	766	13.775	7.875	0.804	46.405
Share of manufacturing imports (% of total imports)	766	55.141	10.704	26.701	80.015
Share of services imports (% of total imports)	766	20.610	7.227	5.017	49.055
1 if Debt crises at start	766	0.052	0.223	0.000	1.000
1 if Banking crises at start	766	0.048	0.215	0.000	1.000
1 if Currency crises at start	766	0.050	0.217	0.000	1.000
Intensity of conflicts	766	1.219	2.227	0.000	10.000
Log of real GDP	766	7.212	3.687	-8.147	15.742
Log. of public debt to GDP	765	3.661	0.696	0.991	5.355
Log. of domestic credit to GDP	757	3.484	0.653	1.380	5.076
Log. of liquid liabilities to GDP	760	3.635	0.573	1.687	5.482
Net capital inflows to GDP	745	2.531	5.075	-22.404	24.586
Log. of foreign reserves to GDP	766	2.201	0.863	-1.138	4.677
Current account to GDP	766	-2.588	5.050	-29.363	22.671
Financial openness index	765	0.469	0.336	0.000	1.000
Log of trade openness to GDP	766	4.021	0.493	2.446	5.116
Terms of trade growth (%)	766	0.005	0.053	-0.323	0.360
Floating exchange rate regime	766	0.110	0.313	0.000	1.000
Government accountability index	766	0.647	0.827	-1.529	1.986
Corruption index	766	-0.589	0.250	-0.960	-0.037
Trading partners' growth (%)	751	3.607	2.034	-4.810	13.262
US interest rate on gov.'s debt securities (%)	766	4.847	4.159	0.125	22.000
Exports diversification index	728	2.840	0.793	1.498	5.558
Trading partners diversification index	728	2.657	0.550	1.651	4.614
Financial development index	766	0.279	0.121	0.061	0.632
Investors' credit ratings risks	761	42.797	14.103	7.650	81.050

A.3 Balance and overlap checks

A.3.1 Balance Checks

Table A.3: Balance diagnostics between the treated and control groups, Debt crises

	(1) Non weighted				(2) Weighted							
					(21) Covariate Balancing propensity score				(22) Pooled probit			
Variables	**Treated**	**Control**	**Std. mean**	**Var. ratio**	**Treated**	**Control**	**Std. mean**	**Var. ratio**	**Treated**	**Control**	**Std. mean**	**Var. ratio**
# of Banking crises over past-5 years (t-5,t)	0.316	0.147	0.405	1.767	0.211	0.211	0.000	1.026	0.238	0.156	0.205	1.413
# of Currency crises over past-5 years (t-5,t)	0.474	0.148	0.687	2.245	0.247	0.247	0.000	0.944	0.320	0.167	0.337	1.671
Intensity of conflicts (t-1)	0.816	1.251	-0.219	0.533	1.161	1.161	0.000	1.042	1.109	1.232	-0.059	0.732
Log of Real GDP per capita (t-1)	5.490	7.356	-0.427	1.994	6.388	6.388	0.000	3.001	6.418	7.233	-0.174	2.484
Log. of public debt to GDP (t-1)	3.985	3.657	0.507	0.785	3.832	3.832	0.000	0.760	3.823	3.678	0.236	0.591
Log. of domestic credit to GDP (t-1)	3.308	3.486	-0.297	0.634	3.326	3.326	0.000	0.673	3.251	3.472	-0.384	0.509
Log. of liquid liabilities to GDP (t-1)	3.361	3.655	-0.517	0.968	3.470	3.470	0.000	0.604	3.417	3.637	-0.440	0.497
Net capital inflows to GDP (t-1)	3.733	2.443	0.247	1.120	3.788	3.789	0.000	1.272	2.516	2.544	-0.005	1.075
Log. of foreign reserves to GDP (t-1)	1.269	2.276	-1.147	1.294	1.747	1.747	0.000	0.508	1.675	2.211	-0.642	0.893
Current account to GDP (t-1)	-3.434	-2.426	-0.192	1.250	-3.585	-3.585	0.000	1.479	-2.305	-2.512	0.040	1.207
Financial openness index (t-1)	0.392	0.480	-0.257	1.097	0.440	0.440	0.000	1.067	0.517	0.474	0.124	1.096
Log of trade openness to GDP (t-1)	3.885	4.031	-0.283	1.237	3.980	3.980	0.000	0.635	3.849	4.024	-0.357	0.931
Terms of trade growth (t-1)	0.009	0.005	0.069	2.131	0.016	0.016	0.000	0.516	0.013	0.006	0.136	1.023
Floating exchange rate regime (t-1)	0.395	0.091	0.751	2.969	0.269	0.269	0.000	1.026	0.225	0.111	0.305	1.807
Government accountability index	0.379	0.683	-0.338	1.499	0.381	0.381	0.000	1.354	0.630	0.655	-0.029	1.295
Corruption index	-0.593	-0.589	-0.016	1.170	-0.632	-0.632	0.000	1.041	-0.637	-0.591	-0.187	0.903
Trading partners' growth (t-1)	2.761	3.702	-0.496	0.799	3.153	3.153	0.000	0.924	3.338	3.633	-0.158	0.717
US interest rate on gov.'s securities (t-1)	8.409	4.442	0.916	1.570	7.299	7.299	0.000	0.435	6.878	4.786	0.501	0.908

Notes: About the cutpoint on the absolute value of the standardized difference to define imbalance, Rubin (2002) suggests a cut-off of 0.25. As such, if the absolute value of the standardized difference for a variable is higher than 0.25, then there is a significant difference between the treated and control group for this variable. Moreover, Rubin (2002) proposes the use of the ratio of treated and control variances as a balance measure of the second moment, where balance is defined by values close to 1.0 and variables are out of balance if the variance ratio is greater than 2.0 or less than 0.5. The CBPS model eliminates all the differences in characteristics between treated and control groups, which is less the case for the pooled probit model.

Table A.4: Balance diagnostics between the treated and control groups, Banking crises

	Banking crises											
	(1) Non weighted				(2) Weighted							
					(21) Covariate Balancing propensity score				(22) Pooled probit			
Variables	**Treated**	**Control**	**Std. mean**	**Var. ratio**	**Treated**	**Control**	**Std. mean**	**Var. ratio**	**Treated**	**Control**	**Std. mean**	**Var. ratio**
# of Debt crises over past-5 years (t-5,t)	0.147	0.149	-0.005	1.266	0.154	0.154	0.000	1.431	0.173	0.149	0.051	1.778
# of Currency crises over past-5 years (t-5,t)	0.206	0.163	0.106	1.114	0.161	0.161	0.000	0.943	0.210	0.166	0.109	1.118
Intensity of conflicts (t-1)	1.353	1.222	0.053	1.471	1.184	1.184	0.000	1.593	1.142	1.230	-0.036	1.379
Log of Real GDP per capita (t-1)	6.890	7.277	-0.099	1.258	7.238	7.238	0.000	1.708	7.286	7.259	0.007	1.268
Log. of public debt to GDP (t-1)	3.551	3.680	-0.161	1.835	3.582	3.582	0.000	1.087	3.668	3.673	-0.007	1.434
Log. of domestic credit to GDP (t-1)	3.617	3.470	0.235	0.818	3.546	3.546	0.000	0.515	3.554	3.477	0.131	0.598
Log. of liquid liabilities to GDP (t-1)	3.438	3.650	-0.374	0.933	3.592	3.592	0.000	0.469	3.583	3.639	-0.112	0.516
Net capital inflows to GDP (t-1)	3.389	2.467	0.198	0.646	2.583	2.584	0.000	0.638	2.402	2.514	-0.023	0.798
Log. of foreign reserves to GDP (t-1)	1.809	2.244	-0.503	1.073	2.136	2.136	0.000	0.779	2.050	2.222	-0.198	1.039
Current account to GDP (t-1)	-3.308	-2.438	-0.191	0.640	-2.473	-2.474	0.000	0.625	-2.259	-2.485	0.048	0.759
Financial openness index (t-1)	0.367	0.480	-0.347	0.911	0.483	0.483	0.000	1.038	0.482	0.475	0.021	1.089
Log of trade openness to GDP (t-1)	3.822	4.033	-0.372	1.768	4.009	4.009	0.000	1.623	4.057	4.023	0.059	1.755
Terms of trade growth (t-1)	0.013	0.005	0.181	0.539	0.010	0.010	0.000	0.517	0.009	0.005	0.073	0.461
Floating exchange rate regime (t-1)	0.176	0.103	0.211	1.616	0.115	0.115	0.000	1.029	0.110	0.107	0.010	1.056
Government accountability index	0.537	0.673	-0.157	1.287	0.713	0.713	0.000	1.010	0.713	0.666	0.056	1.132
Corruption index	-0.581	-0.589	0.035	0.914	-0.553	-0.553	0.000	1.161	-0.524	-0.588	0.235	1.327
Trading partners' growth (t-1)	4.225	3.625	0.356	0.384	3.984	3.984	0.000	0.357	3.983	3.655	0.191	0.446
US interest rate on gov.'s securities (t-1)	6.973	4.535	0.567	1.434	4.984	4.984	0.000	0.312	5.393	4.669	0.204	0.521

Notes: About the cutpoint on the absolute value of the standardized difference to define imbalance, Rubin (2002) suggests a cut-off of 0.25. As such, if the absolute value of the standardized difference for a variable is higher than 0.25, then there is a significant difference between the treated and control group for this variable. Moreover, Rubin (2002) proposes the use of the ratio of treated and control variances as a balance measure of the second moment, where balance is defined by values close to 1.0 and variables are out of balance if the variance ratio is greater than 2.0 or less than 0.5. The CBPS model eliminates all the differences in characteristics between treated and control groups, which is less the case for the pooled probit model.

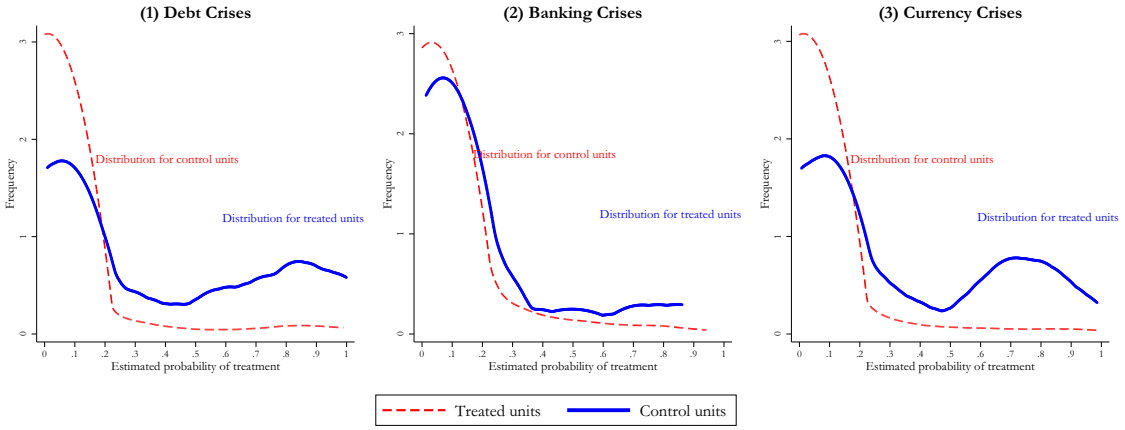
Table A.5: Balance diagnostics between the treated and control groups, Currency crises

	Currency crises											
	(1) Non weighted				(2) Weighted							
					(21) Covariate Balancing propensity score				(22) Pooled probit			
Variables	Treated	Control	Std. mean	Var. ratio	Treated	Control	Std. mean	Var. ratio	Treated	Control	Std. mean	Var. ratio
# of Debt crises over past-5 years (t-5,t)	0.500	0.131	0.735	2.773	0.220	0.220	0.000	1.231	0.212	0.148	0.152	1.399
# of Banking crises over past-5 years (t-5,t)	0.472	0.139	0.767	2.134	0.327	0.327	0.000	1.027	0.264	0.162	0.248	1.468
Intensity of conflicts (t-1)	0.944	1.243	-0.149	0.554	0.994	0.994	0.000	0.653	0.509	1.219	-0.394	0.297
Log of Real GDP per capita (t-1)	5.308	7.360	-0.490	1.707	6.914	6.915	0.000	1.319	7.130	7.262	-0.035	1.174
Log. of public debt to GDP (t-1)	3.749	3.670	0.114	1.039	3.764	3.764	0.000	1.276	3.983	3.678	0.427	1.167
Log. of domestic credit to GDP (t-1)	3.374	3.482	-0.167	0.913	3.474	3.474	0.000	1.125	3.603	3.477	0.197	0.872
Log. of liquid liabilities to GDP (t-1)	3.432	3.651	-0.375	1.078	3.622	3.622	0.000	0.868	3.790	3.640	0.262	0.981
Net capital inflows to GDP (t-1)	3.975	2.434	0.336	0.591	3.604	3.603	0.000	0.745	3.617	2.554	0.220	0.788
Log. of foreign reserves to GDP (t-1)	1.252	2.274	-1.314	0.750	1.688	1.688	0.000	0.302	1.816	2.205	-0.467	0.749
Current account to GDP (t-1)	-3.531	-2.424	-0.243	0.631	-3.158	-3.157	0.000	0.736	-3.259	-2.499	-0.163	0.756
Financial openness index (t-1)	0.327	0.483	-0.504	0.702	0.401	0.401	0.000	1.061	0.496	0.473	0.064	1.362
Log of trade openness to GDP (t-1)	3.665	4.042	-0.740	1.230	3.840	3.840	0.000	0.591	3.912	4.018	-0.223	0.797
Terms of trade growth (t-1)	0.013	0.005	0.154	1.399	0.009	0.009	0.000	0.829	0.005	0.006	-0.005	0.669
Floating exchange rate regime (t-1)	0.389	0.092	0.733	2.923	0.213	0.213	0.000	1.027	0.140	0.109	0.092	1.270
Government accountability index	0.455	0.678	-0.256	1.304	0.326	0.326	0.000	0.793	0.234	0.648	-0.486	1.077
Corruption index	-0.579	-0.589	0.040	1.150	-0.598	-0.598	0.000	1.550	-0.652	-0.588	-0.230	1.480
Trading partners' growth (t-1)	3.501	3.661	-0.090	0.532	3.436	3.435	0.000	0.506	3.263	3.638	-0.216	0.483
US interest rate on gov.'s securities (t-1)	7.388	4.507	0.669	1.466	6.088	6.088	0.000	1.265	5.335	4.718	0.139	1.432

Notes: About the cutpoint on the absolute value of the standardized difference to define imbalance, Rubin (2002) suggests a cut-off of 0.25. As such, if the absolute value of the standardized difference for a variable is higher than 0.25, then there is a significant difference between the treated and control group for this variable. Moreover, Rubin (2002) proposes the use of the ratio of treated and control variances as a balance measure of the second moment, where balance is defined by values close to 1.0 and variables are out of balance if the variance ratio is greater than 2.0 or less than 0.5. The CBPS model eliminates all the differences in characteristics between treated and control groups, which is less the case for the pooled probit model.

A.3.2 Overlap check

Figure A.2: Kernel density of the distribution of the propensity scores for the treated and control groups



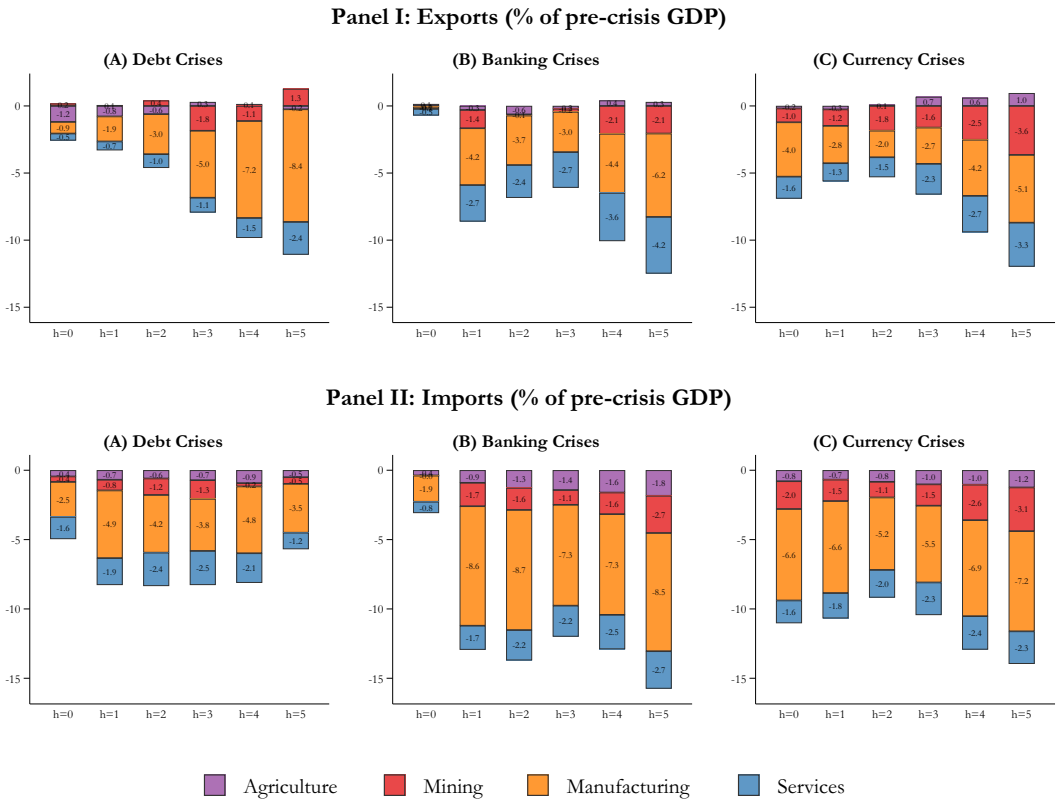
Notes: The predicted propensity scores in (1), (2), and (3) are obtained after applying the CBPS estimator. The dependent variable equals to 1 at the start of financial crises, 0 in country-years observations without crises (unfolding). We use the largest set of control variables described in the data section and included with lags to reduce potential issues of endogeneity. These figures display a high probability of financial crises for the treated groups (especially for debt and currency crises) and a low probability for their counterparts. More importantly, they show a significant overlap between the treated and control groups. Since some observations receive a large weight, we set the maximum weight to 10 for the ATE-AIPW estimates.

A.4 Supplementary graphs and tables

A.4.1 Graphs

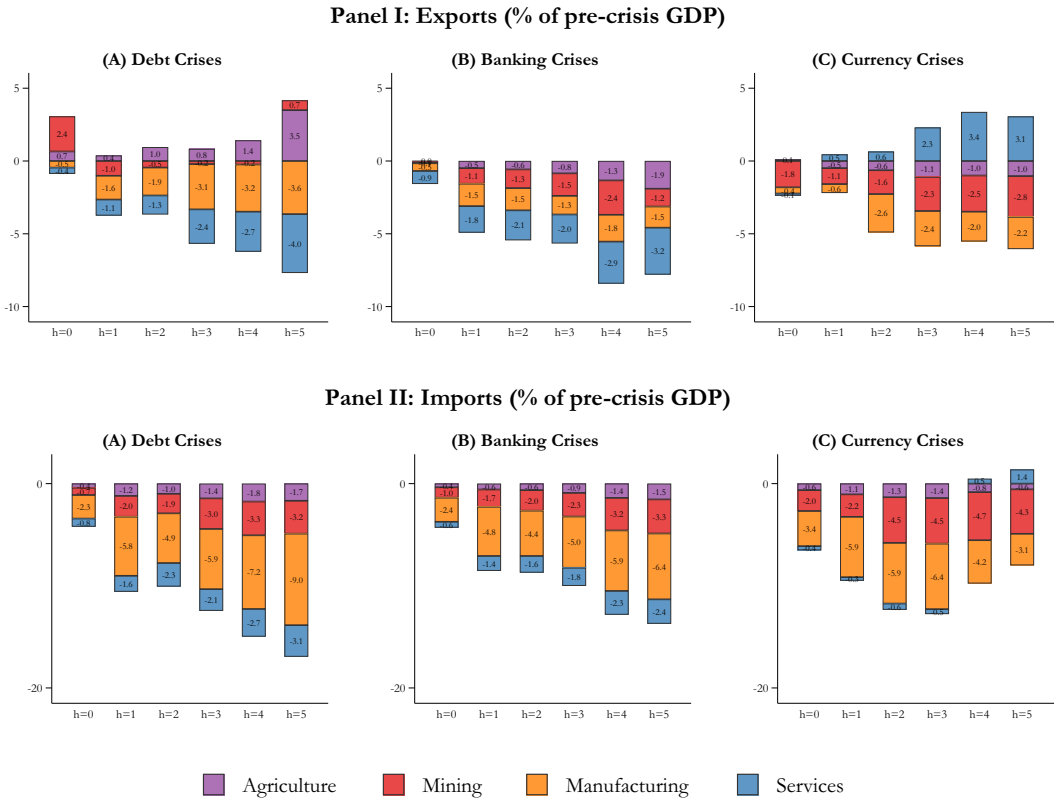
A.4.1.1 Benchmark and robustness results

Figure A.3: Robustness, cumulative trade costs over five years after combined financial crises



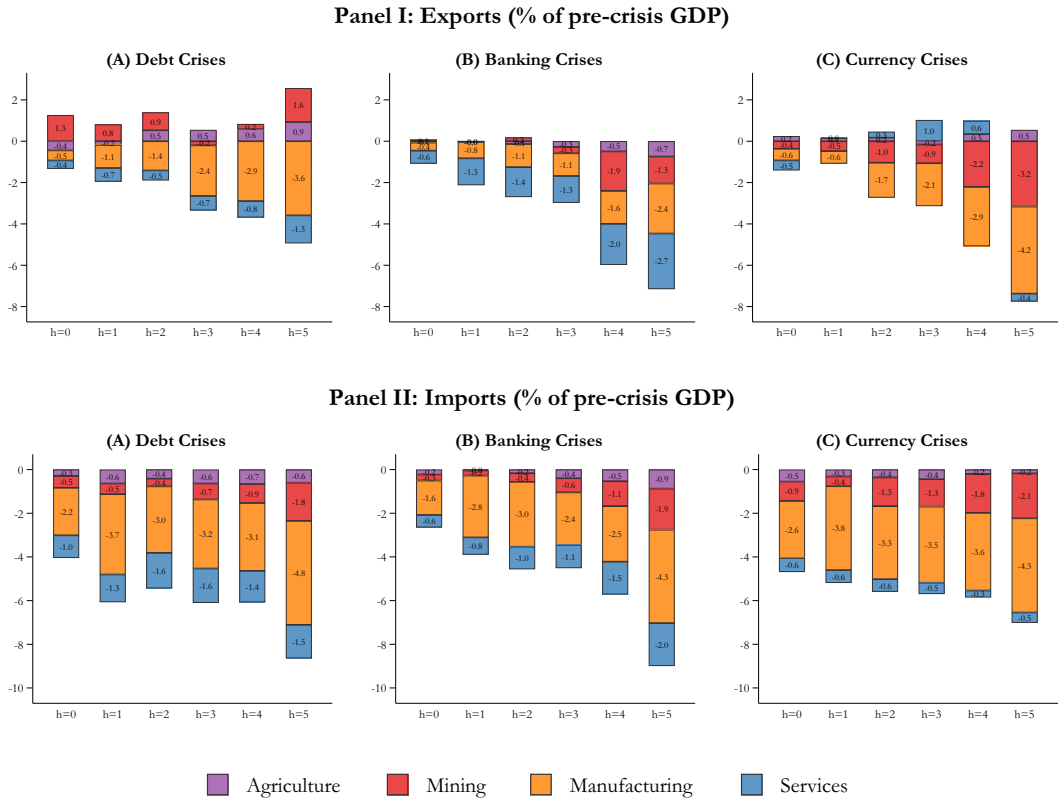
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.4: Robustness, cumulative trade costs over five years after non-combined financial crises



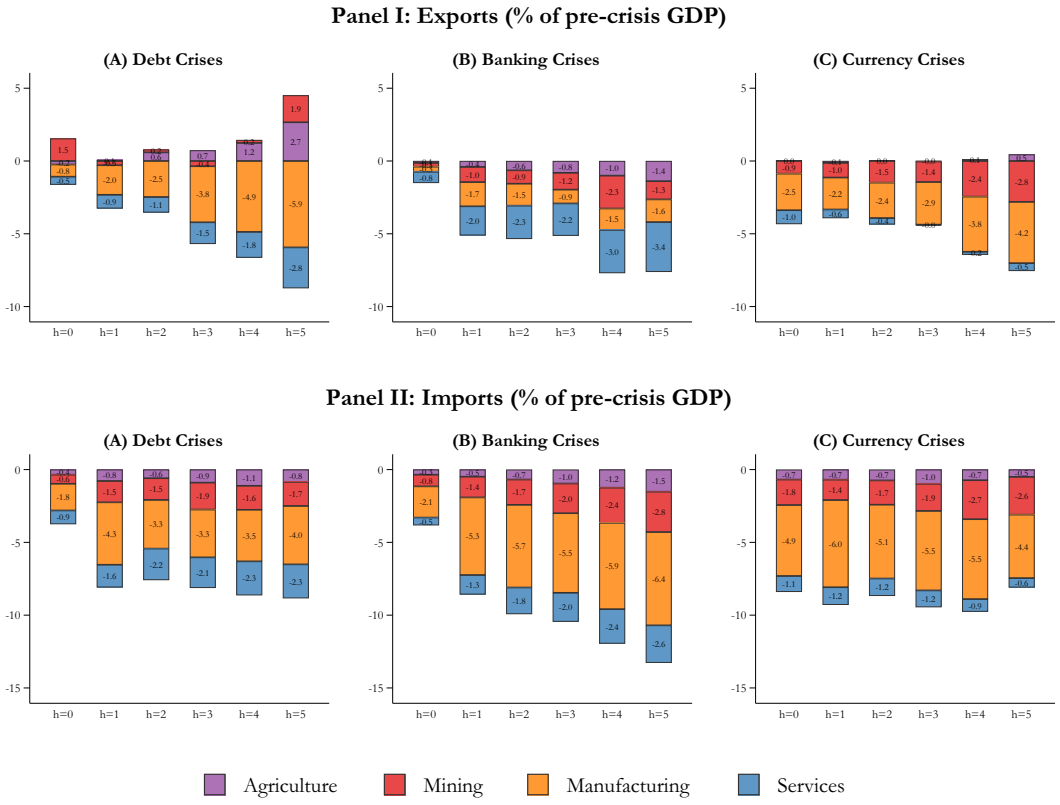
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.5: Robustness, Drop the period 2008 onwards, cumulative trade costs over five years after financial crises



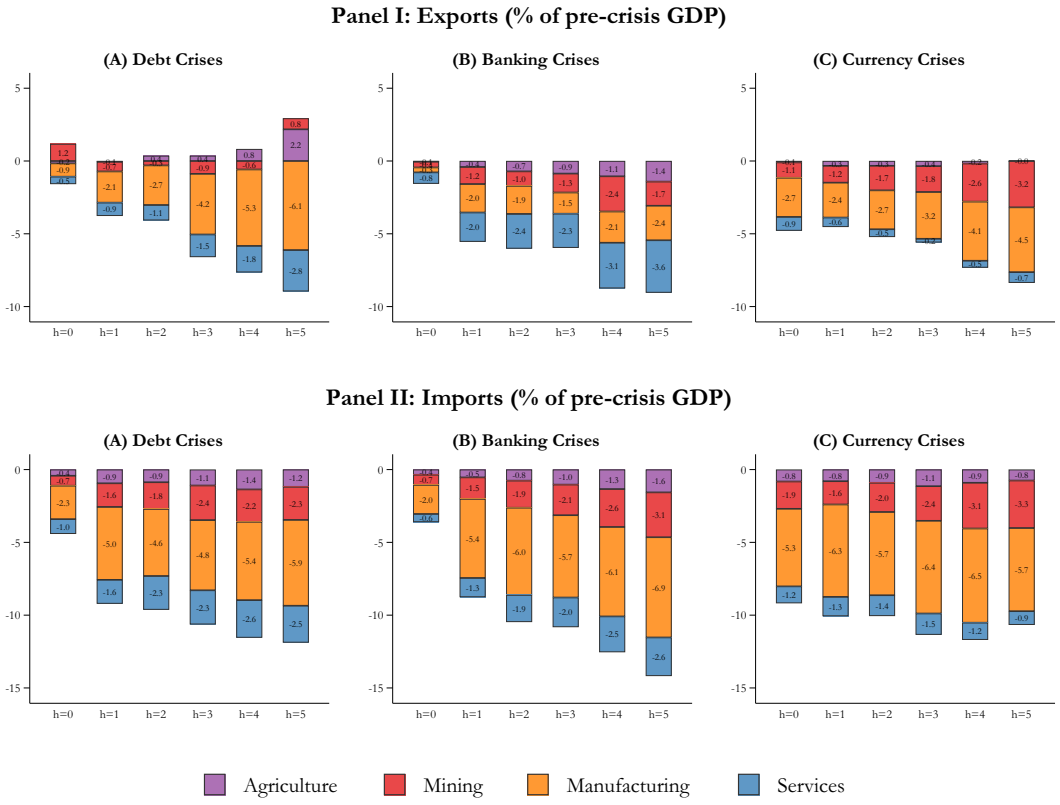
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.6: Robustness, Maximum weight set to 20, cumulative trade costs over five years after financial crises



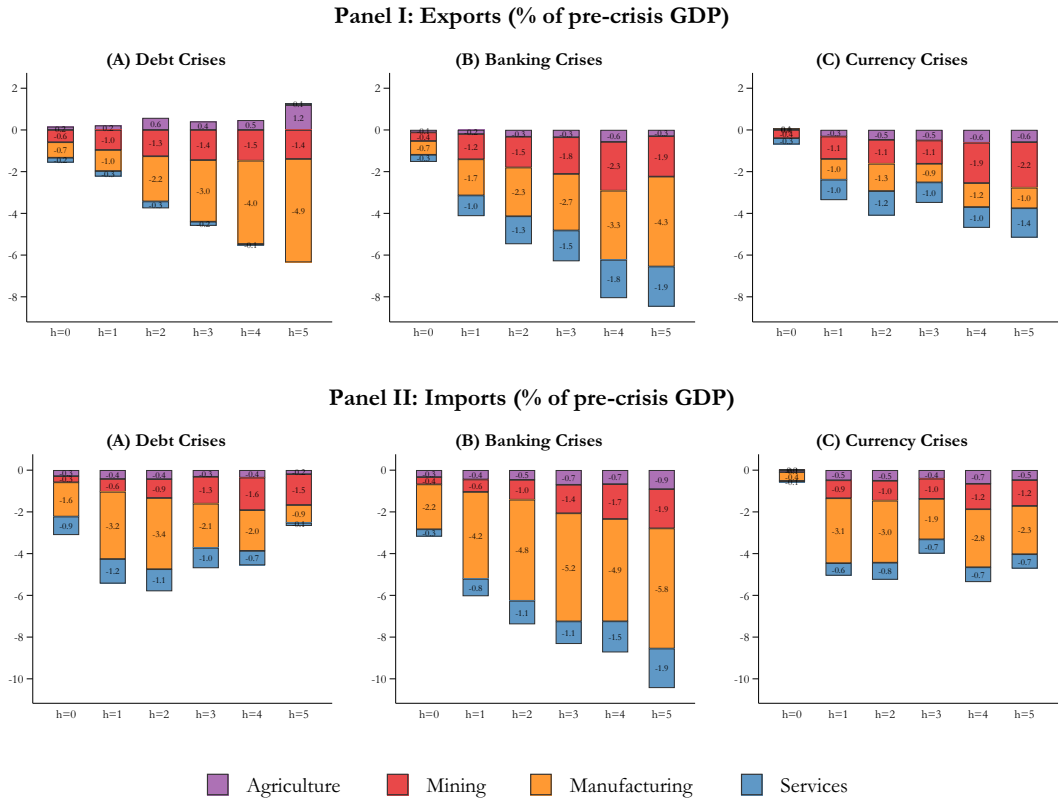
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.7: Robustness, Maximum weight set to 5, cumulative trade costs over five years after financial crises



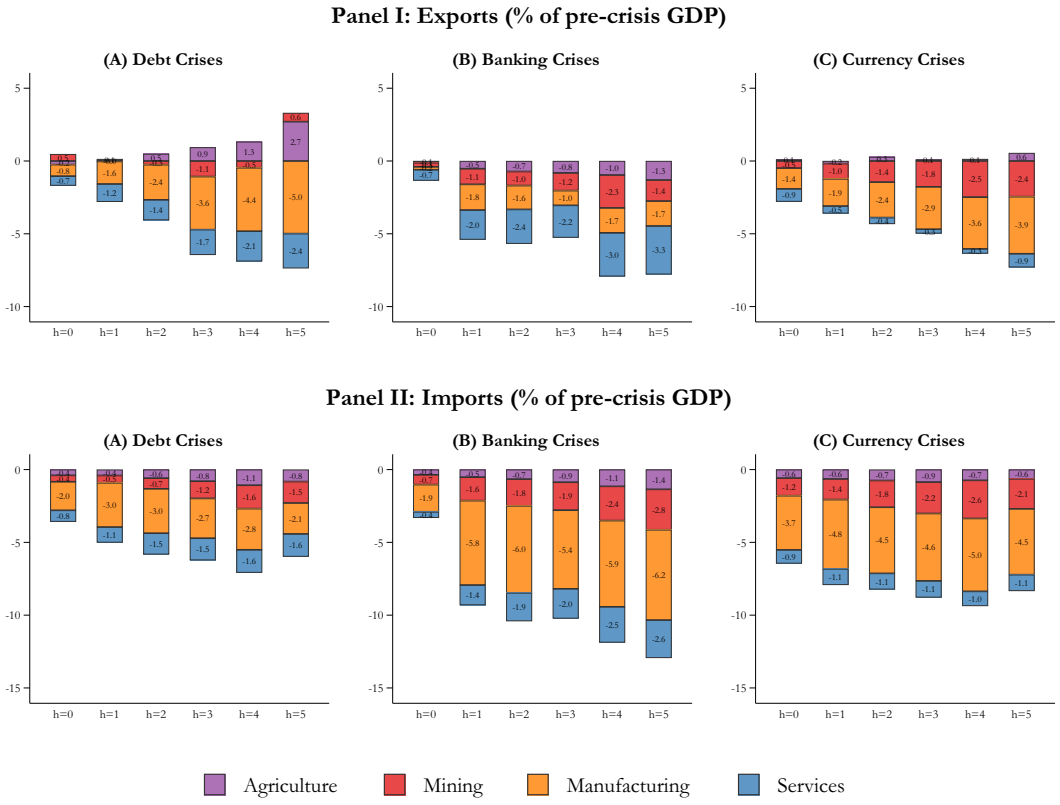
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.8: Robustness, Alternative sources and definitions of crises, cumulative trade costs over five years after financial crises



Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

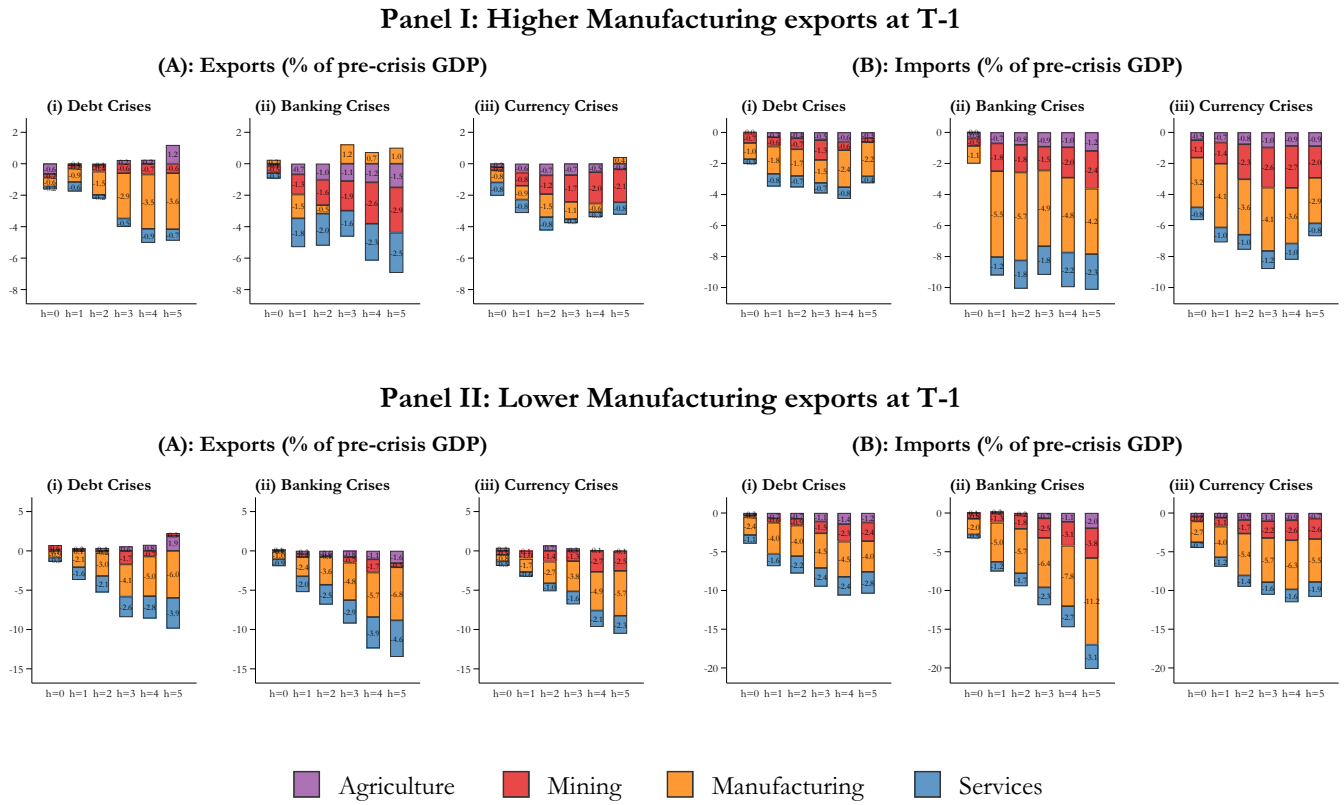
Figure A.9: Robustness, Inverse Probability Weighted (IPW) estimator, cumulative trade costs over five years after financial crises



Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

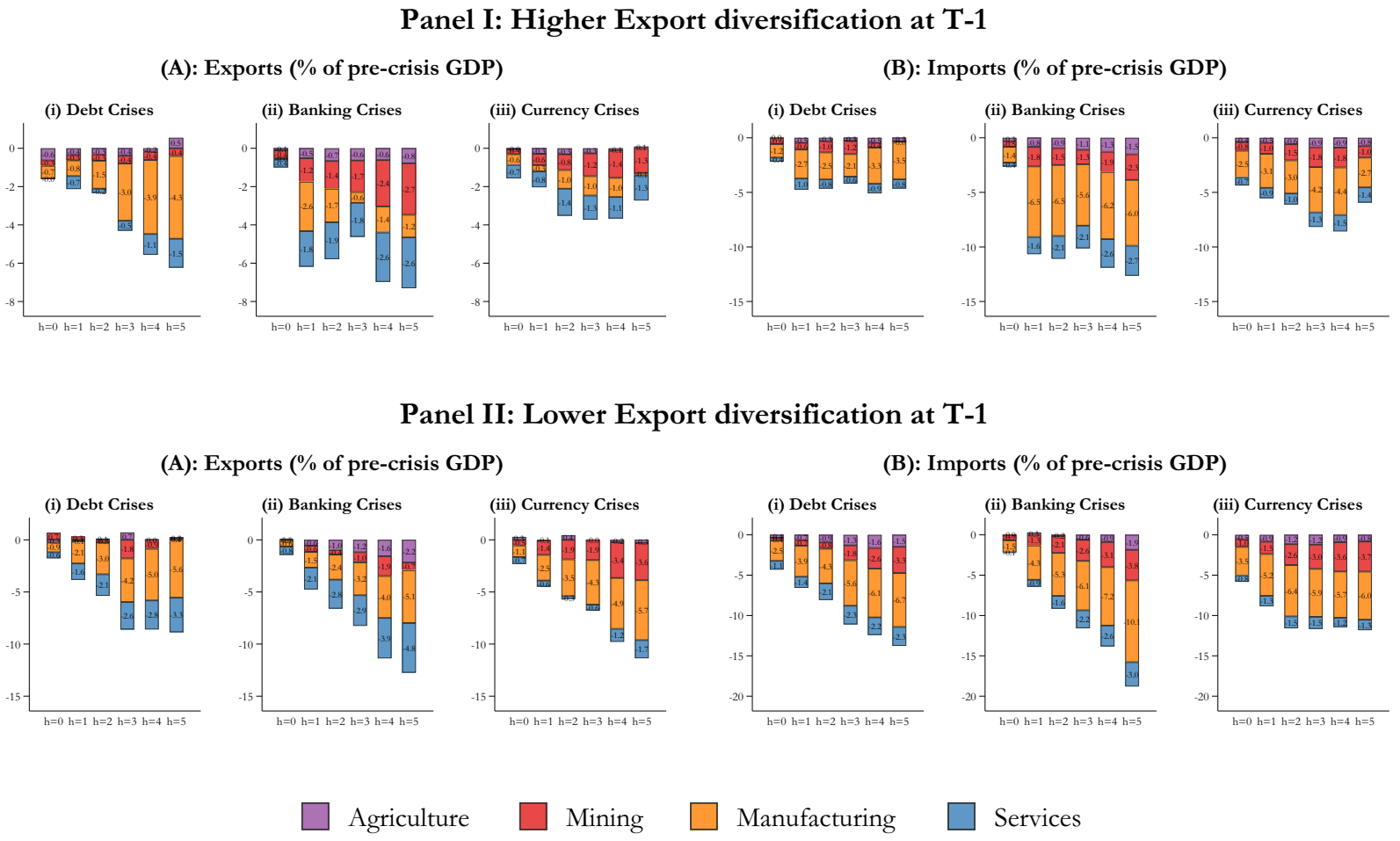
A.4.1.2 Channels

Figure A.10: Channels, cumulative trade costs over five years after financial crises with and without a higher share of manufacturing exports



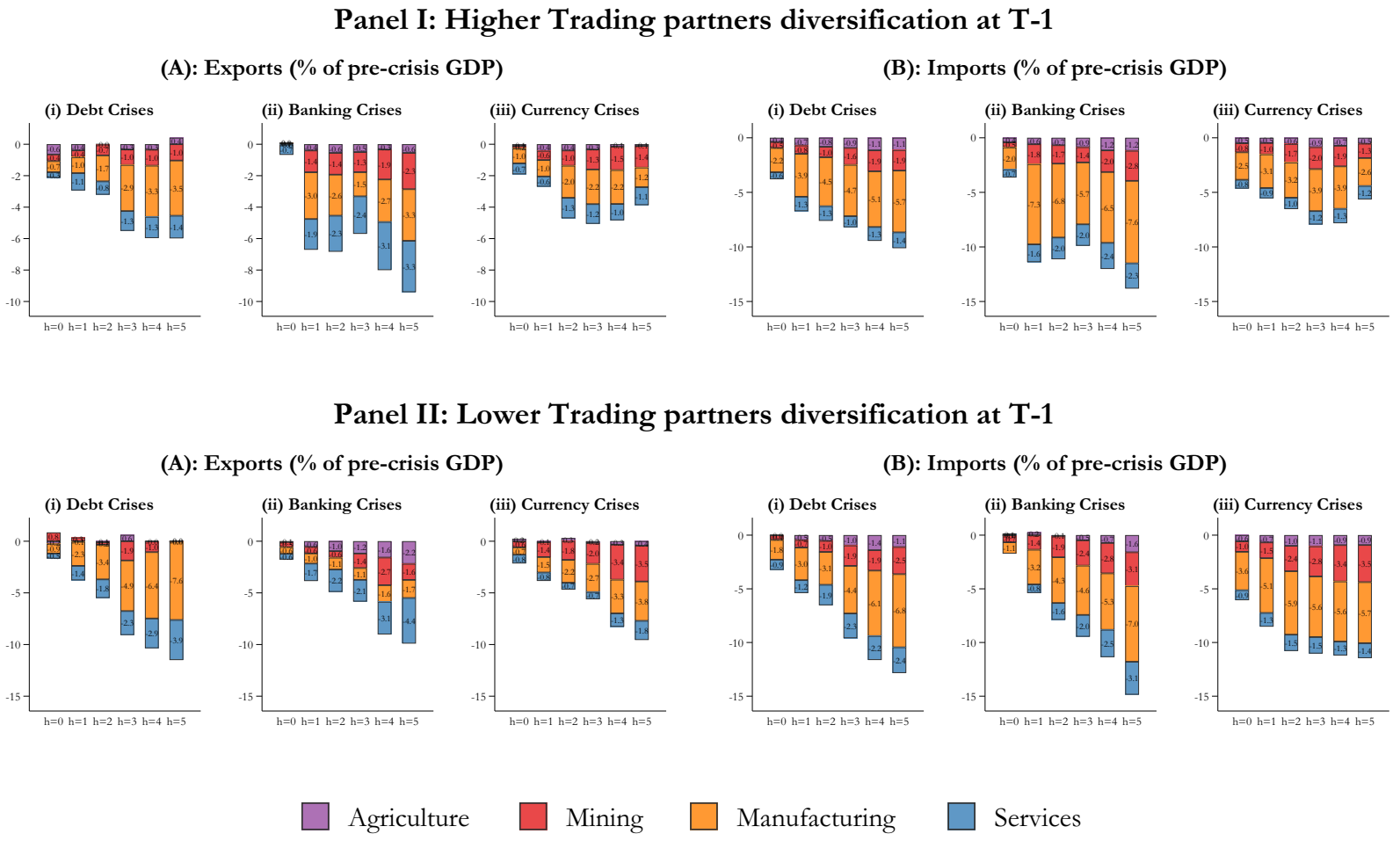
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year before the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.11: Channels, cumulative trade costs over five years after financial crises with and without a higher export diversification



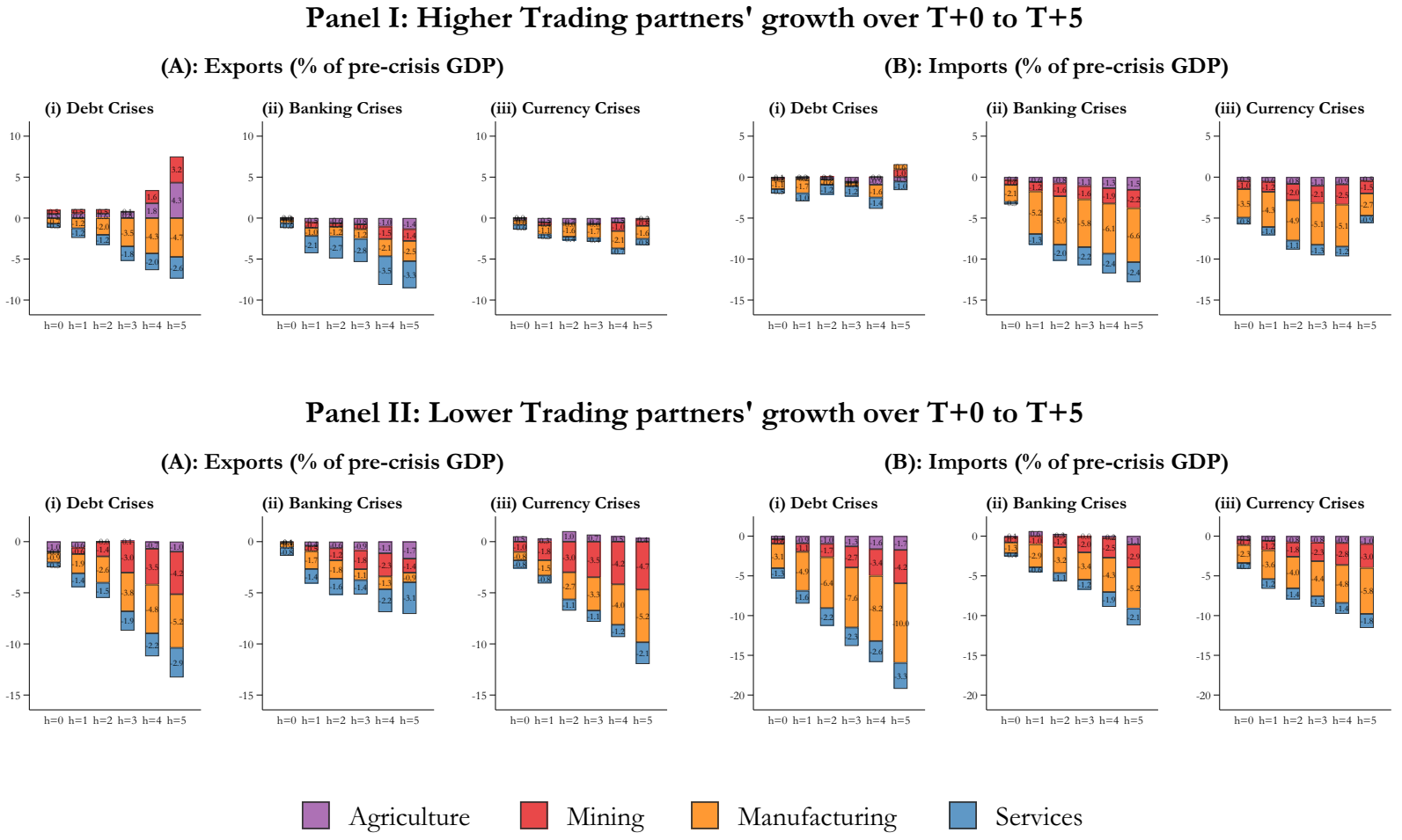
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.12: Channels, cumulative trade costs over five years after financial crises with and without a higher export diversification



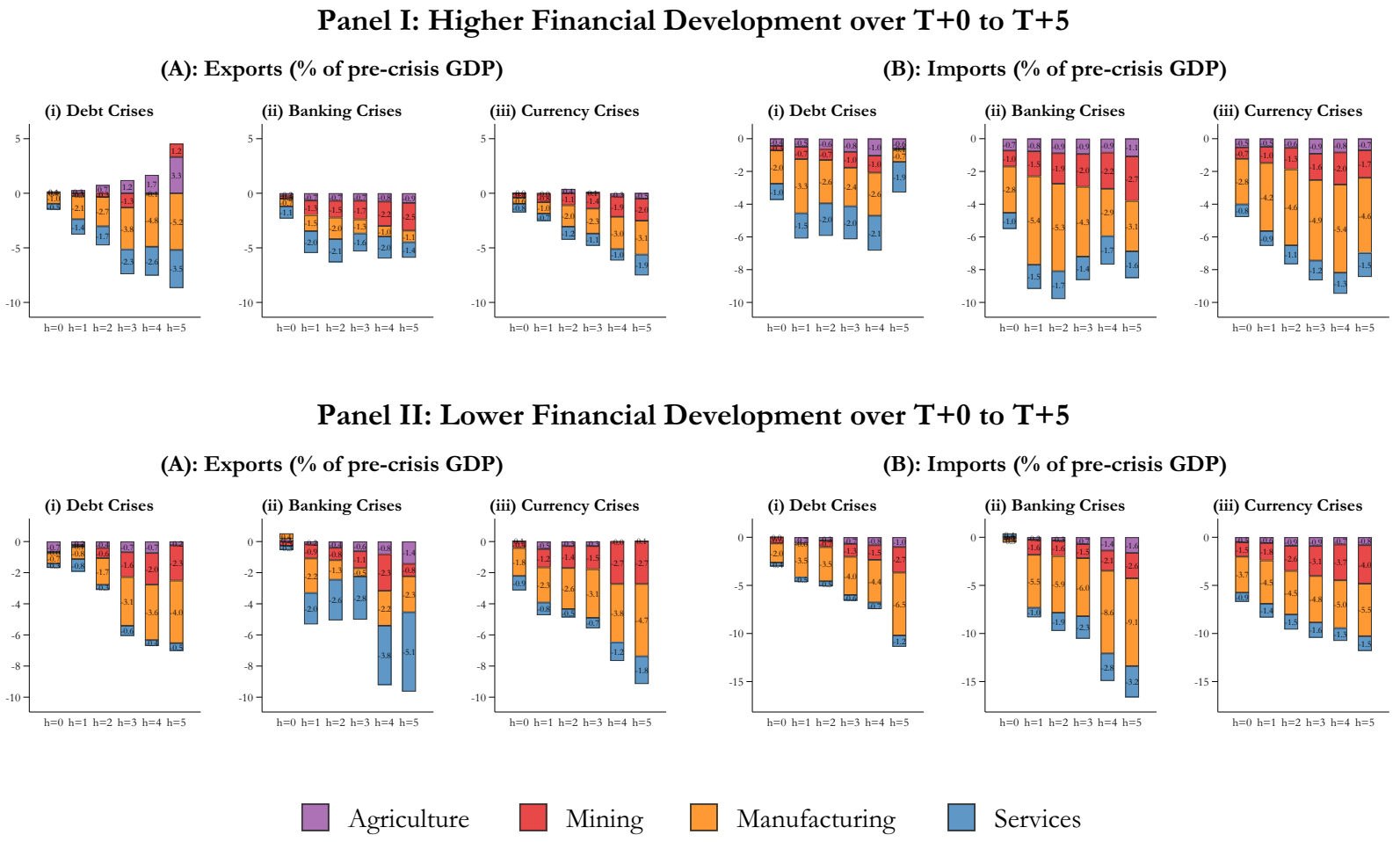
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.13: Channels, cumulative trade costs over five years after financial crises with and without a higher trading partners' growth



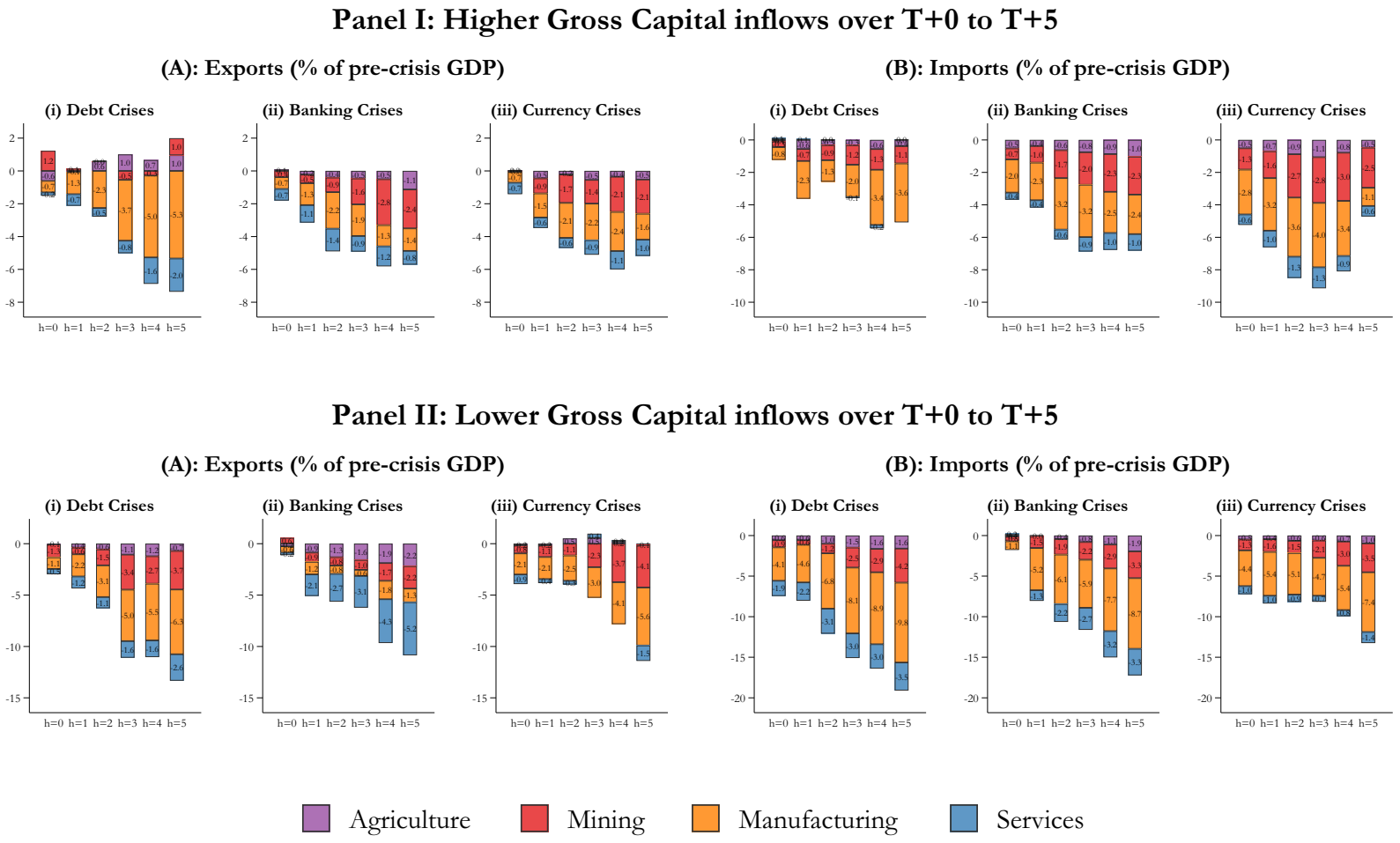
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.14: Channels, cumulative trade costs over five years after financial crises with and without a higher financial development



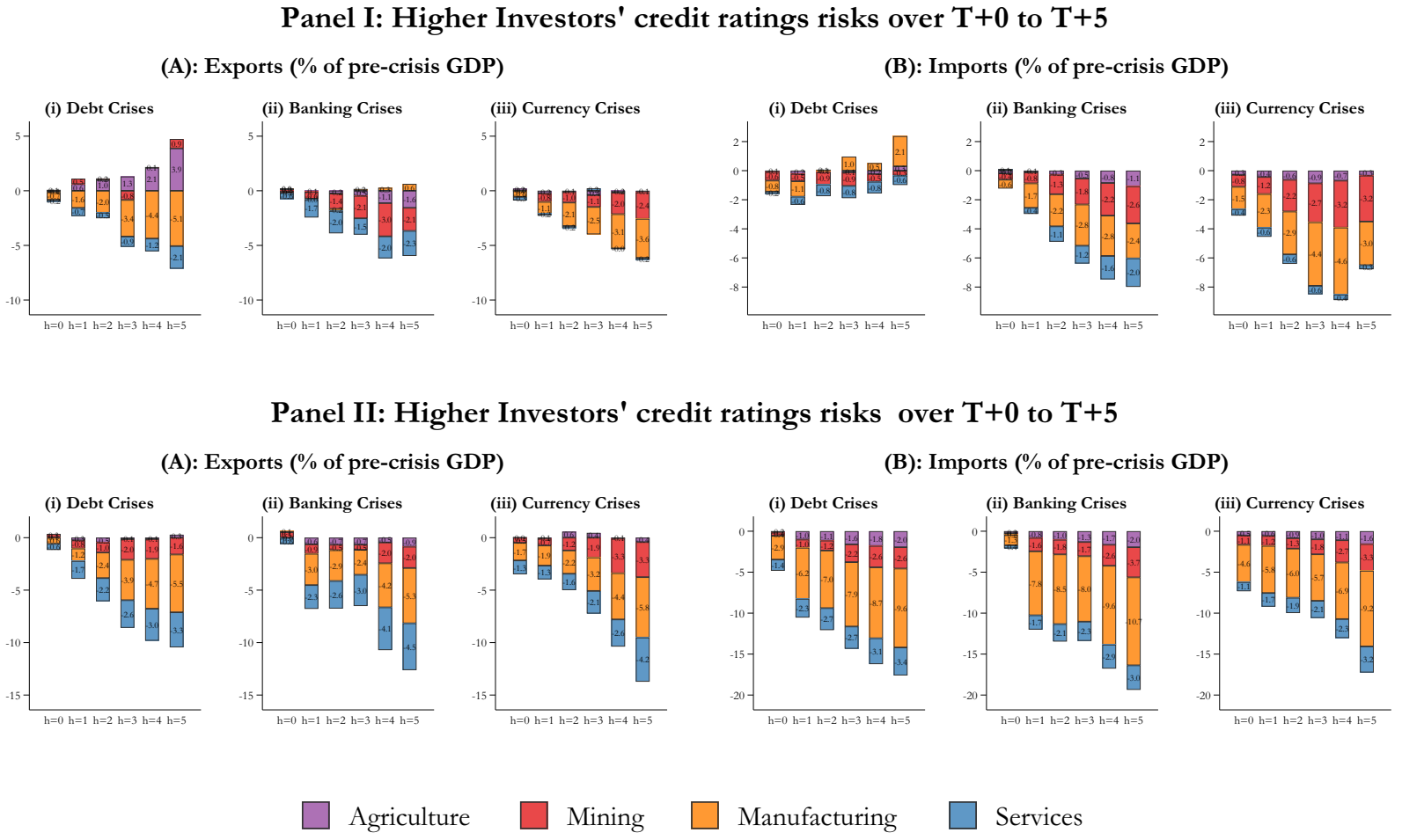
Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.15: Channels, cumulative trade costs over five years after financial crises with and without higher gross capital inflows



Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

Figure A.16: Channels, cumulative trade costs over five years after financial crises with and without a higher investors' credit rating risks



Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, and services exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Maximum weights truncated at 10.

A.4.2 Tables

A.4.2.1 First stage model, pooled probit

Table A.6: Treatment models predicting the likelihood of financial crises, pooled probit, average marginal effects

	(1)	(2)	(3)
	Debt	**Banking**	**Currency**
# of Debt crises over past-5 years (t-5,t)		-0.012	0.034**
		(0.022)	(0.014)
# of Banking crises over past-5 years (t-5,t)	0.026		0.060***
	(0.016)		(0.016)
# of Currency crises over past-5 years (t-5,t)	0.018	0.010	
	(0.016)	(0.023)	
Intensity of conflicts (t-1)	-0.004	-0.002	-0.006
	(0.004)	(0.004)	(0.004)
Log of real GDP (t-1)	-0.001	-0.002	-0.005**
	(0.002)	(0.002)	(0.002)
Log. of public debt to GDP (t-1)	0.042***	0.004	-0.002
	(0.015)	(0.013)	(0.012)
Log. of domestic credit to GDP (t-1)	0.010	0.049***	0.010
	(0.015)	(0.019)	(0.014)
Log. of liquid liabilities to GDP (t-1)	-0.026	-0.051**	0.019
	(0.019)	(0.022)	(0.019)
Net capital inflows to GDP (t-1)	0.002	0.001	0.002
	(0.005)	(0.007)	(0.005)
Log. of foreign reserves to GDP (t-1)	-0.038***	-0.013	-0.034***
	(0.010)	(0.012)	(0.011)
Current account to GDP (t-1)	0.003	-0.001	-0.002
	(0.005)	(0.007)	(0.005)
Financial openness index (t-1)	0.051*	-0.035	-0.002
	(0.027)	(0.026)	(0.026)
Log of trade openness to GDP (t-1)	0.008	-0.015	-0.038**
	(0.017)	(0.018)	(0.017)
Terms of trade growth (t-1)	0.000	0.107	0.050
	(0.101)	(0.132)	(0.104)
Floating exchange rate regime (t-1)	0.054***	-0.028	0.047**
	(0.020)	(0.030)	(0.018)
Government accountability index	-0.000	-0.000	-0.009
	(0.012)	(0.012)	(0.011)
Corruption index	-0.008	0.002	0.003
	(0.034)	(0.036)	(0.035)
Trading partners' growth (t-1)	-0.010**	0.010**	0.001
	(0.004)	(0.005)	(0.004)
US interest rate on gov.'s debt securities (t-1)	0.004**	0.002	-0.001
	(0.002)	(0.002)	(0.002)
Observations	732	732	732
# of crises	38	34	36
Classification	94.262	95.219	95.082
Model AUC	0.922	0.769	0.915
s.e. AUC	0.016	0.038	0.019
pseudoR2	0.338	0.121	0.343

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Pooled probit model. The coefficients are the average marginal effects at the mean. AUC denotes Area Under Receiver Operating Characteristic curve.

A.4.2.2 Benchmark and robustness results

Table A.7: Benchmark results, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-0.134	-3.415***	-3.348***	-5.925***	-6.413***	-5.639***
	(0.342)	(0.466)	(0.597)	(0.860)	(1.093)	(1.514)
ATE-AIPW Agriculture	-0.146	-0.048	0.382**	0.364	0.846**	2.248***
	(0.122)	(0.141)	(0.184)	(0.293)	(0.395)	(0.623)
ATE-AIPW Mining	1.420***	-0.404*	-0.013	-0.639*	-0.263	1.068*
	(0.215)	(0.226)	(0.260)	(0.351)	(0.425)	(0.590)
ATE-AIPW Manufacturing	-0.862***	-2.026***	-2.605***	-4.057***	-5.098***	-6.065***
	(0.145)	(0.257)	(0.327)	(0.418)	(0.540)	(0.736)
ATE-AIPW Services	-0.546***	-0.936***	-1.113***	-1.592***	-1.898***	-2.890***
	(0.082)	(0.128)	(0.187)	(0.246)	(0.293)	(0.380)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.231
Panel B: Banking Crises						
ATE-AIPW Total	-1.274***	-4.957***	-5.561***	-5.642***	-8.392***	-8.943***
	(0.321)	(0.519)	(0.618)	(0.747)	(0.960)	(1.130)
ATE-AIPW Agriculture	-0.086	-0.403***	-0.724***	-0.885***	-1.071***	-1.530***
	(0.070)	(0.097)	(0.133)	(0.158)	(0.192)	(0.212)
ATE-AIPW Mining	-0.156	-0.857***	-0.824***	-1.185***	-2.262***	-1.604***
	(0.165)	(0.238)	(0.280)	(0.315)	(0.353)	(0.480)
ATE-AIPW Manufacturing	-0.362**	-1.853***	-1.830***	-1.399***	-2.065***	-2.326***
	(0.152)	(0.305)	(0.385)	(0.480)	(0.599)	(0.728)
ATE-AIPW Services	-0.669***	-1.844***	-2.183***	-2.174***	-2.994***	-3.484***
	(0.102)	(0.170)	(0.238)	(0.318)	(0.394)	(0.503)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.019	0.000	0.002	0.250	0.008	0.011
Panel C: Currency Crises						
ATE-AIPW Total	-4.435***	-4.198***	-4.901***	-5.135***	-6.757***	-7.702***
	(0.356)	(0.440)	(0.616)	(0.776)	(0.896)	(1.113)
ATE-AIPW Agriculture	-0.037	-0.257**	-0.234	-0.261	-0.079	0.039
	(0.076)	(0.123)	(0.230)	(0.250)	(0.235)	(0.317)
ATE-AIPW Mining	-0.898***	-1.053***	-1.591***	-1.548***	-2.404***	-2.896***
	(0.204)	(0.176)	(0.263)	(0.296)	(0.336)	(0.402)
ATE-AIPW Manufacturing	-2.578***	-2.282***	-2.584***	-3.127***	-3.852***	-3.959***
	(0.195)	(0.256)	(0.314)	(0.416)	(0.507)	(0.616)
ATE-AIPW Services	-0.923***	-0.605***	-0.491**	-0.199	-0.422	-0.886**
	(0.089)	(0.150)	(0.211)	(0.315)	(0.352)	(0.407)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.093	0.000	0.000	0.000	0.004	0.879

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-4.397***	-8.365***	-9.358***	-10.403***	-11.188***	-11.012***
	(0.471)	(0.649)	(1.004)	(1.322)	(1.668)	(2.246)
ATE-AIPW Agriculture	-0.375***	-0.822***	-0.810***	-1.069***	-1.363***	-1.078***
	(0.073)	(0.081)	(0.134)	(0.159)	(0.188)	(0.245)
ATE-AIPW Mining	-0.644***	-1.492***	-1.664***	-2.103***	-1.934***	-1.927***
	(0.093)	(0.156)	(0.215)	(0.298)	(0.381)	(0.531)
ATE-AIPW Manufacturing	-2.265***	-4.432***	-4.456***	-4.730***	-5.207***	-5.388***
	(0.305)	(0.414)	(0.612)	(0.800)	(1.011)	(1.358)
ATE-AIPW Services	-1.113***	-1.619***	-2.429***	-2.502***	-2.685***	-2.619***
	(0.114)	(0.153)	(0.209)	(0.241)	(0.290)	(0.346)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.231
Panel B: Banking Crises						
ATE-AIPW Total	-3.208***	-7.119***	-9.158***	-9.746***	-11.466***	-14.059***
	(0.484)	(0.840)	(0.959)	(1.069)	(1.388)	(1.571)
ATE-AIPW Agriculture	-0.248***	0.027	-0.417***	-0.732***	-0.962***	-1.493***
	(0.081)	(0.139)	(0.149)	(0.149)	(0.180)	(0.173)
ATE-AIPW Mining	-0.666***	-1.310***	-1.669***	-1.938***	-2.421***	-2.934***
	(0.112)	(0.163)	(0.185)	(0.222)	(0.271)	(0.307)
ATE-AIPW Manufacturing	-1.880***	-4.767***	-5.380***	-5.140***	-5.748***	-7.038***
	(0.271)	(0.509)	(0.578)	(0.644)	(0.849)	(0.989)
ATE-AIPW Services	-0.414***	-1.070***	-1.692***	-1.937***	-2.334***	-2.594***
	(0.108)	(0.134)	(0.187)	(0.219)	(0.262)	(0.293)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.019	0.000	0.002	0.250	0.008	0.011
Panel C: Currency Crises						
ATE-AIPW Total	-8.533***	-9.463***	-9.255***	-10.500***	-10.630***	-9.105***
	(0.506)	(0.629)	(0.871)	(1.098)	(1.308)	(1.640)
ATE-AIPW Agriculture	-0.761***	-0.764***	-0.838***	-1.080***	-0.831***	-0.667***
	(0.084)	(0.078)	(0.105)	(0.118)	(0.144)	(0.170)
ATE-AIPW Mining	-1.765***	-1.508***	-1.952***	-2.263***	-2.978***	-2.957***
	(0.112)	(0.144)	(0.209)	(0.250)	(0.282)	(0.389)
ATE-AIPW Manufacturing	-4.930***	-5.963***	-5.179***	-5.839***	-5.801***	-4.557***
	(0.311)	(0.392)	(0.514)	(0.642)	(0.778)	(0.948)
ATE-AIPW Services	-1.077***	-1.229***	-1.286***	-1.318***	-1.021***	-0.925***
	(0.087)	(0.131)	(0.191)	(0.244)	(0.281)	(0.312)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.093	0.000	0.000	0.000	0.004	0.879

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

Table A.8: Robustness, Cumulative trade costs over five years after combined financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-2.398***	-3.242***	-4.211***	-7.640***	-9.691***	-9.805***
	(0.308)	(0.498)	(0.652)	(0.918)	(1.077)	(1.328)
ATE-AIPW Agriculture	-1.190***	-0.780***	-0.609***	0.292	0.137	-0.249
	(0.119)	(0.133)	(0.187)	(0.297)	(0.318)	(0.342)
ATE-AIPW Mining	0.173	0.061	0.400	-1.849***	-1.124***	1.272**
	(0.119)	(0.230)	(0.272)	(0.345)	(0.405)	(0.575)
ATE-AIPW Manufacturing	-0.865***	-1.866***	-2.984***	-4.990***	-7.223***	-8.395***
	(0.150)	(0.273)	(0.347)	(0.450)	(0.562)	(0.673)
ATE-AIPW Services	-0.517***	-0.658***	-1.019***	-1.093***	-1.481***	-2.433***
	(0.089)	(0.144)	(0.205)	(0.260)	(0.303)	(0.378)
Observations	689	689	689	689	689	689
# of Crises	24	24	24	24	24	24
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.461	0.087	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-0.561	-8.605***	-6.842***	-6.090***	-9.662***	-12.192***
	(0.378)	(0.488)	(0.686)	(0.780)	(0.910)	(1.054)
ATE-AIPW Agriculture	0.140*	-0.299***	-0.627***	-0.209	0.405*	0.291
	(0.077)	(0.091)	(0.137)	(0.172)	(0.213)	(0.229)
ATE-AIPW Mining	-0.066	-1.362***	-0.090	-0.229	-2.077***	-2.056***
	(0.154)	(0.219)	(0.314)	(0.351)	(0.417)	(0.542)
ATE-AIPW Manufacturing	-0.155	-4.234***	-3.686***	-3.002***	-4.403***	-6.214***
	(0.177)	(0.283)	(0.354)	(0.449)	(0.581)	(0.703)
ATE-AIPW Services	-0.481***	-2.710***	-2.439***	-2.650***	-3.586***	-4.214***
	(0.114)	(0.184)	(0.264)	(0.328)	(0.422)	(0.541)
Observations	689	689	689	689	689	689
# of Crises	17	17	17	17	17	17
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.001	0.003
Panel C: Currency Crises						
ATE-AIPW Total	-6.901***	-5.610***	-5.217***	-5.917***	-8.798***	-11.019***
	(0.325)	(0.475)	(0.651)	(0.877)	(0.972)	(1.201)
ATE-AIPW Agriculture	-0.187**	-0.257**	0.088	0.674***	0.608**	0.953***
	(0.079)	(0.130)	(0.240)	(0.258)	(0.238)	(0.322)
ATE-AIPW Mining	-1.031***	-1.226***	-1.844***	-1.611***	-2.519***	-3.648***
	(0.115)	(0.220)	(0.289)	(0.299)	(0.356)	(0.509)
ATE-AIPW Manufacturing	-4.049***	-2.782***	-1.980***	-2.704***	-4.183***	-5.050***
	(0.192)	(0.272)	(0.344)	(0.446)	(0.574)	(0.723)
ATE-AIPW Services	-1.634***	-1.344***	-1.482***	-2.277***	-2.705***	-3.274***
	(0.108)	(0.166)	(0.240)	(0.506)	(0.479)	(0.476)
Observations	689	689	689	689	689	689
# of Crises	24	24	24	24	24	24
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.003

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-4.958***	-8.270***	-8.344***	-8.271***	-8.116***	-5.690***
	(0.481)	(0.739)	(1.072)	(1.366)	(1.539)	(1.819)
ATE-AIPW Agriculture	-0.446***	-0.684***	-0.594***	-0.716***	-0.928***	-0.502**
	(0.066)	(0.093)	(0.138)	(0.192)	(0.179)	(0.216)
ATE-AIPW Mining	-0.398***	-0.773***	-1.190***	-1.344***	-0.239	-0.480
	(0.093)	(0.160)	(0.213)	(0.294)	(0.379)	(0.514)
ATE-AIPW Manufacturing	-2.519***	-4.879***	-4.157***	-3.758***	-4.817***	-3.520***
	(0.310)	(0.464)	(0.655)	(0.799)	(0.870)	(0.970)
ATE-AIPW Services	-1.596***	-1.933***	-2.403***	-2.453***	-2.131***	-1.188***
	(0.113)	(0.160)	(0.211)	(0.247)	(0.281)	(0.314)
Observations	689	689	689	689	689	689
# of Crises	24	24	24	24	24	24
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.461	0.087	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-3.082***	-12.940***	-13.704***	-11.994***	-12.902***	-15.745***
	(0.586)	(1.003)	(1.262)	(1.328)	(1.350)	(1.677)
ATE-AIPW Agriculture	-0.382***	-0.907***	-1.271***	-1.427***	-1.606***	-1.840***
	(0.078)	(0.145)	(0.172)	(0.162)	(0.158)	(0.188)
ATE-AIPW Mining	-0.008	-1.687***	-1.592***	-1.065***	-1.558***	-2.685***
	(0.128)	(0.199)	(0.242)	(0.275)	(0.295)	(0.347)
ATE-AIPW Manufacturing	-1.882***	-8.617***	-8.660***	-7.272***	-7.263***	-8.524***
	(0.340)	(0.590)	(0.738)	(0.767)	(0.786)	(1.016)
ATE-AIPW Services	-0.810***	-1.730***	-2.179***	-2.230***	-2.475***	-2.697***
	(0.109)	(0.141)	(0.195)	(0.235)	(0.252)	(0.276)
Observations	689	689	689	689	689	689
# of Crises	17	17	17	17	17	17
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.001	0.003
Panel C: Currency Crises						
ATE-AIPW Total	-11.025***	-10.675***	-9.179***	-10.436***	-12.926***	-13.957***
	(0.495)	(0.653)	(0.852)	(1.251)	(1.401)	(1.697)
ATE-AIPW Agriculture	-0.791***	-0.677***	-0.836***	-1.018***	-1.041***	-1.241***
	(0.085)	(0.085)	(0.102)	(0.173)	(0.156)	(0.193)
ATE-AIPW Mining	-2.005***	-1.546***	-1.128***	-1.537***	-2.557***	-3.148***
	(0.101)	(0.143)	(0.186)	(0.260)	(0.290)	(0.411)
ATE-AIPW Manufacturing	-6.593***	-6.633***	-5.223***	-5.535***	-6.925***	-7.226***
	(0.308)	(0.420)	(0.527)	(0.702)	(0.795)	(0.944)
ATE-AIPW Services	-1.635***	-1.820***	-1.993***	-2.346***	-2.404***	-2.341***
	(0.095)	(0.122)	(0.179)	(0.345)	(0.384)	(0.356)
Observations	689	689	689	689	689	689
# of Crises	24	24	24	24	24	24
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.003

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

Table A.9: Robustness, Cumulative trade costs over five years after non-combined financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	2.186***	-3.367***	-2.720***	-4.850***	-4.808***	-3.521*
	(0.433)	(0.601)	(0.880)	(1.331)	(1.572)	(1.899)
ATE-AIPW Agriculture	0.658***	0.375***	0.950***	0.827***	1.417***	3.495***
	(0.075)	(0.121)	(0.163)	(0.215)	(0.313)	(0.390)
ATE-AIPW Mining	2.403***	-1.013***	-0.450	-0.211	-0.239	0.666
	(0.252)	(0.268)	(0.346)	(0.432)	(0.597)	(0.606)
ATE-AIPW Manufacturing	-0.452**	-1.633***	-1.917***	-3.110***	-3.241***	-3.648***
	(0.183)	(0.322)	(0.454)	(0.722)	(0.793)	(0.993)
ATE-AIPW Services	-0.422***	-1.096***	-1.303***	-2.356***	-2.745***	-4.035***
	(0.162)	(0.195)	(0.283)	(0.388)	(0.442)	(0.557)
Observations	670	670	670	670	670	670
# of Crises	13	13	13	13	13	13
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-1.570***	-4.914***	-5.442***	-5.659***	-8.415***	-7.794***
	(0.403)	(0.548)	(0.651)	(0.833)	(1.199)	(1.225)
ATE-AIPW Agriculture	-0.037	-0.490***	-0.578***	-0.848***	-1.333***	-1.901***
	(0.076)	(0.128)	(0.146)	(0.170)	(0.200)	(0.211)
ATE-AIPW Mining	-0.117	-1.071***	-1.285***	-1.546***	-2.359***	-1.226**
	(0.241)	(0.185)	(0.219)	(0.295)	(0.362)	(0.481)
ATE-AIPW Manufacturing	-0.531***	-1.537***	-1.525***	-1.280**	-1.843**	-1.453*
	(0.194)	(0.332)	(0.421)	(0.531)	(0.725)	(0.783)
ATE-AIPW Services	-0.885***	-1.817***	-2.054***	-1.986***	-2.879***	-3.215***
	(0.105)	(0.186)	(0.269)	(0.373)	(0.493)	(0.594)
Observations	681	681	681	681	681	681
# of Crises	17	17	17	17	17	17
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-2.264***	-1.741***	-4.252***	-3.546***	-2.154**	-2.988**
	(0.318)	(0.478)	(0.600)	(0.811)	(0.954)	(1.183)
ATE-AIPW Agriculture	0.112*	-0.490***	-0.635***	-1.096***	-0.996***	-1.036***
	(0.059)	(0.094)	(0.113)	(0.149)	(0.176)	(0.223)
ATE-AIPW Mining	-1.807***	-1.095***	-1.635***	-2.340***	-2.483***	-2.801***
	(0.216)	(0.286)	(0.268)	(0.341)	(0.393)	(0.559)
ATE-AIPW Manufacturing	-0.423***	-0.607**	-2.625***	-2.407***	-2.039***	-2.206***
	(0.151)	(0.252)	(0.331)	(0.440)	(0.525)	(0.628)
ATE-AIPW Services	-0.145	0.451**	0.642**	2.297***	3.365***	3.056***
	(0.116)	(0.180)	(0.257)	(0.348)	(0.383)	(0.449)
Observations	681	681	681	681	681	681
# of Crises	12	12	12	12	12	12
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.003

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-4.211***	-10.576***	-10.066***	-12.441***	-14.970***	-16.934***
	(0.464)	(0.662)	(1.140)	(1.468)	(2.040)	(2.776)
ATE-AIPW Agriculture	-0.408***	-1.204***	-0.994***	-1.448***	-1.759***	-1.679***
	(0.115)	(0.122)	(0.164)	(0.185)	(0.243)	(0.317)
ATE-AIPW Mining	-0.712***	-2.037***	-1.914***	-2.991***	-3.302***	-3.217***
	(0.107)	(0.153)	(0.255)	(0.334)	(0.446)	(0.601)
ATE-AIPW Manufacturing	-2.301***	-5.782***	-4.867***	-5.891***	-7.210***	-8.958***
	(0.276)	(0.420)	(0.673)	(0.855)	(1.187)	(1.617)
ATE-AIPW Services	-0.791***	-1.553***	-2.291***	-2.110***	-2.699***	-3.080***
	(0.094)	(0.136)	(0.210)	(0.282)	(0.355)	(0.451)
Observations	670	670	670	670	670	670
# of Crises	13	13	13	13	13	13
# of Countries	40	40	40	40	40	40
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-4.305***	-8.532***	-8.706***	-10.003***	-12.822***	-13.706***
	(0.524)	(1.021)	(1.163)	(1.462)	(2.028)	(2.020)
ATE-AIPW Agriculture	-0.360***	-0.577***	-0.639***	-0.912***	-1.401***	-1.545***
	(0.085)	(0.119)	(0.133)	(0.177)	(0.247)	(0.237)
ATE-AIPW Mining	-1.018***	-1.693***	-2.009***	-2.313***	-3.181***	-3.337***
	(0.134)	(0.231)	(0.256)	(0.308)	(0.433)	(0.384)
ATE-AIPW Manufacturing	-2.356***	-4.814***	-4.436***	-5.011***	-5.923***	-6.444***
	(0.300)	(0.597)	(0.662)	(0.817)	(1.127)	(1.209)
ATE-AIPW Services	-0.571***	-1.448***	-1.622***	-1.767***	-2.316***	-2.380***
	(0.099)	(0.171)	(0.239)	(0.295)	(0.362)	(0.362)
Observations	681	681	681	681	681	681
# of Crises	17	17	17	17	17	17
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-6.517***	-9.494***	-12.343***	-12.761***	-9.287***	-6.618***
	(0.438)	(0.763)	(1.090)	(1.265)	(1.490)	(1.802)
ATE-AIPW Agriculture	-0.640***	-1.054***	-1.334***	-1.411***	-0.832***	-0.562***
	(0.058)	(0.094)	(0.138)	(0.140)	(0.163)	(0.197)
ATE-AIPW Mining	-2.042***	-2.197***	-4.469***	-4.466***	-4.708***	-4.350***
	(0.120)	(0.165)	(0.287)	(0.343)	(0.383)	(0.453)
ATE-AIPW Manufacturing	-3.440***	-5.908***	-5.938***	-6.410***	-4.226***	-3.079***
	(0.262)	(0.469)	(0.645)	(0.745)	(0.877)	(1.028)
ATE-AIPW Services	-0.394***	-0.336**	-0.602***	-0.475*	0.479	1.372***
	(0.091)	(0.151)	(0.192)	(0.250)	(0.293)	(0.336)
Observations	681	681	681	681	681	681
# of Crises	12	12	12	12	12	12
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.003

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

Table A.10: Robustness, Drop the period 2008 onwards, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-0.070	-1.142**	-0.504	-2.795**	-2.855**	-2.373
	(0.452)	(0.567)	(0.756)	(1.128)	(1.374)	(1.830)
ATE-AIPW Agriculture	-0.444***	-0.179	0.528**	0.544	0.584	0.929**
	(0.155)	(0.151)	(0.225)	(0.395)	(0.419)	(0.415)
ATE-AIPW Mining	1.261***	0.812***	0.864***	-0.201	0.247	1.634*
	(0.303)	(0.312)	(0.333)	(0.447)	(0.580)	(0.909)
ATE-AIPW Manufacturing	-0.487***	-1.118***	-1.414***	-2.449***	-2.896***	-3.589***
	(0.150)	(0.305)	(0.430)	(0.574)	(0.729)	(0.963)
ATE-AIPW Services	-0.400***	-0.657***	-0.481*	-0.689**	-0.790**	-1.348***
	(0.106)	(0.173)	(0.265)	(0.305)	(0.364)	(0.463)
Observations	409	409	409	409	409	409
# of Crises	33	33	33	33	33	33
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.002	0.001	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-1.009***	-2.124***	-2.521***	-2.977***	-5.977***	-7.152***
	(0.341)	(0.511)	(0.668)	(0.925)	(1.226)	(1.485)
ATE-AIPW Agriculture	0.070	-0.020	-0.136	-0.281	-0.494*	-0.741***
	(0.095)	(0.131)	(0.182)	(0.204)	(0.257)	(0.251)
ATE-AIPW Mining	-0.066	-0.018	0.176	-0.306	-1.912***	-1.305**
	(0.135)	(0.195)	(0.273)	(0.315)	(0.365)	(0.628)
ATE-AIPW Manufacturing	-0.391**	-0.789**	-1.119**	-1.095*	-1.591**	-2.419**
	(0.165)	(0.310)	(0.469)	(0.635)	(0.794)	(1.022)
ATE-AIPW Services	-0.622***	-1.297***	-1.442***	-1.295***	-1.981***	-2.686***
	(0.152)	(0.219)	(0.301)	(0.418)	(0.514)	(0.632)
Observations	409	409	409	409	409	409
# of Crises	31	31	31	31	31	31
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.002	0.003	0.012	0.119	0.837	0.342
Panel C: Currency Crises						
ATE-AIPW Total	-1.166***	-0.930*	-2.269***	-2.112*	-4.091***	-7.208***
	(0.424)	(0.511)	(0.833)	(1.105)	(1.337)	(1.736)
ATE-AIPW Agriculture	0.244**	0.148	0.171	-0.159	0.347	0.542*
	(0.115)	(0.169)	(0.360)	(0.344)	(0.287)	(0.315)
ATE-AIPW Mining	-0.365	-0.479**	-1.041***	-0.906**	-2.210***	-3.164***
	(0.347)	(0.219)	(0.343)	(0.369)	(0.407)	(0.525)
ATE-AIPW Manufacturing	-0.564***	-0.603*	-1.686***	-2.070***	-2.865***	-4.210***
	(0.163)	(0.312)	(0.447)	(0.653)	(0.817)	(1.038)
ATE-AIPW Services	-0.482***	0.004	0.288	1.022***	0.636	-0.377
	(0.106)	(0.172)	(0.279)	(0.393)	(0.458)	(0.598)
Observations	409	409	409	409	409	409
# of Crises	33	33	33	33	33	33
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.086	0.869

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-4.044***	-6.069***	-5.434***	-6.101***	-6.073***	-8.638***
	(0.649)	(0.850)	(1.300)	(1.576)	(1.858)	(2.300)
ATE-AIPW Agriculture	-0.293**	-0.636***	-0.414**	-0.637**	-0.662***	-0.600**
	(0.148)	(0.140)	(0.200)	(0.252)	(0.211)	(0.270)
ATE-AIPW Mining	-0.540***	-0.489***	-0.356	-0.732**	-0.871**	-1.751***
	(0.122)	(0.156)	(0.217)	(0.318)	(0.416)	(0.544)
ATE-AIPW Manufacturing	-2.178***	-3.678***	-3.045***	-3.162***	-3.106***	-4.758***
	(0.419)	(0.549)	(0.817)	(0.939)	(1.116)	(1.330)
ATE-AIPW Services	-1.032***	-1.266***	-1.619***	-1.570***	-1.435***	-1.528***
	(0.170)	(0.219)	(0.295)	(0.314)	(0.383)	(0.449)
Observations	409	409	409	409	409	409
# of Crises	33	33	33	33	33	33
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.002	0.001	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-2.645***	-3.893***	-4.564***	-4.511***	-5.715***	-8.990***
	(0.535)	(0.754)	(0.992)	(1.344)	(1.993)	(2.723)
ATE-AIPW Agriculture	-0.226**	-0.040	-0.166	-0.398*	-0.533**	-0.871**
	(0.107)	(0.125)	(0.151)	(0.204)	(0.250)	(0.347)
ATE-AIPW Mining	-0.278***	-0.234**	-0.394***	-0.647***	-1.140***	-1.881***
	(0.081)	(0.113)	(0.144)	(0.212)	(0.354)	(0.522)
ATE-AIPW Manufacturing	-1.576***	-2.831***	-2.971***	-2.405***	-2.544**	-4.279***
	(0.326)	(0.495)	(0.641)	(0.839)	(1.224)	(1.642)
ATE-AIPW Services	-0.566***	-0.789***	-1.034***	-1.062***	-1.498***	-1.959***
	(0.150)	(0.162)	(0.241)	(0.289)	(0.370)	(0.438)
Observations	409	409	409	409	409	409
# of Crises	31	31	31	31	31	31
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.002	0.003	0.012	0.119	0.837	0.342
Panel C: Currency Crises						
ATE-AIPW Total	-4.687***	-5.187***	-5.589***	-5.694***	-5.854***	-7.014***
	(0.650)	(0.789)	(1.123)	(1.474)	(1.874)	(2.376)
ATE-AIPW Agriculture	-0.549***	-0.318***	-0.358**	-0.441***	-0.202	-0.174
	(0.125)	(0.115)	(0.141)	(0.158)	(0.172)	(0.198)
ATE-AIPW Mining	-0.888***	-0.445***	-1.317***	-1.256***	-1.780***	-2.058***
	(0.136)	(0.157)	(0.270)	(0.296)	(0.380)	(0.449)
ATE-AIPW Manufacturing	-2.608***	-3.841***	-3.345***	-3.483***	-3.557***	-4.313***
	(0.413)	(0.529)	(0.701)	(0.951)	(1.224)	(1.555)
ATE-AIPW Services	-0.642***	-0.582***	-0.569**	-0.514*	-0.314	-0.469
	(0.124)	(0.171)	(0.245)	(0.301)	(0.359)	(0.442)
Observations	409	409	409	409	409	409
# of Crises	33	33	33	33	33	33
# of Countries	39	39	39	39	39	39
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.086	0.869

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

Table A.11: Robustness, Maximum weight set to 20, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-0.080	-3.186***	-2.749***	-4.965***	-5.193***	-4.224*
	(0.548)	(0.646)	(0.849)	(1.291)	(1.693)	(2.526)
ATE-AIPW Agriculture	-0.239	0.069	0.595**	0.730	1.240*	2.661**
	(0.220)	(0.244)	(0.301)	(0.504)	(0.706)	(1.181)
ATE-AIPW Mining	1.544***	-0.291	0.188	-0.361	0.203	1.851*
	(0.362)	(0.370)	(0.401)	(0.548)	(0.686)	(1.003)
ATE-AIPW Manufacturing	-0.837***	-2.029***	-2.474***	-3.849***	-4.870***	-5.933***
	(0.186)	(0.308)	(0.413)	(0.539)	(0.731)	(1.128)
ATE-AIPW Services	-0.547***	-0.936***	-1.057***	-1.485***	-1.766***	-2.803***
	(0.103)	(0.155)	(0.249)	(0.326)	(0.358)	(0.483)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.021	0.015	0.029
Panel B: Banking Crises						
ATE-AIPW Total	-1.507***	-5.105***	-5.351***	-5.129***	-7.698***	-7.614***
	(0.432)	(0.658)	(0.723)	(0.934)	(1.229)	(1.429)
ATE-AIPW Agriculture	-0.131	-0.407***	-0.639***	-0.811***	-1.004***	-1.383***
	(0.092)	(0.130)	(0.184)	(0.207)	(0.259)	(0.286)
ATE-AIPW Mining	-0.259	-1.041***	-0.919***	-1.153***	-2.258***	-1.252*
	(0.232)	(0.276)	(0.320)	(0.404)	(0.433)	(0.658)
ATE-AIPW Manufacturing	-0.347*	-1.664***	-1.508***	-0.948	-1.470*	-1.559
	(0.193)	(0.439)	(0.528)	(0.646)	(0.802)	(0.997)
ATE-AIPW Services	-0.769***	-1.994***	-2.285***	-2.217***	-2.967***	-3.419***
	(0.148)	(0.248)	(0.342)	(0.466)	(0.545)	(0.684)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-4.289***	-3.923***	-4.340***	-4.417***	-6.314***	-7.098***
	(0.497)	(0.620)	(0.918)	(1.114)	(1.285)	(1.619)
ATE-AIPW Agriculture	0.042	-0.127	0.011	-0.037	0.120	0.451
	(0.113)	(0.211)	(0.422)	(0.454)	(0.396)	(0.550)
ATE-AIPW Mining	-0.867***	-1.007***	-1.485***	-1.407***	-2.445***	-2.810***
	(0.249)	(0.252)	(0.405)	(0.408)	(0.442)	(0.548)
ATE-AIPW Manufacturing	-2.511***	-2.195***	-2.434***	-2.924***	-3.789***	-4.206***
	(0.296)	(0.351)	(0.401)	(0.565)	(0.675)	(0.807)
ATE-AIPW Services	-0.954***	-0.594***	-0.433	-0.049	-0.200	-0.533
	(0.120)	(0.217)	(0.286)	(0.423)	(0.505)	(0.590)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.001	0.452

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-3.748***	-8.087***	-7.590***	-8.127***	-8.633***	-8.839**
	(0.760)	(0.935)	(1.596)	(2.012)	(2.515)	(3.475)
ATE-AIPW Agriculture	-0.352***	-0.783***	-0.594**	-0.896***	-1.113***	-0.845**
	(0.117)	(0.118)	(0.233)	(0.218)	(0.271)	(0.333)
ATE-AIPW Mining	-0.622***	-1.464***	-1.491***	-1.850***	-1.648***	-1.656**
	(0.126)	(0.239)	(0.334)	(0.468)	(0.590)	(0.842)
ATE-AIPW Manufacturing	-1.834***	-4.289***	-3.342***	-3.281***	-3.542**	-4.011*
	(0.492)	(0.595)	(0.968)	(1.231)	(1.573)	(2.202)
ATE-AIPW Services	-0.939***	-1.551***	-2.164***	-2.099***	-2.330***	-2.327***
	(0.188)	(0.238)	(0.332)	(0.353)	(0.427)	(0.501)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.021	0.015	0.029
Panel B: Banking Crises						
ATE-AIPW Total	-3.827***	-8.575***	-9.925***	-10.447***	-11.951***	-13.271***
	(0.644)	(1.061)	(1.137)	(1.190)	(1.660)	(1.891)
ATE-AIPW Agriculture	-0.350***	-0.488***	-0.683***	-0.956***	-1.244***	-1.518***
	(0.115)	(0.149)	(0.170)	(0.159)	(0.193)	(0.192)
ATE-AIPW Mining	-0.802***	-1.425***	-1.742***	-2.041***	-2.414***	-2.775***
	(0.139)	(0.193)	(0.209)	(0.253)	(0.318)	(0.361)
ATE-AIPW Manufacturing	-2.142***	-5.332***	-5.675***	-5.466***	-5.927***	-6.406***
	(0.372)	(0.685)	(0.722)	(0.768)	(1.084)	(1.280)
ATE-AIPW Services	-0.533***	-1.331***	-1.825***	-1.983***	-2.365***	-2.572***
	(0.152)	(0.166)	(0.252)	(0.281)	(0.328)	(0.369)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-8.398***	-9.289***	-8.674***	-9.452***	-9.760***	-8.094***
	(0.790)	(0.903)	(1.243)	(1.544)	(1.869)	(2.475)
ATE-AIPW Agriculture	-0.684***	-0.693***	-0.744***	-0.976***	-0.730***	-0.502**
	(0.145)	(0.117)	(0.156)	(0.162)	(0.202)	(0.256)
ATE-AIPW Mining	-1.751***	-1.403***	-1.668***	-1.866***	-2.679***	-2.593***
	(0.157)	(0.206)	(0.308)	(0.366)	(0.385)	(0.606)
ATE-AIPW Manufacturing	-4.875***	-5.985***	-5.068***	-5.458***	-5.487***	-4.359***
	(0.490)	(0.566)	(0.727)	(0.898)	(1.121)	(1.400)
ATE-AIPW Services	-1.088***	-1.208***	-1.194***	-1.151***	-0.864**	-0.639
	(0.116)	(0.182)	(0.257)	(0.330)	(0.387)	(0.430)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.001	0.452

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.12: Robustness, Maximum weight set to 5, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-0.404	-3.766***	-3.717***	-6.236***	-6.823***	-6.020***
	(0.250)	(0.364)	(0.479)	(0.668)	(0.824)	(1.058)
ATE-AIPW Agriculture	-0.163**	-0.058	0.356***	0.359*	0.820***	2.174***
	(0.074)	(0.093)	(0.126)	(0.187)	(0.241)	(0.352)
ATE-AIPW Mining	1.175***	-0.659***	-0.301	-0.882***	-0.580*	0.756*
	(0.150)	(0.162)	(0.200)	(0.271)	(0.319)	(0.411)
ATE-AIPW Manufacturing	-0.913***	-2.142***	-2.721***	-4.163***	-5.252***	-6.116***
	(0.124)	(0.214)	(0.283)	(0.366)	(0.461)	(0.578)
ATE-AIPW Services	-0.503***	-0.907***	-1.052***	-1.550***	-1.811***	-2.834***
	(0.073)	(0.115)	(0.163)	(0.214)	(0.260)	(0.329)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-1.558***	-5.542***	-6.014***	-5.958***	-8.742***	-9.041***
	(0.259)	(0.423)	(0.546)	(0.658)	(0.824)	(0.965)
ATE-AIPW Agriculture	-0.050	-0.409***	-0.713***	-0.863***	-1.051***	-1.413***
	(0.057)	(0.079)	(0.110)	(0.134)	(0.156)	(0.178)
ATE-AIPW Mining	-0.392***	-1.175***	-0.996***	-1.300***	-2.419***	-1.659***
	(0.129)	(0.207)	(0.260)	(0.282)	(0.323)	(0.413)
ATE-AIPW Manufacturing	-0.339**	-1.953***	-1.927***	-1.456***	-2.142***	-2.371***
	(0.135)	(0.238)	(0.314)	(0.398)	(0.501)	(0.600)
ATE-AIPW Services	-0.777***	-2.006***	-2.379***	-2.339***	-3.130***	-3.597***
	(0.081)	(0.132)	(0.188)	(0.250)	(0.315)	(0.388)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-4.785***	-4.526***	-5.213***	-5.588***	-7.321***	-8.365***
	(0.274)	(0.370)	(0.502)	(0.642)	(0.758)	(0.935)
ATE-AIPW Agriculture	-0.097*	-0.331***	-0.328**	-0.350**	-0.175	-0.005
	(0.054)	(0.082)	(0.138)	(0.156)	(0.160)	(0.207)
ATE-AIPW Mining	-1.054***	-1.154***	-1.687***	-1.779***	-2.614***	-3.177***
	(0.131)	(0.149)	(0.211)	(0.260)	(0.299)	(0.360)
ATE-AIPW Manufacturing	-2.690***	-2.398***	-2.672***	-3.211***	-4.060***	-4.451***
	(0.156)	(0.220)	(0.283)	(0.367)	(0.454)	(0.555)
ATE-AIPW Services	-0.944***	-0.643***	-0.526***	-0.248	-0.472*	-0.731**
	(0.077)	(0.122)	(0.173)	(0.259)	(0.285)	(0.330)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.004

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-4.413***	-9.211***	-9.623***	-10.631***	-11.542***	-11.879***
	(0.333)	(0.511)	(0.725)	(0.979)	(1.244)	(1.639)
ATE-AIPW Agriculture	-0.423***	-0.941***	-0.870***	-1.092***	-1.364***	-1.181***
	(0.055)	(0.067)	(0.092)	(0.126)	(0.147)	(0.192)
ATE-AIPW Mining	-0.685***	-1.626***	-1.836***	-2.378***	-2.224***	-2.277***
	(0.077)	(0.119)	(0.156)	(0.212)	(0.268)	(0.368)
ATE-AIPW Manufacturing	-2.296***	-5.006***	-4.604***	-4.822***	-5.380***	-5.893***
	(0.211)	(0.325)	(0.447)	(0.591)	(0.741)	(0.964)
ATE-AIPW Services	-1.009***	-1.637***	-2.312***	-2.339***	-2.575***	-2.528***
	(0.075)	(0.110)	(0.151)	(0.185)	(0.226)	(0.272)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel B: Banking Crises						
ATE-AIPW Total	-3.602***	-8.758***	-10.466***	-10.817***	-12.541***	-14.174***
	(0.365)	(0.669)	(0.824)	(0.963)	(1.234)	(1.415)
ATE-AIPW Agriculture	-0.357***	-0.537***	-0.760***	-1.032***	-1.339***	-1.565***
	(0.053)	(0.085)	(0.099)	(0.112)	(0.142)	(0.157)
ATE-AIPW Mining	-0.696***	-1.478***	-1.860***	-2.103***	-2.604***	-3.084***
	(0.093)	(0.141)	(0.169)	(0.203)	(0.249)	(0.281)
ATE-AIPW Manufacturing	-1.996***	-5.431***	-5.991***	-5.652***	-6.143***	-6.881***
	(0.211)	(0.405)	(0.494)	(0.569)	(0.729)	(0.856)
ATE-AIPW Services	-0.553***	-1.312***	-1.855***	-2.031***	-2.455***	-2.644***
	(0.073)	(0.113)	(0.156)	(0.196)	(0.235)	(0.256)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.000
Panel C: Currency Crises						
ATE-AIPW Total	-9.178***	-10.066***	-10.053***	-11.343***	-11.691***	-10.663***
	(0.386)	(0.514)	(0.697)	(0.881)	(1.078)	(1.310)
ATE-AIPW Agriculture	-0.819***	-0.798***	-0.908***	-1.140***	-0.906***	-0.752***
	(0.054)	(0.061)	(0.084)	(0.095)	(0.118)	(0.138)
ATE-AIPW Mining	-1.875***	-1.600***	-2.004***	-2.377***	-3.141***	-3.263***
	(0.088)	(0.115)	(0.155)	(0.195)	(0.234)	(0.304)
ATE-AIPW Manufacturing	-5.328***	-6.348***	-5.718***	-6.368***	-6.468***	-5.713***
	(0.238)	(0.324)	(0.425)	(0.525)	(0.641)	(0.762)
ATE-AIPW Services	-1.156***	-1.320***	-1.422***	-1.459***	-1.176***	-0.934***
	(0.072)	(0.104)	(0.147)	(0.197)	(0.231)	(0.256)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.000	0.000	0.004

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 5.

Table A.13: Robustness, Alternative sources and definitions of crises, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-1.408***	-2.015***	-3.179***	-4.189***	-5.069***	-5.063***
	(0.384)	(0.551)	(0.769)	(1.102)	(1.256)	(1.611)
ATE-AIPW Agriculture	0.151	0.212	0.574***	0.401	0.466	1.195***
	(0.115)	(0.160)	(0.216)	(0.338)	(0.353)	(0.432)
ATE-AIPW Mining	-0.589**	-0.961***	-1.262***	-1.445***	-1.474***	-1.393**
	(0.239)	(0.251)	(0.349)	(0.481)	(0.518)	(0.672)
ATE-AIPW Manufacturing	-0.743***	-1.010***	-2.167***	-2.953***	-3.993***	-4.949***
	(0.131)	(0.269)	(0.367)	(0.493)	(0.633)	(0.786)
ATE-AIPW Services	-0.227***	-0.257*	-0.325	-0.192	-0.068	0.084
	(0.082)	(0.133)	(0.199)	(0.240)	(0.312)	(0.398)
Observations	590	590	590	590	590	590
# of Crises	41	41	41	41	41	41
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.000	0.000	0.001	0.552	0.559	0.014
Panel B: Banking Crises						
ATE-AIPW Total	-1.525***	-4.126***	-5.473***	-6.291***	-8.058***	-8.470***
	(0.340)	(0.474)	(0.589)	(0.789)	(1.044)	(1.252)
ATE-AIPW Agriculture	-0.117	-0.196	-0.325*	-0.349	-0.574**	-0.300
	(0.093)	(0.131)	(0.195)	(0.219)	(0.257)	(0.354)
ATE-AIPW Mining	-0.414***	-1.211***	-1.476***	-1.760***	-2.339***	-1.938***
	(0.156)	(0.221)	(0.267)	(0.341)	(0.414)	(0.551)
ATE-AIPW Manufacturing	-0.659***	-1.733***	-2.339***	-2.712***	-3.316***	-4.311***
	(0.209)	(0.303)	(0.408)	(0.555)	(0.706)	(0.836)
ATE-AIPW Services	-0.335***	-0.986***	-1.333***	-1.470***	-1.830***	-1.922***
	(0.102)	(0.168)	(0.220)	(0.264)	(0.336)	(0.392)
Observations	590	590	590	590	590	590
# of Crises	44	44	44	44	44	44
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.001	0.001	0.006	0.004	0.379	0.063
Panel C: Currency Crises						
ATE-AIPW Total	-0.609	-3.360***	-4.102***	-3.490***	-4.686***	-5.157***
	(0.462)	(0.656)	(0.727)	(0.945)	(1.332)	(1.739)
ATE-AIPW Agriculture	0.003	-0.317*	-0.475***	-0.507**	-0.616***	-0.584**
	(0.168)	(0.175)	(0.182)	(0.222)	(0.229)	(0.296)
ATE-AIPW Mining	-0.394	-1.075***	-1.147***	-1.115***	-1.933***	-2.186***
	(0.248)	(0.275)	(0.348)	(0.407)	(0.478)	(0.577)
ATE-AIPW Manufacturing	0.075	-0.994***	-1.309***	-0.894	-1.150	-0.984
	(0.220)	(0.383)	(0.473)	(0.656)	(0.934)	(1.262)
ATE-AIPW Services	-0.294**	-0.974***	-1.171***	-0.975***	-0.988**	-1.403***
	(0.121)	(0.194)	(0.245)	(0.318)	(0.432)	(0.462)
Observations	590	590	590	590	590	590
# of Crises	69	69	69	69	69	69
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.898	0.004	0.154	0.590	0.557	0.715

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-3.102***	-5.427***	-5.799***	-4.693***	-4.553***	-2.668
	(0.464)	(0.702)	(1.044)	(1.385)	(1.582)	(1.806)
ATE-AIPW Agriculture	-0.286***	-0.422***	-0.429***	-0.318*	-0.359**	-0.191
	(0.078)	(0.092)	(0.112)	(0.191)	(0.161)	(0.184)
ATE-AIPW Mining	-0.296***	-0.614***	-0.905***	-1.289***	-1.556***	-1.478***
	(0.084)	(0.128)	(0.198)	(0.259)	(0.303)	(0.471)
ATE-AIPW Manufacturing	-1.642***	-3.224***	-3.412***	-2.116**	-1.952*	-0.854
	(0.305)	(0.461)	(0.663)	(0.878)	(0.997)	(1.059)
ATE-AIPW Services	-0.878***	-1.168***	-1.053***	-0.970***	-0.686**	-0.145
	(0.111)	(0.163)	(0.230)	(0.249)	(0.288)	(0.315)
Observations	590	590	590	590	590	590
# of Crises	41	41	41	41	41	41
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.000	0.000	0.001	0.552	0.559	0.014
Panel B: Banking Crises						
ATE-AIPW Total	-3.179***	-6.036***	-7.383***	-8.324***	-8.729***	-10.438***
	(0.529)	(0.761)	(0.952)	(1.048)	(1.325)	(1.577)
ATE-AIPW Agriculture	-0.331***	-0.446***	-0.464***	-0.699***	-0.670***	-0.908***
	(0.113)	(0.118)	(0.133)	(0.139)	(0.139)	(0.160)
ATE-AIPW Mining	-0.350***	-0.596***	-0.951***	-1.367***	-1.670***	-1.883***
	(0.086)	(0.132)	(0.157)	(0.178)	(0.235)	(0.290)
ATE-AIPW Manufacturing	-2.153***	-4.167***	-4.845***	-5.182***	-4.906***	-5.760***
	(0.338)	(0.516)	(0.639)	(0.717)	(0.925)	(1.114)
ATE-AIPW Services	-0.345***	-0.827***	-1.123***	-1.075***	-1.483***	-1.887***
	(0.095)	(0.114)	(0.180)	(0.205)	(0.229)	(0.263)
Observations	590	590	590	590	590	590
# of Crises	44	44	44	44	44	44
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.001	0.001	0.006	0.004	0.379	0.063
Panel C: Currency Crises						
ATE-AIPW Total	-0.548	-5.051***	-5.245***	-3.995***	-5.357***	-4.713**
	(0.512)	(0.762)	(0.958)	(1.163)	(1.473)	(2.081)
ATE-AIPW Agriculture	-0.092	-0.484***	-0.508***	-0.408***	-0.653***	-0.475**
	(0.060)	(0.083)	(0.108)	(0.140)	(0.156)	(0.207)
ATE-AIPW Mining	0.028	-0.861***	-0.953***	-0.968***	-1.219***	-1.239***
	(0.124)	(0.149)	(0.175)	(0.217)	(0.258)	(0.361)
ATE-AIPW Manufacturing	-0.424	-3.112***	-2.973***	-1.941**	-2.783***	-2.315*
	(0.331)	(0.533)	(0.668)	(0.823)	(1.023)	(1.398)
ATE-AIPW Services	-0.059	-0.594***	-0.811***	-0.679***	-0.702**	-0.684*
	(0.111)	(0.129)	(0.181)	(0.218)	(0.291)	(0.370)
Observations	590	590	590	590	590	590
# of Crises	69	69	69	69	69	69
# of Countries	31	31	31	31	31	31
P-value Total Exports= Total Imports	0.898	0.004	0.154	0.590	0.557	0.715

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

Table A.14: Robustness, Inverse Probability Weighted (IPW) estimator, Cumulative trade costs over five years after financial crises

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-1.217***	-2.667***	-3.576***	-5.509***	-5.567***	-4.068***
	(0.284)	(0.898)	(1.112)	(1.164)	(1.066)	(0.850)
ATE-AIPW Agriculture	-0.246	0.134	0.488***	0.940***	1.325**	2.702*
	(0.300)	(0.241)	(0.186)	(0.224)	(0.549)	(1.387)
ATE-AIPW Mining	0.474*	-0.029	-0.252	-1.069***	-0.461	0.602
	(0.253)	(0.493)	(0.380)	(0.256)	(0.398)	(0.702)
ATE-AIPW Manufacturing	-0.793***	-1.551***	-2.414***	-3.646***	-4.360***	-4.986***
	(0.235)	(0.358)	(0.555)	(0.675)	(0.921)	(1.067)
ATE-AIPW Services	-0.652***	-1.221***	-1.398***	-1.735***	-2.071***	-2.387***
	(0.142)	(0.302)	(0.368)	(0.595)	(0.740)	(0.780)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.027	0.053	0.119	0.690	0.361	0.434
Panel B: Banking Crises						
ATE-AIPW Total	-1.344***	-5.400***	-5.681***	-5.263***	-7.923***	-7.786***
	(0.440)	(1.868)	(1.819)	(1.843)	(2.405)	(2.647)
ATE-AIPW Agriculture	-0.119**	-0.530***	-0.722***	-0.819***	-0.961***	-1.304***
	(0.060)	(0.178)	(0.215)	(0.206)	(0.279)	(0.276)
ATE-AIPW Mining	-0.282**	-1.073*	-0.964*	-1.213**	-2.262***	-1.447*
	(0.127)	(0.550)	(0.551)	(0.514)	(0.635)	(0.835)
ATE-AIPW Manufacturing	-0.198	-1.767**	-1.639**	-1.012*	-1.711**	-1.713*
	(0.236)	(0.835)	(0.640)	(0.599)	(0.867)	(0.888)
ATE-AIPW Services	-0.745***	-2.031***	-2.357***	-2.219***	-2.989***	-3.321***
	(0.105)	(0.352)	(0.483)	(0.637)	(0.762)	(0.794)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.024	0.000	0.000	0.000	0.003	0.002
Panel C: Currency Crises						
ATE-AIPW Total	-2.687*	-3.601***	-4.047***	-4.871***	-6.220***	-6.749***
	(1.387)	(1.256)	(1.254)	(1.526)	(1.600)	(1.248)
ATE-AIPW Agriculture	0.106	-0.176	0.279	0.106	0.136	0.550*
	(0.174)	(0.157)	(0.313)	(0.193)	(0.192)	(0.282)
ATE-AIPW Mining	-0.487	-1.046***	-1.449***	-1.775***	-2.481***	-2.447***
	(0.297)	(0.297)	(0.318)	(0.418)	(0.424)	(0.366)
ATE-AIPW Manufacturing	-1.427**	-1.872***	-2.436***	-2.911***	-3.557***	-3.922***
	(0.705)	(0.577)	(0.429)	(0.542)	(0.686)	(0.560)
ATE-AIPW Services	-0.879***	-0.506	-0.440	-0.292	-0.318	-0.931*
	(0.242)	(0.309)	(0.451)	(0.575)	(0.531)	(0.505)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.004	0.004	0.028	0.376

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt Crises						
ATE-AIPW Total	-5.012***	-5.826***	-6.225***	-7.082***	-5.982***	-3.581***
	(0.838)	(1.027)	(1.407)	(2.219)	(1.460)	(0.280)
ATE-AIPW Agriculture	-0.405***	-0.588***	-0.795***	-1.074***	-0.823**	-0.396***
	(0.096)	(0.167)	(0.228)	(0.318)	(0.327)	(0.067)
ATE-AIPW Mining	-0.501**	-0.733***	-1.183***	-1.607***	-1.472***	-0.441***
	(0.199)	(0.253)	(0.333)	(0.282)	(0.335)	(0.099)
ATE-AIPW Manufacturing	-3.042***	-3.047***	-2.735***	-2.826**	-2.125**	-1.960***
	(0.520)	(0.624)	(0.747)	(1.120)	(0.903)	(0.209)
ATE-AIPW Services	-1.064***	-1.458***	-1.512***	-1.574**	-1.562**	-0.784***
	(0.241)	(0.254)	(0.474)	(0.658)	(0.631)	(0.082)
Observations	732	732	732	732	732	732
# of Crises	38	38	38	38	38	38
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.053	0.119	0.690	0.361	0.434	0.027
Panel B: Banking Crises						
ATE-AIPW Total	-9.309***	-10.412***	-10.230***	-11.879***	-12.939***	-3.315***
	(2.975)	(3.369)	(3.722)	(4.541)	(4.912)	(0.525)
ATE-AIPW Agriculture	-0.521**	-0.655**	-0.869**	-1.149**	-1.354***	-0.361***
	(0.244)	(0.302)	(0.349)	(0.453)	(0.502)	(0.070)
ATE-AIPW Mining	-1.611***	-1.832***	-1.920***	-2.354***	-2.779***	-0.669***
	(0.582)	(0.577)	(0.584)	(0.722)	(0.873)	(0.121)
ATE-AIPW Manufacturing	-5.798***	-5.978***	-5.402**	-5.924**	-6.206**	-1.868***
	(1.842)	(2.001)	(2.153)	(2.629)	(2.775)	(0.315)
ATE-AIPW Services	-1.379***	-1.947***	-2.040***	-2.452***	-2.600***	-0.416***
	(0.329)	(0.512)	(0.659)	(0.763)	(0.795)	(0.130)
Observations	732	732	732	732	732	732
# of Crises	34	34	34	34	34	34
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.000	0.000	0.003	0.002	0.024
Panel C: Currency Crises						
ATE-AIPW Total	-7.923***	-8.230***	-8.786***	-9.370***	-8.338***	-6.451***
	(2.038)	(2.072)	(2.678)	(3.115)	(2.305)	(1.924)
ATE-AIPW Agriculture	-0.644***	-0.749***	-0.857***	-0.736**	-0.634**	-0.584***
	(0.192)	(0.240)	(0.304)	(0.336)	(0.293)	(0.144)
ATE-AIPW Mining	-1.415***	-1.839***	-2.158***	-2.620***	-2.063***	-1.210***
	(0.372)	(0.324)	(0.377)	(0.503)	(0.376)	(0.356)
ATE-AIPW Manufacturing	-4.759***	-4.541***	-4.631***	-5.008***	-4.520***	-3.723***
	(1.209)	(1.278)	(1.580)	(1.800)	(1.326)	(1.197)
ATE-AIPW Services	-1.105***	-1.100***	-1.139**	-1.005*	-1.121**	-0.934***
	(0.300)	(0.366)	(0.505)	(0.533)	(0.521)	(0.253)
Observations	732	732	732	732	732	732
# of Crises	36	36	36	36	36	36
# of Countries	41	41	41	41	41	41
P-value Total Exports= Total Imports	0.000	0.004	0.004	0.028	0.376	0.000

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 10.

A.4.2.3 Channels

Table A.15a: Channels, Cumulative trade costs over five years after debt crises with higher and lower manufacturing exports

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.621***	-1.750***	-2.203***	-3.785***	-4.775***	-3.693***
	(0.300)	(0.480)	(0.620)	(0.812)	(1.002)	(1.285)
ATE-AIPW Low	-0.649*	-3.375***	-4.900***	-7.863***	-7.811***	-7.610***
	(0.336)	(0.455)	(0.620)	(0.873)	(1.091)	(1.437)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.030	6.212	9.802	13.553	17.101	21.167
Avg.(trade) in countries below cutoff	2.844	5.659	8.548	11.798	14.526	17.317
Panel b: Agriculture						
ATE-AIPW High	-0.645***	-0.090	-0.103	0.229	0.246	1.188***
	(0.111)	(0.112)	(0.156)	(0.210)	(0.237)	(0.278)
ATE-AIPW Low	0.075	0.081	0.354*	0.553**	0.756*	1.901***
	(0.102)	(0.134)	(0.181)	(0.281)	(0.393)	(0.631)
P-value High=Low	0.000	0.181	0.003	0.230	0.166	0.252
Avg.(trade) in countries above cutoff	0.368	0.728	1.160	1.597	2.034	2.546
Avg.(trade) in countries below cutoff	0.422	0.937	1.471	2.103	2.536	3.161
Panel c: Mining						
ATE-AIPW High	-0.232*	-0.212	-0.397	-0.598*	-0.683*	-0.598
	(0.127)	(0.195)	(0.247)	(0.321)	(0.401)	(0.483)
ATE-AIPW Low	0.646***	0.228	-0.232	-1.717***	-0.713*	0.338
	(0.210)	(0.242)	(0.276)	(0.365)	(0.426)	(0.591)
P-value High=Low	0.000	0.018	0.305	0.000	0.915	0.036
Avg.(trade) in countries above cutoff	0.341	0.761	1.246	1.756	2.230	2.730
Avg.(trade) in countries below cutoff	0.975	1.833	2.767	3.778	4.560	5.295
Panel d: Manufacturing						
ATE-AIPW High	-0.573***	-0.857***	-1.480***	-2.883***	-3.455***	-3.561***
	(0.147)	(0.262)	(0.319)	(0.409)	(0.514)	(0.670)
ATE-AIPW Low	-0.851***	-2.074***	-2.963***	-4.102***	-5.047***	-5.975***
	(0.136)	(0.222)	(0.308)	(0.401)	(0.509)	(0.663)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.502	3.078	4.808	6.585	8.254	10.168
Avg.(trade) in countries below cutoff	0.648	1.295	1.865	2.645	3.324	4.003
Panel e: Services						
ATE-AIPW High	-0.171**	-0.590***	-0.223	-0.533**	-0.882***	-0.722**
	(0.084)	(0.135)	(0.195)	(0.243)	(0.291)	(0.353)
ATE-AIPW Low	-0.520***	-1.610***	-2.060***	-2.597***	-2.807***	-3.874***
	(0.078)	(0.132)	(0.191)	(0.244)	(0.290)	(0.349)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.819	1.645	2.587	3.614	4.583	5.723
Avg.(trade) in countries below cutoff	0.799	1.594	2.445	3.272	4.106	4.857
Observations	709	709	709	709	709	709
# of Crises	20	20	20	20	20	20
Cutoff of channel variable, median	17.031	17.031	17.031	17.031	17.031	17.031

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-2.023***	-3.473***	-3.523***	-3.911***	-4.280***	-3.274**
	(0.505)	(0.641)	(0.937)	(1.123)	(1.399)	(1.633)
ATE-AIPW Low	-3.935***	-6.851***	-7.775***	-9.486***	-10.617***	-10.384***
	(0.540)	(0.692)	(1.014)	(1.225)	(1.539)	(2.014)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.678	7.557	11.744	16.187	20.486	25.232
Avg.(trade) in countries below cutoff	3.305	6.505	9.622	13.326	17.041	20.623
Panel b: Agriculture						
ATE-AIPW High	0.009	-0.310***	-0.376***	-0.494***	-0.593***	-0.349**
	(0.096)	(0.088)	(0.135)	(0.133)	(0.159)	(0.174)
ATE-AIPW Low	-0.293***	-0.688***	-0.742***	-1.099***	-1.434***	-1.226***
	(0.101)	(0.088)	(0.138)	(0.133)	(0.160)	(0.182)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.330	0.691	1.072	1.495	1.928	2.415
Avg.(trade) in countries below cutoff	0.329	0.634	0.951	1.325	1.653	1.951
Panel c: Mining						
ATE-AIPW High	-0.683***	-0.599***	-0.713***	-1.283***	-0.552*	-0.276
	(0.087)	(0.149)	(0.194)	(0.269)	(0.329)	(0.423)
ATE-AIPW Low	-0.175**	-0.558***	-0.871***	-1.519***	-2.261***	-2.406***
	(0.088)	(0.170)	(0.213)	(0.268)	(0.326)	(0.430)
P-value High=Low	0.000	0.750	0.268	0.230	0.000	0.000
Avg.(trade) in countries above cutoff	0.642	1.346	2.126	2.960	3.709	4.479
Avg.(trade) in countries below cutoff	0.444	0.902	1.356	1.839	2.191	2.551
Panel d: Manufacturing						
ATE-AIPW High	-1.036***	-1.763***	-1.717***	-1.478**	-2.384***	-2.205**
	(0.317)	(0.405)	(0.573)	(0.661)	(0.815)	(0.921)
ATE-AIPW Low	-2.371***	-4.014***	-3.951***	-4.481***	-4.544***	-3.966***
	(0.342)	(0.427)	(0.618)	(0.761)	(0.972)	(1.305)
P-value High=Low	0.000	0.000	0.000	0.000	0.002	0.086
Avg.(trade) in countries above cutoff	2.093	4.242	6.542	8.920	11.275	13.933
Avg.(trade) in countries below cutoff	1.949	3.816	5.627	7.811	10.218	12.546
Panel e: Services						
ATE-AIPW High	-0.312***	-0.802***	-0.717***	-0.655***	-0.751***	-0.444
	(0.106)	(0.131)	(0.174)	(0.207)	(0.251)	(0.298)
ATE-AIPW Low	-1.095***	-1.590***	-2.212***	-2.387***	-2.378***	-2.787***
	(0.113)	(0.143)	(0.200)	(0.229)	(0.271)	(0.305)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.614	1.277	2.004	2.812	3.573	4.404
Avg.(trade) in countries below cutoff	0.582	1.154	1.688	2.349	2.980	3.576
Observations	709	709	709	709	709	709
# of Crises	20	20	20	20	20	20
Cutoff of channel variable, median	17.031	17.031	17.031	17.031	17.031	17.031

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.15b: Channels, Cumulative trade costs over five years after banking crises with higher and lower manufacturing exports

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-0.693**	-5.293***	-5.197***	-3.396***	-5.414***	-5.917***
	(0.303)	(0.492)	(0.592)	(0.754)	(0.911)	(1.137)
ATE-AIPW Low	-1.800***	-5.228***	-6.804***	-9.202***	-12.355***	-13.474***
	(0.287)	(0.475)	(0.589)	(0.739)	(0.874)	(1.071)
P-value High=Low	0.000	0.787	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.326	6.776	10.597	14.705	18.538	22.813
Avg.(trade) in countries below cutoff	2.526	5.128	7.980	10.952	13.618	16.620
Panel b: Agriculture						
ATE-AIPW High	-0.112*	-0.674***	-1.013***	-1.100***	-1.181***	-1.503***
	(0.059)	(0.081)	(0.103)	(0.137)	(0.161)	(0.191)
ATE-AIPW Low	-0.063	-0.346***	-0.621***	-0.790***	-1.073***	-1.563***
	(0.064)	(0.094)	(0.136)	(0.162)	(0.183)	(0.213)
P-value High=Low	0.352	0.000	0.000	0.007	0.409	0.653
Avg.(trade) in countries above cutoff	0.346	0.705	1.100	1.511	1.928	2.389
Avg.(trade) in countries below cutoff	0.431	0.887	1.432	2.024	2.485	3.133
Panel c: Mining						
ATE-AIPW High	-0.484***	-1.281***	-1.619***	-1.879***	-2.633***	-2.880***
	(0.140)	(0.226)	(0.249)	(0.271)	(0.325)	(0.410)
ATE-AIPW Low	0.136	-0.446*	-0.132	-0.710**	-1.676***	-0.521
	(0.166)	(0.238)	(0.276)	(0.311)	(0.353)	(0.482)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.308	0.640	1.038	1.474	1.853	2.258
Avg.(trade) in countries below cutoff	0.778	1.584	2.462	3.378	4.167	4.938
Panel d: Manufacturing						
ATE-AIPW High	0.241	-1.514***	-0.538	1.225**	0.731	1.014
	(0.166)	(0.293)	(0.381)	(0.484)	(0.559)	(0.693)
ATE-AIPW Low	-1.004***	-2.437***	-3.557***	-4.765***	-5.660***	-6.751***
	(0.126)	(0.221)	(0.308)	(0.406)	(0.484)	(0.586)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.779	3.641	5.676	7.799	9.775	11.987
Avg.(trade) in countries below cutoff	0.609	1.235	1.845	2.552	3.203	3.961
Panel e: Services						
ATE-AIPW High	-0.338***	-1.824***	-2.027***	-1.641***	-2.331***	-2.549***
	(0.096)	(0.166)	(0.242)	(0.322)	(0.394)	(0.515)
ATE-AIPW Low	-0.868***	-1.999***	-2.494***	-2.937***	-3.946***	-4.639***
	(0.093)	(0.142)	(0.193)	(0.259)	(0.332)	(0.416)
P-value High=Low	0.000	0.121	0.003	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.894	1.791	2.784	3.921	4.982	6.178
Avg.(trade) in countries below cutoff	0.708	1.422	2.240	2.999	3.764	4.589
Observations	711	711	711	711	711	711
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	27.083	27.083	27.083	27.083	27.083	27.083

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-1.995***	-9.200***	-10.062***	-9.171***	-9.966***	-10.131***
	(0.432)	(0.807)	(1.000)	(1.149)	(1.395)	(1.696)
ATE-AIPW Low	-3.188***	-7.324***	-9.441***	-11.890***	-14.729***	-20.120***
	(0.450)	(0.727)	(0.936)	(1.107)	(1.338)	(1.601)
P-value High=Low	0.001	0.000	0.198	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.997	8.298	12.933	17.784	22.317	27.123
Avg.(trade) in countries below cutoff	3.028	5.932	8.867	12.317	15.947	19.893
Panel b: Agriculture						
ATE-AIPW High	-0.390***	-0.706***	-0.800***	-0.916***	-0.955***	-1.195***
	(0.059)	(0.097)	(0.117)	(0.130)	(0.165)	(0.191)
ATE-AIPW Low	0.067	0.188*	-0.223*	-0.685***	-1.128***	-1.969***
	(0.069)	(0.105)	(0.124)	(0.134)	(0.159)	(0.186)
P-value High=Low	0.000	0.000	0.000	0.001	0.032	0.000
Avg.(trade) in countries above cutoff	0.340	0.704	1.116	1.572	2.020	2.496
Avg.(trade) in countries below cutoff	0.315	0.638	0.938	1.289	1.638	2.021
Panel c: Mining						
ATE-AIPW High	-0.484***	-1.792***	-1.780***	-1.538***	-1.960***	-2.430***
	(0.104)	(0.166)	(0.196)	(0.237)	(0.272)	(0.325)
ATE-AIPW Low	-0.750***	-1.257***	-1.821***	-2.532***	-3.094***	-3.844***
	(0.094)	(0.161)	(0.194)	(0.235)	(0.275)	(0.323)
P-value High=Low	0.000	0.000	0.509	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.674	1.499	2.391	3.357	4.204	5.030
Avg.(trade) in countries below cutoff	0.478	0.870	1.302	1.744	2.119	2.562
Panel d: Manufacturing						
ATE-AIPW High	-1.130***	-5.535***	-5.676***	-4.882***	-4.828***	-4.222***
	(0.248)	(0.495)	(0.601)	(0.680)	(0.838)	(1.040)
ATE-AIPW Low	-2.022***	-5.045***	-5.733***	-6.385***	-7.804***	-11.194***
	(0.262)	(0.417)	(0.545)	(0.634)	(0.777)	(0.928)
P-value High=Low	0.000	0.132	0.861	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.295	4.655	7.205	9.771	12.191	14.835
Avg.(trade) in countries below cutoff	1.738	3.435	5.104	7.116	9.417	11.889
Panel e: Services						
ATE-AIPW High	0.008	-1.166***	-1.806***	-1.835***	-2.223***	-2.284***
	(0.097)	(0.139)	(0.196)	(0.236)	(0.271)	(0.308)
ATE-AIPW Low	-0.483***	-1.210***	-1.663***	-2.288***	-2.701***	-3.114***
	(0.090)	(0.121)	(0.163)	(0.207)	(0.249)	(0.289)
P-value High=Low	0.000	0.631	0.250	0.001	0.002	0.000
Avg.(trade) in countries above cutoff	0.688	1.439	2.221	3.084	3.902	4.762
Avg.(trade) in countries below cutoff	0.496	0.988	1.522	2.168	2.773	3.422
Observations	711	711	711	711	711	711
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	27.083	27.083	27.083	27.083	27.083	27.083

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.15c: Channels, Cumulative trade costs over five years after currency crises with higher and lower manufacturing exports

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-2.029***	-3.126***	-4.221***	-3.771***	-3.391***	-2.809***
	(0.297)	(0.411)	(0.547)	(0.734)	(0.859)	(1.060)
ATE-AIPW Low	-1.504***	-3.195***	-4.446***	-6.511***	-9.557***	-10.517***
	(0.298)	(0.410)	(0.617)	(0.743)	(0.848)	(1.076)
P-value High=Low	0.000	0.788	0.577	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.147	6.441	10.080	13.956	17.656	21.730
Avg.(trade) in countries below cutoff	2.714	5.462	8.487	11.692	14.429	17.597
Panel b: Agriculture						
ATE-AIPW High	-0.219***	-0.570***	-0.739***	-0.722***	-0.538**	-0.356
	(0.056)	(0.098)	(0.134)	(0.172)	(0.212)	(0.289)
ATE-AIPW Low	0.377***	0.068	0.677***	0.281	0.099	-0.065
	(0.071)	(0.106)	(0.210)	(0.214)	(0.199)	(0.235)
P-value High=Low	0.000	0.000	0.000	0.000	0.001	0.257
Avg.(trade) in countries above cutoff	0.339	0.708	1.114	1.531	1.964	2.444
Avg.(trade) in countries below cutoff	0.451	0.904	1.450	2.055	2.495	3.135
Panel c: Mining						
ATE-AIPW High	-0.199	-0.825***	-1.192***	-1.705***	-1.989***	-2.092***
	(0.196)	(0.150)	(0.201)	(0.252)	(0.302)	(0.352)
ATE-AIPW Low	-0.493**	-1.026***	-1.369***	-1.308***	-2.664***	-2.479***
	(0.210)	(0.182)	(0.273)	(0.310)	(0.340)	(0.411)
P-value High=Low	0.000	0.060	0.339	0.031	0.000	0.079
Avg.(trade) in countries above cutoff	0.305	0.639	1.024	1.436	1.796	2.167
Avg.(trade) in countries below cutoff	0.839	1.699	2.656	3.669	4.537	5.407
Panel d: Manufacturing						
ATE-AIPW High	-0.771***	-0.882***	-1.462***	-1.092***	-0.555	0.418
	(0.137)	(0.237)	(0.314)	(0.410)	(0.493)	(0.604)
ATE-AIPW Low	-0.847***	-1.658***	-2.747***	-3.841***	-4.924***	-5.705***
	(0.123)	(0.208)	(0.285)	(0.371)	(0.460)	(0.563)
P-value High=Low	0.231	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.667	3.417	5.312	7.286	9.163	11.236
Avg.(trade) in countries below cutoff	0.645	1.300	1.963	2.734	3.383	4.187
Panel e: Services						
ATE-AIPW High	-0.840***	-0.848***	-0.829***	-0.252	-0.309	-0.779**
	(0.077)	(0.129)	(0.184)	(0.264)	(0.304)	(0.363)
ATE-AIPW Low	-0.541***	-0.578***	-1.007***	-1.643***	-2.067***	-2.268***
	(0.078)	(0.134)	(0.183)	(0.243)	(0.295)	(0.373)
P-value High=Low	0.000	0.004	0.165	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.835	1.677	2.631	3.703	4.733	5.882
Avg.(trade) in countries below cutoff	0.779	1.559	2.419	3.235	4.014	4.869
Observations	712	712	712	712	712	712
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	24.364	24.364	24.364	24.364	24.364	24.364

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-5.643***	-7.081***	-7.551***	-8.797***	-8.196***	-6.686***
	(0.422)	(0.608)	(0.819)	(1.041)	(1.266)	(1.563)
ATE-AIPW Low	-4.482***	-6.917***	-9.503***	-10.529***	-11.507***	-10.802***
	(0.403)	(0.553)	(0.789)	(1.009)	(1.209)	(1.513)
P-value High=Low	0.000	0.646	0.000	0.002	0.000	0.000
Avg.(trade) in countries above cutoff	3.838	7.895	12.320	16.948	21.328	26.069
Avg.(trade) in countries below cutoff	3.165	6.288	9.352	12.987	16.753	20.699
Panel b: Agriculture						
ATE-AIPW High	-0.498***	-0.654***	-0.763***	-0.969***	-0.872***	-0.883***
	(0.081)	(0.074)	(0.095)	(0.110)	(0.137)	(0.154)
ATE-AIPW Low	-0.444***	-0.600***	-0.905***	-1.055***	-0.937***	-0.728***
	(0.082)	(0.070)	(0.095)	(0.109)	(0.137)	(0.169)
P-value High=Low	0.094	0.198	0.001	0.064	0.331	0.193
Avg.(trade) in countries above cutoff	0.326	0.672	1.065	1.509	1.951	2.412
Avg.(trade) in countries below cutoff	0.336	0.681	0.998	1.354	1.701	2.097
Panel c: Mining						
ATE-AIPW High	-1.124***	-1.361***	-2.256***	-2.586***	-2.700***	-2.042***
	(0.082)	(0.137)	(0.182)	(0.237)	(0.272)	(0.374)
ATE-AIPW Low	-0.643***	-1.150***	-1.746***	-2.172***	-2.580***	-2.633***
	(0.088)	(0.135)	(0.172)	(0.209)	(0.247)	(0.303)
P-value High=Low	0.000	0.016	0.000	0.011	0.464	0.050
Avg.(trade) in countries above cutoff	0.674	1.457	2.329	3.266	4.059	4.933
Avg.(trade) in countries below cutoff	0.454	0.862	1.269	1.694	2.098	2.418
Panel d: Manufacturing						
ATE-AIPW High	-3.211***	-4.111***	-3.575***	-4.087***	-3.588***	-2.937***
	(0.260)	(0.371)	(0.485)	(0.616)	(0.761)	(0.926)
ATE-AIPW Low	-2.684***	-3.961***	-5.412***	-5.702***	-6.343***	-5.545***
	(0.247)	(0.333)	(0.457)	(0.595)	(0.713)	(0.882)
P-value High=Low	0.000	0.511	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.183	4.400	6.813	9.253	11.612	14.180
Avg.(trade) in countries below cutoff	1.850	3.693	5.475	7.619	10.005	12.576
Panel e: Services						
ATE-AIPW High	-0.810***	-0.955***	-0.957***	-1.154***	-1.036***	-0.824***
	(0.075)	(0.120)	(0.172)	(0.208)	(0.243)	(0.276)
ATE-AIPW Low	-0.711***	-1.205***	-1.441***	-1.600***	-1.647***	-1.897***
	(0.077)	(0.120)	(0.181)	(0.214)	(0.246)	(0.286)
P-value High=Low	0.053	0.001	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.655	1.365	2.113	2.920	3.707	4.544
Avg.(trade) in countries below cutoff	0.525	1.051	1.610	2.319	2.948	3.608
Observations	712	712	712	712	712	712
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	24.364	24.364	24.364	24.364	24.364	24.364

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.16a: Channels, Cumulative trade costs over five years after debt crises with higher and lower export diversification

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.600***	-2.127***	-2.328***	-4.299***	-5.555***	-5.678***
	(0.277)	(0.470)	(0.639)	(0.843)	(1.031)	(1.271)
ATE-AIPW Low	-1.104***	-3.529***	-5.243***	-7.874***	-8.565***	-8.603***
	(0.322)	(0.443)	(0.636)	(0.896)	(1.042)	(1.232)
P-value High=Low	0.051	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.217	6.663	10.494	14.540	18.218	22.318
Avg.(trade) in countries below cutoff	2.355	4.456	6.711	9.156	11.463	14.078
Panel b: Agriculture						
ATE-AIPW High	-0.631***	-0.356***	-0.325**	-0.387**	-0.173	0.549*
	(0.111)	(0.107)	(0.156)	(0.195)	(0.235)	(0.292)
ATE-AIPW Low	-0.267***	-0.127	0.119	0.706**	0.032	0.094
	(0.082)	(0.102)	(0.159)	(0.274)	(0.290)	(0.284)
P-value High=Low	0.000	0.007	0.000	0.000	0.411	0.092
Avg.(trade) in countries above cutoff	0.371	0.766	1.213	1.653	2.107	2.602
Avg.(trade) in countries below cutoff	0.394	0.795	1.293	1.911	2.239	2.793
Panel c: Mining						
ATE-AIPW High	-0.287***	-0.273	-0.323	-0.412	-0.440	-0.403
	(0.109)	(0.191)	(0.269)	(0.344)	(0.431)	(0.503)
ATE-AIPW Low	0.675***	0.303	-0.273	-1.781***	-0.860*	0.154
	(0.200)	(0.238)	(0.297)	(0.388)	(0.455)	(0.611)
P-value High=Low	0.000	0.002	0.754	0.000	0.111	0.210
Avg.(trade) in countries above cutoff	0.409	0.908	1.515	2.157	2.718	3.256
Avg.(trade) in countries below cutoff	0.793	1.434	2.029	2.677	3.204	3.837
Panel d: Manufacturing						
ATE-AIPW High	-0.652***	-0.822***	-1.458***	-2.985***	-3.864***	-4.319***
	(0.141)	(0.261)	(0.323)	(0.413)	(0.512)	(0.624)
ATE-AIPW Low	-0.928***	-2.141***	-3.031***	-4.186***	-4.956***	-5.551***
	(0.129)	(0.225)	(0.316)	(0.407)	(0.502)	(0.610)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.567	3.224	5.004	6.901	8.624	10.625
Avg.(trade) in countries below cutoff	0.496	0.941	1.399	1.855	2.397	2.863
Panel e: Services						
ATE-AIPW High	-0.031	-0.677***	-0.221	-0.515**	-1.079***	-1.505***
	(0.077)	(0.128)	(0.189)	(0.237)	(0.284)	(0.340)
ATE-AIPW Low	-0.584***	-1.564***	-2.059***	-2.614***	-2.780***	-3.301***
	(0.074)	(0.127)	(0.189)	(0.243)	(0.285)	(0.343)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.869	1.764	2.762	3.829	4.769	5.835
Avg.(trade) in countries below cutoff	0.673	1.286	1.990	2.713	3.624	4.585
Observations	707	707	707	707	707	707
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-3.200	-3.200	-3.200	-3.200	-3.200	-3.200

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-2.183***	-4.744***	-4.650***	-4.192***	-5.084***	-4.638***
	(0.459)	(0.625)	(0.924)	(1.146)	(1.356)	(1.605)
ATE-AIPW Low	-4.309***	-6.566***	-8.070***	-11.081***	-12.402***	-13.761***
	(0.516)	(0.680)	(0.992)	(1.186)	(1.407)	(1.605)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.849	7.770	12.059	16.650	21.042	25.598
Avg.(trade) in countries below cutoff	2.883	5.931	8.759	12.002	15.415	19.295
Panel b: Agriculture						
ATE-AIPW High	0.002	-0.455***	-0.295**	-0.266	-0.461***	-0.342*
	(0.116)	(0.107)	(0.139)	(0.177)	(0.161)	(0.188)
ATE-AIPW Low	-0.357***	-0.661***	-0.948***	-1.303***	-1.634***	-1.483***
	(0.121)	(0.109)	(0.143)	(0.181)	(0.162)	(0.190)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.340	0.691	1.087	1.509	1.933	2.380
Avg.(trade) in countries below cutoff	0.308	0.634	0.909	1.290	1.642	2.027
Panel c: Mining						
ATE-AIPW High	-0.579***	-0.627***	-1.045***	-1.228***	-0.432	-0.001
	(0.090)	(0.157)	(0.207)	(0.277)	(0.326)	(0.423)
ATE-AIPW Low	-0.377***	-0.684***	-0.776***	-1.846***	-2.552***	-3.256***
	(0.093)	(0.174)	(0.214)	(0.263)	(0.315)	(0.370)
P-value High=Low	0.000	0.654	0.067	0.001	0.000	0.000
Avg.(trade) in countries above cutoff	0.654	1.341	2.095	2.924	3.671	4.403
Avg.(trade) in countries below cutoff	0.416	0.915	1.448	1.942	2.316	2.745
Panel d: Manufacturing						
ATE-AIPW High	-1.240***	-2.653***	-2.478***	-2.065***	-3.324***	-3.466***
	(0.287)	(0.386)	(0.558)	(0.662)	(0.778)	(0.894)
ATE-AIPW Low	-2.499***	-3.855***	-4.293***	-5.642***	-6.051***	-6.684***
	(0.321)	(0.415)	(0.597)	(0.697)	(0.829)	(0.932)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.230	4.450	6.843	9.398	11.911	14.567
Avg.(trade) in countries below cutoff	1.601	3.242	4.783	6.422	8.338	10.520
Panel e: Services						
ATE-AIPW High	-0.366***	-1.008***	-0.832***	-0.633***	-0.867***	-0.829***
	(0.086)	(0.119)	(0.164)	(0.198)	(0.232)	(0.276)
ATE-AIPW Low	-1.076***	-1.366***	-2.052***	-2.291***	-2.164***	-2.338***
	(0.103)	(0.137)	(0.198)	(0.227)	(0.275)	(0.303)
P-value High=Low	0.000	0.001	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.626	1.288	2.034	2.819	3.527	4.248
Avg.(trade) in countries below cutoff	0.558	1.139	1.620	2.348	3.119	4.003
Observations	707	707	707	707	707	707
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-3.200	-3.200	-3.200	-3.200	-3.200	-3.200

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.16b: Channels, Cumulative trade costs over five years after banking crises with higher and lower export diversification

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-0.991***	-6.176***	-5.784***	-4.618***	-6.971***	-7.303***
	(0.294)	(0.477)	(0.575)	(0.730)	(0.893)	(1.113)
ATE-AIPW Low	-1.383***	-4.750***	-6.592***	-8.249***	-11.364***	-12.734***
	(0.293)	(0.479)	(0.580)	(0.730)	(0.901)	(1.084)
P-value High=Low	0.108	0.000	0.001	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.742	7.485	11.588	15.922	19.878	24.287
Avg.(trade) in countries below cutoff	2.528	5.211	8.193	11.371	14.286	17.555
Panel b: Agriculture						
ATE-AIPW High	-0.107*	-0.521***	-0.668***	-0.638***	-0.617***	-0.780***
	(0.056)	(0.084)	(0.113)	(0.145)	(0.177)	(0.201)
ATE-AIPW Low	-0.009	-0.559***	-0.984***	-1.195***	-1.568***	-2.182***
	(0.063)	(0.093)	(0.131)	(0.150)	(0.165)	(0.179)
P-value High=Low	0.054	0.571	0.002	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.420	0.849	1.308	1.808	2.304	2.872
Avg.(trade) in countries below cutoff	0.352	0.729	1.191	1.673	2.046	2.524
Panel c: Mining						
ATE-AIPW High	-0.421***	-1.229***	-1.447***	-1.651***	-2.418***	-2.692***
	(0.137)	(0.222)	(0.242)	(0.268)	(0.320)	(0.401)
ATE-AIPW Low	0.041	-0.602**	-0.422	-0.968***	-1.904***	-0.737
	(0.165)	(0.235)	(0.272)	(0.313)	(0.352)	(0.478)
P-value High=Low	0.000	0.000	0.000	0.000	0.001	0.000
Avg.(trade) in countries above cutoff	0.382	0.773	1.206	1.633	1.959	2.286
Avg.(trade) in countries below cutoff	0.593	1.218	1.924	2.696	3.383	4.088
Panel d: Manufacturing						
ATE-AIPW High	-0.048	-2.576***	-1.749***	-0.557	-1.365**	-1.184*
	(0.159)	(0.256)	(0.323)	(0.427)	(0.533)	(0.666)
ATE-AIPW Low	-0.641***	-1.501***	-2.410***	-3.154***	-4.026***	-5.059***
	(0.141)	(0.263)	(0.377)	(0.477)	(0.539)	(0.644)
P-value High=Low	0.000	0.000	0.010	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.070	4.176	6.469	8.908	11.156	13.706
Avg.(trade) in countries below cutoff	0.800	1.661	2.559	3.505	4.400	5.405
Panel e: Services						
ATE-AIPW High	-0.416***	-1.850***	-1.921***	-1.772***	-2.571***	-2.647***
	(0.089)	(0.138)	(0.198)	(0.282)	(0.358)	(0.491)
ATE-AIPW Low	-0.774***	-2.088***	-2.776***	-2.932***	-3.867***	-4.755***
	(0.099)	(0.165)	(0.230)	(0.298)	(0.378)	(0.448)
P-value High=Low	0.000	0.031	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.870	1.687	2.605	3.574	4.459	5.422
Avg.(trade) in countries below cutoff	0.784	1.602	2.519	3.496	4.456	5.538
Observations	710	710	710	710	710	710
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-2.445	-2.445	-2.445	-2.445	-2.445	-2.445

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-2.628***	-10.660***	-11.084***	-10.113***	-11.891***	-12.633***
	(0.421)	(0.757)	(0.949)	(1.136)	(1.448)	(1.766)
ATE-AIPW Low	-2.252***	-6.143***	-9.148***	-11.568***	-13.811***	-18.793***
	(0.447)	(0.721)	(0.925)	(1.113)	(1.440)	(1.700)
P-value High=Low	0.310	0.000	0.000	0.002	0.007	0.000
Avg.(trade) in countries above cutoff	3.906	7.937	12.360	16.945	21.150	25.699
Avg.(trade) in countries below cutoff	3.395	6.870	10.444	14.451	18.529	22.795
Panel b: Agriculture						
ATE-AIPW High	-0.310***	-0.835***	-0.947***	-1.102***	-1.282***	-1.517***
	(0.054)	(0.090)	(0.111)	(0.136)	(0.173)	(0.204)
ATE-AIPW Low	-0.013	0.293***	-0.156	-0.600***	-0.883***	-1.857***
	(0.073)	(0.108)	(0.128)	(0.144)	(0.180)	(0.205)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.278	0.575	0.919	1.274	1.634	2.002
Avg.(trade) in countries below cutoff	0.362	0.736	1.110	1.554	1.985	2.452
Panel c: Mining						
ATE-AIPW High	-0.520***	-1.786***	-1.542***	-1.320***	-1.857***	-2.339***
	(0.101)	(0.159)	(0.191)	(0.232)	(0.287)	(0.344)
ATE-AIPW Low	-0.663***	-1.317***	-2.087***	-2.632***	-3.120***	-3.787***
	(0.096)	(0.157)	(0.190)	(0.228)	(0.285)	(0.340)
P-value High=Low	0.008	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.741	1.542	2.417	3.327	4.125	4.902
Avg.(trade) in countries below cutoff	0.498	1.036	1.621	2.256	2.809	3.383
Panel d: Manufacturing						
ATE-AIPW High	-1.439***	-6.470***	-6.507***	-5.627***	-6.151***	-6.037***
	(0.251)	(0.465)	(0.573)	(0.670)	(0.857)	(1.067)
ATE-AIPW Low	-1.491***	-4.254***	-5.328***	-6.119***	-7.238***	-10.144***
	(0.254)	(0.420)	(0.535)	(0.639)	(0.826)	(0.979)
P-value High=Low	0.804	0.000	0.000	0.128	0.033	0.000
Avg.(trade) in countries above cutoff	2.272	4.538	7.019	9.582	11.941	14.602
Avg.(trade) in countries below cutoff	1.931	3.872	5.842	7.993	10.338	12.785
Panel e: Services						
ATE-AIPW High	-0.359***	-1.569***	-2.088***	-2.064***	-2.602***	-2.740***
	(0.073)	(0.129)	(0.166)	(0.212)	(0.257)	(0.291)
ATE-AIPW Low	-0.084	-0.864***	-1.577***	-2.218***	-2.569***	-3.005***
	(0.110)	(0.123)	(0.182)	(0.222)	(0.273)	(0.314)
P-value High=Low	0.008	0.000	0.000	0.253	0.825	0.103
Avg.(trade) in countries above cutoff	0.614	1.282	2.005	2.762	3.450	4.193
Avg.(trade) in countries below cutoff	0.603	1.227	1.871	2.648	3.396	4.174
Observations	710	710	710	710	710	710
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-2.445	-2.445	-2.445	-2.445	-2.445	-2.445

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.16c: Channels, Cumulative trade costs over five years after currency crises with higher and lower export diversification

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-1.563***	-2.033***	-3.514***	-3.720***	-3.663***	-2.633**
	(0.282)	(0.404)	(0.540)	(0.727)	(0.860)	(1.098)
ATE-AIPW Low	-2.035***	-4.481***	-5.249***	-6.774***	-9.782***	-11.354***
	(0.285)	(0.405)	(0.604)	(0.721)	(0.833)	(0.974)
P-value High=Low	0.001	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.590	7.303	11.296	15.768	19.602	23.775
Avg.(trade) in countries below cutoff	2.526	5.128	8.085	11.048	13.954	17.291
Panel b: Agriculture						
ATE-AIPW High	-0.046	-0.293***	-0.312***	-0.265*	-0.117	0.093
	(0.054)	(0.082)	(0.112)	(0.157)	(0.186)	(0.249)
ATE-AIPW Low	0.278***	-0.062	0.421**	-0.026	-0.218	-0.298
	(0.072)	(0.107)	(0.213)	(0.213)	(0.190)	(0.221)
P-value High=Low	0.000	0.014	0.000	0.226	0.532	0.082
Avg.(trade) in countries above cutoff	0.435	0.878	1.344	1.820	2.271	2.796
Avg.(trade) in countries below cutoff	0.334	0.696	1.153	1.651	2.046	2.548
Panel c: Mining						
ATE-AIPW High	-0.262	-0.585***	-0.822***	-1.192***	-1.425***	-1.287***
	(0.169)	(0.150)	(0.205)	(0.261)	(0.313)	(0.383)
ATE-AIPW Low	-0.539***	-1.380***	-1.874***	-1.913***	-3.437***	-3.577***
	(0.185)	(0.178)	(0.262)	(0.296)	(0.318)	(0.373)
P-value High=Low	0.001	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.355	0.729	1.126	1.540	1.857	2.149
Avg.(trade) in countries below cutoff	0.633	1.294	2.053	2.869	3.597	4.365
Panel d: Manufacturing						
ATE-AIPW High	-0.565***	-0.338	-0.976***	-1.011**	-1.006**	-0.123
	(0.134)	(0.227)	(0.305)	(0.412)	(0.500)	(0.602)
ATE-AIPW Low	-1.110***	-2.462***	-3.531***	-4.274***	-4.888***	-5.749***
	(0.126)	(0.214)	(0.290)	(0.372)	(0.464)	(0.560)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.933	3.972	6.128	8.669	10.862	13.242
Avg.(trade) in countries below cutoff	0.781	1.572	2.438	3.165	3.970	4.954
Panel e: Services						
ATE-AIPW High	-0.690***	-0.818***	-1.404***	-1.253***	-1.116***	-1.316***
	(0.081)	(0.143)	(0.184)	(0.253)	(0.305)	(0.386)
ATE-AIPW Low	-0.664***	-0.576***	-0.265	-0.561**	-1.240***	-1.731***
	(0.076)	(0.119)	(0.177)	(0.249)	(0.292)	(0.339)
P-value High=Low	0.611	0.010	0.000	0.000	0.597	0.150
Avg.(trade) in countries above cutoff	0.867	1.724	2.699	3.740	4.611	5.588
Avg.(trade) in countries below cutoff	0.778	1.566	2.441	3.364	4.342	5.424
Observations	710	710	710	710	710	710
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-2.626	-2.626	-2.626	-2.626	-2.626	-2.626

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-4.368***	-5.522***	-6.105***	-8.160***	-8.572***	-5.926***
	(0.407)	(0.564)	(0.777)	(0.995)	(1.220)	(1.575)
ATE-AIPW Low	-5.811***	-8.841***	-11.575***	-11.655***	-11.432***	-11.809***
	(0.409)	(0.576)	(0.806)	(1.002)	(1.210)	(1.376)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.939	8.062	12.409	17.110	21.235	25.790
Avg.(trade) in countries below cutoff	3.320	6.673	10.222	14.087	18.213	22.447
Panel b: Agriculture						
ATE-AIPW High	-0.381***	-0.459***	-0.594***	-0.873***	-0.895***	-0.767***
	(0.079)	(0.070)	(0.093)	(0.107)	(0.135)	(0.169)
ATE-AIPW Low	-0.544***	-0.854***	-1.154***	-1.208***	-0.917***	-0.831***
	(0.080)	(0.074)	(0.098)	(0.111)	(0.138)	(0.151)
P-value High=Low	0.000	0.000	0.000	0.000	0.726	0.578
Avg.(trade) in countries above cutoff	0.306	0.647	1.007	1.406	1.772	2.157
Avg.(trade) in countries below cutoff	0.349	0.697	1.063	1.482	1.916	2.379
Panel c: Mining						
ATE-AIPW High	-0.801***	-1.011***	-1.470***	-1.810***	-1.819***	-1.049***
	(0.076)	(0.130)	(0.167)	(0.221)	(0.260)	(0.352)
ATE-AIPW Low	-0.952***	-1.519***	-2.599***	-3.016***	-3.626***	-3.725***
	(0.093)	(0.138)	(0.180)	(0.211)	(0.250)	(0.279)
P-value High=Low	0.018	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.750	1.581	2.385	3.265	4.025	4.842
Avg.(trade) in countries below cutoff	0.468	0.958	1.568	2.199	2.758	3.282
Panel d: Manufacturing						
ATE-AIPW High	-2.450***	-3.116***	-3.041***	-4.156***	-4.360***	-2.729***
	(0.251)	(0.340)	(0.458)	(0.590)	(0.726)	(0.913)
ATE-AIPW Low	-3.538***	-5.188***	-6.357***	-5.939***	-5.735***	-5.962***
	(0.253)	(0.357)	(0.480)	(0.596)	(0.720)	(0.826)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.256	4.507	6.944	9.576	11.889	14.544
Avg.(trade) in countries below cutoff	1.910	3.831	5.784	7.844	10.223	12.653
Panel e: Services						
ATE-AIPW High	-0.735***	-0.936***	-0.999***	-1.321***	-1.498***	-1.382***
	(0.071)	(0.118)	(0.168)	(0.201)	(0.238)	(0.282)
ATE-AIPW Low	-0.777***	-1.281***	-1.465***	-1.492***	-1.155***	-1.291***
	(0.075)	(0.116)	(0.168)	(0.207)	(0.241)	(0.270)
P-value High=Low	0.400	0.000	0.000	0.178	0.039	0.668
Avg.(trade) in countries above cutoff	0.627	1.327	2.073	2.863	3.548	4.247
Avg.(trade) in countries below cutoff	0.593	1.187	1.807	2.561	3.317	4.132
Observations	710	710	710	710	710	710
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-2.626	-2.626	-2.626	-2.626	-2.626	-2.626

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.17a: Channels, Cumulative trade costs over five years after debt crises with higher and lower partners' diversification

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-2.122***	-2.932***	-3.205***	-5.505***	-5.963***	-5.571***
	(0.273)	(0.438)	(0.601)	(0.786)	(0.995)	(1.371)
ATE-AIPW Low	-0.819***	-3.430***	-5.488***	-8.469***	-10.352***	-11.499***
	(0.316)	(0.414)	(0.580)	(0.824)	(0.995)	(1.342)
P-value High=Low	0.000	0.067	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.408	6.906	10.623	14.548	18.010	21.646
Avg.(trade) in countries below cutoff	2.498	5.122	8.162	11.422	14.550	18.278
Panel b: Agriculture						
ATE-AIPW High	-0.649***	-0.394***	-0.022	-0.332*	-0.348	0.410
	(0.111)	(0.108)	(0.172)	(0.199)	(0.247)	(0.320)
ATE-AIPW Low	-0.244***	-0.056	-0.096	0.609**	-0.027	-0.019
	(0.079)	(0.097)	(0.151)	(0.269)	(0.280)	(0.278)
P-value High=Low	0.000	0.000	0.591	0.000	0.216	0.150
Avg.(trade) in countries above cutoff	0.444	0.926	1.461	2.018	2.498	3.046
Avg.(trade) in countries below cutoff	0.302	0.606	0.981	1.390	1.740	2.210
Panel c: Mining						
ATE-AIPW High	-0.426***	-0.435**	-0.686***	-0.990***	-1.016***	-1.037**
	(0.110)	(0.175)	(0.230)	(0.304)	(0.392)	(0.472)
ATE-AIPW Low	0.847***	0.348	-0.234	-1.860***	-1.028**	-0.022
	(0.197)	(0.227)	(0.261)	(0.350)	(0.413)	(0.580)
P-value High=Low	0.000	0.000	0.004	0.000	0.964	0.021
Avg.(trade) in countries above cutoff	0.573	1.149	1.764	2.415	2.977	3.436
Avg.(trade) in countries below cutoff	0.449	0.942	1.530	2.164	2.706	3.387
Panel d: Manufacturing						
ATE-AIPW High	-0.703***	-1.007***	-1.654***	-2.928***	-3.255***	-3.510***
	(0.147)	(0.253)	(0.326)	(0.418)	(0.542)	(0.739)
ATE-AIPW Low	-0.944***	-2.327***	-3.363***	-4.899***	-6.421***	-7.584***
	(0.137)	(0.224)	(0.318)	(0.412)	(0.536)	(0.732)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.506	3.075	4.661	6.321	7.771	9.344
Avg.(trade) in countries below cutoff	1.010	2.072	3.309	4.654	6.009	7.602
Panel e: Services						
ATE-AIPW High	-0.344***	-1.096***	-0.844***	-1.256***	-1.344***	-1.435***
	(0.081)	(0.134)	(0.194)	(0.247)	(0.296)	(0.379)
ATE-AIPW Low	-0.479***	-1.394***	-1.794***	-2.318***	-2.876***	-3.874***
	(0.078)	(0.131)	(0.188)	(0.244)	(0.290)	(0.377)
P-value High=Low	0.001	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.885	1.756	2.737	3.794	4.764	5.820
Avg.(trade) in countries below cutoff	0.737	1.502	2.343	3.214	4.096	5.079
Observations	708	708	708	708	708	708
# of Crises	20	20	20	20	20	20
Cutoff of channel variable, median	-2.647	-2.647	-2.647	-2.647	-2.647	-2.647

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-3.793***	-6.716***	-7.603***	-8.189***	-9.440***	-10.110***
	(0.390)	(0.594)	(0.894)	(1.086)	(1.382)	(1.759)
ATE-AIPW Low	-3.227***	-5.393***	-6.527***	-9.592***	-11.627***	-12.841***
	(0.452)	(0.647)	(0.941)	(1.095)	(1.397)	(1.694)
P-value High=Low	0.074	0.001	0.034	0.017	0.001	0.002
Avg.(trade) in countries above cutoff	3.969	7.939	12.020	16.432	20.518	24.673
Avg.(trade) in countries below cutoff	3.157	6.540	10.233	14.240	18.398	22.999
Panel b: Agriculture						
ATE-AIPW High	-0.389***	-0.710***	-0.822***	-0.932***	-1.148***	-1.131***
	(0.073)	(0.076)	(0.124)	(0.121)	(0.162)	(0.187)
ATE-AIPW Low	-0.017	-0.464***	-0.535***	-0.966***	-1.402***	-1.110***
	(0.064)	(0.077)	(0.125)	(0.125)	(0.161)	(0.183)
P-value High=Low	0.000	0.000	0.000	0.594	0.000	0.816
Avg.(trade) in countries above cutoff	0.330	0.700	1.079	1.493	1.899	2.306
Avg.(trade) in countries below cutoff	0.334	0.654	1.001	1.406	1.807	2.265
Panel c: Mining						
ATE-AIPW High	-0.547***	-0.764***	-0.965***	-1.551***	-1.925***	-1.875***
	(0.092)	(0.148)	(0.198)	(0.278)	(0.350)	(0.474)
ATE-AIPW Low	-0.432***	-0.697***	-1.030***	-1.900***	-1.903***	-2.524***
	(0.088)	(0.165)	(0.207)	(0.256)	(0.316)	(0.397)
P-value High=Low	0.055	0.603	0.669	0.076	0.906	0.027
Avg.(trade) in countries above cutoff	0.700	1.425	2.161	2.955	3.563	4.132
Avg.(trade) in countries below cutoff	0.466	1.001	1.643	2.316	3.000	3.739
Panel d: Manufacturing						
ATE-AIPW High	-2.218***	-3.927***	-4.484***	-4.700***	-5.101***	-5.660***
	(0.244)	(0.364)	(0.537)	(0.624)	(0.789)	(0.968)
ATE-AIPW Low	-1.834***	-3.033***	-3.060***	-4.431***	-6.093***	-6.815***
	(0.296)	(0.411)	(0.578)	(0.656)	(0.831)	(0.979)
P-value High=Low	0.057	0.000	0.000	0.435	0.019	0.013
Avg.(trade) in countries above cutoff	2.297	4.536	6.786	9.185	11.553	13.961
Avg.(trade) in countries below cutoff	1.788	3.670	5.742	7.941	10.269	12.914
Panel e: Services						
ATE-AIPW High	-0.639***	-1.315***	-1.332***	-1.007***	-1.266***	-1.444***
	(0.090)	(0.129)	(0.170)	(0.201)	(0.240)	(0.305)
ATE-AIPW Low	-0.945***	-1.200***	-1.901***	-2.295***	-2.230***	-2.391***
	(0.103)	(0.143)	(0.199)	(0.227)	(0.275)	(0.323)
P-value High=Low	0.000	0.277	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.642	1.278	1.993	2.799	3.504	4.273
Avg.(trade) in countries below cutoff	0.569	1.215	1.848	2.577	3.322	4.081
Observations	708	708	708	708	708	708
# of Crises	20	20	20	20	20	20
Cutoff of channel variable, median	-2.647	-2.647	-2.647	-2.647	-2.647	-2.647

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.17b: Channels, Cumulative trade costs over five years after banking crises with higher and lower partners' diversification

Panel I: Exports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-0.586	-6.705***	-6.833***	-5.696***	-8.003***	-9.403***
	(0.368)	(0.512)	(0.619)	(0.758)	(0.998)	(1.131)
ATE-AIPW Low	-1.773***	-3.846***	-4.900***	-5.836***	-9.015***	-9.904***
	(0.291)	(0.501)	(0.643)	(0.781)	(1.028)	(1.149)
P-value High=Low	0.000	0.000	0.000	0.729	0.042	0.349
Avg.(trade) in countries above cutoff	3.323	6.806	10.544	14.475	17.794	21.415
Avg.(trade) in countries below cutoff	2.673	5.405	8.500	11.824	15.120	18.851
Panel b: Agriculture						
ATE-AIPW High	-0.019	-0.399***	-0.554***	-0.498***	-0.336*	-0.554***
	(0.072)	(0.091)	(0.116)	(0.149)	(0.189)	(0.211)
ATE-AIPW Low	-0.082	-0.554***	-0.954***	-1.190***	-1.580***	-2.190***
	(0.065)	(0.095)	(0.128)	(0.148)	(0.161)	(0.176)
P-value High=Low	0.312	0.029	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.444	0.938	1.496	2.055	2.533	3.077
Avg.(trade) in countries below cutoff	0.317	0.630	1.000	1.423	1.790	2.272
Panel c: Mining						
ATE-AIPW High	0.063	-1.384***	-1.377***	-1.277***	-1.906***	-2.307***
	(0.180)	(0.260)	(0.291)	(0.318)	(0.381)	(0.470)
ATE-AIPW Low	-0.486***	-0.624**	-0.639**	-1.407***	-2.674***	-1.556***
	(0.162)	(0.266)	(0.310)	(0.312)	(0.357)	(0.507)
P-value High=Low	0.000	0.000	0.000	0.415	0.000	0.006
Avg.(trade) in countries above cutoff	0.536	1.112	1.726	2.360	2.898	3.336
Avg.(trade) in countries below cutoff	0.496	0.998	1.590	2.241	2.806	3.482
Panel d: Manufacturing						
ATE-AIPW High	0.023	-2.973***	-2.611***	-1.537***	-2.704***	-3.280***
	(0.177)	(0.273)	(0.325)	(0.439)	(0.564)	(0.647)
ATE-AIPW Low	-0.648***	-0.985***	-1.147***	-1.138**	-1.613***	-1.748**
	(0.147)	(0.269)	(0.390)	(0.493)	(0.598)	(0.705)
P-value High=Low	0.000	0.000	0.000	0.255	0.004	0.002
Avg.(trade) in countries above cutoff	1.461	2.954	4.508	6.153	7.485	9.038
Avg.(trade) in countries below cutoff	1.104	2.290	3.594	4.986	6.458	8.068
Panel e: Services						
ATE-AIPW High	-0.652***	-1.949***	-2.290***	-2.384***	-3.057***	-3.262***
	(0.102)	(0.147)	(0.208)	(0.285)	(0.388)	(0.437)
ATE-AIPW Low	-0.556***	-1.683***	-2.160***	-2.100***	-3.149***	-4.409***
	(0.097)	(0.167)	(0.250)	(0.338)	(0.435)	(0.468)
P-value High=Low	0.275	0.019	0.413	0.181	0.687	0.000
Avg.(trade) in countries above cutoff	0.882	1.802	2.813	3.906	4.878	5.964
Avg.(trade) in countries below cutoff	0.756	1.488	2.316	3.174	4.065	5.029
Observations	710	710	710	710	710	710
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-2.570	-2.570	-2.570	-2.570	-2.570	-2.570

Panel II: Imports (% of pre-crisis GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-3.632***	-11.387***	-11.124***	-9.891***	-12.012***	-13.812***
	(0.539)	(0.817)	(0.987)	(1.209)	(1.599)	(1.633)
ATE-AIPW Low	-1.576***	-5.140***	-7.882***	-9.455***	-11.356***	-14.855***
	(0.421)	(0.774)	(0.990)	(1.216)	(1.637)	(1.665)
P-value High=Low	0.000	0.000	0.000	0.377	0.372	0.197
Avg.(trade) in countries above cutoff	3.740	7.721	11.843	16.362	20.229	24.397
Avg.(trade) in countries below cutoff	3.452	6.888	10.586	14.539	18.889	23.430
Panel b: Agriculture						
ATE-AIPW High	-0.419***	-0.598***	-0.684***	-0.866***	-1.156***	-1.193***
	(0.065)	(0.086)	(0.105)	(0.140)	(0.211)	(0.200)
ATE-AIPW Low	-0.012	0.248**	-0.116	-0.481***	-0.732***	-1.598***
	(0.074)	(0.104)	(0.119)	(0.145)	(0.218)	(0.197)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.311	0.683	1.074	1.510	1.902	2.313
Avg.(trade) in countries below cutoff	0.351	0.675	1.014	1.400	1.813	2.263
Panel c: Mining						
ATE-AIPW High	-0.467***	-1.820***	-1.685***	-1.393***	-1.983***	-2.755***
	(0.134)	(0.207)	(0.240)	(0.294)	(0.367)	(0.328)
ATE-AIPW Low	-0.655***	-1.358***	-1.944***	-2.358***	-2.829***	-3.146***
	(0.108)	(0.203)	(0.240)	(0.273)	(0.355)	(0.322)
P-value High=Low	0.029	0.000	0.000	0.000	0.000	0.001
Avg.(trade) in countries above cutoff	0.695	1.446	2.222	3.046	3.611	4.210
Avg.(trade) in countries below cutoff	0.495	1.028	1.643	2.302	3.017	3.710
Panel d: Manufacturing						
ATE-AIPW High	-2.023***	-7.348***	-6.772***	-5.672***	-6.491***	-7.555***
	(0.300)	(0.473)	(0.557)	(0.657)	(0.851)	(0.941)
ATE-AIPW Low	-1.051***	-3.232***	-4.261***	-4.591***	-5.258***	-7.048***
	(0.233)	(0.434)	(0.555)	(0.674)	(0.897)	(0.991)
P-value High=Low	0.000	0.000	0.000	0.001	0.020	0.402
Avg.(trade) in countries above cutoff	2.119	4.316	6.547	8.991	11.217	13.583
Avg.(trade) in countries below cutoff	2.004	3.963	6.071	8.251	10.712	13.371
Panel e: Services						
ATE-AIPW High	-0.723***	-1.621***	-1.982***	-1.961***	-2.383***	-2.310***
	(0.097)	(0.135)	(0.179)	(0.228)	(0.292)	(0.305)
ATE-AIPW Low	0.143	-0.798***	-1.562***	-2.026***	-2.536***	-3.063***
	(0.088)	(0.123)	(0.192)	(0.246)	(0.302)	(0.315)
P-value High=Low	0.000	0.000	0.001	0.634	0.305	0.000
Avg.(trade) in countries above cutoff	0.614	1.277	2.000	2.816	3.499	4.291
Avg.(trade) in countries below cutoff	0.602	1.223	1.857	2.585	3.346	4.086
Observations	710	710	710	710	710	710
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-2.570	-2.570	-2.570	-2.570	-2.570	-2.570

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.17c: Channels, Cumulative trade costs over five years after currency crises with higher and lower partners' diversification

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-1.906***	-2.691***	-4.702***	-5.056***	-4.832***	-3.864***
	(0.284)	(0.390)	(0.543)	(0.719)	(0.863)	(1.180)
ATE-AIPW Low	-1.910***	-3.838***	-4.368***	-5.609***	-8.273***	-9.555***
	(0.308)	(0.422)	(0.612)	(0.756)	(0.847)	(0.989)
P-value High=Low	0.981	0.000	0.407	0.253	0.000	0.000
Avg.(trade) in countries above cutoff	3.400	6.948	10.694	14.608	18.135	21.811
Avg.(trade) in countries below cutoff	2.482	5.023	8.011	11.265	14.308	17.989
Panel b: Agriculture						
ATE-AIPW High	-0.107**	-0.426***	-0.399***	-0.336*	-0.147	-0.109
	(0.053)	(0.087)	(0.122)	(0.172)	(0.205)	(0.284)
ATE-AIPW Low	0.237***	-0.097	0.306	-0.161	-0.333*	-0.437**
	(0.072)	(0.105)	(0.214)	(0.215)	(0.193)	(0.223)
P-value High=Low	0.000	0.001	0.001	0.407	0.311	0.214
Avg.(trade) in countries above cutoff	0.437	0.921	1.452	2.001	2.481	3.028
Avg.(trade) in countries below cutoff	0.306	0.604	0.979	1.393	1.740	2.209
Panel c: Mining						
ATE-AIPW High	-0.155	-0.579***	-0.968***	-1.269***	-1.498***	-1.378***
	(0.196)	(0.153)	(0.210)	(0.272)	(0.323)	(0.392)
ATE-AIPW Low	-0.593***	-1.431***	-1.805***	-2.032***	-3.390***	-3.460***
	(0.211)	(0.182)	(0.264)	(0.298)	(0.324)	(0.377)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.564	1.137	1.755	2.395	2.958	3.418
Avg.(trade) in countries below cutoff	0.457	0.950	1.535	2.182	2.720	3.407
Panel d: Manufacturing						
ATE-AIPW High	-0.952***	-1.044***	-2.038***	-2.204***	-2.152***	-1.244*
	(0.128)	(0.211)	(0.295)	(0.396)	(0.498)	(0.649)
ATE-AIPW Low	-0.713***	-1.498***	-2.212***	-2.729***	-3.262***	-3.808***
	(0.135)	(0.235)	(0.308)	(0.399)	(0.483)	(0.579)
P-value High=Low	0.001	0.000	0.241	0.013	0.000	0.000
Avg.(trade) in countries above cutoff	1.510	3.092	4.702	6.371	7.869	9.484
Avg.(trade) in countries below cutoff	0.991	2.024	3.224	4.549	5.844	7.387
Panel e: Services						
ATE-AIPW High	-0.692***	-0.643***	-1.296***	-1.247***	-1.034***	-1.134***
	(0.081)	(0.143)	(0.187)	(0.252)	(0.304)	(0.392)
ATE-AIPW Low	-0.840***	-0.811***	-0.657***	-0.687***	-1.288***	-1.850***
	(0.075)	(0.122)	(0.183)	(0.266)	(0.307)	(0.353)
P-value High=Low	0.005	0.082	0.000	0.003	0.291	0.018
Avg.(trade) in countries above cutoff	0.890	1.798	2.785	3.841	4.827	5.881
Avg.(trade) in countries below cutoff	0.728	1.445	2.274	3.141	4.003	4.986
Observations	710	710	710	710	710	710
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-2.659	-2.659	-2.659	-2.659	-2.659	-2.659

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-4.646***	-5.541***	-6.528***	-7.934***	-7.824***	-5.638***
	(0.415)	(0.556)	(0.784)	(1.023)	(1.248)	(1.638)
ATE-AIPW Low	-6.056***	-8.521***	-10.785***	-11.023***	-11.202***	-11.450***
	(0.419)	(0.590)	(0.805)	(1.012)	(1.214)	(1.389)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.961	7.986	12.116	16.485	20.600	24.793
Avg.(trade) in countries below cutoff	3.144	6.446	10.070	14.116	18.242	22.809
Panel b: Agriculture						
ATE-AIPW High	-0.501***	-0.479***	-0.572***	-0.868***	-0.730***	-0.538***
	(0.083)	(0.070)	(0.094)	(0.110)	(0.139)	(0.173)
ATE-AIPW Low	-0.580***	-0.680***	-0.996***	-1.050***	-0.927***	-0.921***
	(0.081)	(0.074)	(0.097)	(0.109)	(0.135)	(0.149)
P-value High=Low	0.019	0.000	0.000	0.000	0.004	0.001
Avg.(trade) in countries above cutoff	0.328	0.701	1.083	1.486	1.896	2.311
Avg.(trade) in countries below cutoff	0.337	0.651	0.994	1.412	1.807	2.259
Panel c: Mining						
ATE-AIPW High	-0.832***	-1.046***	-1.694***	-1.999***	-1.890***	-1.315***
	(0.079)	(0.134)	(0.173)	(0.234)	(0.270)	(0.389)
ATE-AIPW Low	-0.974***	-1.464***	-2.366***	-2.797***	-3.390***	-3.457***
	(0.091)	(0.134)	(0.173)	(0.206)	(0.242)	(0.273)
P-value High=Low	0.033	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.696	1.427	2.180	2.959	3.586	4.166
Avg.(trade) in countries below cutoff	0.464	0.988	1.606	2.294	2.958	3.687
Panel d: Manufacturing						
ATE-AIPW High	-2.512***	-3.078***	-3.225***	-3.851***	-3.888***	-2.562***
	(0.253)	(0.333)	(0.457)	(0.598)	(0.730)	(0.924)
ATE-AIPW Low	-3.578***	-5.107***	-5.905***	-5.647***	-5.591***	-5.686***
	(0.261)	(0.370)	(0.482)	(0.605)	(0.727)	(0.843)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.290	4.569	6.844	9.240	11.616	14.045
Avg.(trade) in countries below cutoff	1.782	3.606	5.644	7.842	10.158	12.786
Panel e: Services						
ATE-AIPW High	-0.801***	-0.938***	-1.037***	-1.215***	-1.316***	-1.222***
	(0.075)	(0.116)	(0.178)	(0.211)	(0.249)	(0.299)
ATE-AIPW Low	-0.924***	-1.271***	-1.518***	-1.529***	-1.294***	-1.385***
	(0.076)	(0.123)	(0.176)	(0.217)	(0.248)	(0.274)
P-value High=Low	0.021	0.000	0.000	0.016	0.898	0.469
Avg.(trade) in countries above cutoff	0.647	1.288	2.008	2.801	3.502	4.272
Avg.(trade) in countries below cutoff	0.561	1.201	1.826	2.568	3.319	4.077
Observations	710	710	710	710	710	710
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	-2.659	-2.659	-2.659	-2.659	-2.659	-2.659

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.18a: Channels, Cumulative trade costs over five years after debt crises with higher and lower trading partners' growth

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-0.172	-1.326***	-2.185***	-4.365***	-2.954***	0.138
	(0.309)	(0.466)	(0.606)	(0.810)	(1.048)	(1.376)
ATE-AIPW Low	-2.507***	-4.443***	-5.493***	-8.602***	-11.205***	-13.270***
	(0.265)	(0.397)	(0.572)	(0.798)	(0.963)	(1.170)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.398	7.038	10.886	14.885	18.763	22.794
Avg.(trade) in countries below cutoff	1.239	1.969	3.337	5.137	6.293	7.925
Panel b: Agriculture						
ATE-AIPW High	0.502***	0.609***	0.562***	0.753***	1.796***	4.327***
	(0.084)	(0.131)	(0.168)	(0.214)	(0.352)	(0.624)
ATE-AIPW Low	-0.973***	-0.594***	-0.020	0.096	-0.696***	-0.980***
	(0.100)	(0.092)	(0.153)	(0.251)	(0.258)	(0.227)
P-value High=Low	0.000	0.000	0.000	0.013	0.000	0.000
Avg.(trade) in countries above cutoff	0.438	0.907	1.389	1.897	2.403	2.981
Avg.(trade) in countries below cutoff	0.131	0.218	0.525	0.791	0.900	1.191
Panel c: Mining						
ATE-AIPW High	0.488**	0.478**	0.524**	0.106	1.599***	3.184***
	(0.205)	(0.237)	(0.257)	(0.324)	(0.398)	(0.535)
ATE-AIPW Low	-0.112	-0.621***	-1.420***	-3.027***	-3.506***	-4.160***
	(0.117)	(0.163)	(0.225)	(0.319)	(0.373)	(0.442)
P-value High=Low	0.001	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.674	1.385	2.089	2.910	3.670	4.399
Avg.(trade) in countries below cutoff	-0.098	-0.249	-0.043	-0.086	-0.287	-0.413
Panel d: Manufacturing						
ATE-AIPW High	-0.684***	-1.246***	-2.044***	-3.457***	-4.317***	-4.737***
	(0.139)	(0.260)	(0.326)	(0.409)	(0.515)	(0.629)
ATE-AIPW Low	-0.944***	-1.876***	-2.578***	-3.785***	-4.767***	-5.246***
	(0.135)	(0.227)	(0.318)	(0.403)	(0.503)	(0.613)
P-value High=Low	0.000	0.000	0.000	0.003	0.003	0.010
Avg.(trade) in countries above cutoff	1.405	2.936	4.546	6.147	7.723	9.355
Avg.(trade) in countries below cutoff	0.704	1.146	1.655	2.702	3.438	4.293
Panel e: Services						
ATE-AIPW High	-0.478***	-1.167***	-1.227***	-1.767***	-2.032***	-2.635***
	(0.086)	(0.136)	(0.199)	(0.257)	(0.328)	(0.427)
ATE-AIPW Low	-0.478***	-1.352***	-1.476***	-1.886***	-2.236***	-2.883***
	(0.084)	(0.136)	(0.192)	(0.264)	(0.329)	(0.424)
P-value High=Low	0.994	0.001	0.013	0.342	0.124	0.126
Avg.(trade) in countries above cutoff	0.881	1.810	2.863	3.931	4.967	6.059
Avg.(trade) in countries below cutoff	0.501	0.854	1.201	1.730	2.242	2.854
Observations	698	698	698	698	698	698
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	7.041	7.041	7.041	7.041	7.041	7.041

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.994***	-2.942***	-2.033**	-2.356*	-3.811**	-0.008
	(0.414)	(0.620)	(0.950)	(1.273)	(1.758)	(2.514)
ATE-AIPW Low	-5.291***	-8.481***	-11.274***	-13.819***	-15.840***	-19.211***
	(0.410)	(0.624)	(0.926)	(1.209)	(1.668)	(2.232)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	4.046	8.612	13.261	18.035	22.883	27.790
Avg.(trade) in countries below cutoff	1.536	1.762	2.502	4.440	5.702	7.410
Panel b: Agriculture						
ATE-AIPW High	-0.095	-0.220***	-0.285**	-0.599***	-0.932***	-0.541*
	(0.064)	(0.078)	(0.135)	(0.164)	(0.219)	(0.300)
ATE-AIPW Low	-0.363***	-0.903***	-0.973***	-1.290***	-1.640***	-1.735***
	(0.066)	(0.075)	(0.132)	(0.160)	(0.215)	(0.291)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.354	0.774	1.188	1.632	2.098	2.580
Avg.(trade) in countries below cutoff	0.219	0.273	0.424	0.690	0.832	1.064
Panel c: Mining						
ATE-AIPW High	-0.244***	0.005	0.077	-0.083	0.045	0.957*
	(0.085)	(0.169)	(0.211)	(0.287)	(0.374)	(0.535)
ATE-AIPW Low	-0.599***	-1.073***	-1.682***	-2.655***	-3.361***	-4.206***
	(0.081)	(0.136)	(0.183)	(0.253)	(0.357)	(0.462)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.691	1.508	2.345	3.203	3.988	4.785
Avg.(trade) in countries below cutoff	0.154	0.062	0.115	0.316	0.384	0.336
Panel d: Manufacturing						
ATE-AIPW High	-1.124***	-1.749***	-0.641	-0.423	-1.560	0.609
	(0.271)	(0.379)	(0.582)	(0.779)	(1.073)	(1.535)
ATE-AIPW Low	-3.070***	-4.905***	-6.402***	-7.558***	-8.197***	-10.014***
	(0.265)	(0.396)	(0.560)	(0.689)	(0.933)	(1.249)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.328	4.894	7.475	10.074	12.796	15.565
Avg.(trade) in countries below cutoff	0.859	0.994	1.461	2.604	3.514	4.724
Panel e: Services						
ATE-AIPW High	-0.530***	-0.977***	-1.184***	-1.250***	-1.364***	-1.032***
	(0.090)	(0.137)	(0.189)	(0.227)	(0.282)	(0.351)
ATE-AIPW Low	-1.259***	-1.599***	-2.218***	-2.315***	-2.642***	-3.256***
	(0.103)	(0.139)	(0.183)	(0.229)	(0.294)	(0.357)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.672	1.436	2.253	3.125	4.001	4.861
Avg.(trade) in countries below cutoff	0.305	0.434	0.501	0.829	0.971	1.287
Observations	698	698	698	698	698	698
# of Crises	19	19	19	19	19	19
Cutoff of channel variable, median	7.041	7.041	7.041	7.041	7.041	7.041

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.18b: Channels, Cumulative trade costs over five years after banking crises with higher and lower trading partners' growth

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-1.192***	-4.281***	-4.924***	-5.350***	-8.152***	-8.547***
	(0.317)	(0.516)	(0.575)	(0.697)	(0.916)	(1.126)
ATE-AIPW Low	-1.372***	-4.084***	-5.190***	-5.163***	-6.886***	-7.061***
	(0.304)	(0.515)	(0.573)	(0.740)	(0.974)	(1.135)
P-value High=Low	0.387	0.382	0.294	0.600	0.007	0.010
Avg.(trade) in countries above cutoff	3.566	7.497	11.648	15.781	19.801	23.915
Avg.(trade) in countries below cutoff	1.547	2.546	4.018	6.215	7.919	10.127
Panel b: Agriculture						
ATE-AIPW High	-0.200***	-0.509***	-0.635***	-0.773***	-1.037***	-1.352***
	(0.062)	(0.092)	(0.119)	(0.148)	(0.176)	(0.211)
ATE-AIPW Low	-0.050	-0.413***	-0.648***	-0.860***	-1.135***	-1.660***
	(0.063)	(0.093)	(0.113)	(0.130)	(0.152)	(0.182)
P-value High=Low	0.000	0.108	0.884	0.366	0.384	0.009
Avg.(trade) in countries above cutoff	0.469	0.975	1.506	2.034	2.537	3.151
Avg.(trade) in countries below cutoff	0.159	0.283	0.534	0.832	1.075	1.376
Panel c: Mining						
ATE-AIPW High	0.009	-0.679***	-0.428*	-0.577*	-1.508***	-1.441***
	(0.171)	(0.226)	(0.245)	(0.311)	(0.406)	(0.463)
ATE-AIPW Low	-0.090	-0.518**	-1.177***	-1.831***	-2.266***	-1.374***
	(0.153)	(0.220)	(0.223)	(0.278)	(0.383)	(0.494)
P-value High=Low	0.309	0.050	0.000	0.000	0.000	0.812
Avg.(trade) in countries above cutoff	0.739	1.537	2.358	3.221	4.035	4.789
Avg.(trade) in countries below cutoff	0.002	-0.071	0.025	0.164	0.148	0.239
Panel d: Manufacturing						
ATE-AIPW High	-0.429***	-0.993***	-1.162***	-1.199**	-2.120***	-2.465***
	(0.159)	(0.288)	(0.380)	(0.465)	(0.532)	(0.647)
ATE-AIPW Low	-0.448***	-1.742***	-1.791***	-1.070**	-1.254**	-0.938
	(0.151)	(0.263)	(0.323)	(0.429)	(0.557)	(0.690)
P-value High=Low	0.846	0.000	0.015	0.704	0.018	0.002
Avg.(trade) in countries above cutoff	1.442	3.063	4.762	6.430	8.053	9.666
Avg.(trade) in countries below cutoff	0.845	1.429	2.087	3.160	4.057	5.205
Panel e: Services						
ATE-AIPW High	-0.572***	-2.101***	-2.699***	-2.802***	-3.488***	-3.290***
	(0.091)	(0.157)	(0.224)	(0.297)	(0.380)	(0.500)
ATE-AIPW Low	-0.784***	-1.412***	-1.575***	-1.402***	-2.231***	-3.089***
	(0.096)	(0.144)	(0.197)	(0.274)	(0.350)	(0.415)
P-value High=Low	0.005	0.000	0.000	0.000	0.000	0.545
Avg.(trade) in countries above cutoff	0.916	1.922	3.021	4.096	5.175	6.310
Avg.(trade) in countries below cutoff	0.541	0.905	1.373	2.059	2.639	3.308
Observations	700	700	700	700	700	700
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	7.984	7.984	7.984	7.984	7.984	7.984

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-3.316***	-8.238***	-10.201***	-10.742***	-11.746***	-12.816***
	(0.455)	(0.745)	(0.812)	(0.956)	(1.226)	(1.428)
ATE-AIPW Low	-2.543***	-3.910***	-5.419***	-6.725***	-8.888***	-11.218***
	(0.479)	(0.736)	(0.816)	(0.993)	(1.281)	(1.485)
P-value High=Low	0.024	0.000	0.000	0.000	0.000	0.046
Avg.(trade) in countries above cutoff	4.403	9.231	14.243	19.193	24.208	29.261
Avg.(trade) in countries below cutoff	1.528	2.544	3.707	6.150	8.179	10.579
Panel b: Agriculture						
ATE-AIPW High	-0.363***	-0.592***	-0.771***	-1.098***	-1.349***	-1.550***
	(0.053)	(0.093)	(0.098)	(0.110)	(0.140)	(0.157)
ATE-AIPW Low	-0.087	0.622***	0.276**	-0.035	-0.244	-1.051***
	(0.073)	(0.107)	(0.111)	(0.122)	(0.157)	(0.169)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.372	0.798	1.248	1.714	2.216	2.706
Avg.(trade) in countries below cutoff	0.223	0.378	0.531	0.805	0.969	1.261
Panel c: Mining						
ATE-AIPW High	-0.585***	-1.156***	-1.559***	-1.615***	-1.878***	-2.244***
	(0.101)	(0.142)	(0.152)	(0.179)	(0.232)	(0.277)
ATE-AIPW Low	-0.708***	-1.027***	-1.392***	-2.011***	-2.464***	-2.873***
	(0.098)	(0.145)	(0.154)	(0.184)	(0.228)	(0.270)
P-value High=Low	0.001	0.033	0.009	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.778	1.661	2.609	3.521	4.370	5.213
Avg.(trade) in countries below cutoff	0.129	0.176	0.229	0.517	0.666	0.784
Panel d: Manufacturing						
ATE-AIPW High	-2.092***	-5.195***	-5.912***	-5.831***	-6.120***	-6.584***
	(0.271)	(0.448)	(0.494)	(0.583)	(0.742)	(0.861)
ATE-AIPW Low	-1.324***	-2.894***	-3.242***	-3.435***	-4.327***	-5.187***
	(0.281)	(0.443)	(0.492)	(0.596)	(0.771)	(0.900)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.013
Avg.(trade) in countries above cutoff	2.517	5.229	7.964	10.650	13.449	16.297
Avg.(trade) in countries below cutoff	0.899	1.477	2.273	3.682	4.996	6.525
Panel e: Services						
ATE-AIPW High	-0.275***	-1.295***	-1.959***	-2.199***	-2.398***	-2.438***
	(0.105)	(0.143)	(0.184)	(0.221)	(0.264)	(0.302)
ATE-AIPW Low	-0.424***	-0.612***	-1.062***	-1.244***	-1.853***	-2.107***
	(0.095)	(0.135)	(0.170)	(0.215)	(0.255)	(0.291)
P-value High=Low	0.141	0.000	0.000	0.000	0.000	0.058
Avg.(trade) in countries above cutoff	0.736	1.542	2.423	3.308	4.174	5.045
Avg.(trade) in countries below cutoff	0.277	0.514	0.674	1.146	1.548	2.011
Observations	700	700	700	700	700	700
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	7.984	7.984	7.984	7.984	7.984	7.984

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.18c: Channels, Cumulative trade costs over five years after currency crises with higher and lower trading partners' growth

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-1.364***	-2.490***	-2.713***	-2.881***	-4.422***	-3.300***
	(0.269)	(0.412)	(0.540)	(0.706)	(0.838)	(1.054)
ATE-AIPW Low	-2.102***	-3.787***	-5.713***	-7.148***	-8.791***	-11.604***
	(0.267)	(0.393)	(0.587)	(0.698)	(0.823)	(0.956)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.443	7.127	11.100	15.111	18.992	23.077
Avg.(trade) in countries below cutoff	1.297	2.162	3.353	5.326	6.735	8.418
Panel b: Agriculture						
ATE-AIPW High	-0.266***	-0.516***	-0.697***	-0.707***	-0.538***	-0.153
	(0.056)	(0.088)	(0.115)	(0.154)	(0.182)	(0.257)
ATE-AIPW Low	0.516***	0.296***	1.023***	0.686***	0.531***	0.355
	(0.069)	(0.102)	(0.209)	(0.209)	(0.188)	(0.229)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.024
Avg.(trade) in countries above cutoff	0.448	0.923	1.411	1.916	2.395	2.980
Avg.(trade) in countries below cutoff	0.128	0.231	0.534	0.835	1.071	1.367
Panel c: Mining						
ATE-AIPW High	0.037	-0.379**	-0.005	-0.034	-1.040***	-0.792**
	(0.143)	(0.163)	(0.234)	(0.283)	(0.316)	(0.392)
ATE-AIPW Low	-1.004***	-1.810***	-2.992***	-3.482***	-4.174***	-4.685***
	(0.156)	(0.169)	(0.232)	(0.264)	(0.315)	(0.362)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.690	1.402	2.152	2.978	3.757	4.498
Avg.(trade) in countries below cutoff	-0.075	-0.146	-0.049	-0.025	-0.195	-0.276
Panel d: Manufacturing						
ATE-AIPW High	-0.551***	-1.110***	-1.571***	-1.698***	-2.124***	-1.582***
	(0.134)	(0.233)	(0.307)	(0.409)	(0.497)	(0.591)
ATE-AIPW Low	-0.824***	-1.503***	-2.657***	-3.251***	-3.952***	-5.156***
	(0.127)	(0.210)	(0.283)	(0.366)	(0.459)	(0.550)
P-value High=Low	0.000	0.002	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.420	2.970	4.631	6.245	7.832	9.484
Avg.(trade) in countries below cutoff	0.724	1.207	1.648	2.709	3.490	4.354
Panel e: Services						
ATE-AIPW High	-0.583***	-0.485***	-0.441**	-0.442*	-0.720**	-0.772**
	(0.085)	(0.145)	(0.192)	(0.265)	(0.309)	(0.385)
ATE-AIPW Low	-0.791***	-0.770***	-1.087***	-1.101***	-1.197***	-2.117***
	(0.072)	(0.119)	(0.180)	(0.251)	(0.295)	(0.338)
P-value High=Low	0.000	0.004	0.000	0.001	0.046	0.000
Avg.(trade) in countries above cutoff	0.886	1.833	2.905	3.972	5.008	6.116
Avg.(trade) in countries below cutoff	0.521	0.870	1.220	1.807	2.369	2.973
Observations	701	701	701	701	701	701
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	7.295	7.295	7.295	7.295	7.295	7.295

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-5.765***	-7.089***	-8.831***	-9.538***	-9.656***	-5.608***
	(0.422)	(0.580)	(0.807)	(0.994)	(1.207)	(1.532)
ATE-AIPW Low	-4.109***	-6.614***	-7.946***	-8.878***	-9.760***	-11.549***
	(0.382)	(0.538)	(0.749)	(0.951)	(1.176)	(1.365)
P-value High=Low	0.000	0.171	0.059	0.208	0.865	0.000
Avg.(trade) in countries above cutoff	4.130	8.756	13.541	18.397	23.253	28.205
Avg.(trade) in countries below cutoff	1.498	1.947	2.607	4.545	6.128	7.998
Panel b: Agriculture						
ATE-AIPW High	-0.467***	-0.566***	-0.829***	-1.061***	-0.886***	-0.451***
	(0.085)	(0.076)	(0.099)	(0.112)	(0.136)	(0.167)
ATE-AIPW Low	-0.455***	-0.584***	-0.788***	-0.823***	-0.870***	-0.993***
	(0.080)	(0.069)	(0.094)	(0.105)	(0.134)	(0.149)
P-value High=Low	0.727	0.691	0.385	0.000	0.804	0.000
Avg.(trade) in countries above cutoff	0.359	0.780	1.207	1.655	2.128	2.609
Avg.(trade) in countries below cutoff	0.217	0.301	0.433	0.704	0.854	1.113
Panel c: Mining						
ATE-AIPW High	-1.004***	-1.233***	-1.988***	-2.078***	-2.468***	-1.543***
	(0.084)	(0.133)	(0.190)	(0.228)	(0.272)	(0.352)
ATE-AIPW Low	-0.658***	-1.200***	-1.803***	-2.331***	-2.760***	-3.008***
	(0.087)	(0.130)	(0.158)	(0.194)	(0.231)	(0.264)
P-value High=Low	0.000	0.675	0.183	0.087	0.064	0.000
Avg.(trade) in countries above cutoff	0.705	1.524	2.394	3.271	4.058	4.866
Avg.(trade) in countries below cutoff	0.158	0.148	0.167	0.368	0.499	0.493
Panel d: Manufacturing						
ATE-AIPW High	-3.478***	-4.286***	-4.923***	-5.114***	-5.130***	-2.706***
	(0.252)	(0.345)	(0.465)	(0.588)	(0.721)	(0.894)
ATE-AIPW Low	-2.260***	-3.615***	-3.973***	-4.395***	-4.776***	-5.786***
	(0.238)	(0.341)	(0.457)	(0.573)	(0.707)	(0.823)
P-value High=Low	0.000	0.003	0.000	0.017	0.310	0.000
Avg.(trade) in countries above cutoff	2.379	4.982	7.641	10.281	12.994	15.786
Avg.(trade) in countries below cutoff	0.831	1.076	1.491	2.638	3.750	5.036
Panel e: Services						
ATE-AIPW High	-0.816***	-1.003***	-1.091***	-1.284***	-1.173***	-0.908***
	(0.078)	(0.122)	(0.172)	(0.203)	(0.242)	(0.290)
ATE-AIPW Low	-0.735***	-1.216***	-1.383***	-1.329***	-1.354***	-1.761***
	(0.064)	(0.109)	(0.155)	(0.201)	(0.240)	(0.267)
P-value High=Low	0.135	0.005	0.007	0.738	0.292	0.000
Avg.(trade) in countries above cutoff	0.687	1.469	2.299	3.190	4.073	4.944
Avg.(trade) in countries below cutoff	0.292	0.421	0.517	0.835	1.026	1.356
Observations	701	701	701	701	701	701
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	7.295	7.295	7.295	7.295	7.295	7.295

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.19a: Channels, Cumulative trade costs over five years after debt crises with higher and lower evolution of financial development

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.330***	-3.509***	-4.022***	-6.209***	-5.852***	-4.147***
	(0.330)	(0.434)	(0.602)	(0.849)	(1.066)	(1.356)
ATE-AIPW Low	-1.688***	-1.924***	-3.107***	-6.051***	-6.711***	-7.029***
	(0.277)	(0.402)	(0.555)	(0.699)	(0.874)	(1.057)
P-value High=Low	0.153	0.000	0.001	0.753	0.179	0.001
Avg.(trade) in countries above cutoff	3.150	6.576	10.282	14.141	17.839	21.941
Avg.(trade) in countries below cutoff	2.338	4.155	6.369	8.905	10.716	12.419
Panel b: Agriculture						
ATE-AIPW High	0.045	0.262*	0.742***	1.197***	1.675***	3.321***
	(0.102)	(0.135)	(0.179)	(0.278)	(0.388)	(0.635)
ATE-AIPW Low	-0.665***	-0.222**	-0.418***	-0.686***	-0.738***	-0.243
	(0.110)	(0.095)	(0.139)	(0.163)	(0.197)	(0.215)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.400	0.822	1.319	1.783	2.225	2.779
Avg.(trade) in countries below cutoff	0.312	0.616	0.932	1.420	1.786	2.220
Panel c: Mining						
ATE-AIPW High	0.113	-0.273	-0.338	-1.314***	-0.070	1.207**
	(0.209)	(0.223)	(0.256)	(0.350)	(0.411)	(0.558)
ATE-AIPW Low	-0.049	-0.118	-0.646***	-1.597***	-2.032***	-2.266***
	(0.107)	(0.155)	(0.215)	(0.265)	(0.324)	(0.384)
P-value High=Low	0.372	0.356	0.037	0.225	0.000	0.000
Avg.(trade) in countries above cutoff	0.577	1.166	1.863	2.598	3.304	4.039
Avg.(trade) in countries below cutoff	0.297	0.633	0.917	1.266	1.323	1.269
Panel d: Manufacturing						
ATE-AIPW High	-0.958***	-2.107***	-2.691***	-3.832***	-4.828***	-5.195***
	(0.136)	(0.227)	(0.315)	(0.407)	(0.512)	(0.619)
ATE-AIPW Low	-0.701***	-0.786***	-1.714***	-3.129***	-3.562***	-4.017***
	(0.142)	(0.235)	(0.316)	(0.405)	(0.505)	(0.608)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.361	2.889	4.392	6.009	7.542	9.202
Avg.(trade) in countries below cutoff	0.935	1.534	2.561	3.588	4.383	5.257
Panel e: Services						
ATE-AIPW High	-0.530***	-1.391***	-1.735***	-2.259***	-2.629***	-3.480***
	(0.080)	(0.135)	(0.196)	(0.250)	(0.294)	(0.353)
ATE-AIPW Low	-0.273***	-0.798***	-0.329*	-0.639***	-0.379	-0.503
	(0.078)	(0.135)	(0.183)	(0.237)	(0.278)	(0.334)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.812	1.698	2.708	3.752	4.768	5.921
Avg.(trade) in countries below cutoff	0.794	1.373	1.959	2.632	3.224	3.673
Observations	702	702	702	702	702	702
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-3.726***	-6.091***	-5.929***	-6.136***	-6.831***	-3.282
	(0.464)	(0.644)	(0.962)	(1.227)	(1.528)	(2.021)
ATE-AIPW Low	-2.995***	-4.646***	-5.097***	-6.569***	-7.457***	-11.367***
	(0.378)	(0.598)	(0.863)	(1.057)	(1.302)	(1.550)
P-value High=Low	0.013	0.000	0.098	0.533	0.470	0.000
Avg.(trade) in countries above cutoff	3.934	8.125	12.488	17.125	21.423	26.126
Avg.(trade) in countries below cutoff	2.346	4.351	6.563	9.195	12.348	15.096
Panel b: Agriculture						
ATE-AIPW High	-0.438***	-0.497***	-0.642***	-0.804***	-1.036***	-0.603***
	(0.079)	(0.081)	(0.128)	(0.134)	(0.157)	(0.194)
ATE-AIPW Low	0.018	-0.657***	-0.329***	-0.681***	-0.827***	-1.004***
	(0.064)	(0.079)	(0.120)	(0.123)	(0.146)	(0.174)
P-value High=Low	0.000	0.000	0.000	0.043	0.002	0.000
Avg.(trade) in countries above cutoff	0.355	0.720	1.117	1.561	1.970	2.440
Avg.(trade) in countries below cutoff	0.249	0.527	0.781	1.059	1.422	1.709
Panel c: Mining						
ATE-AIPW High	-0.281***	-0.750***	-0.659***	-0.967***	-1.037***	-0.070
	(0.091)	(0.144)	(0.199)	(0.282)	(0.359)	(0.466)
ATE-AIPW Low	-0.644***	-0.007	-0.693***	-1.345***	-1.511***	-2.662***
	(0.087)	(0.168)	(0.213)	(0.263)	(0.323)	(0.380)
P-value High=Low	0.000	0.000	0.810	0.038	0.009	0.000
Avg.(trade) in countries above cutoff	0.662	1.394	2.175	2.972	3.649	4.457
Avg.(trade) in countries below cutoff	0.334	0.658	1.041	1.554	1.997	2.018
Panel d: Manufacturing						
ATE-AIPW High	-2.031***	-3.310***	-2.649***	-2.357***	-2.630***	-0.742
	(0.283)	(0.392)	(0.578)	(0.748)	(0.954)	(1.291)
ATE-AIPW Low	-1.988***	-3.492***	-3.546***	-3.969***	-4.441***	-6.536***
	(0.232)	(0.359)	(0.509)	(0.610)	(0.747)	(0.880)
P-value High=Low	0.818	0.426	0.004	0.001	0.005	0.000
Avg.(trade) in countries above cutoff	2.287	4.671	7.090	9.619	12.048	14.642
Avg.(trade) in countries below cutoff	1.245	2.255	3.521	4.966	6.834	8.824
Panel e: Services						
ATE-AIPW High	-0.976***	-1.534***	-1.979***	-2.009***	-2.127***	-1.867***
	(0.112)	(0.149)	(0.201)	(0.229)	(0.265)	(0.301)
ATE-AIPW Low	-0.382***	-0.490***	-0.530***	-0.574***	-0.679***	-1.164***
	(0.085)	(0.119)	(0.157)	(0.195)	(0.227)	(0.267)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.631	1.339	2.107	2.973	3.756	4.587
Avg.(trade) in countries below cutoff	0.517	0.912	1.221	1.616	2.096	2.545
Observations	702	702	702	702	702	702
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.19b: Channels, Cumulative trade costs over five years after banking crises with higher and lower evolution of financial development

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-2.306***	-5.461***	-6.304***	-5.320***	-5.970***	-5.898***
	(0.278)	(0.473)	(0.554)	(0.696)	(0.878)	(1.082)
ATE-AIPW Low	-0.014	-5.316***	-5.057***	-5.012***	-9.209***	-9.637***
	(0.305)	(0.475)	(0.567)	(0.701)	(0.858)	(1.059)
P-value High=Low	0.000	0.535	0.000	0.409	0.000	0.000
Avg.(trade) in countries above cutoff	3.591	7.423	11.452	15.652	19.711	24.007
Avg.(trade) in countries below cutoff	1.895	3.640	5.876	8.340	10.264	12.566
Panel b: Agriculture						
ATE-AIPW High	-0.221***	-0.674***	-0.696***	-0.689***	-0.764***	-0.883***
	(0.063)	(0.087)	(0.119)	(0.148)	(0.170)	(0.204)
ATE-AIPW Low	0.171***	-0.185**	-0.404***	-0.626***	-0.822***	-1.433***
	(0.058)	(0.086)	(0.112)	(0.132)	(0.160)	(0.185)
P-value High=Low	0.000	0.000	0.002	0.557	0.649	0.000
Avg.(trade) in countries above cutoff	0.429	0.890	1.378	1.835	2.334	2.927
Avg.(trade) in countries below cutoff	0.296	0.580	0.980	1.472	1.769	2.182
Panel c: Mining						
ATE-AIPW High	-0.274	-1.332***	-1.537***	-1.705***	-2.237***	-2.542***
	(0.167)	(0.223)	(0.240)	(0.292)	(0.358)	(0.428)
ATE-AIPW Low	-0.269*	-0.902***	-0.794***	-1.079***	-2.342***	-0.802*
	(0.143)	(0.226)	(0.258)	(0.282)	(0.327)	(0.461)
P-value High=Low	0.953	0.000	0.000	0.000	0.492	0.000
Avg.(trade) in countries above cutoff	0.671	1.270	2.107	2.972	3.751	4.520
Avg.(trade) in countries below cutoff	0.244	0.662	0.864	1.139	1.325	1.519
Panel d: Manufacturing						
ATE-AIPW High	-0.709***	-1.461***	-1.967***	-1.295***	-0.965*	-1.065*
	(0.126)	(0.229)	(0.307)	(0.417)	(0.530)	(0.624)
ATE-AIPW Low	0.351**	-2.218***	-1.257***	-0.543	-2.244***	-2.308***
	(0.169)	(0.292)	(0.378)	(0.465)	(0.526)	(0.674)
P-value High=Low	0.000	0.000	0.006	0.026	0.000	0.008
Avg.(trade) in countries above cutoff	1.519	3.256	4.845	6.576	8.259	9.971
Avg.(trade) in countries below cutoff	0.829	1.430	2.494	3.553	4.375	5.467
Panel e: Services						
ATE-AIPW High	-1.101***	-1.993***	-2.104***	-1.631***	-2.003***	-1.408***
	(0.092)	(0.144)	(0.194)	(0.271)	(0.336)	(0.460)
ATE-AIPW Low	-0.267***	-2.011***	-2.602***	-2.764***	-3.802***	-5.093***
	(0.090)	(0.157)	(0.224)	(0.288)	(0.353)	(0.412)
P-value High=Low	0.000	0.870	0.001	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.972	2.007	3.121	4.269	5.367	6.589
Avg.(trade) in countries below cutoff	0.526	0.968	1.538	2.177	2.795	3.397
Observations	705	705	705	705	705	705
# of Crises	17	17	17	17	17	17
Cutoff of channel variable, median	0.006	0.006	0.006	0.006	0.006	0.006

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-5.496***	-9.162***	-9.787***	-8.626***	-7.680***	-8.499***
	(0.422)	(0.727)	(0.851)	(1.001)	(1.266)	(1.521)
ATE-AIPW Low	-0.131	-8.313***	-9.721***	-10.532***	-14.917***	-16.622***
	(0.398)	(0.695)	(0.837)	(0.946)	(1.202)	(1.469)
P-value High=Low	0.000	0.073	0.887	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	4.294	9.036	13.876	18.734	23.349	28.106
Avg.(trade) in countries below cutoff	2.345	4.250	6.480	9.508	12.560	15.974
Panel b: Agriculture						
ATE-AIPW High	-0.724***	-0.773***	-0.892***	-0.937***	-0.854***	-1.083***
	(0.056)	(0.087)	(0.102)	(0.112)	(0.145)	(0.167)
ATE-AIPW Low	0.048	-0.246**	-0.348***	-0.709***	-1.383***	-1.629***
	(0.061)	(0.098)	(0.110)	(0.115)	(0.132)	(0.162)
P-value High=Low	0.000	0.000	0.000	0.001	0.000	0.000
Avg.(trade) in countries above cutoff	0.374	0.793	1.246	1.737	2.169	2.638
Avg.(trade) in countries below cutoff	0.257	0.477	0.688	0.952	1.293	1.651
Panel c: Mining						
ATE-AIPW High	-0.976***	-1.524***	-1.861***	-2.005***	-2.203***	-2.723***
	(0.094)	(0.146)	(0.169)	(0.199)	(0.252)	(0.308)
ATE-AIPW Low	-0.204**	-1.578***	-1.605***	-1.463***	-2.098***	-2.636***
	(0.101)	(0.151)	(0.169)	(0.206)	(0.250)	(0.300)
P-value High=Low	0.000	0.398	0.000	0.000	0.318	0.469
Avg.(trade) in countries above cutoff	0.690	1.483	2.341	3.161	3.903	4.751
Avg.(trade) in countries below cutoff	0.412	0.791	1.197	1.779	2.202	2.460
Panel d: Manufacturing						
ATE-AIPW High	-2.825***	-5.402***	-5.341***	-4.256***	-2.897***	-3.075***
	(0.252)	(0.445)	(0.519)	(0.606)	(0.774)	(0.928)
ATE-AIPW Low	-0.327	-5.505***	-5.886***	-6.033***	-8.596***	-9.124***
	(0.231)	(0.417)	(0.501)	(0.565)	(0.716)	(0.883)
P-value High=Low	0.000	0.751	0.084	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.530	5.233	7.899	10.521	13.122	15.688
Avg.(trade) in countries below cutoff	1.232	2.228	3.517	5.222	7.013	9.286
Panel e: Services						
ATE-AIPW High	-0.971***	-1.463***	-1.693***	-1.428***	-1.726***	-1.619***
	(0.087)	(0.134)	(0.167)	(0.203)	(0.237)	(0.271)
ATE-AIPW Low	0.353***	-0.984***	-1.882***	-2.327***	-2.841***	-3.232***
	(0.089)	(0.115)	(0.167)	(0.198)	(0.240)	(0.281)
P-value High=Low	0.000	0.000	0.121	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.699	1.527	2.390	3.314	4.156	5.029
Avg.(trade) in countries below cutoff	0.444	0.754	1.078	1.555	2.052	2.577
Observations	705	705	705	705	705	705
# of Crises	17	17	17	17	17	17
Cutoff of channel variable, median	0.006	0.006	0.006	0.006	0.006	0.006

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.19c: Channels, Cumulative trade costs over five years after currency crises with higher and lower evolution of financial development

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-1.746***	-2.530***	-3.852***	-4.669***	-6.155***	-7.517***
	(0.286)	(0.407)	(0.583)	(0.755)	(0.864)	(1.100)
ATE-AIPW Low	-3.067***	-4.724***	-4.861***	-5.566***	-7.669***	-9.094***
	(0.384)	(0.426)	(0.568)	(0.714)	(0.830)	(1.004)
P-value High=Low	0.000	0.000	0.010	0.054	0.004	0.039
Avg.(trade) in countries above cutoff	3.157	6.498	10.061	13.818	17.344	21.302
Avg.(trade) in countries below cutoff	2.126	3.955	6.467	9.158	11.308	13.106
Panel b: Agriculture						
ATE-AIPW High	-0.009	-0.041	0.393*	0.130	-0.294	-0.498*
	(0.059)	(0.106)	(0.216)	(0.227)	(0.217)	(0.272)
ATE-AIPW Low	0.060	-0.479***	-0.292**	-0.290*	-0.008	0.054
	(0.076)	(0.090)	(0.120)	(0.148)	(0.170)	(0.225)
P-value High=Low	0.282	0.000	0.001	0.039	0.087	0.016
Avg.(trade) in countries above cutoff	0.400	0.821	1.313	1.773	2.200	2.735
Avg.(trade) in countries below cutoff	0.290	0.573	0.868	1.383	1.796	2.290
Panel c: Mining						
ATE-AIPW High	-0.401**	-0.785***	-1.102***	-1.406***	-1.856***	-2.017***
	(0.180)	(0.153)	(0.210)	(0.268)	(0.321)	(0.395)
ATE-AIPW Low	-0.417**	-1.181***	-1.408***	-1.490***	-2.713***	-2.721***
	(0.198)	(0.178)	(0.265)	(0.293)	(0.324)	(0.377)
P-value High=Low	0.857	0.000	0.094	0.625	0.000	0.001
Avg.(trade) in countries above cutoff	0.565	1.149	1.808	2.503	3.167	3.876
Avg.(trade) in countries below cutoff	0.289	0.590	0.946	1.385	1.483	1.366
Panel d: Manufacturing						
ATE-AIPW High	-0.554***	-1.034***	-1.955***	-2.285***	-2.967***	-3.105***
	(0.138)	(0.233)	(0.308)	(0.416)	(0.502)	(0.601)
ATE-AIPW Low	-1.792***	-2.261***	-2.633***	-3.120***	-3.757***	-4.651***
	(0.213)	(0.250)	(0.303)	(0.379)	(0.473)	(0.581)
P-value High=Low	0.000	0.000	0.000	0.000	0.002	0.000
Avg.(trade) in countries above cutoff	1.355	2.832	4.289	5.868	7.354	8.946
Avg.(trade) in countries below cutoff	0.866	1.481	2.606	3.665	4.501	5.505
Panel e: Services						
ATE-AIPW High	-0.782***	-0.671***	-1.188***	-1.108***	-1.037***	-1.897***
	(0.083)	(0.144)	(0.190)	(0.282)	(0.322)	(0.395)
ATE-AIPW Low	-0.919***	-0.802***	-0.528***	-0.667**	-1.190***	-1.776***
	(0.085)	(0.132)	(0.200)	(0.305)	(0.329)	(0.382)
P-value High=Low	0.035	0.201	0.000	0.037	0.536	0.708
Avg.(trade) in countries above cutoff	0.837	1.695	2.650	3.674	4.622	5.746
Avg.(trade) in countries below cutoff	0.681	1.311	2.047	2.726	3.527	3.944
Observations	705	705	705	705	705	705
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-4.780***	-6.537***	-7.660***	-8.646***	-9.468***	-8.439***
	(0.413)	(0.546)	(0.780)	(1.015)	(1.236)	(1.578)
ATE-AIPW Low	-6.698***	-8.322***	-9.583***	-10.429***	-10.760***	-11.804***
	(0.523)	(0.625)	(0.839)	(1.014)	(1.222)	(1.454)
P-value High=Low	0.000	0.000	0.000	0.001	0.049	0.002
Avg.(trade) in countries above cutoff	3.949	8.017	12.196	16.687	20.890	25.421
Avg.(trade) in countries below cutoff	1.922	3.976	6.522	9.347	12.662	15.733
Panel b: Agriculture						
ATE-AIPW High	-0.533***	-0.498***	-0.562***	-0.917***	-0.843***	-0.708***
	(0.083)	(0.074)	(0.101)	(0.112)	(0.140)	(0.172)
ATE-AIPW Low	-0.502***	-0.601***	-0.890***	-0.909***	-0.749***	-0.821***
	(0.082)	(0.077)	(0.105)	(0.114)	(0.138)	(0.153)
P-value High=Low	0.393	0.029	0.000	0.874	0.155	0.351
Avg.(trade) in countries above cutoff	0.358	0.718	1.105	1.536	1.934	2.384
Avg.(trade) in countries below cutoff	0.211	0.495	0.756	1.060	1.457	1.792
Panel c: Mining						
ATE-AIPW High	-0.695***	-0.984***	-1.313***	-1.605***	-1.959***	-1.679***
	(0.078)	(0.128)	(0.162)	(0.218)	(0.255)	(0.352)
ATE-AIPW Low	-1.511***	-1.807***	-2.606***	-3.114***	-3.725***	-4.008***
	(0.121)	(0.140)	(0.199)	(0.220)	(0.256)	(0.290)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.693	1.392	2.120	2.890	3.566	4.292
Avg.(trade) in countries below cutoff	0.120	0.499	1.027	1.596	1.989	2.200
Panel d: Manufacturing						
ATE-AIPW High	-2.785***	-4.159***	-4.640***	-4.924***	-5.384***	-4.596***
	(0.250)	(0.326)	(0.459)	(0.599)	(0.734)	(0.910)
ATE-AIPW Low	-3.739***	-4.501***	-4.538***	-4.835***	-4.971***	-5.450***
	(0.326)	(0.402)	(0.507)	(0.606)	(0.737)	(0.889)
P-value High=Low	0.000	0.205	0.717	0.782	0.290	0.150
Avg.(trade) in countries above cutoff	2.255	4.582	6.922	9.375	11.738	14.293
Avg.(trade) in countries below cutoff	1.149	2.103	3.459	4.994	7.035	9.060
Panel e: Services						
ATE-AIPW High	-0.766***	-0.896***	-1.145***	-1.200***	-1.282***	-1.456***
	(0.077)	(0.118)	(0.174)	(0.221)	(0.259)	(0.293)
ATE-AIPW Low	-0.945***	-1.413***	-1.549***	-1.572***	-1.315***	-1.525***
	(0.081)	(0.122)	(0.179)	(0.228)	(0.265)	(0.300)
P-value High=Low	0.003	0.000	0.000	0.006	0.850	0.773
Avg.(trade) in countries above cutoff	0.642	1.324	2.048	2.885	3.652	4.452
Avg.(trade) in countries below cutoff	0.442	0.878	1.279	1.698	2.182	2.682
Observations	705	705	705	705	705	705
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.20a: Channels, Cumulative trade costs over five years after debt crises with higher and lower evolution of gross capital inflows

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-0.284	-1.984***	-2.188***	-4.005***	-6.220***	-5.370***
	(0.391)	(0.551)	(0.703)	(1.051)	(1.494)	(1.986)
ATE-AIPW Low	-2.969***	-4.344***	-6.274***	-11.091***	-11.031***	-13.326***
	(0.275)	(0.474)	(0.699)	(1.001)	(1.459)	(1.942)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.157	6.913	10.928	15.150	18.932	22.777
Avg.(trade) in countries below cutoff	2.571	4.552	6.909	9.276	11.957	14.748
Panel b: Agriculture						
ATE-AIPW High	-0.606***	-0.068	0.582***	1.002***	0.657**	0.958***
	(0.136)	(0.122)	(0.194)	(0.313)	(0.324)	(0.301)
ATE-AIPW Low	-0.061	-0.381***	-0.558***	-1.059***	-1.219***	-0.708***
	(0.066)	(0.089)	(0.148)	(0.171)	(0.219)	(0.230)
P-value High=Low	0.000	0.001	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.334	0.836	1.347	1.870	2.339	2.875
Avg.(trade) in countries below cutoff	0.360	0.559	0.885	1.238	1.600	1.990
Panel c: Mining						
ATE-AIPW High	1.222***	0.135	0.016	-0.543	-0.284	1.031
	(0.234)	(0.299)	(0.305)	(0.399)	(0.511)	(0.677)
ATE-AIPW Low	-1.272***	-0.650**	-1.548***	-3.413***	-2.674***	-3.749***
	(0.151)	(0.260)	(0.286)	(0.385)	(0.462)	(0.624)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.728	1.450	2.278	3.228	3.960	4.537
Avg.(trade) in countries below cutoff	0.389	0.791	1.248	1.652	2.222	2.939
Panel d: Manufacturing						
ATE-AIPW High	-0.699***	-1.348***	-2.259***	-3.706***	-4.987***	-5.339***
	(0.173)	(0.326)	(0.441)	(0.662)	(0.876)	(1.070)
ATE-AIPW Low	-1.118***	-2.160***	-3.085***	-5.008***	-5.519***	-6.301***
	(0.157)	(0.281)	(0.436)	(0.661)	(0.878)	(1.066)
P-value High=Low	0.000	0.000	0.000	0.000	0.009	0.000
Avg.(trade) in countries above cutoff	1.367	3.063	4.766	6.409	7.974	9.593
Avg.(trade) in countries below cutoff	1.150	1.995	2.981	4.082	5.177	6.285
Panel e: Services						
ATE-AIPW High	-0.201***	-0.703***	-0.526***	-0.757***	-1.605***	-2.020***
	(0.076)	(0.136)	(0.203)	(0.274)	(0.424)	(0.613)
ATE-AIPW Low	-0.517***	-1.153***	-1.083***	-1.610***	-1.619***	-2.567***
	(0.073)	(0.137)	(0.205)	(0.258)	(0.421)	(0.603)
P-value High=Low	0.000	0.000	0.000	0.000	0.930	0.001
Avg.(trade) in countries above cutoff	0.728	1.565	2.538	3.643	4.659	5.771
Avg.(trade) in countries below cutoff	0.673	1.206	1.795	2.304	2.958	3.534
Observations	576	576	576	576	576	576
# of Crises	15	15	15	15	15	15
Cutoff of channel variable, median	-1.017	-1.017	-1.017	-1.017	-1.017	-1.017

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.111**	-3.563***	-2.538**	-3.576**	-5.443***	-5.047**
	(0.495)	(0.698)	(0.985)	(1.408)	(1.918)	(2.531)
ATE-AIPW Low	-7.441***	-8.027***	-12.078***	-15.083***	-16.385***	-19.098***
	(0.513)	(0.702)	(0.998)	(1.380)	(1.918)	(2.494)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.770	8.651	13.650	18.749	23.812	28.669
Avg.(trade) in countries below cutoff	2.684	4.068	5.793	7.984	10.379	13.319
Panel b: Agriculture						
ATE-AIPW High	-0.096	-0.561***	-0.326**	-0.327*	-0.563***	-0.381*
	(0.132)	(0.130)	(0.129)	(0.175)	(0.170)	(0.205)
ATE-AIPW Low	-0.569***	-0.571***	-1.008***	-1.483***	-1.644***	-1.602***
	(0.123)	(0.117)	(0.127)	(0.172)	(0.167)	(0.198)
P-value High=Low	0.000	0.885	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.305	0.696	1.155	1.648	2.131	2.685
Avg.(trade) in countries below cutoff	0.328	0.566	0.715	0.968	1.207	1.474
Panel c: Mining						
ATE-AIPW High	-0.345***	-0.735***	-0.924***	-1.202***	-1.273***	-1.067**
	(0.096)	(0.155)	(0.198)	(0.279)	(0.381)	(0.497)
ATE-AIPW Low	-0.887***	-0.560***	-1.180***	-2.465***	-2.881***	-4.205***
	(0.104)	(0.188)	(0.225)	(0.273)	(0.345)	(0.443)
P-value High=Low	0.000	0.242	0.126	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.622	1.574	2.553	3.565	4.425	5.174
Avg.(trade) in countries below cutoff	0.563	0.774	1.087	1.383	1.747	2.090
Panel d: Manufacturing						
ATE-AIPW High	-0.782**	-2.323***	-1.317*	-1.984**	-3.403***	-3.627**
	(0.333)	(0.463)	(0.679)	(0.968)	(1.284)	(1.662)
ATE-AIPW Low	-4.116***	-4.648***	-6.818***	-8.109***	-8.873***	-9.842***
	(0.328)	(0.445)	(0.657)	(0.942)	(1.277)	(1.648)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.266	5.048	7.772	10.441	13.283	15.973
Avg.(trade) in countries below cutoff	1.327	1.959	2.951	4.258	5.668	7.514
Panel e: Services						
ATE-AIPW High	0.113	0.056	0.029	-0.063	-0.204	0.028
	(0.076)	(0.122)	(0.170)	(0.214)	(0.282)	(0.355)
ATE-AIPW Low	-1.868***	-2.247***	-3.072***	-3.026***	-2.987***	-3.450***
	(0.110)	(0.131)	(0.185)	(0.216)	(0.287)	(0.351)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.577	1.333	2.169	3.095	3.973	4.837
Avg.(trade) in countries below cutoff	0.466	0.769	1.040	1.375	1.757	2.239
Observations	576	576	576	576	576	576
# of Crises	15	15	15	15	15	15
Cutoff of channel variable, median	-1.017	-1.017	-1.017	-1.017	-1.017	-1.017

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.20b: Channels, Cumulative trade costs over five years after banking crises with higher and lower evolution of gross capital inflows

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-1.710***	-3.143***	-4.896***	-4.913***	-5.811***	-5.704***
	(0.384)	(0.512)	(0.651)	(0.908)	(1.168)	(1.364)
ATE-AIPW Low	-0.541	-5.077***	-5.633***	-6.218***	-9.661***	-10.856***
	(0.404)	(0.515)	(0.655)	(0.897)	(1.160)	(1.319)
P-value High=Low	0.000	0.000	0.003	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.114	6.771	10.547	14.491	18.125	21.969
Avg.(trade) in countries below cutoff	2.444	3.959	6.261	8.596	11.214	13.576
Panel b: Agriculture						
ATE-AIPW High	0.089	-0.224	-0.406***	-0.462***	-0.506***	-1.129***
	(0.075)	(0.136)	(0.141)	(0.176)	(0.193)	(0.202)
ATE-AIPW Low	-0.250***	-0.864***	-1.312***	-1.592***	-1.883***	-2.193***
	(0.061)	(0.130)	(0.126)	(0.155)	(0.181)	(0.197)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.348	0.857	1.328	1.847	2.279	2.780
Avg.(trade) in countries below cutoff	0.336	0.391	0.744	1.041	1.455	1.876
Panel c: Mining						
ATE-AIPW High	-0.381	-0.527***	-0.887***	-1.576***	-2.799***	-2.372***
	(0.241)	(0.194)	(0.273)	(0.339)	(0.402)	(0.494)
ATE-AIPW Low	0.560**	-0.905***	-0.815***	-0.951***	-1.725***	-2.172***
	(0.254)	(0.191)	(0.252)	(0.337)	(0.423)	(0.503)
P-value High=Low	0.000	0.000	0.541	0.000	0.000	0.192
Avg.(trade) in countries above cutoff	0.715	1.397	2.186	2.977	3.660	4.303
Avg.(trade) in countries below cutoff	0.284	0.659	1.068	1.663	2.296	2.898
Panel d: Manufacturing						
ATE-AIPW High	-0.716***	-1.330***	-2.226***	-1.927***	-1.290*	-1.371*
	(0.185)	(0.267)	(0.343)	(0.487)	(0.674)	(0.777)
ATE-AIPW Low	-0.619***	-1.223***	-0.813*	-0.589	-1.796***	-1.332*
	(0.199)	(0.311)	(0.421)	(0.523)	(0.648)	(0.792)
P-value High=Low	0.310	0.584	0.000	0.000	0.240	0.945
Avg.(trade) in countries above cutoff	1.353	2.999	4.567	6.171	7.753	9.386
Avg.(trade) in countries below cutoff	1.097	1.726	2.770	3.752	4.612	5.475
Panel e: Services						
ATE-AIPW High	-0.701***	-1.063***	-1.376***	-0.947***	-1.216***	-0.831
	(0.094)	(0.151)	(0.229)	(0.353)	(0.462)	(0.603)
ATE-AIPW Low	-0.231**	-2.085***	-2.692***	-3.086***	-4.256***	-5.159***
	(0.094)	(0.175)	(0.266)	(0.371)	(0.476)	(0.543)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.699	1.518	2.466	3.496	4.434	5.500
Avg.(trade) in countries below cutoff	0.727	1.183	1.679	2.140	2.851	3.328
Observations	579	579	579	579	579	579
# of Crises	14	14	14	14	14	14
Cutoff of channel variable, median	-2.225	-2.225	-2.225	-2.225	-2.225	-2.225

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-3.678***	-4.163***	-6.129***	-6.869***	-6.770***	-6.816***
	(0.526)	(0.878)	(1.253)	(1.936)	(2.526)	(2.109)
ATE-AIPW Low	-1.548***	-8.040***	-10.632***	-11.615***	-15.010***	-17.229***
	(0.559)	(0.923)	(1.284)	(1.942)	(2.530)	(2.108)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.725	8.316	12.864	17.794	22.457	27.076
Avg.(trade) in countries below cutoff	2.356	3.071	4.634	6.077	8.429	11.204
Panel b: Agriculture						
ATE-AIPW High	-0.521***	-0.375***	-0.630***	-0.757**	-0.871***	-1.033***
	(0.092)	(0.135)	(0.188)	(0.301)	(0.331)	(0.264)
ATE-AIPW Low	-0.098	-0.043	-0.436**	-0.801***	-1.108***	-1.942***
	(0.090)	(0.138)	(0.185)	(0.302)	(0.330)	(0.262)
P-value High=Low	0.000	0.000	0.005	0.427	0.001	0.000
Avg.(trade) in countries above cutoff	0.328	0.719	1.113	1.598	2.019	2.543
Avg.(trade) in countries below cutoff	0.278	0.454	0.648	0.820	1.122	1.350
Panel c: Mining						
ATE-AIPW High	-0.680***	-1.024***	-1.721***	-2.005***	-2.324***	-2.337***
	(0.147)	(0.184)	(0.249)	(0.364)	(0.489)	(0.472)
ATE-AIPW Low	-0.609***	-1.489***	-1.911***	-2.181***	-2.944***	-3.306***
	(0.143)	(0.188)	(0.250)	(0.363)	(0.485)	(0.464)
P-value High=Low	0.078	0.000	0.001	0.002	0.000	0.000
Avg.(trade) in countries above cutoff	0.592	1.486	2.348	3.268	4.082	4.793
Avg.(trade) in countries below cutoff	0.616	0.676	1.022	1.266	1.549	1.825
Panel d: Manufacturing						
ATE-AIPW High	-2.043***	-2.315***	-3.172***	-3.225***	-2.537*	-2.430**
	(0.294)	(0.500)	(0.703)	(1.088)	(1.405)	(1.166)
ATE-AIPW Low	-1.063***	-5.205***	-6.101***	-5.920***	-7.729***	-8.712***
	(0.313)	(0.526)	(0.722)	(1.091)	(1.397)	(1.172)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.235	4.833	7.330	9.976	12.614	15.169
Avg.(trade) in countries below cutoff	1.025	1.258	2.134	2.946	4.301	6.157
Panel e: Services						
ATE-AIPW High	-0.433***	-0.449***	-0.605***	-0.883***	-1.038***	-1.016***
	(0.085)	(0.143)	(0.212)	(0.280)	(0.385)	(0.339)
ATE-AIPW Low	0.223*	-1.303***	-2.183***	-2.714***	-3.229***	-3.269***
	(0.119)	(0.153)	(0.218)	(0.285)	(0.393)	(0.342)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.570	1.278	2.073	2.952	3.742	4.571
Avg.(trade) in countries below cutoff	0.438	0.682	0.830	1.045	1.456	1.872
Observations	579	579	579	579	579	579
# of Crises	14	14	14	14	14	14
Cutoff of channel variable, median	-2.225	-2.225	-2.225	-2.225	-2.225	-2.225

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.20c: Channels, Cumulative trade costs over five years after currency crises with higher and lower evolution of gross capital inflows

Panel I: Exports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-1.391***	-3.473***	-4.683***	-5.104***	-5.993***	-5.173***
	(0.314)	(0.473)	(0.672)	(0.812)	(0.978)	(1.212)
ATE-AIPW Low	-3.920***	-3.825***	-3.451***	-4.278***	-7.463***	-11.400***
	(0.443)	(0.529)	(0.694)	(0.843)	(0.974)	(1.172)
P-value High=Low	0.000	0.280	0.002	0.095	0.010	0.000
Avg.(trade) in countries above cutoff	3.116	6.885	10.831	14.932	18.658	22.547
Avg.(trade) in countries below cutoff	2.594	4.403	6.742	9.167	11.856	14.477
Panel b: Agriculture						
ATE-AIPW High	0.022	-0.453***	-0.216*	-0.548***	-0.352**	-0.523**
	(0.058)	(0.080)	(0.110)	(0.137)	(0.169)	(0.213)
ATE-AIPW Low	-0.152**	-0.157	0.508**	0.547**	0.191	-0.144
	(0.069)	(0.116)	(0.250)	(0.242)	(0.208)	(0.227)
P-value High=Low	0.000	0.002	0.002	0.000	0.000	0.010
Avg.(trade) in countries above cutoff	0.331	0.850	1.350	1.871	2.325	2.859
Avg.(trade) in countries below cutoff	0.368	0.510	0.841	1.183	1.563	1.942
Panel c: Mining						
ATE-AIPW High	-0.050	-0.916***	-1.732***	-1.444***	-2.146***	-2.086***
	(0.170)	(0.186)	(0.297)	(0.364)	(0.425)	(0.497)
ATE-AIPW Low	-0.792***	-1.139***	-1.147***	-2.281***	-3.745***	-4.119***
	(0.172)	(0.191)	(0.275)	(0.349)	(0.390)	(0.462)
P-value High=Low	0.000	0.002	0.003	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.722	1.424	2.247	3.125	3.864	4.460
Avg.(trade) in countries below cutoff	0.371	0.782	1.216	1.702	2.246	2.942
Panel d: Manufacturing						
ATE-AIPW High	-0.669***	-1.470***	-2.130***	-2.236***	-2.385***	-1.582**
	(0.166)	(0.268)	(0.358)	(0.441)	(0.532)	(0.633)
ATE-AIPW Low	-2.052***	-2.146***	-2.463***	-2.967***	-4.076***	-5.641***
	(0.272)	(0.320)	(0.369)	(0.458)	(0.556)	(0.672)
P-value High=Low	0.000	0.003	0.112	0.008	0.000	0.000
Avg.(trade) in countries above cutoff	1.359	3.053	4.692	6.315	7.855	9.512
Avg.(trade) in countries below cutoff	1.145	1.922	2.961	4.052	5.153	6.151
Panel e: Services						
ATE-AIPW High	-0.694***	-0.634***	-0.605***	-0.875***	-1.110***	-0.982**
	(0.100)	(0.163)	(0.234)	(0.296)	(0.346)	(0.440)
ATE-AIPW Low	-0.924***	-0.384***	-0.349	0.423	0.168	-1.496***
	(0.102)	(0.145)	(0.216)	(0.296)	(0.349)	(0.414)
P-value High=Low	0.001	0.043	0.155	0.000	0.000	0.175
Avg.(trade) in countries above cutoff	0.704	1.557	2.542	3.621	4.614	5.716
Avg.(trade) in countries below cutoff	0.710	1.190	1.724	2.230	2.894	3.443
Observations	579	579	579	579	579	579
# of Crises	15	15	15	15	15	15
Cutoff of channel variable, median	-1.371	-1.371	-1.371	-1.371	-1.371	-1.371

Panel II: Imports (% of pre-crisis GDP)	(1)	(2)	(3)	(4)	(5)	(6)
	h=0	h=1	h=2	h=3	h=4	h=5
Panel C: Currency crises						
Panel a: Total						
ATE-AIPW High	-5.233***	-6.613***	-8.501***	-9.139***	-8.097***	-4.712***
	(0.522)	(0.685)	(1.013)	(1.150)	(1.397)	(1.747)
ATE-AIPW Low	-7.220***	-8.368***	-8.167***	-8.152***	-9.938***	-13.246***
	(0.620)	(0.718)	(0.951)	(1.152)	(1.447)	(1.704)
P-value High=Low	0.000	0.000	0.540	0.081	0.007	0.000
Avg.(trade) in countries above cutoff	3.736	8.616	13.472	18.537	23.372	28.228
Avg.(trade) in countries below cutoff	2.651	3.743	5.446	7.450	10.028	12.806
Panel b: Agriculture						
ATE-AIPW High	-0.516***	-0.702***	-0.881***	-1.061***	-0.786***	-0.478**
	(0.100)	(0.092)	(0.144)	(0.138)	(0.168)	(0.209)
ATE-AIPW Low	-0.486***	-0.446***	-0.647***	-0.617***	-0.734***	-0.971***
	(0.099)	(0.089)	(0.137)	(0.136)	(0.172)	(0.190)
P-value High=Low	0.373	0.000	0.000	0.000	0.461	0.000
Avg.(trade) in countries above cutoff	0.324	0.720	1.161	1.660	2.112	2.670
Avg.(trade) in countries below cutoff	0.296	0.513	0.668	0.888	1.163	1.400
Panel c: Mining						
ATE-AIPW High	-1.311***	-1.649***	-2.671***	-2.818***	-2.972***	-2.470***
	(0.117)	(0.167)	(0.253)	(0.283)	(0.347)	(0.410)
ATE-AIPW Low	-1.337***	-1.571***	-1.514***	-2.131***	-2.994***	-3.550***
	(0.134)	(0.162)	(0.191)	(0.237)	(0.288)	(0.350)
P-value High=Low	0.812	0.337	0.000	0.000	0.914	0.000
Avg.(trade) in countries above cutoff	0.603	1.550	2.502	3.501	4.334	5.057
Avg.(trade) in countries below cutoff	0.591	0.748	1.055	1.311	1.684	2.037
Panel d: Manufacturing						
ATE-AIPW High	-2.766***	-3.239***	-3.645***	-3.967***	-3.393***	-1.120
	(0.315)	(0.402)	(0.554)	(0.660)	(0.794)	(0.975)
ATE-AIPW Low	-4.405***	-5.394***	-5.114***	-4.667***	-5.449***	-7.367***
	(0.375)	(0.436)	(0.565)	(0.688)	(0.853)	(0.998)
P-value High=Low	0.000	0.000	0.000	0.036	0.000	0.000
Avg.(trade) in countries above cutoff	2.242	5.021	7.664	10.315	13.014	15.730
Avg.(trade) in countries below cutoff	1.292	1.745	2.736	3.959	5.502	7.232
Panel e: Services						
ATE-AIPW High	-0.641***	-1.024***	-1.305***	-1.293***	-0.947***	-0.644*
	(0.090)	(0.144)	(0.196)	(0.215)	(0.277)	(0.347)
ATE-AIPW Low	-0.992***	-0.957***	-0.892***	-0.736***	-0.761***	-1.358***
	(0.099)	(0.148)	(0.187)	(0.221)	(0.271)	(0.304)
P-value High=Low	0.000	0.463	0.001	0.000	0.387	0.015
Avg.(trade) in countries above cutoff	0.567	1.324	2.145	3.060	3.912	4.771
Avg.(trade) in countries below cutoff	0.473	0.737	0.988	1.292	1.679	2.137
Observations	579	579	579	579	579	579
# of Crises	15	15	15	15	15	15
Cutoff of channel variable, median	-1.371	-1.371	-1.371	-1.371	-1.371	-1.371

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.21a: Channels, Cumulative trade costs over five years after debt crises with higher and lower evolution of investors' credit ratings risks

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-0.921***	-1.214***	-1.386**	-3.828***	-3.383***	-2.395*
	(0.321)	(0.416)	(0.610)	(0.859)	(1.111)	(1.398)
ATE-AIPW Low	-0.812***	-3.913***	-6.050***	-8.587***	-9.814***	-10.174***
	(0.282)	(0.412)	(0.607)	(0.861)	(1.056)	(1.277)
P-value High=Low	0.697	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.978	6.358	10.305	14.546	18.777	23.345
Avg.(trade) in countries below cutoff	0.231	-0.010	1.075	2.520	3.834	5.983
Panel b: Agriculture						
ATE-AIPW High	-0.118	0.608***	0.969***	1.295***	2.104***	3.875***
	(0.141)	(0.151)	(0.179)	(0.295)	(0.405)	(0.680)
ATE-AIPW Low	0.068	-0.259**	-0.464***	-0.142	-0.133	0.274
	(0.062)	(0.107)	(0.143)	(0.196)	(0.238)	(0.323)
P-value High=Low	0.177	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.358	0.794	1.295	1.793	2.316	2.947
Avg.(trade) in countries below cutoff	0.155	0.074	0.301	0.712	1.042	1.583
Panel c: Mining						
ATE-AIPW High	0.080	0.491**	0.156	-0.837***	0.052	0.856
	(0.201)	(0.200)	(0.251)	(0.324)	(0.417)	(0.548)
ATE-AIPW Low	0.286*	-0.773***	-0.955***	-1.965***	-1.890***	-1.606***
	(0.154)	(0.159)	(0.235)	(0.371)	(0.426)	(0.506)
P-value High=Low	0.306	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.451	1.032	1.808	2.691	3.588	4.476
Avg.(trade) in countries below cutoff	-0.247	-0.498	-0.542	-0.593	-0.569	-0.325
Panel d: Manufacturing						
ATE-AIPW High	-0.710***	-1.565***	-2.010***	-3.354***	-4.374***	-5.061***
	(0.128)	(0.214)	(0.323)	(0.424)	(0.545)	(0.650)
ATE-AIPW Low	-0.601***	-1.196***	-2.437***	-3.856***	-4.750***	-5.512***
	(0.120)	(0.212)	(0.311)	(0.419)	(0.529)	(0.637)
P-value High=Low	0.056	0.000	0.000	0.000	0.022	0.017
Avg.(trade) in countries above cutoff	1.265	2.710	4.328	6.099	7.849	9.740
Avg.(trade) in countries below cutoff	0.267	0.290	0.993	1.693	2.233	3.020
Panel e: Services						
ATE-AIPW High	-0.173**	-0.749***	-0.502**	-0.931***	-1.165***	-2.064***
	(0.084)	(0.143)	(0.204)	(0.260)	(0.302)	(0.354)
ATE-AIPW Low	-0.565***	-1.684***	-2.194***	-2.624***	-3.042***	-3.330***
	(0.086)	(0.137)	(0.195)	(0.246)	(0.291)	(0.352)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.905	1.822	2.873	3.963	5.024	6.183
Avg.(trade) in countries below cutoff	0.055	0.124	0.324	0.708	1.128	1.706
Observations	627	627	627	627	627	627
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-5.567	-5.567	-5.567	-5.567	-5.567	-5.567

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel A: Debt crises						
Panel a: Total						
ATE-AIPW High	-1.601***	-2.344***	-1.690*	-0.923	-1.036	1.391
	(0.426)	(0.580)	(0.896)	(1.197)	(1.470)	(1.977)
ATE-AIPW Low	-4.820***	-10.537***	-12.064***	-14.338***	-16.217***	-17.600***
	(0.536)	(0.619)	(0.941)	(1.218)	(1.418)	(1.713)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.788	8.141	12.819	17.750	22.800	28.183
Avg.(trade) in countries below cutoff	-1.147	-2.884	-2.379	-0.824	0.693	2.899
Panel b: Agriculture						
ATE-AIPW High	-0.097	-0.225**	-0.092	-0.117	-0.222	0.295
	(0.116)	(0.110)	(0.141)	(0.188)	(0.161)	(0.201)
ATE-AIPW Low	-0.166	-1.021***	-1.148***	-1.609***	-1.798***	-1.954***
	(0.122)	(0.115)	(0.146)	(0.195)	(0.168)	(0.202)
P-value High=Low	0.142	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.342	0.716	1.160	1.629	2.107	2.627
Avg.(trade) in countries below cutoff	-0.105	-0.157	-0.091	0.065	0.172	0.373
Panel c: Mining						
ATE-AIPW High	-0.586***	-0.503***	-0.865***	-0.932***	-0.544*	-0.341
	(0.095)	(0.144)	(0.197)	(0.275)	(0.326)	(0.448)
ATE-AIPW Low	-0.403***	-1.004***	-1.216***	-2.166***	-2.608***	-2.604***
	(0.085)	(0.137)	(0.191)	(0.267)	(0.316)	(0.430)
P-value High=Low	0.009	0.000	0.008	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.546	1.223	2.023	2.956	3.912	4.900
Avg.(trade) in countries below cutoff	-0.197	-0.406	-0.158	0.016	0.020	0.228
Panel d: Manufacturing						
ATE-AIPW High	-0.754***	-1.064***	0.060	0.962	0.519	2.077
	(0.256)	(0.366)	(0.560)	(0.748)	(0.953)	(1.314)
ATE-AIPW Low	-2.893***	-6.238***	-7.030***	-7.858***	-8.661***	-9.637***
	(0.316)	(0.371)	(0.561)	(0.708)	(0.829)	(0.975)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.204	4.739	7.389	10.093	12.882	15.881
Avg.(trade) in countries below cutoff	-0.658	-1.872	-1.579	-0.675	0.447	1.776
Panel e: Services						
ATE-AIPW High	-0.164*	-0.552***	-0.793***	-0.836***	-0.789***	-0.639**
	(0.094)	(0.125)	(0.173)	(0.210)	(0.248)	(0.279)
ATE-AIPW Low	-1.358***	-2.274***	-2.670***	-2.704***	-3.149***	-3.406***
	(0.116)	(0.125)	(0.172)	(0.209)	(0.245)	(0.286)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.696	1.463	2.247	3.072	3.900	4.775
Avg.(trade) in countries below cutoff	-0.188	-0.449	-0.551	-0.230	0.054	0.521
Observations	627	627	627	627	627	627
# of Crises	18	18	18	18	18	18
Cutoff of channel variable, median	-5.567	-5.567	-5.567	-5.567	-5.567	-5.567

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.21b: Channels, Cumulative trade costs over five years after banking crises with higher and lower evolution of investors' credit ratings risks

Panel I: Exports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-0.580	-2.438***	-3.889***	-3.848***	-5.909***	-5.329***
	(0.400)	(0.492)	(0.576)	(0.788)	(0.962)	(1.190)
ATE-AIPW Low	0.005	-6.781***	-6.752***	-6.508***	-10.713***	-12.620***
	(0.440)	(0.514)	(0.601)	(0.800)	(0.910)	(1.144)
P-value High=Low	0.024	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	3.219	6.821	11.233	15.863	20.400	25.571
Avg.(trade) in countries below cutoff	1.433	2.971	4.873	7.251	9.741	12.156
Panel b: Agriculture						
ATE-AIPW High	0.151**	-0.087	-0.249*	-0.465***	-1.131***	-1.561***
	(0.071)	(0.102)	(0.134)	(0.169)	(0.193)	(0.225)
ATE-AIPW Low	-0.015	-0.636***	-0.675***	-0.669***	-0.458**	-0.860***
	(0.066)	(0.086)	(0.116)	(0.161)	(0.207)	(0.243)
P-value High=Low	0.004	0.000	0.000	0.090	0.000	0.000
Avg.(trade) in countries above cutoff	0.382	0.839	1.365	1.894	2.464	3.157
Avg.(trade) in countries below cutoff	0.231	0.427	0.771	1.173	1.526	1.996
Panel c: Mining						
ATE-AIPW High	-0.178	-0.649***	-1.406***	-2.057***	-3.038***	-2.116***
	(0.236)	(0.208)	(0.226)	(0.280)	(0.334)	(0.474)
ATE-AIPW Low	0.522**	-0.902***	-0.521**	-0.494	-1.986***	-2.033***
	(0.254)	(0.219)	(0.257)	(0.326)	(0.371)	(0.440)
P-value High=Low	0.000	0.005	0.000	0.000	0.000	0.790
Avg.(trade) in countries above cutoff	0.534	1.155	1.993	2.894	3.769	4.751
Avg.(trade) in countries below cutoff	0.013	0.195	0.530	1.016	1.622	2.072
Panel d: Manufacturing						
ATE-AIPW High	0.027	-0.047	-0.185	0.161	0.272	0.628
	(0.208)	(0.289)	(0.399)	(0.519)	(0.612)	(0.768)
ATE-AIPW Low	0.093	-2.984***	-2.935***	-2.376***	-4.201***	-5.268***
	(0.223)	(0.280)	(0.330)	(0.453)	(0.546)	(0.680)
P-value High=Low	0.632	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.313	2.853	4.696	6.635	8.546	10.685
Avg.(trade) in countries below cutoff	0.783	1.490	2.301	3.316	4.278	5.239
Panel e: Services						
ATE-AIPW High	-0.580***	-1.656***	-2.049***	-1.486***	-2.012***	-2.281***
	(0.108)	(0.179)	(0.258)	(0.350)	(0.414)	(0.547)
ATE-AIPW Low	-0.595***	-2.259***	-2.622***	-2.969***	-4.068***	-4.459***
	(0.104)	(0.149)	(0.200)	(0.277)	(0.337)	(0.423)
P-value High=Low	0.873	0.000	0.001	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.990	1.974	3.180	4.440	5.621	6.978
Avg.(trade) in countries below cutoff	0.406	0.860	1.271	1.746	2.315	2.850
Observations	628	628	628	628	628	628
# of Crises	17	17	17	17	17	17
Cutoff of channel variable, median	0.267	0.267	0.267	0.267	0.267	0.267

Panel II: Imports (% of pre-crisis GDP)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel B: Banking crises						
Panel a: Total						
ATE-AIPW High	-1.111**	-2.971***	-4.883***	-6.376***	-7.466***	-7.985***
	(0.542)	(0.736)	(0.943)	(1.213)	(1.520)	(1.773)
ATE-AIPW Low	-2.091***	-12.004***	-13.464***	-13.384***	-16.763***	-19.355***
	(0.569)	(0.735)	(0.922)	(1.213)	(1.470)	(1.711)
P-value High=Low	0.010	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	4.194	9.173	14.933	20.582	26.050	32.097
Avg.(trade) in countries below cutoff	1.069	1.807	2.689	4.869	7.713	10.531
Panel b: Agriculture						
ATE-AIPW High	-0.187**	-0.115	-0.277**	-0.542***	-0.847***	-1.079***
	(0.076)	(0.107)	(0.129)	(0.150)	(0.176)	(0.187)
ATE-AIPW Low	-0.241***	-0.826***	-1.044***	-1.321***	-1.654***	-1.953***
	(0.061)	(0.087)	(0.109)	(0.144)	(0.170)	(0.189)
P-value High=Low	0.411	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.353	0.778	1.303	1.841	2.351	2.921
Avg.(trade) in countries below cutoff	0.148	0.256	0.388	0.597	0.868	1.166
Panel c: Mining						
ATE-AIPW High	-0.436***	-0.758***	-1.340***	-1.786***	-2.245***	-2.551***
	(0.120)	(0.149)	(0.184)	(0.229)	(0.276)	(0.342)
ATE-AIPW Low	-0.181	-1.629***	-1.788***	-1.731***	-2.565***	-3.681***
	(0.118)	(0.153)	(0.184)	(0.238)	(0.284)	(0.341)
P-value High=Low	0.000	0.000	0.000	0.544	0.007	0.000
Avg.(trade) in countries above cutoff	0.596	1.371	2.370	3.392	4.368	5.500
Avg.(trade) in countries below cutoff	0.159	0.295	0.482	0.941	1.490	1.887
Panel d: Manufacturing						
ATE-AIPW High	-0.602*	-1.684***	-2.213***	-2.834***	-2.774***	-2.400**
	(0.317)	(0.444)	(0.559)	(0.723)	(0.932)	(1.098)
ATE-AIPW Low	-1.303***	-7.810***	-8.507***	-7.986***	-9.632***	-10.738***
	(0.346)	(0.450)	(0.557)	(0.721)	(0.875)	(1.026)
P-value High=Low	0.001	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	2.502	5.448	8.733	11.834	14.863	18.177
Avg.(trade) in countries below cutoff	0.501	0.759	1.217	2.425	4.086	5.807
Panel e: Services						
ATE-AIPW High	0.114	-0.414***	-1.052***	-1.215***	-1.600***	-1.955***
	(0.115)	(0.133)	(0.215)	(0.258)	(0.288)	(0.325)
ATE-AIPW Low	-0.366***	-1.740***	-2.125***	-2.346***	-2.912***	-2.982***
	(0.110)	(0.135)	(0.187)	(0.229)	(0.267)	(0.299)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.743	1.576	2.528	3.514	4.468	5.500
Avg.(trade) in countries below cutoff	0.260	0.498	0.602	0.907	1.270	1.672
Observations	628	628	628	628	628	628
# of Crises	17	17	17	17	17	17
Cutoff of channel variable, median	0.267	0.267	0.267	0.267	0.267	0.267

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

Table A.21c: Channels, Cumulative trade costs over five years after currency crises with higher and lower evolution of investors' credit ratings risks

Panel I: Exports (% of pre-crisis GDP)							**Panel II: Imports (% of pre-crisis GDP)**						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	h=0	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**		**h=0**	**h=1**	**h=2**	**h=3**	**h=4**	**h=5**
Panel C: Currency crises							**Panel C: Currency crises**						
Panel a: Total							**Panel a: Total**						
ATE-AIPW High	-0.686**	-2.269***	-3.408***	-3.764***	-5.295***	-6.311***	**ATE-AIPW High**	-3.086***	-4.540***	-6.405***	-8.495***	-8.893***	-6.775***
	(0.325)	(0.432)	(0.578)	(0.763)	(0.882)	(1.115)		(0.463)	(0.612)	(0.882)	(1.078)	(1.283)	(1.580)
ATE-AIPW Low	-3.485***	-3.967***	-4.424***	-6.777***	-10.375***	-13.722***	**ATE-AIPW Low**	-7.322***	-9.207***	-9.981***	-10.584***	-13.025***	-17.237***
	(0.405)	(0.454)	(0.663)	(0.819)	(0.952)	(1.175)		(0.571)	(0.684)	(0.885)	(1.151)	(1.388)	(1.753)
P-value High=Low	0.000	0.000	0.024	0.000	0.000	0.000	**P-value High=Low**	0.000	0.000	0.000	0.001	0.000	0.000
Avg.(trade) in countries above cutoff	2.992	6.470	10.572	14.938	19.333	24.126	**Avg.(trade) in countries above cutoff**	3.852	8.450	13.474	18.622	23.806	29.408
Avg.(trade) in countries below cutoff	0.938	1.257	2.425	4.075	5.444	7.228	**Avg.(trade) in countries below cutoff**	-0.059	-1.225	-1.161	0.337	2.221	4.302
Panel b: Agriculture							**Panel b: Agriculture**						
ATE-AIPW High	0.187**	-0.222**	-0.108	-0.394***	-0.163	-0.146	**ATE-AIPW High**	-0.286***	-0.437***	-0.631***	-0.873***	-0.686***	-0.344**
	(0.075)	(0.089)	(0.119)	(0.150)	(0.187)	(0.245)		(0.093)	(0.083)	(0.108)	(0.123)	(0.145)	(0.173)
ATE-AIPW Low	0.005	-0.093	0.566**	0.450*	-0.096	-0.421	**ATE-AIPW Low**	-0.517***	-0.584***	-0.851***	-1.001***	-1.103***	-1.581***
	(0.066)	(0.130)	(0.253)	(0.267)	(0.265)	(0.341)		(0.091)	(0.076)	(0.103)	(0.118)	(0.146)	(0.161)
P-value High=Low	0.009	0.291	0.006	0.000	0.756	0.359	**P-value High=Low**	0.000	0.004	0.000	0.032	0.000	0.000
Avg.(trade) in countries above cutoff	0.364	0.799	1.292	1.783	2.315	2.970	**Avg.(trade) in countries above cutoff**	0.345	0.734	1.205	1.700	2.183	2.727
Avg.(trade) in countries below cutoff	0.181	0.253	0.593	1.065	1.405	1.855	**Avg.(trade) in countries below cutoff**	0.006	0.006	0.050	0.175	0.359	0.541
Panel c: Mining							**Panel c: Mining**						
ATE-AIPW High	-0.004	-0.794***	-0.971***	-1.087***	-1.980***	-2.426***	**ATE-AIPW High**	-0.826***	-1.169***	-2.179***	-2.677***	-3.228***	-3.155***
	(0.233)	(0.185)	(0.242)	(0.309)	(0.360)	(0.444)		(0.104)	(0.145)	(0.202)	(0.234)	(0.277)	(0.331)
ATE-AIPW Low	-0.497**	-0.655***	-1.218***	-1.888***	-3.295***	-3.343***	**ATE-AIPW Low**	-1.143***	-1.211***	-1.270***	-1.816***	-2.713***	-3.251***
	(0.222)	(0.161)	(0.266)	(0.303)	(0.353)	(0.406)		(0.124)	(0.152)	(0.186)	(0.248)	(0.287)	(0.424)
P-value High=Low	0.000	0.206	0.196	0.000	0.000	0.000	**P-value High=Low**	0.004	0.687	0.000	0.000	0.010	0.794
Avg.(trade) in countries above cutoff	0.461	1.050	1.847	2.766	3.732	4.686	**Avg.(trade) in countries above cutoff**	0.546	1.275	2.128	3.074	4.044	5.094
Avg.(trade) in countries below cutoff	-0.099	-0.153	-0.065	-0.019	-0.073	0.047	**Avg.(trade) in countries below cutoff**	0.013	-0.190	-0.033	0.293	0.499	0.635
Panel d: Manufacturing							**Panel d: Manufacturing**						
ATE-AIPW High	-0.554***	-1.074***	-2.147***	-2.499***	-3.146***	-3.571***	**ATE-AIPW High**	-1.538***	-2.314***	-2.946***	-4.364***	-4.606***	-3.002***
	(0.133)	(0.242)	(0.322)	(0.426)	(0.519)	(0.622)		(0.282)	(0.368)	(0.511)	(0.639)	(0.764)	(0.932)
ATE-AIPW Low	-1.673***	-1.916***	-2.219***	-3.191***	-4.404***	-5.756***	**ATE-AIPW Low**	-4.558***	-5.753***	-6.005***	-5.682***	-6.911***	-9.234***
	(0.221)	(0.245)	(0.313)	(0.428)	(0.542)	(0.671)		(0.344)	(0.418)	(0.529)	(0.691)	(0.846)	(1.043)
P-value High=Low	0.000	0.000	0.701	0.009	0.000	0.000	**P-value High=Low**	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	1.249	2.744	4.460	6.287	8.086	10.057	**Avg.(trade) in countries above cutoff**	2.254	4.930	7.800	10.639	13.497	16.585
Avg.(trade) in countries below cutoff	0.620	0.815	1.319	2.052	2.706	3.430	**Avg.(trade) in countries below cutoff**	-0.086	-0.905	-0.976	-0.190	1.077	2.466
Panel e: Services							**Panel e: Services**						
ATE-AIPW High	-0.315***	-0.179	-0.182	0.215	-0.006	-0.169	**ATE-AIPW High**	-0.436***	-0.620***	-0.648***	-0.580**	-0.373	-0.275
	(0.083)	(0.145)	(0.208)	(0.296)	(0.342)	(0.416)		(0.077)	(0.126)	(0.194)	(0.231)	(0.272)	(0.316)
ATE-AIPW Low	-1.320***	-1.303***	-1.553***	-2.148***	-2.581***	-4.202***	**ATE-AIPW Low**	-1.104***	-1.659***	-1.854***	-2.084***	-2.299***	-3.171***
	(0.084)	(0.138)	(0.191)	(0.249)	(0.295)	(0.362)		(0.091)	(0.133)	(0.189)	(0.222)	(0.246)	(0.280)
P-value High=Low	0.000	0.000	0.000	0.000	0.000	0.000	**P-value High=Low**	0.000	0.000	0.000	0.000	0.000	0.000
Avg.(trade) in countries above cutoff	0.918	1.877	2.972	4.102	5.199	6.412	**Avg.(trade) in countries above cutoff**	0.707	1.511	2.341	3.209	4.082	5.002
Avg.(trade) in countries below cutoff	0.236	0.342	0.578	0.976	1.406	1.896	**Avg.(trade) in countries below cutoff**	0.008	-0.137	-0.202	0.060	0.287	0.660
Observations	627	627	627	627	627	627	**Observations**	627	627	627	627	627	627
# of Crises	18	18	18	18	18	18	**# of Crises**	18	18	18	18	18	18
Cutoff of channel variable, median	-3.509	-3.509	-3.509	-3.509	-3.509	-3.509	**Cutoff of channel variable, median**	-3.509	-3.509	-3.509	-3.509	-3.509	-3.509

Notes: Robust standard errors clustered at the country-level in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. AIPW estimates. The dependent variables are 100 times the cumulative change of agricultural, mining, manufacturing, services, and total exports and imports relative to the year prior to the onset of the crisis for years 1-5 after the onset of the crisis, scaled pre-crisis GDP. Accumulated costs over five years. Observations in the treated and control groups are weighted by the propensity scores predicted in the treatment model. Maximum weights truncated at 20.

CHAPTER 3

FISCAL SPACE AND STABILIZATION POLICY IN DEVELOPING AND EMERGING COUNTRIES

This chapter is joint work with Jean-Louis COMBES (CERDI-UCA), Xavier DEBRUN (National Bank of Belgium) and Alexandru MINEA (CERDI-UCA).[1]

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Abstract

Our paper seeks to unveil how fiscal policy space shapes the dynamics of output losses in the aftermath of financial crises and normal recessions. We use a sample of 35 developing and 56 emerging countries over the period 1985-2017. We build a new index of fiscal space and apply a combination of local projections models and impact assessment to identify a causal effect. We find that the availability of pre-shock fiscal space generates a mixed fiscal environment with different output losses of shocks. In countries with enough fiscal space, the output is quite resilient due to expansionary fiscal policy and supportive private consumption and investments, and net capital inflows. In countries with limited fiscal space, the story is different and painful; governments immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations, which deepens the recessionary forces. Also, private consumption and investments, as well as net capital inflows, are depressed, and recovery, if any, is a distant and uncertain prospect. Governments and policymakers need to fix the roof while the sun is shining, improve substantially their fiscal position to be able to appropriately respond to the next crisis looming on the horizon.

Keywords: Fiscal policy space; Financial crises; Normal recessions; Local Projections; IPWRA
JEL Codes: E62; F44; G01; H63

3.1 Introduction

"The best time to repair the roof is when the sun is shining"
—John F. Kennedy, Former President of the United States, 1961-1963

In the aftermath of the global financial crisis (GFC) of 2008-09, many governments around the world enacted large fiscal stimulus plans to boost their sagging economies. These plans were based on the Keynesian theory that sustains that deficit spending by governments can stimulate their economy by supporting the aggregate demand. This is of particular interest since the evidence of larger fiscal multipliers in recessions than in expansions. However, at the same time, many other countries were forced to implement large fiscal consolidations to dissipate fiscal sustainability issues, and this at the worst possible time, which exacerbated the recessionary forces of the crisis. One noticeable difference between countries that were implementing loose and contractionary fiscal policy lies in the availability of fiscal space they had in the run-up of the crisis. To be effective and credibly conducted, fiscal stabilization should rely on enough

fiscal space that is on the "room in a government's budget that allows it to provide resources for the desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy" as defined by Heller (2005).

This paper builds a new measure of fiscal space and studies its effect on output dynamics in the aftermath of financial crises and normal recessions (hereafter denominated as shocks) in the context of developing and emerging countries over the period 1985-2017. It contributes to various strands of literature. First, it is related to the literature that assesses the output costs of financial crises, in which there is a consensus on the contractionary role of financial crises. This strand of literature that uses conventional panel regressions, local projections and/or impact assessment methodology includes, e.g., Kaminsky and Reinhart (1999); Bordo et al. (2003); Tomz and Wright (2007); Cerra and Saxena (2008); Reinhart and Rogoff (2009); Fatás and Mihov (2013); Borensztein and Panizza (2014); Jordà et al. (2013, 2016); Jordà and Taylor (2016); Asonuma et al. (2016); Trebesch and Zabel (2017); Laeven and Valencia (2018); Romer and Romer (2018); Kuvshinov and Zimmermann (2019), and Asonuma et al. (2019). With the notable exception of Jordà et al. (2013); Romer and Romer (2018), and Asonuma et al. (2019) who respectively show that more credit-intensive expansions, higher public debt and lower bound central bank interest rate, and severe sudden stops amplify the output costs of crises and prevent recovery to happen, the rest of the papers show little evidence of the channels through which financial crises or recessions exert a negative effect on the economic development of countries.

Second, this paper is closely linked to Romer and Romer (2018) who analyze the effects of fiscal and monetary space on output dynamics in the aftermath of financial distress. They show that the output losses are less than 1% when a country has both types of policy space, but almost 10% when it has neither. One of the channels is that governments can use monetary and fiscal policy more aggressively when policy space is available. However, they focus exclusively on advanced countries for which in the post-WWII, crises and recessions have been less recurrent and severe compared to developing and emerging countries. Although this question became of great interest for advanced countries in the aftermath of the GFC that reignites the role of fiscal and monetary policy responses, it is also quite appealing for both developing and emerging countries as they have had a long history of pro-cyclical fiscal policy (e.g., Alesina et al. 2008; Ilzetzki and Vegh 2008), even if, over the last two decades, a growing share of fiscal policies in these countries had graduated and become countercyclical (e.g., Frankel 2011; Frankel et al. 2013; Aizenman et al. 2019). We go beyond these limitations by analyzing how fiscal space reduces the losses of financial crises and normal recessions in the context of developing and emerging countries. Besides, their analysis suffers from endogeneity issues for two reasons. On the one hand, financial distress is endogenous to the country's key characteristics making countries during normal times potentially different from those with financial distress. In this

case, by comparing countries in normal times with those in financial distress, their output losses could be biased and overestimated. On the other hand, the country's pre-shock policy space is correlated with the country's key structural characteristics and may be affected by a shock that reduces the policy space and generates a protracted recession. In such a situation, the benefits of fiscal space may be underestimated. In this paper, we deal with these endogeneity issues by estimating the average treatment effects on the treated (ATT) of shocks and fiscal space on output dynamics after re-randomization (i.e. eliminating the differences in the characteristics between countries with and without shocks).

Third, our study falls into the literature that examines the different measures of fiscal space. A frequent concern with fiscal space is the lack of clarity about it and how to measure it. Different measures have been proposed in the literature where many authors relied on a single indicator including debt in percentage of GDP or tax revenues (Aizenman and Jinjarak 2010; Aizenman et al. 2013; De Grauwe and Ji 2013; Aizenman et al. 2019) while others recommend to the use of a dashboard of indicators (Botev et al. 2016; Kose et al. 2017; Cheng and Pitterle 2018). We share the latter argument as fiscal space is a multidimensional concept that is difficult to measure using a single indicator. In this paper, we use four indicators including debt to average tax revenues ratio, fiscal balance to average tax revenues ratio, short-term external debt in percentage of the total, and debt services in the percentage of international reserves. We aggregate them into an index of fiscal space using the signals approach *à la* Kaminsky et al. (1998). Then, our index overcomes the shortcomings of the measures used in previous studies by incorporating as much information given the availability of data to measure the multidimensional concept of fiscal space.

Fourth, our paper is also related to the literature on fiscal multipliers and the cyclicality of fiscal policy. For example, Bohn (2002) and Mendoza and Ostry (2008) show that fiscal policy tends to be on average more expansionary when government debt is low. Giavazzi and Pagano (1990); Blanchard (1993); Perotti (1999); Minea and Villieu (2010); Corsetti et al. (2012), and Ilzetzki et al. (2013) show that expansionary fiscal policy is more effective and has Keynesian effects at low levels of debt or deficit, and non-Keynesian effects in the opposite circumstances. Auerbach and Gorodnichenko (2012, 2013), and Corsetti et al. (2012) reveal that fiscal multipliers are larger during recessions and financial crises. Altogether, these papers show that fiscal policy may be more effective in alleviating the size of recessions when countries have enough fiscal space that allows them to enact stimulus packages without deterioration their fiscal position and the market sentiment.[2]

[2]In the aftermath of the recent global financial crisis of 2008-09, there is a growing work on the fiscal multipliers when monetary space winds up at the zero lower bound on policy rates. In such circumstances, Christiano et al. (2011) find that fiscal multipliers on output exceed two or even three; see also, Woodford (2011); Erceg and Lindé (2014).

Taking stock of the existing literature, we contribute to it in many ways. First, we build a new index of fiscal space that we use to analyze the output losses of financial crises and normal recessions and show how fiscal space in the run-up of shocks helps to alleviate their costs. Second, this paper is in the context of emerging and developing countries in which financial crises and normal recessions have been more recurrent, and where fiscal stabilization has had a long history of procyclicality. The literature has overlooked the role of fiscal space in these countries. Third, we differentiate between the costs of financial crises (banking and currency) and normal recessions that are not associated with a crisis. Fourth, we provide a treatment of endogeneity to identify a causal effect running from fiscal space and shocks to the output dynamics in the aftermath of financial crises and normal recessions. Fifth, we seek to provide the potential channels through which the effects of fiscal space operate. We then study how the availability of pre-shock fiscal space affects the dynamics of primary fiscal balance, fiscal space itself, private consumption and investment, and net capital inflows in the aftermath of financial crises and normal recessions.

Our benchmark results show that financial crises and normal recessions induce persistent and large output losses. Indeed, for financial crises, output falls by 1.5 percentage points (pp.) in year 1, 5.1 pp. in year 2 and around 4 pp. in subsequent years. For normal recessions, the output contraction is much larger in year 1 and stands at 5.6 pp., before lowering to around 2.5 pp. in subsequent years. To put these findings into perspective, knowing that the median Real GDP growth in our sample is 4.8% per year so that the median economy would have grown by 24% over five years; a single episode of a financial crisis and normal recession would cost about 16 and 10% of that economy's long-term growth, respectively. Besides, the results show that, also in the context of developing and emerging countries, fiscal space still matters and significantly reduces the output losses of financial crises and normal recessions. We find that an increase of pre-shock fiscal space by one standard deviation is associated with a maximum reduction of the output losses of 4.6 and 3.9 percentage points in the aftermath of financial crises and normal recessions, respectively, which is enough to completely offset their output losses. These findings show that there is a significant gain to fix the roof when the sun is shining, i.e. to build-up fiscal buffers, reduce debt and deficit, increase tax base and revenues, and lock the drinks cabinet when the economy is booming for weathering the storm in recessions; otherwise, there may be no way out but to adjust at the worst possible time. These results remain unchanged after several robustness checks. About the channels, our results reveal that in countries with higher fiscal space, governments enact stimulus packages by using fiscal space and loosening fiscal policy to alleviate the output losses of financial crises and normal recessions. Although fiscal space is used and depressed, it remains strong and above that of countries with limited fiscal space that implement fiscal consolidations to address their fiscal issues. Besides, we find that higher

fiscal space is associated with an increase of private consumption and investment, supporting the Keynesian view, and an increase of net capital flows necessary to finance the recovery. The opposite results are found in countries with limited fiscal space where both private consumption and investment and net capital inflows are strongly depressed. Our results add clarity to that time where following the GFC of 2008-09, many governments are drowning into large amounts of debt, persisted fiscal deficit, and depleted fiscal buffers whereas another crisis may be looming on the horizon. The previous experiences have taught us valuable lessons; some of them are old forgotten ones. This paper revives the benefits of fiscal space and the role of fiscal policy stabilization in the aftermath of financial crises and normal recessions and calls for efforts to consolidate public finances in booms to be well prepared for the next recessions.

The rest of this paper proceeds as follows. Section 3.2 presents data and definitions. Section 3.3 describes how we build our fiscal space index and some stylized facts on it. Section 3.4 details the methodology used to analyze the output losses of financial crises and normal recessions as well as the benefits of fiscal space. Section 3.5 reports our key findings. Section 3.6 discusses the channels through which fiscal space may operate. Section 3.7 shows the robustness of our benchmark findings. Section 3.8 concludes the paper.

3.2 Data, and definitions

Our data set covers 91 countries (whose 35 developing and 56 emerging countries according to the IMF WEO classification) over the period 1985-2017 at annual frequency.[3] Regarding the macroeconomic shocks, we differentiate between financial crises and normal recessions. Financial crises encompass banking crises obtained from Laeven and Valencia (2018) and currency crises that are built using the definition of Frankel and Rose (1996). Banking crises are defined as events where there are signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations) and/or banking policy intervention measures in response to significant losses in the banking system. Currency crises are defined as at least a 25% depreciation of the nominal effective exchange rate that is also at least a 10% increase in the rate of depreciation. Normal recessions are recessions that coincide with neither financial crises nor major conflicts in a window of five years centered around the shock. We derive them by applying the Bry and Boschan (1971) algorithm on real GDP. Section B.1.1 describes the list of countries, and section B.1.2 shows the list of financial crises and normal recessions used in our analysis.

[3] In fact, due to our local projections methodology, we can only study the costs of financial crises and normal times that occurred between 1985 and 2012 on the output dynamics until 2017.

As shown in table 3.1, given the data availability, our analysis includes 55 financial crises and 58 normal recessions lasting, on average, 2.7 and 1.2 years. Also, 43% of normal recessions occurred in 2008-09, which stands at only 11% for financial crises. This means that despite being not affected by banking and currency crises as we saw in many advanced countries, developing and emerging countries suffered a recession linked to the global economic development in 2008-09. Then, the normal recessions shocks are likely to capture the dynamics of output in developing and emerging countries in the aftermath of the GFC.

Table 3.1: Statistics on financial crises and normal recessions

	Financial crises	**Normal recessions**
Full sample		
# of episodes	55	58
Average duration of episodes (in years)	2.7	1.2
# of episodes between 2008 and 2009	6	25
# of countries	43	40
Low-income countries		
# of episodes	22	23
Average duration of episodes (in years)	2.4	1.2
# of countries	15	15
Emerging countries		
# of episodes	33	35
Average duration of episodes (in years)	2.8	1.2
# of countries	28	25

Notes: This tables presents the set of financial crises and normal recessions used in our regressions given the data availability that constrained our sample of shocks.

We also use data for fiscal crises from Medas et al. (2018) to compute our fiscal space index as described in the following section. Finally, in line with the existing literature on the output costs of financial crises and recessions, we use a set of control variables including macroeconomic and political variables as determinants of shocks and/or the dynamics of output. Recall that we go beyond the literature and use a larger set of variables in this analysis to limit the omitted variable bias. The data and their sources are reported in Table B.1 in section B.1.3, and table B.2 in section B.1.4 presents the summary statistics.

3.3 Measuring Fiscal space

This section describes how we build the fiscal space index. We draw upon the signals approach proposed by Kaminsky et al. (1998). This methodology selects a set of indicators as early warning indicators and determines the threshold values for each variable beyond which signals are issued indicating that a crisis is likely to happen shortly. Contrary to previous studies on fiscal space including, e.g., Aizenman and Jinjarak (2010); Aizenman et al. (2013); Romer and Romer (2018), and Aizenman et al. (2019) that use as indicator of fiscal space either the level

of debt or the ratio of debt to average tax revenues, we use four indicators that we combine in a way that accounts for their predictive power of fiscal crises. Then, our index overcomes the shortcomings of the measures used in previous studies by incorporating as much information given the availability of data to measure the multidimensional concept of fiscal space.

3.3.1 Fiscal crises and early warning indicators

Data on fiscal crises are taken from Medas et al. (2018). Their definition of fiscal crises encompasses public debt default and near-default events, as well as severe deteriorations in the fiscal solvency risk outlook leading to fiscal sustainability risks. They identify 439 episodes of fiscal crises in 188 countries over the period 1970-2015 by employing four distinctive criteria: (i) credit events associated with sovereign debt (e.g., outright defaults and restructuring); (ii) recourse to large-scale IMF financial support; (iii) implicit domestic public default (e.g., via high inflation rates); and (iv) loss of market confidence in the sovereign. These criteria are complementary, as individual indicators may not capture all fiscal crises.

Conditional on data availability in developing and emerging countries, we select four fiscal indicators as early warning indicators of fiscal crises: (i) (minus) debt to average tax revenues ratio, (ii) fiscal balance to average tax revenues ratio, (iii) (minus) short-term external debt in percentage of the total, (iv) (minus) debt services in percentage of international reserves.[4] we multiply some of the indicators by minus (-) so that lower values of each indicator are associated with higher risks of fiscal crises.

3.3.2 Signals approach

To identify critical values or thresholds of early warning indicators of fiscal space, we follow Balducci et al. (2011); Berti et al. (2012), and Cerovic et al. (2018), and first construct a composite early warning indicator of fiscal crises. The index of fiscal space will be equal to one minus the composite early warning indicator of fiscal crises. More specifically, for each indicator and country, we draw the country-specific percentile distribution of each indicator and identify thresholds in the lower tail of the distribution by minimizing the total misspecification errors (sum of type I and II errors) and ensuring a balance of the two types of statistical errors.[5] The use of percentiles to define thresholds, instead of absolute values, takes into consideration

[4]The average tax revenues over the last five years is computed to smooth for business cycle fluctuations, and it is used as a proxy of the tax base.

[5]A lower threshold (the model sends fewer signals) is associated with an increase of type II errors or missed crises, but at the same time, a decrease of type I errors or false alarms. A higher threshold (the model sends more signals) is associated with a decrease of type II errors or missed crises, but at the same time, an increase of type I errors or false alarms. The thresholds are determined endogenously between the 10^{th} and 40^{th} percentiles.

structural differences across countries and identifies fiscal distress in a country-specific fashion, based on the country's history.

Table 3.2: Illustration of the signals approach method

	No fiscal crises (t+1 to t+h)	Fiscal crises (t+1 to t+h)
No signal (t)	**A (true negative)**	**B (missed or type II error)**
Signal (t)	**C (false alarms or type I error)**	**D (true positive)**

The results of the signaling analysis can be summarized in a matrix as in table 3.2 in which fiscal crisis occurrence and the signal issuance of each indicator are measured against each other. We choose the period between the signal and fiscal crises to be equal to one, two or three years ($max(h) = 3$) and retain the one that gives the highest predictive power. The type I error or share of false alarms among non-fiscal crises is defined as $C/(A + C)$, and the type II error or share of missed crises among fiscal crises is defined as $B/(B + D)$. Then, the total misspecification error is the sum of type I and II errors, i.e. $TME = C/(A + C) + B/(B + D)$, and the predictive power is one minus the total misspecification error, i.e. $PW = 1 - TME$. We can also define two other performance indicators: the effectiveness defined as the share of true positive among all signals, i.e effectiveness= $D/(C + D)$, and the incidence defined as the share of true positive among all fiscal crises, i.e incidence=$D/(B + D)$.

3.3.3 Fiscal space index

For each of our four early warning indicators I^i, we define two signal variables: (i) $within = d_t^{i,c}$ (see, eq. (3.1a)) and (ii) $between = d_t^{i,g}$ (see, eq. (3.1b)) based on a country-specific threshold $thr^{i,c}$ and an income group-specific threshold $thr^{i,g}$, respectively. For example, if the threshold based on the signal approach is equal to the 20^{th} percentile, $thr^{i,c}$ will be the corresponding value specific to each country while $thr^{i,g}$ will be the corresponding value specific to each income group (developing countries and emerging countries). By doing so, we identify fiscal distress by comparing a country with itself at other periods and with its income group counterparts at all periods. For example, fiscal distress is aggravating with an increase of the fiscal deficit of a country relative to its historical values that also tends to be higher than the fiscal deficit of its income group counterparts at all periods.

$$within = d_t^{i,c} = \begin{cases} 1 \; if \; I^i \leq thr^{i,c} \\ 0 \; if \; otherwise \end{cases} \tag{3.1a}$$

$$between = d_t^{i,g} = \begin{cases} 1 \; if \; I^i \leq thr^{i,g} \\ 0 \; if \; otherwise \end{cases} \tag{3.1b}$$

We then construct three indexes of fiscal space. The first two indexes FS_t^w and FS_t^b are defined as one minus the composite early warning indicator of fiscal crises, based on the country-specific (see, eq. (3.2a)) and the income group-specific thresholds (see, eq. (3.2b)), respectively. The third index FS_t is our preferred index of fiscal space as it allows for both within and between comparisons in the calculation of fiscal space by computing the average of the indexes FS_t^w and FS_t^b (see, eq. (3.2c)). For each signal variable $d_t^{i,c}$ or $d_t^{i,g}$, the corresponding weight w_i is given by the predictive power ($PW = 1 - TME$) for the relevant early warning indicator.

$$FS_t^w = 1 - \sum_{i=1}^{4} w_i \times d_t^{i,c} \tag{3.2a}$$

$$FS_t^b = 1 - \sum_{i=1}^{4} w_i \times d_t^{i,g} \tag{3.2b}$$

$$FS_t = \frac{1}{2}\left(FS_t^w + FS_t^b\right) \tag{3.2c}$$

3.3.4 Results of the signals approach

We apply the signals approach on three different samples including (i) a full sample, (ii) a sample of developing countries, and (iii) emerging countries using a period of one, two and three years between the signals of early warning indicators and fiscal crises. Table 3.3 reports the results for a period of three years as this horizon provides the highest predictive power of the early warning indicators. First, our strategy leads to lower type I errors and higher type II errors. Second, we also find that signals tend to be followed by few fiscal crises (the effectiveness is between 8% and 20%) while fiscal crises are generally preceded by a signal (the incidence is between 36% and 74%). Third, we show that the variables fiscal balance to average tax revenues and debt services in the percentage of international reserves are good predictors of fiscal crises in both developing and emerging countries whereas debt to average tax revenues and short-term external debt in percentage of the total are exclusively good predictors of fiscal crises in developing countries and emerging countries, respectively. Fourth, the thresholds of the early warning indicators differ between developing and emerging countries.

We define the fiscal space index as described in section 3.3.3 based on the results and thresholds obtained for developing and emerging countries in table 3.3. Relying on different thresholds for each level of development allows us to maximize the predictive power of the early warning indicator and account for the structural differences between countries at different stages of development.

Table 3.3: Thresholds and relative weights of fiscal indicators

Variables	Thres-holds	Effect-iveness	Inci-dence	Type I error	Type II error	TME	Weights	# of fiscal crises	# of non crises	# of signals
Full sample										
(minus) debt to average tax revenues ratio	25	0.108	0.423	0.285	0.577	0.862	0.176	208	2554	816
fiscal balance to average tax revenues ratio	15	0.154	0.435	0.187	0.565	0.752	0.316	161	2055	454
(minus) short-term external debt in percentage of total	30	0.108	0.457	0.301	0.543	0.845	0.198	208	2614	883
(minus) debt service in percentage of international reserves	25	0.137	0.559	0.316	0.441	0.756	0.311	177	1984	725
Developing countries										
(minus) debt to average tax revenues ratio	16	0.193	0.400	0.174	0.600	0.774	0.265	105	1009	218
fiscal balance to average tax revenues ratio	15	0.207	0.440	0.178	0.560	0.737	0.308	84	798	179
(minus) short-term external debt in percentage of total	30	0.112	0.366	0.271	0.634	0.905	0.112	112	1204	367
(minus) debt service in percentage of international reserves	25	0.196	0.570	0.301	0.430	0.731	0.315	93	724	271
Emerging countries										
(minus) debt to average tax revenues ratio	22	0.078	0.356	0.270	0.644	0.914	0.103	101	1585	464
fiscal balance to average tax revenues ratio	10	0.151	0.364	0.120	0.636	0.757	0.291	77	1313	186
(minus) short-term external debt in percentage of total	33	0.104	0.604	0.357	0.396	0.753	0.296	96	1397	557
(minus) debt service in percentage of international reserves	37	0.095	0.738	0.480	0.262	0.742	0.309	84	1228	651

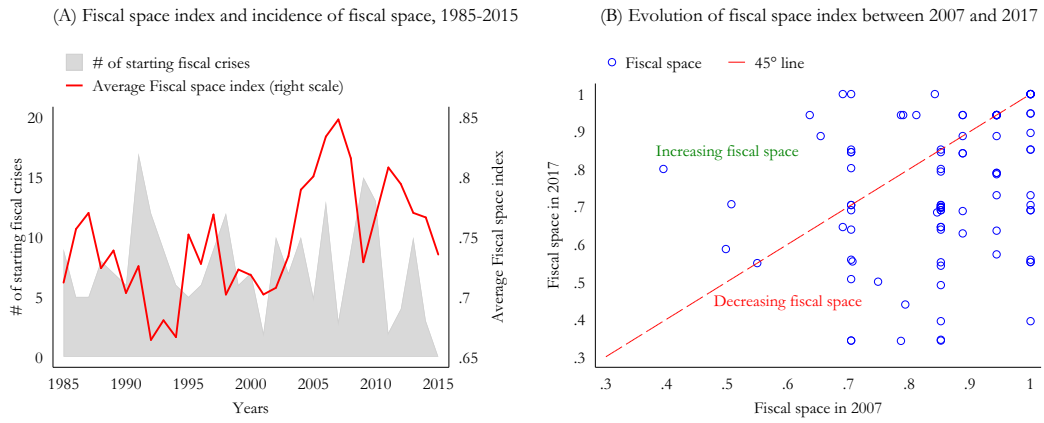
Notes: This table presents the results of the signals approach when the time span between signals and the onset of fiscal crises is set to be three years. This time span gives the higher predictive power of our early warning indicators. The results when using a time span of one and two years can be obtained upon request. The fiscal space index uses the results and thresholds obtained when applying the signals approach to the different samples of developing and emerging countries.

3.3.5 Stylized facts on fiscal space index

In fig. 3.1, we plot the historical trend of average fiscal space index and incidence of fiscal crises (left figure), and the recent development of the fiscal space index, notably around the GFC of 2008-09 (right figure). First, fiscal space has increased in developing and emerging countries between the periods 1985-2000 and 2000-2007, and then decreased in the aftermath of the GFC of 2008-09. Indeed, following the GFC, many developing and emerging countries have enacted stimulus packages to smooth their economy over the business cycle or have increased their external and domestic public debt, and fiscal deficit, especially thanks to lower interest rates and accommodative monetary policy. Second, fiscal crises peaked around 1990-91 when many transitions countries moved from command to market economies; around 1998 characterized by the Asian financial crises and Russian crisis; around 2002 marked by the Argentina crisis; around 2006 when many sub-Saharan countries recourse to large IMF financing; and finally, around the GFC. Third, fiscal space index tends to remarkably decrease in the run-up of large episodes of fiscal crises signaling a deterioration in the fiscal position of governments, that intensifies after the crises strike.

Figure 3.2 is an illustration of the role of fiscal space in the output dynamics in the aftermath of financial crises and normal recessions. It shows the deviation of real GDP growth five years after the shocks from the pre-shock level against the fiscal space index in the pre-shock year. The positive slopes of the two fitted lines indicate that the larger the fiscal space one year before the shock the higher is output growth and recovery in the aftermath of both financial crises and normal recessions. This confirms our intuition about the role of fiscal space that needs to be

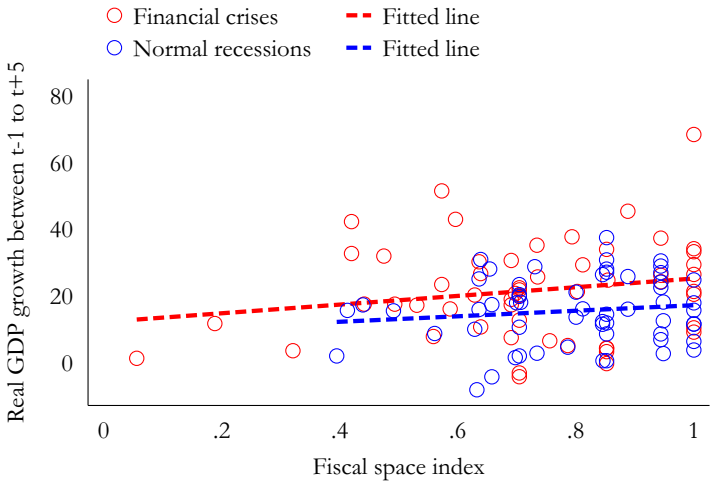
Figure 3.1: Historical and recent trend of fiscal space index and fiscal crises



Notes: Figure 3.1 (A) shows the historical trend of fiscal space and fiscal crises, and fig. 3.1 (B) presents the recent developments in the fiscal space index one year before and ten years after the GFC of 2008-09.

further analyzed.

Figure 3.2: Fiscal space index and the costs of financial crises and normal recessions



Notes: This figure shows that higher fiscal space one year before financial crises and normal recessions is associated with higher output growth and recovery in the aftermath of these shocks. Year t indicates the start of financial crises or normal recessions. The sample used for this figure is similar to the one used in the regressions below.

3.4 Empirical methodology

The question that we ultimately want to answer is if and how the availability of fiscal space in the run-up of financial crises and normal recessions influences their output costs. To answer it, first, we rely on local projections methods by Jordà (2005) to draw a dynamic of the effects of financial crises, normal recessions, and fiscal space over a horizon of five years after the shocks. Second, we combine both local projections and the inverse propensity weighted with regression adjustment (IPWRA) estimation and obtain dynamic ATT estimates which establish a causal effect running from shocks and fiscal space to output growth. One technical innovation of this paper is that it accounts for the possibility that shocks and fiscal space are endogenous to output dynamics. We will first show the advantages of this methodology over OLS estimates, and then move to analyze whether higher fiscal space is associated with lower output losses and rapid output recovery in the aftermath of shocks.

3.4.1 Local projections

To quantify the overall cumulative effect (both direct and indirect) of shocks and country's prior fiscal space on output dynamics, while controlling for the dynamic feedback from other variables, we employ the Jordà local projections (LPs) method described for the unconditional path as follows

$$\Delta y_{i,t+h} = \alpha_i^h + \Lambda^{f,h} D_{i,t}^f + \Lambda^{n,h} D_{i,t}^n + \theta_{L1}^h \Delta y_{i,t-1} + \theta_{L2}^h \Delta y_{i,t-2} + \sum_o \Lambda^{o,h} OS_{i,around}^o + X_{i,t-1}^x \beta^h + \upsilon_{i,t+h} \tag{3.3}$$

where $h \in [\![0;5]\!]$ denotes the time-horizon. $\Delta y_{i,t+h} = (y_{i,t+h} - y_{i,t-1})/y_{i,t-1} \times 100$ is the cumulative change between $t-1$ and $t+h$ in 100 times the real GDP of country i. $D_{i,t}^f$ and $D_{i,t}^n$ are dummies equal to 1 if country i has a financial crisis (banking or currency crisis) or normal recession at time t (the onset), respectively. Then, the effects of financial crises and normal recessions at each horizon relative to normal times are captured by $\Lambda^{f,h}$ and $\Lambda^{n,h}$, respectively.[6] $\Delta y_{i,t-1}$ and $\Delta y_{i,t-2}$ are the real GDP growth rate at one and two years prior to the onset of the shock, respectively. $OS_{i,around}^o$ captures other shocks including conflicts and the number of financial crises and normal recessions over the past three years. $X_{i,t-1}^x$ is a set of lagged control (macroeconomic and political) variables. We control for (i) the log of the real GDP to capture both the resilience to shocks and the convergence theory, (ii) terms of trade that affects both the likelihood of financial crisis and normal recession as well as fiscal space, (iii) fiscal rules

[6] Normal times are obtained as years without any unfolding financial crisis (banking, currency, and fiscal crisis) and normal recession.

used as a signal of a sound fiscal policy and a reduced discretion of governments, (iv) political rights as a proxy for the quality of institutions, (v) presence of an IMF program as a signal of a balance of payment crisis and a support from the IMF, and (vi) world growth to account for global shocks. These control variables are used at time $t-1$, the year before the onset of the shock. Finally, α_i^h stands for country fixed effects used to control for unobserved heterogeneity, and $\upsilon_{i,t+h}$ is the error term.

After describing the output costs of shocks, our interest is to show to what extent fiscal space prior to shocks affects the trajectory of output growth in the aftermath of these shocks. Here is where the role of fiscal space comes into our model. It is captured by introducing in eq. (3.3) an interaction term between our dummy of shock and our fiscal space index as follows

$$\Delta y_{i,t+h} = \alpha_i^h + \Lambda^{s,h} D_{i,t}^s + \delta^{s,h} D_{i,t}^s \times FS_{t-1} + \sigma^{s,h} FS_{t-1} + ... + \upsilon_{i,t+h} \quad \text{where } s = \{f, n\} \tag{3.4}$$

Here the coefficients of interest are $\Lambda^{s,h}$ and $\delta^{s,h}$. They capture the effects of shock of type s on output modulated by fiscal space. In the case where fiscal space helps to alleviate the output losses following shocks, $\delta^{p,h}$ will be positive. We also include the level of fiscal space to account for any systematic difference between countries with and without space in normal times. We estimate both eqs. (3.3) and (3.4) separately for horizons 0 to 5 (that is, up to five years after time t) and derive the unconditional and conditional on country's prior fiscal space impulse response function of output in the aftermath of shocks.

3.4.2 Treating endogeneity, combining local projections and IPWRA

3.4.2.1 The endogeneity of financial crises, normal recessions, and fiscal space

This paper takes new steps to address the endogeneity issue that arises when analyzing the effects of shocks and fiscal space on output dynamics, contrary to Romer and Romer (2018). We identify two mains sources of endogeneity.

First, as shown in table 3.4, countries hit by shocks (treated group) differ from countries in normal times (control group) in many aspects. Indeed, countries hit by shocks have less distress in the years leading to the shocks (as we consider repeated shocks in a window of three years as a unique shock). They also experience a decline in output growth one and two years before financial crises and an increase in output growth two years before normal recessions. Also, in the run-up of the shocks, the economy is overheating as output is above its potential, REER is over-valuated, and the current account deficit increases. We also find that financial crises are more likely in less developed countries and less likely in countries with fiscal rules. Finally, shocks happen in countries with weak institutions, and when global growth is halting and weak.

The choice of the control variables draws upon Asonuma et al. (2016); Forni et al. (2016); Jordà and Taylor (2016); Kuvshinov and Zimmermann (2019), and Asonuma et al. (2019). As a result, OLS estimates of the costs of shocks that do not account for differences in characteristics between the treated (bad characteristics) and control (good characteristics) group are biased and overestimated.

Table 3.4: Difference in characteristics between treated and control groups

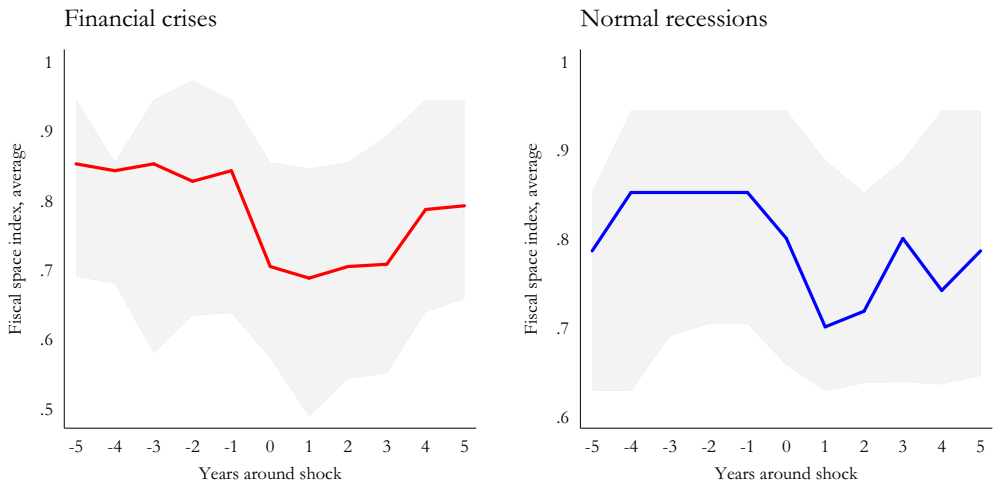
	(1) Financial Crises		(2) Normal Recessions		
Variables	**Coeff**	**SE**	**Coeff**	**SE**	**Obs.**
# of financial crises, t-3 to t-1	-0.143***	(0.016)	-0.039***	(0.012)	928
# of normal recessions, t-3 to t-1	-0.070***	(0.019)	-0.167***	(0.033)	928
Intensity of conflicts, t-1 to t+1	0.037	(0.030)	-0.028	(0.045)	928
Real GDP growth, t-1	-1.311***	(0.179)	-0.011	(0.364)	928
Real GDP growth, t-2	-1.270***	(0.212)	0.755***	(0.188)	928
Output gap, t-1	0.007*	(0.004)	0.035***	(0.003)	928
REER gap, t-1	0.086***	(0.011)	0.015***	(0.004)	928
Current account, t-1	-2.746***	(0.385)	-1.008***	(0.244)	916
Log of Real GDP, t-1	-0.178***	(0.025)	0.057*	(0.030)	928
Terms of trade, t-1	-2.717***	(0.528)	-0.615	(1.595)	928
Presence of fiscal rule, t-1	-0.095***	(0.027)	-0.009	(0.027)	928
Political rights, t-1	0.287***	(0.075)	0.124***	(0.035)	928
Presence of IMF program, t-1	-0.018	(0.033)	0.068	(0.042)	928
World growth, t-1	-0.378***	(0.127)	-0.654**	(0.281)	928

Notes: Driscoll-Kraay standards errors are in parentheses. $*p < 0.10$, $**p < 0.05$, $***p < 0.01$. The tables describes the difference in country's characteristics in the run-up of shocks between the treated group (countries with financial crises and normal recessions) and the control group (countries in normal times). Here, the difference is country specific and is obtained by regressing on each variable the dummies of shocks using a panel fixed-effects model. Hodrick-Prescott filter are used to calculate the output gap and REER gap. The Political Right index ranges between 1 (high) and 7 (weak).

Second, although relying on fiscal space the year before the onset of the crises reduces the endogeneity of fiscal space with respect to future output and current fiscal policy, it does not prevent our OLS estimates to be biased for two reasons. Indeed, the country's prior fiscal space may be correlated with the deterioration of the country's economic conditions and key structural characteristics in the run-up of the shock, therefore the benefits of fiscal space may be underestimated. We conduct two analysis checks. We first depict the dynamics of fiscal space ten years around the start of shocks in fig. 3.3. It shows that fiscal space remains stable in the run-up of shocks, and then declines after the shocks strike the economy. This general trend sustains that fiscal space before shocks may be exogenous, while fiscal space after the shocks is affected by the shocks and/or is used to alleviate their output losses. However, this general trend does not mean that all countries do not encounter a fall in their fiscal space in the run-up of shocks. To check that, we estimate in table 3.5 a panel fixed effects model on the

sample of shocks where fiscal space before the shock is explained by past shocks, lagged and current growth, output gap, and terms of trade. The findings show that countries with lower fiscal space one year before financial crises have lower growth, output gap, and terms of trade as well as suffer past-recessions. Those with lower fiscal space one year before normal recessions have lower growth and terms of trade. These results sustain that fiscal space before the shocks may be affected by other shocks that have implications for both fiscal space and future output growth. This leads us to the second reason why fiscal space may be endogenous. Countries that endure a severe decline of fiscal space the year before shock may be the ones with lower resilience and weak macroeconomic policies that make them more prone to protracted and large recessions. As we are interested in the recovery resulting from the use of fiscal policy, the benefits of fiscal space in the latter case may be underestimated as the output losses also depend on the characteristics of countries rather than the use of the fiscal policy.

Figure 3.3: Fiscal space dynamics around shocks



Notes: In the run-up of shocks, fiscal space is quite stable, and then collapse when the shocks strike. The solid lines depict the median of fiscal space, and the areas show the interquartile range.

In sum, the OLS estimates may suffer from endogeneity issues for (i) a selection on observables between countries hit by shocks and those in normal times, and (ii) a selection on observables between countries with higher and limited fiscal space in the run-up of financial crises or normal recessions. To address these issues, we included, in eqs. (3.3) and (3.4), country fixed-effects as well as many of the macroeconomic and political variables for which countries differ, but more accurately we estimate an average treatment effect on the treated (ATT) of shocks and fiscal space on output dynamics after re-randomization (i.e. eliminating the difference in the

Table 3.5: Endogeneity check of fiscal space

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Financial crisis				**Normal recession**			
Dependent variable: Fiscal space index at time t-1 (t=start date of the shocks)								
# of financial crises, t-5 to t-1					0.002			
					(0.077)			
# of normal recessions, t-5 to t-1	-0.347***							
	(0.089)							
Growth, t-2		-0.003				-0.010***		
		(0.007)				(0.003)		
Growth, t-1		0.036***				0.022***		
		(0.008)				(0.005)		
Output gap, t-2			-8.231***				-1.236**	
			(1.102)				(0.600)	
Output gap, t-1			7.510***				0.861	
			(1.101)				(1.077)	
Terms of trade, t-2				0.005***				0.001*
				(0.002)				(0.000)
Terms of trade, t-1				0.009*				0.000
				(0.005)				(0.001)
Constant	0.741***	0.607***	0.712***	0.715***	0.795***	0.753***	0.798***	0.790***
	(0.019)	(0.043)	(0.019)	(0.012)	(0.016)	(0.032)	(0.029)	(0.013)
Observations	55	55	55	55	58	58	58	58
R-squared	0.097	0.222	0.328	0.196	0.000	0.161	0.038	0.037
F-test P-value	0.000	0.000	0.000	0.005	0.976	0.000	0.012	0.000

Notes: Driscoll-Kraay standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table describes how past and current shocks affect fiscal space in the run-up of shocks. F-test reported in the bottom of table test the joint-significance of parameters.

characteristics between our treated and control groups).[7] Besides, the occurrence of subsequent shocks may pollute our ATT estimates of the output losses of shocks and the benefits of fiscal space. Indeed, if a subsequent shock occurs in the years following an initial shock, it will intensify the costs of the initial shock and offset the benefits of fiscal space and fiscal policy expansion. Based on that, the output losses of shocks will be overestimated and the benefits of fiscal space underestimated. To account for this possibility, we remove, in robustness checks, all shocks that are followed by subsequent shocks in the five years after they hit the economy.

3.4.2.2 Inverse Propensity Weighted with Regression Adjustment (IPWRA)

To tackle the endogeneity issues, we estimate an ATT of shocks and fiscal space on output dynamics by combining the inverse propensity weighted with regression adjustment (IPWRA) estimation and local projections *à la* Jordà (2005) following, among others, Asonuma et al. (2016); Forni et al. (2016); Jordà and Taylor (2016); Asonuma et al. (2019); Kuvshinov and

[7] Recall that Romer and Romer (2018) do not provide any treatment of the endogeneity issues; besides, they do not include control variables, as we suggest here. Therefore, their study may suffer from endogeneity.

Zimmermann (2019), and Atsebi et al. (2019).[8] Then, our impact assessment considers that financial crises and normal recessions, $D^s_{i,t}$, are the treatment and cumulative changes in output at each horizon h, $\Delta y_{i,t+h}$, are the outcome variables. Simplifying the algebra for the type of shock, s, the ATT of shocks is obtained as follows

$$ATT = \Lambda^h = \mathbb{E}[\Delta y_{i,t+h}(1)|D_{i,t} = 1] - \mathbb{E}[\Delta y_{i,t+h}(0)|D_{i,t} = 1], \forall\ h. \tag{3.5}$$

Since $\mathbb{E}[\Delta y_{i,t+h}(0)|D_{i,t} = 1]$ is not observable, we use a counterfactual. Rosenbaum and Rubin (1983) show that under unconfoundedness, $\Delta y_{i,t+h}(d) \perp D_{i,t}|Z_{i,t}\ ;\forall\ h\ ;\ d \in \{0,1\}$, i.e. an independence between potential outcomes and shocks, conditional on a set of covariates $Z_{i,t}$, all biases can be removed by adjusting for differences in covariates between our treated and control groups. This means that under unconfoundedness, we can estimate an unbiased ATT by comparing output changes in countries with and without financial crises or normal recessions, after weighting by propensity scores based on the set of covariates $Z_{i,t}$.

More practically, our methodology consists of three steps. First, we estimate a treatment model by explaining the shock $D_{i,t}$ by a set of determinants $Z_{i,t}$, and we predict the propensity score or the likelihood for country i at time t to be in the treated, $\hat{p}_{i,t} = p_1(Z_{it})$, and control, $1 - \hat{p}_{i,t} = p_0(Z_{it})$, groups. As proposed by Rosenbaum and Rubin (1983), we use the predicted propensity score to eliminate the difference in observables between the treated and the control groups. The set of determinants $Z_{i,t}$ is presented in table 3.4 above. Ideally, any predictor of shocks should be included, regardless of whether that predictor is a fundamental variable in a macroeconomic model (Lunceford and Davidian 2004; Jordà et al. 2016). We estimate the propensity score using three different strategies: (i) a covariate balancing propensity score (CBPS) introduced by Imai and Ratkovic (2014), (ii) an entropy balancing (EB) proposed by Hainmueller (2012), and (iii) a pooled logit. Indeed, (i) and (ii) ensure the perfect balancing of covariates between the treated and control groups compared to (iii), and they also limit the bias due to misspecification in the treatment model (see, tables B.3 and B.4).[9]

Second, we fit an outcome model for each horizon h as in eq. (3.3) with weights derived from the first-stage to mimic a situation where the shocks occurred randomly. We do so over the treated group only ($D_{i,t} = 1$) and obtain the predicted potential outcomes for the whole sample

[8] In fact, many of these papers use the Augmented Inverse Propensity Weighted (AIPW) estimation instead of the IPWRA, which however provides only the Average treatment effects (ATE). As we are interested in the ATT, we estimate the IPWRA, which as the AIPW, falls into the class of doubly robust estimators of treatment effects. See, for instance, Imbens (2004); Lunceford and Davidian (2004), and Stuart (2010) for a comprehensive review of these estimations.

[9] Consequently, we use the propensity score predicted using the method (i) in the rest of the paper. Our results remain robust when using methods (ii) and (iii). For ATT estimates, we use as weights, $w^1_{i,t} = \hat{p}_{i,t} = 1$ for the treated group, and $w^0_{i,t} = \hat{p}_{i,t}/(1 - \hat{p}_{i,t})$ for the control groups.

based on the treated group characteristics, $\hat{m}_1^h(X_{i,t})$. We repeat the same operation over the control group only ($D_{i,t} = 0$), and obtain the predicted potential outcomes for the whole sample based on the control group characteristics, $\hat{m}_0^h(X_{i,t})$.

Third, we estimate the following equations only over the sample of shocks at the start to obtain the unconditional ATT estimates of shocks on output dynamics (see, eq. (3.6a)), and the conditional ATT estimates of shocks on pre-shock fiscal space (see, eq. (3.6b)).

$$\hat{m}_1^h(X_{i,t}) - \hat{m}_0^h(X_{i,t}) = \Lambda_{IPWRA}^h D_{i,t}, \forall\ h\ and\ D_{i,t} = 1 \tag{3.6a}$$

$$\hat{m}_1^h(X_{i,t}) - \hat{m}_0^h(X_{i,t}) = \Lambda_{IPWRA}^h D_{i,t} + \delta_{IPWRA}^h FS_{t-1}, \forall\ h\ and\ D_{i,t} = 1 \tag{3.6b}$$

The IPWRA estimator falls into the class of doubly robust estimators (see, e.g., Imbens 2004; Lunceford and Davidian 2004; Imbens and Wooldridge 2008; Stuart 2010). This means that it is unbiased when either the treatment model or the outcome model is correctly specified.

3.5 Benchmark results

In this section, we present our benchmark results. We first discuss briefly the advantages of the ATT estimates over the OLS estimates. Second, we show the unconditional paths of output growth in financial crises and normal recessions. Third, we incorporate in the analysis the role of fiscal space and describe the paths of output growth conditional on pre-shock fiscal space.

3.5.1 OLS estimates and the advantages of ATT estimates

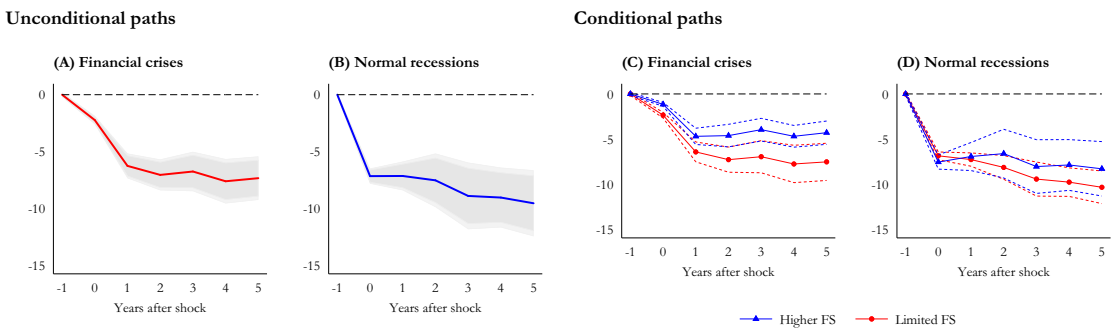
The unconditional OLS estimates of the effects of financial crises and normal recessions are shown in tables B.5 and B.6 in section B.2.2, and fig. 3.4 (A) and (B) depict them graphically. They are obtained by estimating eq. (3.3) and show the difference in output dynamics between countries hit by shocks and countries in normal times. The coefficients are statistically significant and quantitatively large. On average and relative to the pre-shock level, after financial crises, output falls by 2.2 pp. at the onset and decline further to 7.3 pp. in year 5; after normal recessions, the collapse is even greater at the onset at 7.2 pp., which rises to 9.5 pp. in year 5. These paths do not show a recovery of output in the aftermath of shocks as output persistently remains below its pre-shock level.

The average output losses in the aftermath of financial crises and normal recessions may obscure a different trajectory of output in countries with and without fiscal space. To reveal the effects of fiscal space, we estimate eq. (3.4) and report the conditional effects of shocks on pre-shock fiscal space in tables B.7 and B.8 in section B.2.2. The tables show that an increase

of fiscal space by one standard deviation is associated with a maximum reduction in the output losses of shocks by 2.4 and 1.5 pp. in the aftermath of financial crises and normal recessions, respectively. Graphically, the dynamics for countries with higher fiscal space when the fiscal space index is at its 75^{th} percentile, and for countries with limited fiscal space when the fiscal space index is at its 25^{th} percentile are presented in fig. 3.4 (C) and (D) for financial crises and normal recessions, respectively. We adopt this convention throughout the paper to differentiate between the dynamics of countries with higher and limited fiscal space. The findings imply that higher pre-shock fiscal space is associated with lower output losses. The estimated gain is around 5.5 pp. for both financial crises and normal recessions in year 5 after the shock.

However, as discussed in section 3.4.2.1 above, the OLS estimates may overestimate the effects of shocks and underestimate the benefits of fiscal space. To check this assumption, we compare the results of the OLS estimates with the ATT estimates after eliminating the differences in characteristics between countries hit by shocks and countries in normal times. As shown below, our assumptions about the bias of the OLS estimates are verified and could be attributed to the differences in characteristics between countries. Consequently, the OLS estimates may provide us with the upper bound of the costs of shocks, and the lower bound of the benefits of fiscal space.

Figure 3.4: OLS estimates, effects of shocks and fiscal space on output growth and recovery



Notes: OLS estimates. Conditional cumulative changes in output from the onset of financial crises and normal recessions. The solid path shows local projection point estimates of the output losses for years 1-5 after the onset of the shocks. These losses describe the difference between the changes of output in financial crises or normal recessions relative to normal times at each horizon. For figures (A) and (B), the thinner and thicker bands are 90% and 95% confidence intervals, respectively. For figures (C) and (D), the dashed lines are 90% confidence intervals; the Higher FS and Lower FS paths correspond to the 75^{th} percentile and 25^{th} percentile of the fiscal space index, respectively.

3.5.2 The role of fiscal space in accounting for the variation of output dynamics in the aftermath of shocks

In this section, we compute the ATT estimates of the effects of shocks and fiscal space after re-randomization as described in section 3.4.2.2 to address the endogeneity issues. The results for the unconditional and conditional paths are presented in tables 3.6 and 3.7, respectively. Figure 3.5 depicts these results graphically.

In line with the existing literature that analyzes the output costs of financial crises and normal recessions (e.g., Reinhart and Rogoff 2009; Fatás and Mihov 2013; Jordà et al. 2013, 2016; Jordà and Taylor 2016; Trebesch and Zabel 2017; Laeven and Valencia 2018; Romer and Romer 2018; Asonuma et al. 2019; Kuvshinov and Zimmermann 2019), we find that financial crises and normal recessions lead to large and protracted output losses, and that recovery, if any, is a distant and uncertain prospect (see, table 3.6 and fig. 3.5 (A) and (B)). Indeed, for financial crises, output falls by 1.5 pp. in year 1, 5.1 pp. in year 2 and around 4 pp. in subsequent years. For normal recessions, the output contraction is much larger in year 1 and stands at 5.6 pp., before lowering to around 2.5 pp. in subsequent years. To put these findings into perspective, knowing that the median Real GDP growth in our sample is 4.8% per year so that the median economy would have grown by 24% over five years; a single episode of a financial crisis and normal recession would cost about 16 and 10% of that economy's long-term growth, respectively.

Recall that the paper aims at assessing whether fiscal space in the run-up of financial crises and normal recessions shapes the dynamics of their output costs. Indeed, some financial crises or normal recessions are less detrimental to growth because countries can enact fiscal stimulus to smooth the economy over the business cycle, or they can continue to assess external financing. The results of the conditional paths of output in the aftermath of financial crises and normal recessions modulating by pre-shock fiscal space are presented in table 3.7. Figure 3.5 (C) and (D) depict them graphically. The findings show that, also in the context of developing and emerging countries, fiscal space still matters and significantly reduces the output losses of financial crises and normal recessions. We find that an increase of pre-shock fiscal space by one standard deviation is associated with a maximum reduction of the output losses of 4.6 and 3.9 pp. in the aftermath of financial crises and normal recessions, respectively, which is enough to completely offset their output losses. Putting differently, if pre-shock fiscal space increases by one standard deviation, the long-term growth of the median economy will not be affected by a financial crisis or normal recession. These results can be seen graphically in Figure 3.5 (C) and (D) where we depict the dynamics of output in the aftermath of shocks for countries with higher and limited fiscal space (as previously defined). In countries with limited fiscal space (equals the 25^{th} percentile), output collapses by 1.8% at the onset of financial crises, and the

Table 3.6: ATT estimates of the effects of shocks on output dynamics, unconditional paths

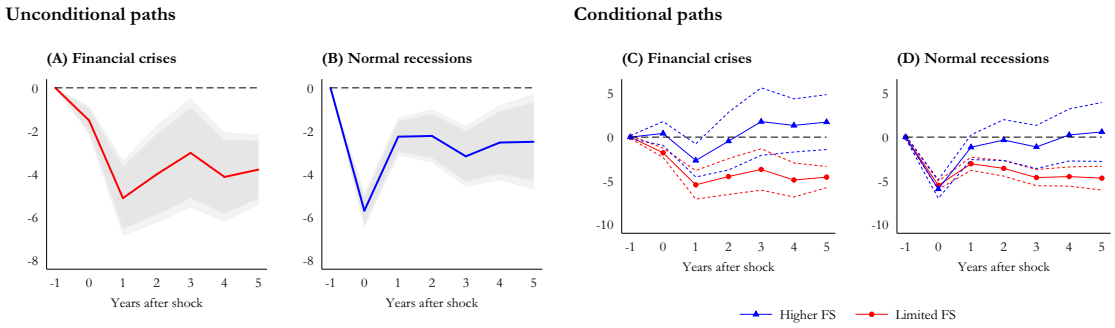
Panel A: Financial crises						
	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Financial crisis, t	-1.511***	-5.109***	-4.004***	-3.013**	-4.126***	-3.789***
	(0.337)	(0.882)	(1.144)	(1.286)	(1.050)	(0.830)
Observations	55	55	55	55	55	55
Panel B: Normal recessions						
	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Normal recession, t	-5.688***	-2.262***	-2.229***	-3.172***	-2.534***	-2.498**
	(0.398)	(0.437)	(0.627)	(0.718)	(0.886)	(1.118)
Observations	58	58	58	58	58	58

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. The first-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. The second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

decline peaks in year 2 at 5.5% and remains persistent around 4.5% in subsequent years. After normal recessions, the decline in output is severe at the onset at 5.5% and remains persistent but reduced around 4.5% in subsequent years. For countries with higher fiscal space (equals the 75^{th} percentile), output falls in the first two years following financial crises and normal recessions before recovering in subsequent years. More generally, besides being non significantly different from zero two years after the shocks, the average dynamics of output in countries with higher fiscal space in the run-up of shocks are established well above the ones in countries with limited fiscal space.

Our results confirm the findings of Romer and Romer (2018) on 24 advanced countries, but this time in the context of developing and emerging countries. Moreover, it supplements the previous analyses by building a comprehensive index of fiscal space, and by addressing the endogeneity issues. As we know that developing and emerging countries have had a long history of pro-cyclical fiscal policy (e.g., Alesina et al. 2008; Ilzetzki and Vegh 2008), even if, over the last two decades, a growing share of fiscal policies in these countries had graduated and become countercyclical (e.g., Frankel 2011; Frankel et al. 2013; Aizenman et al. 2019), our findings give them strong evidence of the benefits they may enjoy when moving to a countercyclical fiscal policy. These findings show that there is a significant gain to fix the roof when the sun is shining, i.e., to build-up fiscal buffers, reduce debt and deficit, increase tax base and revenues,

Figure 3.5: ATT estimates, effects of shocks and fiscal space on output growth and recovery



Notes: ATT estimates. Conditional cumulative changes in output from the onset of financial crises and normal recessions. The solid path shows local projection point estimates of the output losses for years 1-5 after the onset of the shocks. These losses describe the difference between the changes of output in financial crises or normal recessions relative to normal times at each horizon. For figures (A) and (B), the thinner and thicker bands are 90% and 95% confidence intervals, respectively. For figures (C) and (D), the dashed lines are 90% confidence intervals; the Higher FS and Lower FS paths correspond to the 75^{th} percentile and 25^{th} percentile of the fiscal space index, respectively.

Table 3.7: ATT estimates of the effects of shocks and fiscal space on output dynamics, conditional paths

Panel A: Financial crises						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial crisis, t	-7.796***	-13.052***	-15.530***	-18.584***	-21.884***	-21.707***
	(1.606)	(1.718)	(2.572)	(2.909)	(3.177)	(4.325)
Financial crisis, t X FS, t-1	8.705***	11.000***	15.963***	21.564***	24.593***	24.814***
	(2.498)	(2.099)	(4.253)	(4.920)	(4.665)	(6.392)
Observations	55	55	55	55	55	55
Output gain when FS increases by one std. dev.	1.614	2.040	2.960	3.999	4.560	4.601

Panel B: Normal recessions						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Normal recession, t	-4.329***	-8.194***	-12.383**	-14.168***	-17.447***	-19.085***
	(1.106)	(3.040)	(4.951)	(4.912)	(5.940)	(6.286)
Normal recession, t X FS, t-1	-1.707	7.454*	12.760*	13.817**	18.740**	20.843**
	(1.759)	(4.013)	(6.663)	(6.683)	(8.082)	(8.626)
Observations	58	58	58	58	58	58
Output gain when FS increases by one std. dev.	-	1.381	2.364	2.560	3.472	3.862

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. Conditional effects of shocks on pre-shock fiscal space. The first-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. The second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

and lock the drinks cabinet when the economy is booming for weathering the storm in recessions; otherwise, there may be no way out but to adjust at the worst possible time.

3.6 Channels

Our benchmark results reveal that output falls considerably in countries with limited fiscal space while it remains relatively unchanged or even increases in countries with higher fiscal space in the aftermath of financial crises and normal recessions. However, very little is known about the transmission channels through which fiscal space could alleviate the output costs of financial crises and normal recessions.[10]

In this paper, we test three main channels of the effects of fiscal space on output dynamics in the aftermath of shocks. First, the primary fiscal balance channel analyzes the behavior of the primary fiscal balance in the aftermath of shocks. When fiscal space is high, countries could effort to run significant deficits without raising concerns about debt sustainability or deteriorating the market sentiment. On the contrary, when fiscal space is limited, countries immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations. This is particularly of interest since the literature highlighted that fiscal multipliers are higher in downturns (e.g., Auerbach and Gorodnichenko 2012, 2013; Fazzari et al. 2015). Besides, as shown by DeLong and Summers (2012); Jordà and Taylor (2016) and Fatás and Summers (2018), fiscal consolidations may be self-defeating in downturns as they depress growth and investment further, then failing to reduce and stabilize debt levels. Based on these findings, in downturns, fiscal space may be self-sustaining as the increase in fiscal deficit today supports future growth and tends to increase the levels of future fiscal space. We also present the dynamic of fiscal space in the aftermath of shocks conditional on the pre-shock fiscal space. This is done to support the idea of the use of fiscal space in the aftermath of shocks and check whether fiscal consolidations implemented in countries with low fiscal space are enough to achieve higher levels of fiscal space.

Second, we further test whether a Keynesian mechanism is driving our findings and that there is no Neoclassical or Ricardian view that may undermine the benefits of a fiscal expansion when fiscal space is available. Under a Keynesian view, a discretionary increase in the fiscal deficit or a fiscal policy expansion will lead to higher aggregate demand and higher output growth. The effectiveness of the fiscal expansion will depend, among others, on whether the expansion is associated with a crowding-out effect of private investment or an increase in precautionary savings, as predicted by neoclassical view or a Ricardian equivalence. This leads us to the private

[10] Romer and Romer (2018) find that higher fiscal space is associated with an increase in the government's deficit in advanced countries; nevertheless, they do not provide any further analysis of the channels.

absorption channel in which we analyze the behavior of private consumption and investment in the aftermath of shocks, and conditional on the pre-shock fiscal space. If we find that countries with higher fiscal space can loose fiscal policy and simultaneously have an increase in private absorption in the aftermath of shocks, then the Keynesian view is likely to drive our findings while the evidence of Neoclassical and Ricardian views may be weakened.

Third, we look at the behavior of net capital inflows in the aftermath of shocks, and conditional on the pre-shock fiscal space. There is clear evidence that abrupt declines in net capital inflows or sudden stops following financial crises or recessions tend to exacerbate the contraction of output (see e.g., Bordo 2006; Hutchison and Noy 2006; Mendoza 2010; Reinhart and Rogoff 2009; Asonuma et al. 2019). We guess that higher fiscal space can prevent capital flows to pull back from the country and maintain an external source of deficit financing in downturns. Then, fiscal space increases the available funds the government may tap on to finance its loose fiscal policy by preventing a sudden stop in capital flows and preserving a good market sentiment. In countries with limited fiscal space, capital flows are likely to be pro-cyclical. This means that they contribute to the build-up of risks in booms and flow away in downturns where they are needed, deepening the recessionary forces.

To test these channels, we employ the same strategy as in section 3.4.2.2 and rely on ATT estimates. One issue that arises here is that we want to capture the behavior of our channel variables adjusted for business cycles. For example, when analyzing the impacts of shocks and fiscal space on primary fiscal balance, we want to focus on the discretionary policy of the governments and purge the effects of the automatic stabilizers. To do so, we sightly modify the outcome models estimated in the second stage of the IPWRA procedure to add as explanatory variable the difference between the output gap at each horizon h after the shock and the pre-shock output gap as follows

$$\Delta y_{i,t+h} = \alpha_i^h + \Lambda^{f,h} D_{i,t}^f + \Lambda^{n,h} D_{i,t}^n + \theta_{L1}^h \Delta y_{i,t-1} + \theta_{L2}^h \Delta y_{i,t-2} + \phi^h \left(ygap_{i,t+h} - ygap_{i,t-1} \right) + \ldots + \upsilon_{i,t+h} \tag{3.7}$$

ϕ^h captures the effects of the changes in business cycles at the horizon h. $\Delta y_{i,t+h}$ represents the cumulative changes of the dependent channel variables (fiscal deficit, fiscal space, private absorption, and net capital flows) between $t-1$ and $t+h$ after the shocks.

The results of the transmission channels in the aftermath of financial crises and normal recessions are reported in tables B.9 and B.10, respectively. They reveal that in countries with higher fiscal space, governments enact stimulus packages by using fiscal space and loosening fiscal policy to alleviate the output losses of financial crises and normal recessions. Although fiscal space is used and depressed, it remains strong and above that of countries with limited fiscal space that implement fiscal consolidations to address their fiscal issues. Besides, we find

that higher fiscal space is associated with an increase of private consumption and investment, supporting the Keynesian view, and an increase of net capital flows necessary to finance the recovery. The opposite results are found in countries with limited fiscal space where both private absorption and net capital inflows are strongly depressed.

Going into detail, first, we find in Panel A that an increase of pre-shock fiscal space by one standard deviation leads to a decrease of the primary fiscal balance between 1.4 and 2.1 pp. for financial crises and between 1.1 and 1.8 pp. for normal recessions for each year after the shock. This also leads to a use and decrease of fiscal space for all years after the shocks except for year 5 after normal recessions that peaks at 0.14 in year 5 after financial crises, and 0.09 in year 4 after normal recessions as shown in Panel B. However, one can notice that although fiscal space decreases in countries with higher fiscal space and increases in countries with limited fiscal space, it remains strong and higher in countries with higher fiscal space for all years after the shock. This result shows a strong link between the availability of fiscal space and the cyclicality of fiscal policy in line with Aizenman et al. (2019). In countries with higher fiscal space, fiscal policy is countercyclical and dissipates the recessionary forces, while in countries with limited fiscal space, fiscal policy is procyclical and intensify the recessionary forces in the aftermath of shocks. Second, in Panel C, we find that an increase of pre-shock fiscal space by one standard deviation favors an increase of private consumption and investment for all years after the shocks that peaks at 5.1 pp. in year 5 after financial crises and 3.6 pp. in year 2 and remains close of 3.2 pp. in subsequent years after normal recessions. In that case, fiscal space that allows fiscal deficits to increase in downturn helps to achieve sufficient demand and output in line with the Keynesian view. This result shows indirectly the Neoclassical and Ricardian views sustaining that deficits will crowd-out private investment and will induce an increase of precautionary savings in the prevention of future higher taxes are of the least concern. Third, we show that an increase of pre-shock fiscal space by one standard deviation induces an increase in net capital flows that peaks at 6.3 pp. in year 5 after financial crises and at 4.5 pp. in year 3 after normal recessions. This finding reveals that fiscal space helps to preserve an external financing source of fiscal deficit.

Altogether, based on these channels, we find that fiscal space is necessary to conduct a credible countercyclical fiscal policy that increases output growth and support private consumption and investment. It also helps to maintain an external financing source that governments may tap on to finance their recovery. As the experience of some successful examples of crisis and recession management in Latin American and Asian countries have shown, it is possible to pursue countercyclical policies to mitigate output losses; however, this depends crucially on the availability of fiscal space, that is on the room in a government's budget that allows it to provide resources for a fiscal stabilization without jeopardizing the sustainability of its financial position

or the stability of the economy.

3.7 Robustness checks

In this section, we check the robustness of our benchmark results. To do so, we first check the misspecification of the IPWRA estimation when fiscal space and the interaction term between fiscal space and shocks are not included as explanatory variables in models. Second, we use different alternative measures of fiscal space. Third, we estimate the baseline models on a sample of shocks not followed by subsequent shocks in the next five years.

3.7.1 Relevance of fiscal space for the dynamics of output, misspecification errors

We employ a strategy to show the misspecification error when fiscal space and the interaction term between fiscal space and shock are not included in the IPWRA estimation. This indirectly shows the relevance of fiscal space for explaining the variation of the output dynamics in the aftermath of financial crises and normal recessions. More specifically, this strategy requires estimating a test equation on the sample of shocks where we regress each of the observed dependent variables at each horizon h on their predicted values based on the different variants of IPWRA models and the measure of fiscal space. If the coefficient associated with fiscal space is significant, then there is a misspecification error. The results are reported in tables B.11 and B.12 for financial crises and normal recessions, respectively. First, In Panel A and B, we do not include fiscal space and an interaction term between fiscal space and shock in the IPWRA model. When comparing Panel A and B of each table, one can notice that the explanatory power increases by around 3 pp. when fiscal space is included as regressors in the test equation. This means that fiscal space explains a variation of output dynamics that is not captured by the Panel A and B IPWRA model. Also, the coefficients associated with fiscal space are statistically significant and positive, which raises an issue of misspecification related to fiscal space that is positively associated with output in the aftermath of shocks. Second, in Panel C, we include as regressors fiscal space in the IPWRA models; however, this does not resolve the misspecification as the coefficients associated with fiscal space are still statistically significant. Third, in Panel D, we include as regressors both fiscal space and an interaction term between fiscal space and shock in the IPWRA models. Here, the coefficients associated with fiscal space turn into insignificant, which shows that the misspecification issue is lifted. Based on these model specification checks, we show that fiscal space is an important variable that explains output dynamics in the aftermath of financial crises and normal recessions; therefore, our benchmark models (in Panel D) are

well-performing compared to other specifications which do not account for the role of fiscal space.

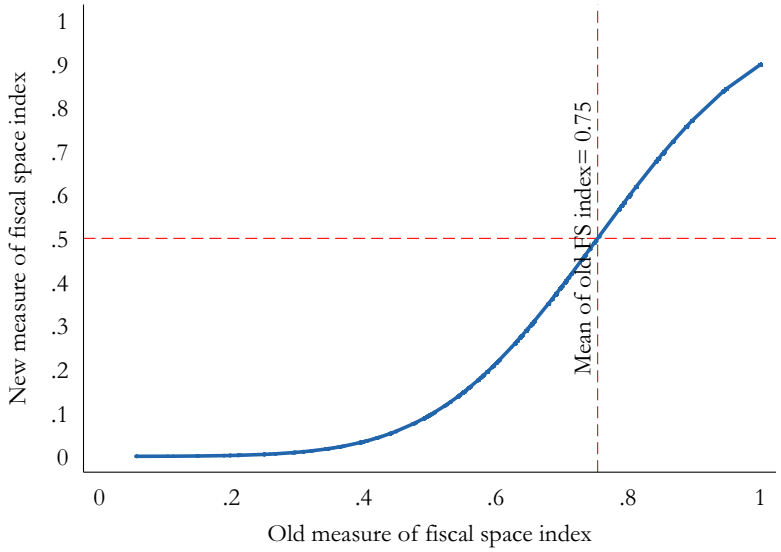
3.7.2 Alternative measures of fiscal space

We check the robustness of our benchmark results to the use of alternative measures of fiscal space. First, although our strategy helps to address the endogeneity of fiscal space, we use an average of one and two-year lags in fiscal space instead of a one-year lag in the benchmark models. By doing so, we reduce the possibility that an exogenous shock will simultaneously affect both fiscal space and future growth. Second, we use the fiscal space measure that is computed based on the income group-specific thresholds as described in eq. (3.2b); this index allows for better comparison between countries within the same income groups. Indeed, based on this index, countries with limited fiscal space will be the ones with the worst early warning indicators in comparison with their counterparts. Third, we assume that fiscal space may be a non-linear function of our computed fiscal measure as shown in fig. 3.6 and in line with the concept of fiscal fatigue (i.e., there are limits to the government's ability to raise the primary surplus in response to higher debt) in Ghosh et al. (2013). To capture this non-linearity, we draw upon the cumulative normal distribution with mean and standard deviation set at the mean and standard deviation of our initial measure. The new index is a non-linear function of the initial (old) measure; it is essentially zero at a value of the old index below 0.4, 0.5 at 0.75, the mean of the old index, and close to 0.9 at a value of the old index close to 1. The results are reported in tables B.13 and B.14 for financial crises and normal recessions, respectively. They reveal that our benchmark results are quite robust to the use of alternative measures of fiscal space.

3.7.3 Shocks not followed by subsequent shocks in the next five years

Throughout this paper, we consider that financial crises and normal recessions that are overlapping with other similar shocks in a window of three years constitute a unique shock. This helps to reduce the bias of our estimates. However, among the 55 financial crises and 58 normal recessions identified, 10 and 15 are followed by subsequent shocks in the next five years, respectively. This means that for these types of shocks, our ATT estimates of the benefits of fiscal space may be underestimated as the subsequent shocks may offset the benefits of fiscal space. To deal with these potential biases, we remove from our initial sample, the shocks that are followed by subsequent shocks. The results are reported in table B.15. They reinforce our benchmark findings and show that our assumptions about the bias generated by subsequent shocks are verified. The benefits of fiscal space for output recovery in the aftermath of financial crises and normal recessions are even larger and significant (especially for normal recessions).

Figure 3.6: Non-linearity of fiscal space



An increase of fiscal space by one standard deviation leads to a reduction of output losses by around 4.9 and 5.4 pp. for financial crises and normal recessions, respectively, compared to 4.6 and 3.9 pp. in the benchmark results. Consequently, there is no doubt that fiscal space is beneficial for output recovery, especially when shocks are not followed by subsequent shocks.

3.8 Concluding remarks

This paper reveals that the availability of fiscal space in the aftermath of financial crises and normal recessions generates a mixed fiscal environment with different output losses of shocks. In countries with enough fiscal space, governments can enact credible fiscal policy expansion by increasing their deficit and using their fiscal space to alleviate the costs of financial crises and normal recessions. In such a situation, private consumption and investment, as well as net capital inflows, increase, which favors a rapid recovery. In countries with limited fiscal space, the story is different and painful; governments immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations, which deepens the recessionary forces. Besides, in these countries, private consumption and investment, as well as net capital inflows, are depressed, and recovery, if any, is a distant and uncertain prospect. Quantitatively, we find that an increase of pre-shock fiscal space by one standard deviation is associated with a maximum reduction of the output losses of 4.6 and 3.9 pp. in the aftermath of financial crises and normal recessions, respectively, which is enough to completely offset their output losses.

These findings show that, also in the context of developing and emerging countries, there is a significant gain to fix the roof when the sun is shining for weathering the storm in recessions; otherwise, there may be no way out but to adjust at the worst possible time. Just like in physics, i.e., momentum naturally winds down rather than up unless outside energy is applied, countries that neglect the right disciplines will not only fall but will slope there unless they have fiscal space that allows them to boost their economy in downturns. Governments and policymakers need to be more than proactive to learn lessons from the past, fix the roof while the sun is shining, build fiscal buffers, reduce debt and deficit, increase tax base and revenues, and lock the drinks cabinet when the economy is starting to improve substantially to be able to appropriately respond to the next crisis looming on the horizon.

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APPENDIX B

APPENDIX TO CHAPTER 3

B.1 Sample and data

B.1.1 List of 91 countries

56 Emerging countries

Albania; Algeria; Angola; Argentina; Armenia; Belarus; Bolivia; Bosnia and Herzegovina; Botswana; Brazil; Bulgaria; Chile; China; Colombia; Costa Rica; Croatia; Dominican Republic; Ecuador; Egypt; El Salvador; Equatorial Guinea; Gabon; Georgia; Guatemala; Guyana; Hungary; India; Indonesia; Jamaica; Jordan; Kazakhstan; Malaysia; Mauritius; Mexico; Mongolia; Morocco; Namibia; Pakistan; Panama; Paraguay; Peru; Philippines; Poland; Qatar; Romania; Russia; Saudi Arabia; South Africa; Sri Lanka; Swaziland; Thailand; Trinidad and Tobago; Tunisia; Turkey; Ukraine; United Arab Emirates.

35 Developing countries

Cambodia; Cameroon; Central African Republic; Chad; Congo; Democratic Republic of Congo; Eritrea; Ethiopia; Gambia; Ghana; Guinea; Haiti; Honduras; Kenya; Kyrgyzstan; Laos; Lesotho; Madagascar; Malawi; Mauritania; Mozambique; Nicaragua; Nigeria; Papua New Guinea; Republic of Moldova; Rwanda; Sierra Leone; Solomon Islands; Sudan; Tajikistan; Tanzania; Uganda; Uzbekistan; Viet Nam; Zambia.

B.1.2 List of financial crises and normal recessions

55 financial crises at start

Algeria (1994); Argentina (1995, 2001); Belarus (2011); Bolivia (1986, 1994); Brazil (1999); Central African Republic (1994); Colombia (1998); Congo (1992); Costa Rica (1994); Croatia (1998); Democratic Republic of Congo (1999); Dominican Republic (2003); Ecuador (1998); Egypt (2003); Gambia (2003); Ghana (1986, 2000); Guatemala (2001, 2006); Guinea (1993, 2005); Haiti (2003); Honduras (1999); Hungary (2008); India (1993); Indonesia (1997); Jamaica (1991, 1996); Jordan (1989); Kazakhstan (2008); Kenya (1985, 1992); Kyrgyzstan (1999); Madagascar (1987, 1994, 2004); Malawi (2003, 2012); Malaysia (1997); Mexico (1994); Mongolia (2008); Nigeria (1999, 2009); Paraguay (1995); Philippines (1997); Republic of Moldova (1999); Romania (1996); Russia (2008); Swaziland (1995); Thailand (1997); Ukraine (1998, 2008); Uzbekistan (2000).

58 normal recessions at start

Argentina (2009); Bosnia and Herzegovina (2009); Brazil (2009); Bulgaria (1999, 2009); Central African Republic (1990, 2000); Chile (1999, 2009); Congo (1997, 2007); Costa Rica (2009); El Salvador (2009); Eritrea (2000, 2003, 2006); Ethiopia (1998); Gabon (2002, 2006); Gambia (2011); Georgia (2009, 2009); Guyana (1998, 2003); Honduras (2009); Hungary (2012); Kyrgyzstan (2002, 2005); Madagascar (1991, 2009); Mauritania (2009); Mexico (2001, 2009); Morocco (1992, 1995); Namibia (1993); Nicaragua (2009); Papua New Guinea (1995, 2000, 2008); Paraguay (1999, 2009, 2012); Philippines (1991); Republic of Moldova (2009); Romania (2009); Saudi Arabia (1999, 2009); Solomon Islands (2009); South Africa (2009); Sri Lanka (2001); Sudan (2011); Thailand (2009); Trinidad and Tobago (1992, 2009); Tunisia (2011); Turkey (2009); United Arab Emirates (2009).

B.1.3 Data sources of variables

Table B.1: Data sources

Variables	Data sources
Dependent variables (main and channels)	
Cumulative changes of real GDP at each horizon h (main)	Authors' calculation based on real GDP from WDI of the World Bank
Cumulative changes of primary fiscal balance at each horizon h	Authors' calculation based on primary fiscal balance from WEO of the IMF
Cumulative changes of fiscal space at each horizon h	Authors' calculation based on data from Global Debt Database of the IMF (Mbaye et al. 2018), WEO of the IMF, WDI of the World Bank, and ICTD
Cumulative changes of private absorption at each horizon h	Authors' calculation based on private consumption and investment from WEO of the IMF
Cumulative changes of net capital inflows at each horizon h	Authors' calculation based on net capital inflows from Alfaro et al. (2014)
Financial crises and normal recessions	
Banking crises	Laeven and Valencia (2018)
Currency crises	Authors' calculation based on nominal effective exchange rate from Bruegel datasets
Fiscal crises	Medas et al. (2018)
Financial crises	Authors' calculation based on banking and currency crises
Normal recessions	Authors' calculation based on data from real GDP, and using the Bry and Boschan (1971) algorithm
Selected indicators used to compute the fiscal space index	
(minus) Debt to average tax revenues ratio	Authors' calculation based on data from Global Debt Database of the IMF (Mbaye et al. 2018), WEO of the IMF, WDI of the World Bank, and ICTD
Fiscal balance to average tax revenues ratio	Authors' calculation based on data from WEO of the IMF, WDI of the World Bank, and ICTD
(minus) Short-term external debt in percentage of total	Authors' calculation based on data from WEO of the IMF
(minus) Debt service in percentage of international reserves	Authors' calculation based on data from WEO of the IMF, and WDI of the World Bank
Fiscal space index	Authors' calculation based on data from Global Debt Database of the IMF (Mbaye et al. 2018), WEO of the IMF, WDI of the World Bank, and ICTD, and using the Signals approach à la Kaminsky et al. (1998)
Other control variables	
Log of Real GDP	Authors' calculation based on real GDP from WDI of the World Bank
Terms of trade	WEO of the IMF
Presence of fiscal rule	IMF Fiscal Rules Dataset
Political rights	Freedom house
Presence of IMF program	IMF-supported programs since 1952 from the SPR Department of the IMF
World growth	Authors' calculation based on real GDP from WDI of the World Bank
Intensity of conflicts	Major Episode of Political Violence database
Output gap	Authors' calculation based on real GDP data from WDI of the World Bank, and using the Hodrick-Prescott filter
REER gap	Authors' calculation based on real effective exchange rate from Bruegel datasets, and using the Hodrick-Prescott filter
Current account	WEO of the IMF

B.1.4 Summary statistics

Table B.2: summary statistics, both treated and control groups

Variables	(1) Obs.	(2) Mean	(3) Std. Dev.	(4) Min	(5) Max
Cumulative changes of real GDP at each horizon t+5	928	30.752	18.030	-24.645	102.837
Cumulative changes of primary fiscal balance at each horizon t+5	903	-1.184	5.660	-35.293	31.553
Cumulative changes of fiscal space at each horizon t+5	924	-0.019	0.244	-0.776	0.751
Cumulative changes of private absorption at each horizon t+5	767	-0.529	8.740	-39.340	34.778
Cumulative changes of net capital inflows at each horizon t+5	650	0.531	8.723	-37.467	35.931
Financial crisis, t	928	0.059	0.236	0.000	1.000
Normal recessions, t	928	0.063	0.242	0.000	1.000
# of financial crises, t-3 to t-1	928	0.068	0.252	0.000	1.000
# of normal recessions, t-3 to t-1	928	0.097	0.296	0.000	1.000
Intensity of conflicts, t-1 to t+1	928	0.702	1.726	0.000	10.000
Fiscal space, t-1, based on both country and income group specific thresholds	928	0.778	0.185	0.056	1.000
Fiscal space, t-1, based on country specific thresholds	928	0.799	0.220	0.000	1.000
Fiscal space, t-1, based on income group specific thresholds	928	0.756	0.219	0.000	1.000
Real GDP growth, t-1	928	5.322	3.856	-12.674	37.999
Real GDP growth, t-2	928	5.033	4.044	-12.674	37.999
Log of Real GDP, t-1	928	10.421	1.842	5.242	15.715
Terms of trade, t-1	928	3.001	16.018	-60.788	164.361
Presence of fiscal rule, t-1	928	0.202	0.401	0.000	1.000
Political rights, t-1	928	3.870	1.988	1.000	7.000
Presence of IMF program, t-1	928	0.347	0.476	0.000	1.000
World growth, t-1	928	3.338	1.025	1.525	8.076
Output gap, t-1	928	0.008	0.037	-0.153	0.148
REER gap, t-1	928	0.005	0.090	-0.404	0.935
Current account, t-1	916	-1.929	8.430	-30.162	31.068

B.2 Supplementary tables

B.2.1 Balance checks

Table B.3: Balance diagnostics between the treated and control groups after weighting, financial crises

	Treated		Control											
			(i) Covariate balancing propensity score				(ii) Entropy balancing				(iii) Pooled logit			
Variables	Mean	Variance	Mean	Variance	Std-diff	Var-ratio	Mean	Variance	Std-diff	Var-ratio	Mean	Variance	Std-diff	Var-ratio
# of financial crises, t-3 to t-1	0.000	0.000	0.000	0.000	-0.006	0.000	0.002	0.002	-0.060	0.000	0.000	0.000	0.000	0.000
# of normal recessions, t-3 to t-1	0.036	0.036	0.036	0.035	0.000	1.017	0.036	0.035	-0.000	1.016	0.041	0.039	-0.024	0.908
Intensity of conflicts, t-3 to t-1	0.685	3.142	0.685	2.614	-0.000	1.202	0.686	2.614	-0.000	1.202	0.699	2.574	-0.008	1.220
Growth, t-1	3.401	13.025	3.401	17.683	-0.000	0.737	3.402	17.661	-0.000	0.737	3.492	14.342	-0.025	0.908
Growth, t-2	3.074	22.383	3.074	9.238	-0.000	2.423	3.067	9.309	0.002	2.404	3.735	9.074	-0.167	2.467
Output gap, t-1	0.012	0.002	0.012	0.002	0.000	1.218	0.012	0.002	-0.000	1.219	0.019	0.002	-0.151	1.322
REER gap, t-1	0.101	0.029	0.101	0.005	0.000	6.223	0.101	0.005	0.000	6.221	0.059	0.005	0.324	5.478
Current account, t-1	-4.532	28.474	-4.532	49.771	-0.000	0.572	-4.525	49.754	-0.001	0.572	-4.492	66.420	-0.006	0.429
Log of Real GDP, t-1	10.339	3.334	10.339	3.882	-0.000	0.859	10.342	3.887	-0.001	0.858	10.143	3.895	0.103	0.856
Terms of trade, t-1	0.414	132.792	0.414	153.199	0.000	0.867	0.420	153.315	-0.000	0.866	0.430	143.013	-0.001	0.929
Presence of fiscal rule, t-1	0.109	0.099	0.109	0.097	0.000	1.017	0.109	0.097	0.001	1.019	0.100	0.090	0.031	1.102
Political rights, t-1	4.036	3.406	4.036	4.116	0.000	0.827	4.037	4.113	-0.000	0.828	4.027	4.123	0.005	0.826
Presence of IMF program, t-1	0.418	0.248	0.418	0.244	-0.000	1.017	0.418	0.243	0.001	1.018	0.417	0.243	0.003	1.018
World growth, t-1	3.066	0.976	3.066	0.933	0.000	1.046	3.067	0.933	-0.001	1.046	3.037	0.957	0.029	1.020

Notes: Rubin (2002) suggests the use the absolute value of the standardized difference (Sdt-diff) as a balance measure for the first moment, where the balance is defined by absolute values below 0.25. He also suggests the use of the ratio of treated and control variances (Var-ratio) as a balance measure for the second moment, where the balance is defined by values close to 1.0, and variables are out of balance if the variance ratio is greater than 2.0 or less than 0.5.

Table B.4: Balance diagnostics between the treated and control groups after weighting, normal recessions

	Treated		Control											
			(i) Covariate balancing propensity score				(ii) Entropy balancing				(iii) Pooled logit			
Variables	Mean	Variance	Mean	Variance	Std-diff	Var-ratio	Mean	Variance	Std-diff	Var-ratio	Mean	Variance	Std-diff	Var-ratio
# of financial crises, t-3 to t-1	0.017	0.017	0.017	0.017	0.000	1.016	0.018	0.018	-0.005	0.982	0.014	0.014	0.024	1.227
# of normal recessions, t-3 to t-1	0.103	0.094	0.103	0.093	-0.000	1.016	0.104	0.093	-0.000	1.015	0.153	0.130	-0.148	0.727
Intensity of conflicts, t-3 to t-1	0.592	2.168	0.592	1.752	-0.000	1.238	0.593	1.758	-0.001	1.233	0.961	2.274	-0.247	0.953
Growth, t-1	4.287	5.781	4.286	15.138	0.000	0.382	4.289	15.125	-0.001	0.382	3.695	13.739	0.189	0.421
Growth, t-2	4.830	13.869	4.830	16.131	0.000	0.860	4.829	16.128	0.000	0.860	4.060	15.508	0.201	0.894
Output gap, t-1	0.040	0.001	0.040	0.002	0.000	0.403	0.040	0.002	0.002	0.403	0.058	0.003	-0.424	0.306
REER gap, t-1	0.019	0.005	0.019	0.008	-0.000	0.627	0.019	0.008	0.000	0.627	0.010	0.007	0.125	0.755
Current account, t-1	-3.597	115.926	-3.596	60.761	-0.000	1.908	-3.595	60.763	-0.000	1.908	-3.953	57.616	0.038	2.012
Log of Real GDP, t-1	10.060	3.893	10.060	3.656	-0.000	1.065	10.061	3.654	-0.000	1.066	9.575	4.141	0.242	0.940
Terms of trade, t-1	3.920	795.382	3.920	348.248	-0.000	2.284	3.921	348.401	-0.000	2.283	1.726	218.766	0.097	3.636
Presence of fiscal rule, t-1	0.172	0.145	0.172	0.143	0.000	1.016	0.172	0.143	0.000	1.017	0.257	0.191	-0.207	0.759
Political rights, t-1	3.862	3.665	3.862	4.069	-0.000	0.901	3.863	4.068	-0.000	0.901	4.011	4.079	-0.076	0.899
Presence of IMF program, t-1	0.431	0.250	0.431	0.246	0.000	1.016	0.431	0.246	0.000	1.016	0.357	0.230	0.151	1.086
World growth, t-1	2.762	1.564	2.762	0.898	-0.000	1.740	2.764	0.899	-0.001	1.739	2.929	0.822	-0.153	1.903

Notes: Rubin (2002) suggests the use the absolute value of the standardized difference (Sdt-diff) as a balance measure for the first moment, where the balance is defined by absolute values below 0.25. He also suggests the use of the ratio of treated and control variances (Var-ratio) as a balance measure for the second moment, where the balance is defined by values close to 1.0, and variables are out of balance if the variance ratio is greater than 2.0 or less than 0.5.

B.2.2 OLS estimates

Table B.5: OLS estimates of the effects of financial crises on output dynamics, unconditional paths

	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Financial crisis, t	-2.233***	-6.265***	-7.057***	-6.759***	-7.617***	-7.345***
	(0.188)	(0.555)	(0.692)	(0.883)	(0.996)	(0.975)
Normal recession, t	-7.227***	-7.252***	-7.651***	-9.081***	-9.313***	-9.825***
	(0.326)	(0.690)	(1.275)	(1.597)	(1.405)	(1.598)
Real GDP growth, t-1	0.189***	0.235***	0.400***	0.540***	0.554***	0.432***
	(0.012)	(0.028)	(0.033)	(0.041)	(0.063)	(0.087)
Real GDP growth, t-2	0.002	0.041	0.102***	0.051	-0.021	0.108
	(0.016)	(0.029)	(0.034)	(0.036)	(0.057)	(0.101)
# of normal recessions, t-3 to t-1	-0.564***	-0.922	-1.095	-1.581	-2.380**	-2.524
	(0.158)	(0.629)	(0.861)	(1.180)	(1.187)	(1.565)
Intensity of conflicts, t-1 to t+1	-0.240	-0.497*	-0.815**	-1.182***	-1.567***	-2.077***
	(0.154)	(0.293)	(0.326)	(0.299)	(0.235)	(0.438)
Log of Real GDP, t-1	-0.923*	-1.928*	-3.266**	-5.062**	-8.396***	-11.607***
	(0.471)	(1.133)	(1.642)	(2.166)	(2.427)	(2.693)
Terms of trade, t-1	-0.002	0.009*	0.001	0.000	-0.005	-0.023*
	(0.003)	(0.005)	(0.008)	(0.009)	(0.011)	(0.012)
Presence of fiscal rule, t-1	0.590***	0.408	0.674	1.356***	2.726***	3.235***
	(0.220)	(0.379)	(0.408)	(0.479)	(0.585)	(0.641)
Political rights, t-1	0.123	0.189	-0.077	-0.435*	-0.983***	-1.536***
	(0.118)	(0.190)	(0.230)	(0.231)	(0.239)	(0.189)
Presence of IMF program, t-1	0.302**	0.853**	1.245***	1.149***	0.931**	1.182**
	(0.122)	(0.419)	(0.315)	(0.325)	(0.406)	(0.482)
World growth, t-1	0.279*	-0.153	-0.714***	-0.996***	-1.532***	-1.202***
	(0.157)	(0.180)	(0.186)	(0.237)	(0.358)	(0.380)
Constant	12.598**	28.981**	49.842***	75.940***	120.422***	160.583***
	(4.982)	(12.219)	(17.918)	(23.201)	(26.263)	(28.773)
Observations	928	928	928	928	928	928
R2 within	0.305	0.151	0.131	0.132	0.146	0.156
# of countries	91	91	91	91	91	91
# of financial crises	55	55	55	55	55	55

Notes: Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of financial crises to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions.

Table B.6: OLS estimates of the effects of normal recessions on output dynamics, unconditional paths

	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Normal recession, t	-7.166***	-7.151***	-7.536***	-8.908***	-9.050***	-9.555***
	(0.339)	(0.644)	(1.202)	(1.496)	(1.342)	(1.482)
Financial crisis, t	-2.309***	-6.385***	-7.222***	-6.962***	-7.915***	-7.702***
	(0.179)	(0.627)	(0.771)	(1.008)	(1.083)	(1.060)
Real GDP growth, t-1	0.196***	0.247***	0.415***	0.561***	0.585***	0.464***
	(0.012)	(0.023)	(0.032)	(0.036)	(0.049)	(0.067)
Real GDP growth, t-2	0.009	0.054	0.115***	0.072**	0.011	0.141
	(0.015)	(0.037)	(0.043)	(0.035)	(0.052)	(0.089)
# of financial crises, t-3 to t-1	-0.809***	-1.301***	-1.675***	-2.213***	-3.284***	-3.724***
	(0.242)	(0.488)	(0.473)	(0.627)	(0.602)	(0.572)
Intensity of conflicts, t-1 to t+1	-0.231	-0.483	-0.798**	-1.157***	-1.530***	-2.037***
	(0.160)	(0.305)	(0.346)	(0.328)	(0.262)	(0.437)
Log of Real GDP, t-1	-1.034**	-2.107*	-3.489**	-5.366**	-8.850***	-12.109***
	(0.516)	(1.201)	(1.702)	(2.241)	(2.545)	(2.796)
Terms of trade, t-1	-0.001	0.010**	0.003	0.003	-0.001	-0.018*
	(0.003)	(0.005)	(0.008)	(0.009)	(0.011)	(0.011)
Presence of fiscal rule, t-1	0.553**	0.349	0.596	1.255***	2.577***	3.064***
	(0.227)	(0.383)	(0.401)	(0.458)	(0.550)	(0.593)
Political rights, t-1	0.116	0.176	-0.090	-0.456**	-1.015***	-1.567***
	(0.122)	(0.183)	(0.220)	(0.211)	(0.228)	(0.182)
Presence of IMF program, t-1	0.334***	0.904**	1.312***	1.235***	1.059***	1.330***
	(0.126)	(0.400)	(0.282)	(0.281)	(0.339)	(0.469)
World growth, t-1	0.278*	-0.155	-0.716***	-0.999***	-1.537***	-1.208***
	(0.157)	(0.181)	(0.186)	(0.237)	(0.353)	(0.374)
Constant	13.692**	30.748**	52.066***	78.953***	124.911***	165.575***
	(5.503)	(13.050)	(18.720)	(24.245)	(27.786)	(30.184)
Observations	928	928	928	928	928	928
R2 within	0.306	0.152	0.132	0.133	0.148	0.158
# of countries	91	91	91	91	91	91
# of normal recessions	58	58	58	58	58	58

Notes: Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of normal recessions to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions.

Table B.7: OLS estimates of the effects of financial crises and fiscal space on output dynamics, conditional paths

	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Financial crisis, t	-5.611***	-11.129***	-14.550***	-15.128***	-16.121***	-16.341***
	(0.629)	(1.668)	(1.995)	(2.720)	(3.325)	(3.525)
Financial crisis, t X FS, t-1	4.721***	6.809***	10.519***	11.830***	12.101***	12.760***
	(0.684)	(1.718)	(2.099)	(2.658)	(3.178)	(3.551)
FS, t-1	0.585**	1.057**	2.179***	3.896***	5.485***	5.027***
	(0.269)	(0.438)	(0.611)	(0.778)	(1.107)	(1.545)
Normal recession, t	-7.207***	-7.220***	-7.592***	-8.990***	-9.194***	-9.712***
	(0.322)	(0.690)	(1.272)	(1.592)	(1.401)	(1.587)
Real GDP growth, t-1	0.180***	0.222***	0.377***	0.505***	0.511***	0.390***
	(0.013)	(0.029)	(0.033)	(0.046)	(0.071)	(0.097)
Real GDP growth, t-2	-0.006	0.029	0.078**	0.015	-0.068	0.064
	(0.016)	(0.029)	(0.036)	(0.040)	(0.063)	(0.108)
# of normal recessions, t-3 to t-1	-0.519***	-0.849	-0.961	-1.376	-2.112	-2.270
	(0.163)	(0.648)	(0.900)	(1.254)	(1.286)	(1.635)
Intensity of conflicts, t-1 to t+1	-0.242	-0.502	-0.829**	-1.214***	-1.617***	-2.121***
	(0.162)	(0.304)	(0.348)	(0.323)	(0.240)	(0.418)
Log of Real GDP, t-1	-1.006**	-2.070*	-3.542**	-5.526**	-9.030***	-12.195***
	(0.475)	(1.151)	(1.703)	(2.259)	(2.533)	(2.745)
Terms of trade, t-1	-0.002	0.008*	0.001	-0.000	-0.005	-0.023**
	(0.003)	(0.005)	(0.008)	(0.009)	(0.010)	(0.011)
Presence of fiscal rule, t-1	0.614***	0.452	0.766*	1.527***	2.971***	3.457***
	(0.223)	(0.387)	(0.433)	(0.487)	(0.577)	(0.627)
Political rights, t-1	0.100	0.153	-0.136	-0.513**	-1.075***	-1.627***
	(0.101)	(0.167)	(0.194)	(0.198)	(0.211)	(0.194)
Presence of IMF program, t-1	0.261**	0.792*	1.144***	1.018**	0.780	1.031*
	(0.122)	(0.466)	(0.396)	(0.437)	(0.553)	(0.557)
World growth, t-1	0.261	-0.182	-0.763***	-1.065***	-1.618***	-1.286***
	(0.165)	(0.187)	(0.193)	(0.247)	(0.370)	(0.385)
Constant	13.240***	30.002**	51.665***	78.640***	123.860***	163.867***
	(5.043)	(12.426)	(18.395)	(24.003)	(27.257)	(29.525)
Observations	928	928	928	928	928	928
R2 within	0.311	0.155	0.138	0.141	0.157	0.164
# of countries	91	91	91	91	91	91
# of financial crises	55	55	55	55	55	55
Output gain when FS increases by one std. dev.	0.875	1.263	1.951	2.194	2.244	2.366

Notes: Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of financial crises to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. The effects of financial crises on output conditional on pre-shock fiscal space.

Table B.8: OLS estimates of the effects of normal recessions and fiscal space on output dynamics, conditional paths

	(1) t+0	(2) t+1	(3) t+2	(4) t+3	(5) t+4	(6) t+5
Normal recession, t	-4.975***	-8.195***	-12.311***	-13.224***	-14.967***	-15.934***
	(0.570)	(1.700)	(2.016)	(1.282)	(1.993)	(2.005)
Normal recession, t X FS, t-1	-2.732***	1.333	6.030	5.481*	7.511**	8.085**
	(1.029)	(2.652)	(3.729)	(2.958)	(3.615)	(3.657)
FS, t-1	1.171***	1.671***	2.925***	4.813***	6.378***	5.958***
	(0.386)	(0.537)	(0.728)	(0.799)	(1.061)	(1.536)
Financial crisis, t	-2.279***	-6.317***	-7.085***	-6.758***	-7.644***	-7.443***
	(0.171)	(0.649)	(0.805)	(1.059)	(1.162)	(1.153)
Real GDP growth, t-1	0.191***	0.237***	0.395***	0.530***	0.544***	0.426***
	(0.012)	(0.023)	(0.030)	(0.039)	(0.054)	(0.074)
Real GDP growth, t-2	-0.000	0.041	0.095**	0.038	-0.035	0.099
	(0.015)	(0.037)	(0.045)	(0.038)	(0.057)	(0.093)
# of financial crises, t-3 to t-1	-0.810***	-1.272**	-1.603***	-2.120***	-3.159***	-3.601***
	(0.253)	(0.502)	(0.495)	(0.666)	(0.662)	(0.640)
Intensity of conflicts, t-1 to t+1	-0.249	-0.501*	-0.825**	-1.208***	-1.596***	-2.098***
	(0.157)	(0.301)	(0.345)	(0.331)	(0.263)	(0.431)
Log of Real GDP, t-1	-1.149**	-2.280*	-3.798**	-5.868**	-9.515***	-12.732***
	(0.499)	(1.182)	(1.699)	(2.266)	(2.586)	(2.786)
Terms of trade, t-1	-0.001	0.010**	0.004	0.003	0.000	-0.017
	(0.003)	(0.005)	(0.008)	(0.009)	(0.010)	(0.011)
Presence of fiscal rule, t-1	0.599***	0.431	0.752*	1.497***	2.899***	3.368***
	(0.220)	(0.391)	(0.417)	(0.454)	(0.523)	(0.554)
Political rights, t-1	0.112	0.163	-0.120	-0.499**	-1.072***	-1.622***
	(0.115)	(0.172)	(0.204)	(0.193)	(0.208)	(0.185)
Presence of IMF program, t-1	0.330**	0.880**	1.256***	1.159***	0.958**	1.231**
	(0.128)	(0.430)	(0.334)	(0.373)	(0.459)	(0.525)
World growth, t-1	0.266	-0.172	-0.744***	-1.046***	-1.600***	-1.266***
	(0.161)	(0.184)	(0.192)	(0.248)	(0.378)	(0.396)
Constant	14.116**	31.475**	53.424***	81.085***	127.743***	168.246***
	(5.503)	(13.100)	(18.929)	(24.678)	(28.384)	(30.542)
Observations	928	928	928	928	928	928
R2 within	0.309	0.154	0.137	0.140	0.157	0.165
# of countries	91	91	91	91	91	91
# of normal recessions	58	58	58	58	58	58
Output gain when FS increases by one std. dev.	-0.506	-	-	1.016	1.392	1.498

Notes: Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of normal recessions to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. The effects of normal recessions on output conditional on pre-shock fiscal space.

B.2.3 Channels

Table B.9: ATT estimates, dynamics of fiscal balance, fiscal space, private absorption, and net capital inflows in the aftermath of financial crises, conditional on pre-shock fiscal space

Panel A: Dependent: Primary Fiscal balance						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial, t	5.632***	10.241***	8.069***	9.158***	7.193***	6.530***
	(1.337)	(1.441)	(1.093)	(0.734)	(2.155)	(1.100)
Financial, t X FS, t-1	-7.731***	-11.589***	-9.050***	-11.163***	-9.445***	-8.819***
	(1.661)	(1.944)	(1.724)	(0.977)	(2.738)	(1.431)
Observations	44	44	44	44	44	44
Evolution of primary fiscal balance when FS increases by one std. dev.	-1.433	-2.149	-1.678	-2.070	-1.751	-1.635
Threshold of FS, t-1 ; critical point	0.729	0.884	0.892	0.820	0.762	0.740
% of shocks with a decrease of primary fiscal balance	50.000	25.000	22.727	38.636	43.182	45.455
Panel B: Dependent: Fiscal space						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial, t	0.100	0.424***	0.485***	0.501***	0.369***	0.635***
	(0.089)	(0.101)	(0.073)	(0.049)	(0.103)	(0.075)
Financial, t X FS, t-1	-0.233**	-0.513***	-0.597***	-0.605***	-0.458***	-0.762***
	(0.091)	(0.137)	(0.105)	(0.069)	(0.118)	(0.107)
Observations	43	43	43	43	43	43
Evolution of fiscal space when FS increases by one std. dev.	-0.043	-0.095	-0.111	-0.112	-0.085	-0.141
Threshold of FS, t-1 ; critical point	0.429	0.827	0.812	0.828	0.805	0.833
% of shocks with a decrease in fiscal space	97.674	39.535	39.535	39.535	41.860	39.535
Mean difference of FS between countries with dec. and inc. FS	0.354	0.145	0.145	0.145	0.136	0.145
P-value Mean difference	-	0.019	0.019	0.019	0.026	0.019
Panel C: Dependent: Private Absorption						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial, t	-2.302	-7.320	-14.460***	-11.623*	-19.256***	-20.644***
	(3.005)	(4.884)	(5.096)	(6.517)	(6.789)	(6.441)
Financial, t X FS, t-1	4.570	10.166*	18.898***	16.934**	27.189***	27.480***
	(4.397)	(5.836)	(6.033)	(7.683)	(8.175)	(7.916)
Observations	39	39	39	39	39	39
Evolution of private absorption when FS increases by one std. dev.	-	1.885	3.504	3.140	5.041	5.095
Threshold of FS, t-1 ; critical point	-	0.720	0.765	0.686	0.708	0.751
% of shocks with an increase in private absorption	-	48.718	41.026	71.795	48.718	43.590
Panel D: Dependent: Net capital inflows						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial, t	-8.422***	-14.018***	-14.517**	-16.529**	-19.729***	-27.742***
	(1.661)	(4.736)	(6.541)	(8.229)	(6.287)	(6.950)
Financial, t X FS, t-1	9.062***	14.961**	16.547*	19.863*	25.179***	34.122***
	(2.152)	(5.959)	(8.358)	(10.450)	(7.880)	(8.279)
Observations	41	41	41	41	41	41
Evolution of net capital inflows when FS increases by one std. dev.	1.680	2.774	3.068	3.683	4.668	6.326
Threshold of FS, t-1 ; critical point	0.929	0.937	0.877	0.832	0.784	0.813
% of shocks with an increase in net capital inflows	21.951	21.951	24.390	36.585	46.341	36.585

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Conditional cumulative changes of output from the start of shocks. The table also reports: (i) the effect of a one standard deviation increase of fiscal space on each dependent variable, (ii) the critical point of fiscal space for which the derivative of the dependent variable with respect to shock is null; (iii) the percentage of shocks for which fiscal space is above its critical value; and (iv) the difference of fiscal space between countries with decreasing fiscal space and increasing fiscal space, and its associated p-value. Sample restricted to be exactly the same in all regressions. Conditional effects of shocks on pre-shock fiscal space. First-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. Second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the difference in output gap between t+h and t-1 as well as the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

Table B.10: ATT estimates, dynamics of fiscal balance, fiscal space, private absorption, and net capital inflows in the aftermath of normal recessions, conditional on pre-shock fiscal space

Panel A: Dependent: Primary Fiscal balance						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
NRecession, t	6.927***	5.417***	5.302***	5.564**	6.899***	5.916***
	(1.766)	(1.950)	(1.332)	(2.161)	(1.778)	(1.537)
NRecession, t X FS, t-1	-9.906***	-7.260***	-7.198***	-6.012**	-8.006***	-6.639***
	(1.457)	(1.695)	(1.636)	(2.558)	(1.595)	(1.181)
Observations	51	51	51	51	51	51
Evolution of primary fiscal balance when FS increases by one std. dev.	-1.837	-1.346	-1.334	-1.115	-1.484	-1.231
Threshold of FS, t-1 ; critical point	0.699	0.746	0.737	0.926	0.862	0.891
% of shocks with a decrease of primary fiscal balance	72.549	56.863	56.863	21.569	25.490	21.569
Panel B: Dependent: Fiscal space						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
NRecession, t	0.196***	0.246***	0.358***	0.406***	0.410***	0.330***
	(0.044)	(0.084)	(0.047)	(0.054)	(0.070)	(0.092)
NRecession, t X FS, t-1	-0.243***	-0.347***	-0.439***	-0.475***	-0.482***	-0.415***
	(0.060)	(0.093)	(0.053)	(0.059)	(0.084)	(0.146)
Observations	54	54	54	54	54	54
Evolution of fiscal space when FS increases by one std. dev.	-0.045	-0.064	-0.081	-0.088	-0.089	-0.077
Threshold of FS, t-1 ; critical point	0.808	0.709	0.815	0.855	0.849	0.795
% of shocks with a decrease in fiscal space	55.556	62.963	53.704	29.630	44.444	59.259
Mean difference of FS between countries with dec. and inc. FS	0.152	0.153	0.146	0.212	0.154	0.145
P-value Mean difference	0.001	0.001	0.001	0.000	0.001	0.002
Panel C: Dependent: Private Absorption						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
NRecession, t	-14.454***	-0.527	-14.912**	-13.551*	-14.599***	-17.052***
	(2.757)	(3.277)	(6.594)	(7.401)	(5.346)	(5.163)
NRecession, t X FS, t-1	15.995***	1.858	19.499**	17.620**	16.984***	17.288**
	(3.068)	(3.297)	(7.726)	(7.749)	(6.305)	(6.840)
Observations	46	46	46	46	46	46
Evolution of private absorption when FS increases by one std. dev.	2.965	-	3.615	3.267	3.149	3.205
Threshold of FS, t-1 ; critical point	0.904	-	0.765	0.769	0.860	0.986
% of shocks with an increase in private absorption	23.913	-	54.348	54.348	26.087	13.043
Panel D: Dependent: Net capital inflows						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
NRecession, t	-7.067**	-3.437	-10.518*	-21.433***	-13.227***	-8.095
	(3.283)	(8.846)	(6.037)	(6.217)	(4.673)	(7.193)
NRecession, t X FS, t-1	3.607	3.618	14.022**	24.060***	15.386***	10.215
	(3.456)	(10.554)	(6.727)	(6.844)	(5.240)	(8.413)
Observations	30	30	30	30	30	30
Evolution of net capital inflows when FS increases by one std. dev.	-	-	2.600	4.461	2.853	-
Threshold of FS, t-1 ; critical point	-	-	0.750	0.891	0.860	-
% of shocks with an increase in net capital inflows	-	-	70.000	36.667	43.333	-

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Conditional cumulative changes of output from the start of shocks. The table also reports: (i) the effect of a one standard deviation increase of fiscal space on each dependent variable, (ii) the critical point of fiscal space for which the derivative of the dependent variable with respect to shock is null; (iii) the percentage of shocks for which fiscal space is above its critical value; and (iv) the difference of fiscal space between countries with decreasing fiscal space and increasing fiscal space, and its associated p-value. Conditional effects of shocks on pre-shock fiscal space. First-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. Second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the difference in output gap between t+h and t-1 as well as the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

B.2.4 Robustness

Table B.11: Misspecification error and relevance of fiscal space, financial crises, ATT estimates

Panel A: IPWRA model without fiscal space and interaction term between fiscal space and financial crises						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	1.090***	1.178***	1.082***	1.057***	1.053***	1.048***
	(0.040)	(0.068)	(0.061)	(0.042)	(0.048)	(0.044)
Constant	-0.206	-0.559	-0.570	-0.690	-0.875	-1.023
	(0.143)	(0.466)	(0.660)	(0.801)	(0.841)	(0.902)
Observations	55	55	55	55	55	55
R-squared	0.820	0.803	0.751	0.795	0.834	0.879

Panel B: IPWRA model without fiscal space and interaction term between fiscal space and financial crises, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	1.057***	1.160***	1.039***	1.018***	1.033***	1.039***
	(0.027)	(0.057)	(0.053)	(0.042)	(0.037)	(0.033)
Fiscal Space, t-1	3.054***	5.932***	7.846***	9.090***	9.585***	9.635***
	(0.808)	(1.454)	(2.115)	(2.373)	(2.257)	(2.903)
Constant	-2.337***	-4.787***	-5.934***	-6.783***	-7.476***	-7.799***
	(0.602)	(0.687)	(0.953)	(0.955)	(1.163)	(1.683)
Observations	55	55	55	55	55	55
R-squared	0.847	0.832	0.788	0.834	0.863	0.900

Panel C: IPWRA model with fiscal space and without interaction term between fiscal space and financial crises, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	1.066***	1.183***	1.073***	1.040***	1.044***	1.047***
	(0.027)	(0.049)	(0.050)	(0.050)	(0.042)	(0.036)
Fiscal Space, t-1	1.525**	2.169**	3.159**	3.791**	4.173***	3.596*
	(0.588)	(0.970)	(1.518)	(1.745)	(1.524)	(2.150)
Constant	-1.252**	-2.142***	-2.789***	-3.229***	-3.740***	-3.599***
	(0.482)	(0.393)	(0.471)	(0.535)	(0.554)	(0.941)
Observations	55	55	55	55	55	55
R-squared	0.848	0.858	0.813	0.852	0.872	0.906

Panel D: IPWRA model with fiscal space and interaction term between fiscal space and financial crises, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	1.072***	1.188***	1.094***	1.061***	1.055***	1.050***
	(0.034)	(0.042)	(0.041)	(0.055)	(0.040)	(0.033)
Fiscal Space, t-1	-0.404	-1.558	-1.291	-0.942	-0.794	-0.653
	(0.479)	(0.944)	(1.411)	(1.649)	(1.477)	(2.133)
Constant	0.128	0.534	0.284	-0.058	-0.333	-0.608
	(0.431)	(0.543)	(0.579)	(0.680)	(0.660)	(0.896)
Observations	55	55	55	55	55	55
R-squared	0.855	0.870	0.826	0.861	0.878	0.906

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the observed cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. The explanatory variables are the predicted dependent variables based on the IPWRA estimator and fiscal space. There is a misspecification error in the model when the coefficient associated with fiscal space is significant.

Table B.12: Misspecification error and relevance of fiscal space, normal recessions, ATT estimates

Panel A: IPWRA model without fiscal space and interaction term between fiscal space and normal recessions						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	0.879***	0.421***	0.583***	0.713***	0.725***	0.801***
	(0.113)	(0.159)	(0.143)	(0.104)	(0.104)	(0.078)
Constant	-0.306	0.796***	1.983***	2.197***	3.244***	3.072***
	(0.219)	(0.264)	(0.598)	(0.575)	(0.536)	(0.714)
Observations	58	58	58	58	58	58
R-squared	0.536	0.219	0.328	0.453	0.502	0.569

Panel B: IPWRA model without fiscal space and interaction term between fiscal space and normal recessions, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	0.873***	0.424***	0.580***	0.715***	0.723***	0.800***
	(0.110)	(0.159)	(0.128)	(0.094)	(0.094)	(0.073)
Fiscal Space, t-1	-0.566	2.503	6.668	8.050**	8.981*	8.036
	(0.702)	(3.314)	(4.068)	(3.124)	(4.594)	(5.284)
Constant	0.130	-1.200	-3.308	-4.224*	-3.872	-3.313
	(0.736)	(2.564)	(3.004)	(2.171)	(3.618)	(4.244)
Observations	58	58	58	58	58	58
R-squared	0.538	0.231	0.357	0.479	0.528	0.585

Panel C: IPWRA model with fiscal space and without interaction term between fiscal space and normal recessions, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	0.862***	0.419***	0.571***	0.702***	0.710***	0.790***
	(0.112)	(0.158)	(0.127)	(0.097)	(0.097)	(0.082)
Fiscal Space, t-1	-1.126	2.278	5.758	5.881*	6.399	4.601
	(0.804)	(3.262)	(3.997)	(3.044)	(4.499)	(5.275)
Constant	0.549	-1.014	-2.540	-2.406	-1.671	-0.417
	(0.825)	(2.521)	(2.923)	(2.099)	(3.554)	(4.308)
Observations	58	58	58	58	58	58
R-squared	0.535	0.227	0.350	0.476	0.525	0.585

Panel D: IPWRA model with fiscal space and interaction term between fiscal space and normal recessions, fiscal space as explanatory						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Predicted dependent at horizon t+h	0.869***	0.421***	0.584***	0.716***	0.720***	0.795***
	(0.114)	(0.158)	(0.124)	(0.098)	(0.099)	(0.085)
Fiscal Space, t-1	-0.187	1.241	2.948	2.182	2.682	1.699
	(0.631)	(2.981)	(3.697)	(2.833)	(4.297)	(5.235)
Constant	-0.181	-0.192	-0.368	0.436	1.168	1.816
	(0.679)	(2.301)	(2.668)	(1.938)	(3.424)	(4.305)
Observations	58	58	58	58	58	58
R-squared	0.540	0.224	0.355	0.485	0.529	0.586

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the observed cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. The explanatory variables are the predicted dependent variables based on the IPWRA estimator and fiscal space. There is a misspecification error in the model when the coefficient associated with fiscal space is significant.

Table B.13: Alternative measures of fiscal space, financial crises, ATT estimates

Panel A: Average fiscal space over two years prior to shock						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial crisis, t	-7.277**	-9.794***	-11.105***	-14.258***	-17.505***	-16.938***
	(2.946)	(2.285)	(3.587)	(3.724)	(4.291)	(6.083)
Financial crisis, t X FS, t-1	7.739*	6.288*	9.530*	15.093**	17.957***	17.648**
	(4.154)	(3.390)	(5.469)	(5.810)	(6.159)	(8.433)
Observations	55	55	55	55	55	55
Output gain when FS increases by one std. dev.	1.330	1.080	1.637	2.593	3.085	3.032

Panel B: Fiscal space computed using income group specific threshold						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial crisis, t	-6.705***	-12.172***	-13.857***	-15.554***	-18.262***	-18.616***
	(0.964)	(1.309)	(1.883)	(2.298)	(2.725)	(3.514)
Financial crisis, t X FS, t-1	7.380***	10.035***	13.998***	17.817***	20.083***	21.064***
	(1.576)	(1.274)	(3.299)	(4.011)	(3.987)	(5.233)
Observations	55	55	55	55	55	55
Output gain when FS increases by one std. dev.	1.614	2.195	3.062	3.897	4.393	4.608

Panel C: Fiscal space accounting for non-linearity						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial crisis, t	-4.347***	-8.245***	-7.813***	-8.188***	-10.402***	-9.989***
	(0.922)	(1.096)	(1.287)	(1.282)	(1.534)	(2.264)
Financial crisis, t X FS, t-1	6.002***	6.634***	8.059**	10.948***	13.277***	13.117**
	(2.281)	(1.829)	(3.683)	(4.169)	(3.848)	(5.202)
Observations	55	55	55	55	55	55
Output gain when FS increases by one std. dev.	1.693	1.872	2.274	3.089	3.746	3.700

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. Conditional effects of shocks on pre-shock fiscal space. The first-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. The second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

Table B.14: Alternative measures of fiscal space, normal recessions, ATT estimates

Panel A: Average fiscal space over two years prior to shock						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Normal recession, t	-4.569***	-8.339***	-12.417***	-12.432***	-17.850***	-22.231***
	(0.882)	(1.744)	(4.121)	(4.068)	(4.493)	(4.774)
Normal recession, t X FS, t-1	-1.403	7.628***	12.788**	11.624**	19.224***	24.766***
	(1.186)	(2.233)	(5.425)	(5.493)	(6.019)	(6.391)
Observations	58	58	58	58	58	58
Output gain when FS increases by one std. dev.	-	1.308	2.193	1.993	3.297	4.247

Panel B: Fiscal space computed using income group specific threshold						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Normal recession, t	-4.964***	-6.638**	-9.843**	-12.689***	-16.363***	-18.579***
	(0.641)	(2.938)	(4.088)	(3.755)	(5.014)	(4.901)
Normal recession, t X FS, t-1	-0.950	5.749	10.003*	12.503**	18.170**	21.127***
	(1.169)	(3.966)	(5.680)	(5.265)	(6.962)	(6.910)
Observations	58	58	58	58	58	58
Output gain when FS increases by one std. dev.	-	1.256	2.186	2.732	3.971	4.617

Panel C: Fiscal space accounting for non-linearity						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Normal recession, t	-5.016***	-4.629***	-6.426***	-7.782***	-9.086***	-10.167***
	(0.341)	(1.195)	(1.903)	(1.881)	(2.295)	(2.410)
Normal recession, t X FS, t-1	-1.162	4.091*	7.256*	7.968**	11.328**	13.258***
	(0.930)	(2.295)	(3.847)	(3.914)	(4.735)	(5.017)
Observations	58	58	58	58	58	58
Output gain when FS increases by one std. dev.	-	1.153	2.045	2.246	3.193	3.737

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. Conditional effects of shocks on pre-shock fiscal space. The first-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. The second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

Table B.15: Shocks not followed by subsequent shocks in the next five years, ATT estimates

Panel A: Financial crises						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Financial crisis, t	-8.168***	-14.609***	-17.022***	-20.724***	-23.176***	-22.675***
	(1.915)	(2.458)	(3.300)	(3.623)	(3.959)	(4.086)
Financial, t X FS, t-1	8.384***	11.487***	16.454***	23.273***	25.867***	26.204***
	(2.910)	(2.551)	(3.845)	(4.419)	(4.783)	(5.796)
Observations	45	45	45	45	45	45
Output gain when FS increases by one std. dev.	1.555	2.130	3.051	4.315	4.797	4.859

Panel B: Normal recessions						
	(1)	(2)	(3)	(4)	(5)	(6)
	t+0	t+1	t+2	t+3	t+4	t+5
Normal recession, t	-5.965***	-13.877***	-17.819***	-20.226***	-23.070***	-25.761***
	(1.057)	(1.951)	(2.562)	(2.725)	(4.048)	(4.512)
NRecession, t X FS, t-1	0.515	13.581***	18.364***	21.113***	25.040***	29.122***
	(1.727)	(2.842)	(4.368)	(4.491)	(6.420)	(6.614)
Observations	43	43	43	43	43	43
Output gain when FS increases by one std. dev.	-	2.513	3.397	3.906	4.633	5.388

Notes: ATT estimates. Driscoll-Kraay standards errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Dependent variables are the cumulative changes of output from the start of shocks to each horizon 1-5 after the shock. Sample restricted to be exactly the same in all regressions. Conditional effects of shocks on pre-shock fiscal space. The first-stage treatment models used to predict the propensity scores are estimated using the covariate balancing propensity score algorithm and include as predictors of shocks: # of financial crises, t-3 to t-1, # of normal recessions, t-3 to t-1, intensity of conflicts, t-3 to t-1, growth, t-1, growth, t-2, output gap, t-1, REER gap, t-1, current account, t-1, log of Real GDP, t-1, terms of trade, t-1, presence of fiscal rule, t-1, political rights, t-1,presence of IMF program, t-1, and world growth, t-1. As shown in tables B.3 and B.4, weighting the determinants of shocks by the propensity score predicted in the first-stage models perfectly eliminate differences in characteristics between countries hit by shocks and countries in normal times. The second-stage outcome models are separately estimated for countries hit by shocks and countries in normal times using the weights from the first-stage models, and predict the potential outcomes based on the characteristics of each sample after re-randomization. They include as control variables the same variables in the first-stage models except the output gap, t-1, REER gap, t-1, and current account, t-1. The results from the first- and second-stages models can be obtained upon request.

Part II:

Igniting Growth Surges: What, exactly, Can Countries do? What Role for the IMF?

CHAPTER 4

IGNITING GROWTH SURGES: LESSONS FROM THE PAST

Abstract

"What, exactly" can countries do to initiate an episode of growth surge? I identify 132 episodes of growth surges in 117 countries over the period 1980-2010. I find that disproportionate improvements in macroeconomic stability and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. Countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Also, macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges. Finally, there is a notable difference between decades, regions, and levels of development, which calls for careful tailoring of policies aiming at igniting growth surges to local conditions.

Keywords: Growth surges; Macroeconomic stability; External factors; Structural reforms; Noise-to-Signal Ratio; Binary outcomes models
JEL Codes: O11; O47; F43; E65

4.1 Introduction

"Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia's or Egypt's? If so, what, exactly? If not, what is it about the nature of India that makes it so? Once one starts to think about them, it is hard to think about anything else."

—Lucas (1988), p. 5

"What exactly?" I do not think that this question is outdated, even for India that experienced two episodes of sustained growth since 1989; because many countries around the world failed to grow faster over a prolonged period, and those that successfully did so still need to achieve growth surges to address the global challenges of this era. Indeed, igniting periods of sustained growth can have quantitatively huge implications for national income, poverty, and more broadly, for population well-being. Pritchett et al. (2016) estimate that the top 20 acceleration in the last six decades had a net present value of 30 trillion dollars: twice the size of US GDP, and Chen

and Ravallion (2010) and Radelet (2016) show that growth surges in China and India, and also in Indonesia, Pakistan, and Vietnam contributed to the reduction in global poverty since 1981.[1]

As Easterly et al. (1993) first highlighted and many others have confirmed since, growth process tends to be highly unstable and exhibit multiple structural breaks (see, e.g. Pritchett 2000; Hausmann et al. 2005; Jones and Olken 2008; Aizenman and Spiegel 2010; Jong-A-Pin and de Haan 2011; Pritchett et al. 2016; Peruzzi and Terzi 2018). The more typical pattern is that countries experience phases of growth, stagnation, or decline of varying length. Therefore, the focus of the "first-generation" neoclassical growth models (see, e.g. Solow 1956; Swan 1956) and the "second generation" endogenous growth theories (see, e.g. Romer 1986, 1987; Lucas 1988; Barro 1991) on long-run growth averages for a country may hide distinct periods of success and failure.

Moving away from explaining long-run growth averages to explaining growth surges is crucial; however, not straightforward. It necessitates the identification of the timing of growth surges and their determinants. First, three types of approaches have been used to identify growth surges: (i) a filter-based approach, (ii) a statistical structural breaks approach (see, e.g. Kerekes 2007; Jones and Olken 2008; Berg et al. 2012), and (iii) a combination of the two previous approaches (see, e.g. Kar et al. 2013a,b; Munro 2020). Although none of the methods is perfect, the filter-based approach remains the parsimonious and easiest way of detecting growth surges and having a clear understanding of the process that leads to their determination by setting reasonable criteria. Also, it allows setting different criteria to identify multiple sets of growth surges to be used as robustness checks. I, therefore, employ it and identify 132 episodes of growth surges in 117 countries over the period 1980-2010. I also find that the unconditional probability of growth surges was higher in the decade 2000-2010, in emerging countries, in Asia and the Pacific, the Middle East and Central Asia, and Europe.

Second, turning to the determinants of growth surges, the literature found inconclusive results. Among others, Hausmann et al. (2005) concluded that investment and trade, real exchange rate depreciation, political regime changes, external factors, and economic reforms, "on the whole, [...] do a very poor job of predicting the turning points. [...] growth accelerations are caused predominantly by idiosyncratic, and often small-scale changes" and Peruzzi and Terzi (2018) pointed that "growth accelerations are extremely hard to engineer with a high degree of certainty [...] roughly 9 out of 10 instances failed to ignite a take-off". Jong-A-Pin and de Haan (2011) highlighted the important role of economic liberalizations while they found that a move toward more democracy reduces the likelihood of growth surges. Berg et al. (2012) pointed out

[1] There is a literature that shows that growth surges are not the only cause of the reduction of poverty, and sometimes even fail to do so (see, e.g. Munro 2020). However, there is no doubt that it has contributed to growth reduction in many countries.

the critical role of macroeconomic stability and trade diversification to ignite and sustain growth. In this paper, I attempt to reconcile the existing papers. To do so, after identifying the growth determinants in the growth surge literature and general literature on growth, I classify them in six broad categories of determinants: (i) external factors and endowments, (ii) institutions, (iii) macroeconomic stability, (iv) structural reforms, (v) trade diversification and quality, and (vi) investments, labor, and productivity. I further analyze how significant changes in these determinants are related to growth surges. Then, I develop a new strategy and employ the non-parametric noise-to-signal ratio method introduced by Kaminsky et al. (1998) to identify significant changes in many of these determinants that are essential for growth. As in Rodrik (2019) and Hausmann et al. (2008), my theoretical understanding of the initiation of growth surges is that, each country as its realities, and then its impediments to growth. For some, the concerns may be a high level of inflation, debt, or deficit, for other the lack of infrastructures or a corrupted political system, and so on. Therefore, my determinants should account for country characteristics. Finally, I use a more comprehensive empirical analysis where growth surges are explained by all the six broad determinants.

My results are as follows. First, all growth determinants have a significant and positive effect on the probability of initiating growth. However, improvements in macroeconomic stability, and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. Second, when looking at the two-way interactions of growth determinants, I show that countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Besides, I find that significant changes in either macroeconomic stability or external factors are needed to have a higher and positive effect of the other broad determinants on growth surges. Third, there is a notable difference between decades, regions, and levels of development. This calls for careful tailoring of policies aiming at igniting growth surges to local conditions. Fourth, one clear message from this analysis is that the capacity to ignite growth surges relies on the capacity to restore or preserve macroeconomic stability, although other determinants also matter.

I have several contributions to the literature. First, to the best of my knowledge, this is the first paper of growth surges that fully covers and characterizes the growth surges of the 2000s. In this decade, all the determinants turn to have a higher, positive, and significant effect on the probability of a growth surge compared to the 1980s and 1990s. Second, I use an extensive list of growth determinants that I combine in different broad categories to create a good narrative. Third, I employ an optimization process to identify the threshold beyond which significant changes or improvements in the broad determinants occurred in a way

that accounts for country-specific characteristics. Fourth, I show that growth surges exhibit a significant predictive component and that disproportionate changes of determinants, when they are accurately identified, can significantly impact the likelihood of growth surges, contrary to the existing literature (see, e.g. Hausmann et al. 2005; Gupta et al. 2005; Peruzzi and Terzi 2018). I, therefore, solve the "poor predictive power" problem of the literature. Fifth, there exists combinations of growth determinants that may help to maximize the probability of growth surges. Sixth, macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges.

The remainder of the paper is organized as follows. Section 4.2 identifies growth surges. Section 4.3 presents the growth determinants and the strategy used to determine significant changes of these determinants, as well as results of the noise-to-signal ratio as a prerequisite for the comprehensive regression analysis. Section 4.4 describes the empirical analysis, baseline results, robustness checks, and sensitivity analysis. Section 4.5 presents the concluding remarks.

4.2 Growth surges identification and stylized facts

4.2.1 Growth surges identification

The first step in my analysis is to identify growth surges, i.e. sustained periods of relatively high growth. To do so, I employ a filter-based approach introduced by Hausmann et al. (2005) and used, e.g., by Hausmann et al. (2011), Aizenman and Spiegel (2010), and Libman et al. (2019). Following the seminal work of Pritchett (2000), three types of approaches have been used to identify growth surges : (i) a filter-based approach, (ii) a statistical structural breaks approach (see, e.g. Kerekes 2007; Jones and Olken 2008; Berg et al. 2012), and (iii) a combination of the two previous approaches (see, e.g. Kar et al. 2013a,b; Munro 2020). This literature on how to determine turning points in growth dynamics highlighted the main limitation of the filter-based approach - the use of filters pre-determined by the researcher is ad-hoc and may lead to lack of consistency across studies that use this method. However, the second approach or Bai and Perron (1998) method has also several potential issues. First, this method may capture "growth spells" following a period of sharply negative growth where the level of per capita income fails to reach its previous height. Second, this method may capture "growth spells" where the average growth rate during the spell differs relatively little from the growth rate before the spell. Third, and more importantly, the Bai-Perron test used in this approach has a low power so that it is unable to identify genuine breaks in highly volatile series (the "true negative" problem). Besides, the

papers that sustained improving the two other methods by combining them may also bear their shortcomings, and generally leads to similar identification than the filter-based approach when applying the same criteria.

Against this backdrop, the filter-based approach remains the parsimonious and easiest way of detecting growth surges and having a clear understanding of the process that leads to their determination by setting reasonable criteria. Also, it allows me to set different criteria and identify multiple sets of growth surges to be used in the robustness checks. In line with most of the papers in the literature, I assume that a growth surge lasts a minimum of eight years (i.e., $n = 7$).[2] My criteria are as follows

1) $g_{t,t+n} \geq 3.5$ pp., i.e., growth is rapid: the average annual growth rate of real income per capita over the next eight years is at least 3.5 percentage points.

2) $\Delta g_{t,n} = g_{t,t+n} - g_{t-n,t} \geq 2.0$ pp., i.e, growth accelerates: the average annual growth rate over the next eight years is at least 2 percentage points above the one of the previous eight years period.

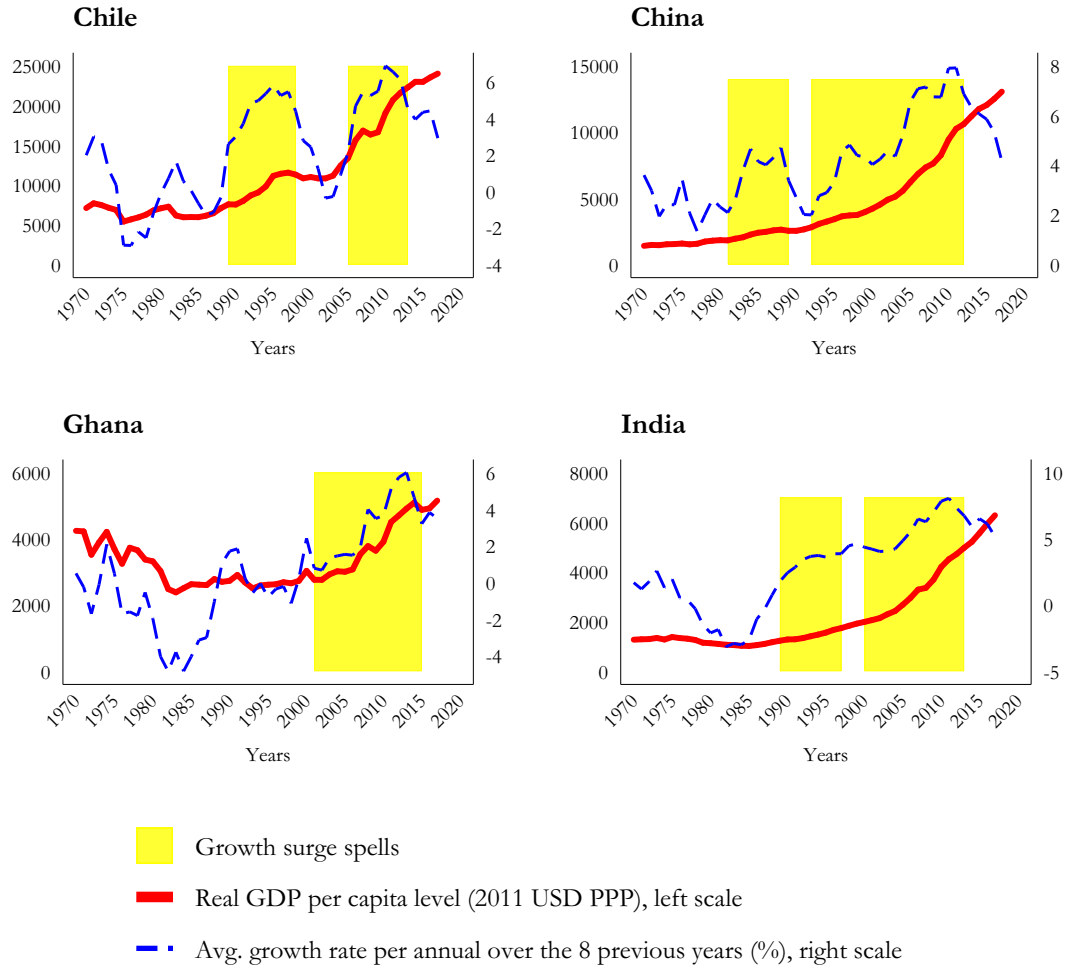
3) $y_{t-1} >= max(y_{t-n}, ..., y_{t-1})$, i.e, the level of income per capita one year before the start of the growth surge is the peak of the pre-episode period.

A few comments are in order here. First, my first-two criteria are like those in Hausmann et al. (2005), but the third one is different. Indeed, Hausmann et al. (2005) set the criteria to be $y_{t+n} >= max(y_{t-n}, ..., y_{t-1})$, i.e., the income level the eighth year after the surge exceeds its pre-episode peak. By doing so, they may capture episodes in which the first years are "pure recovery" from previous bad shocks (like natural disasters, major political upheavals, or wars). The more stringent criterion used in this analysis helps avoid identifying growth surges capturing recovery from bad shocks. Second, when these criteria are met in consecutive years, I deem the first instance to be the "best" starting date. Third, I do not allow countries to have overlapping growth surges. If these criteria are met within an overlapping period of eight years, then I extend the end date of the surge.[3] To check the robustness of my results, I employ the same criteria than Hausmann et al. (2005), or "stricter" or "looser" filters.

[2]The use of shorter periods (e.g. between three or five years) may capture pure recovery from a bad shock or business cycles. The use of longer duration may significantly reduce the number of episodes that can be identified. However, I test the robustness of my findings to using episodes of at least six or ten years.

[3]More specifically, if these criteria are met within overlapping periods, then the final year of the latter period has deemed the end of the growth surge (e.g. if the criteria are met in 1980 and 1986 then the end of the growth surge would be 1993).

Figure 4.1: Illustration of identified growth surges: cases of Chile, China, Ghana, and India



Notes: The figures show episodes of identified growth surges.

4.2.2 Stylized facts on growth surges

4.2.2.1 Country illustration

Application of this procedure using real income per capita at PPP values from the Penn World Tables for 169 countries (eliminating countries that do not have enough data series) identifies 132 episodes of growth surges in 117 countries over the period 1980-2010. I also find that 102 countries experience one growth surge and 15 countries experience two growth surges over the full period, indicating nonetheless that growth surges are a surprisingly widespread phenomenon. Figure 4.1 shows typical episodes of growth surges identified by the filters. I present the cases of Chile, China, Ghana, and India (some of them are well-known by growth

economists). One can notice that during episodes of growth surges the average growth rate over the last past eight years spikes at the start of the episodes and remains higher for several years until the end of the episodes; it looks like a mountain. At the same time, income per capita continuously increases to reach very high levels never encounter in the countries (except if they had a dramatic collapse as we can see in less developed economies). Indeed, Chile had two episodes of growth surges between 1989 and 1998, and 2005 and 2013; where the average growth was 4.1 and 5.8%, respectively. Since the start of the first episode, income per capita has tripled to reach 22291 USD PPP. Similarly, China also had two episodes. The first one began in 1981 and lasted nine years in which the average growth rate was 3.8%. The second started three years later the first, i.e. in 1992 and lasted 21 years (this is the second-largest duration of growth surges after 1980, after the Bolivia case from 1992-2013). Since the first growth surge, China's income per capita went from 1826.9 to 10596.5 USD PPP. As the case of Ghana illustrates, growth surges have also occurred in low-income countries. It started in 2001 until 2015, in which the average growth rate was 3.9% and where income per capita was multiplied by 1.8 to reach 4875 USD PPP. Finally, India has two growth surges starting in 1989 and 2000, and lasting 9 and 14 years, respectively. The average growth rate during these episodes was 3.9 and 6.8%, which helps to boost income per capita that went from 1232 to 4975.8 USD PPP at the end of the last episode. Table C.1 shows the full list of growth surges and related information as identified by my criteria.[4]

4.2.2.2 Statistics and unconditional probability

The 132 growth surges episodes identified occurred mainly in the decade 2000-2010 (65 episodes, i.e. 49.2%), followed by the decade 1990-1999 (40 episodes, i.e. 30.3%), and less in the decade 1980-1989 (27 episodes, i.e. 20.4%). Besides, the region that has had the largest number of episodes was Europe with 34 cases (25.8%); it was followed closely by Asia and the Pacific and Africa regions with 28 and 26 cases (around 20%), respectively. The Middle East and Central Asia, and the Americas and Caribbean regions had 22 cases each (16.7%). Finally, the growth surges were largely concentrated in current emerging economies in which 79 cases (59.9%) were identified, followed by low-income countries with 34 cases (25.8%), and advanced economies with 19 cases (14.4%). To get a better sense of the distribution of growth surges, I look at the unconditional probability by decades, regions, and income levels. The unconditional probability is defined as the ratio of episodes over the number of years where an episode may occur. I exclude the non-starting years of growth surges because an episode cannot take place then. Table 4.1 reports the unconditional probabilities. I find that the average

[4]Due to the nature of filters, episodes can only be obtained over the period 1980-2010. Therefore, my analysis focuses on this period.

unconditional probability in my sample is 3.6% (slightly above the 2.8% found in Hausmann et al. (2005) over the period 1957-1992). Saying otherwise, it means that a typical country would have 36% chance of experiencing a growth surge in a decade. Looking at the unconditional probabilities by decades, it was almost twice higher in 2000-2010 (5.7%) compared with the decades 1990-1990 (3.3%) and 1980-1989 (2.1%). There is no doubt that growth surges have significantly increased over the decades. Looking by regions, the unconditional probability was almost three-times higher in Asia and the Pacific (6.4%), and twice higher in the Middle East and Central Asia (5.0%) compared to the Americas and Caribbean (2.8%) and Africa (2.2%). In all these regions, the unconditional probability has increased over the decades. Looking at the levels of development, emerging economies are dominating the occurrence of growth surges with an unconditional probability of 4.8% compared to around 2.7% in low-income countries, and 2.5% in advanced economies. The low performance for low-income countries is driven by the low unconditional probability in the decades 1980-1989 and 1990-1999, which substantially increase in the decade 2000-2010. This fact is also observed in emerging economies while I find a diminution of the unconditional probability in advanced economies over time.

Table 4.1: Unconditional probability, by decades, regions, and levels of development

	Decades			
	1980-1989	**1990-1999**	**2000-2010**	**Total**
Regions				
Africa	0.008	0.016	0.045	0.022
Asia and Pacific	0.051	0.060	0.085	0.064
Europe	0.029	0.051	0.050	0.044
Middle East and Central Asia	0.012	0.056	0.100	0.050
Americas and Caribbean	0.021	0.015	0.049	0.028
Levels of development				
LICs	0.007	0.018	0.062	0.027
EMs	0.025	0.044	0.085	0.048
AEs	0.036	0.035	0.010	0.025
Total	0.021	0.033	0.057	0.036

4.3 Growth determinants

To paraphrase Lucas (1988), “What, exactly" can countries do to initiate an episode of growth surge? This question has always been central to all economists. In this section, I develop a new strategy to identify significant changes in many factors that are essential for growth. As in Rodrik (2019) and Hausmann et al. (2008), my theoretical understanding of the initiation

of growth surges is that, each country as its realities, and then its impediments to growth. For some, the concerns may be a high level of inflation, debt, or deficit, for other the lack of infrastructures or a corrupted political system, and so on. Therefore, my determinants should be country-specific and account for country characteristics. Given that, if a country can eliminate its “binding constraints", growth may accelerate. In this country, I should expect to capture significant changes in growth determinants in the run-up of the take-off. This means that while the changes should be country-specific, I can identify a set of standard growth determinants that the literature found to be crucial for predicting medium to long-term growth, and check how they evolve in the run-up of the take-off in a way that accounts for the country characteristics. In other words, first, I start by identifying the main determinants of growth without looking at the specific economic situation of a country. Second, I identify significant changes at the country-level for all the determinants and focus on the period before the growth surge (over five years before the start). Third, if I find that in the run-up of a growth surge, there were significant changes or improvements in one determinant, I assume that this determinant was potentially a bottleneck to growth in this country. Consequently, this strategy allows identifying ex-post potential country-specific bottlenecks to growth surge in each country. As one will notice in the results section, this strategy solves the “poor predictive power" problem of the literature.

4.3.1 Categorization of growth determinants

To identify growth determinants, I rely on the existing growth surges literature (see, e.g. Hausmann et al. 2005; Gupta et al. 2005; Hausmann et al. 2008; Kerekes 2007; Jones and Olken 2008; Aizenman and Spiegel 2010; Jong-A-Pin and de Haan 2011; Berg et al. 2012; Peruzzi and Terzi 2018) and general literature on growth (see below). I classify them in six broad categories of determinants.[5]

1) **External factors and Endowments:** many papers have shown the importance of external factors (see, e.g. Edwards and Van Wijnbergen 1987; Easterly et al. 1993; Barro 2003; Hamann and Prati 2002; Gupta et al. 2005) and natural resources endowments (see, e.g. Manzano and Rigobon 2001; Mehlum et al. 2006; Sala-i Martin et al. 2004; Mideksa 2013) for growth. This broad determinant captures the effects of “good luck" (favorable external conditions or discoveries of natural resources). I, therefore, include in this category: (i) trading partners’ growth, (ii) terms of trade, (iii) nominal US FED interest rate, (iv) volatility of S&P 500 index returns, and (v) total natural resources rents.

[5]This practice is uncommon in the literature and was applied in Peruzzi and Terzi (2018). However, the set of variables that I use in this analysis is quite extensive compared to what is done in the literature.

2) **Institutions:** Institutional factors have proven to be central and critical for growth through its direct effects on growth or its conditional effects on other growth determinants (see, e.g. Acemoglu et al. 2001; Hamann and Prati 2002; Barro 2003; Gupta et al. 2005; Mehlum et al. 2006; Jong-A-Pin and de Haan 2011; Berg et al. 2012; Giuliano et al. 2013). However, the literature that focuses on the political regime (democracy versus autocracy) is very inconclusive and sometimes points toward a higher likelihood of growth surges in autocracy or democracy. I think that beyond everything, what matters for growth is not the political regime, but rather the quality of institutions (accountability, corruption, civil liberties, economic freedom, rule of law) and how they organize or affect the economic choices. Thus, I rely on different indexes that measure: (i) government's accountability, (ii) civil liberties, (iii) political corruption, and (iv) the rule of law.

3) **Macroeconomic stability:** Does an economy may grow faster when debt exceeds 90% or when inflation is greater than 40%? Indeed, macroeconomic stability is a prerequisite to sustained growth, a view that is cherished by multilateral institutions (see, e.g. Mussa and Savastano 1999; Collier and Hoeffler 2004; Easterly 2005). Many papers have highlighted the significant role of macroeconomic stability for growth (see, e.g. Dornbusch et al. 1995; Bruno and Easterly 1998; Berg et al. 2012; Darvas 2012; Libman et al. 2019). For countries with significant macroeconomic stability, demand-restraining measures, sometimes combined with exchange rate depreciation may be needed before take-off takes place. Consequently, I include in this category: (i) end of financial crises and normal recessions, (ii) public debt, (iii) current account, (iv) inflation, and (v) change of real effective exchange rate.

4) **Structural Reforms:** Igniting growth surges heavily depends on the structure of the economy and the capacity to implement structural reforms to eliminate the bottlenecks of the economy (see, e.g. Ahluwalia 2002; Panagariya 2004; Gupta et al. 2005; Giuliano et al. 2013; Prati et al. 2013; IMF 2019; Libman et al. 2019). Moreover, while achieving macroeconomic stability (which is not without any cost for the economy), structural reforms may be needed to significantly increase the allocation of resources and their effectiveness that would have a medium to long-term effect on growth; this has been the strategy adopted in IMF-supported programs (see, e.g. Mussa and Savastano 1999). I therefore include in this category different sets of reforms including: (i) agriculture-, (ii) product market-, (iii) labor market-, (iv) financial-, (v) trade-tariff-, (vi) current account-, and (vii) capital account reforms.

5) **Trade diversification and quality:** Many countries achieved a higher level of devel-

opment because they succeeded the diversification of their exports and trading' partners while improving the quality of the products they export and import (machinery and highly technological products) (see, e.g. Hausmann et al. 2007, 2011; Berg et al. 2012; Cadot et al. 2013). Consequently, I use in this category: (i) export and (ii) import quality, (iii) product, and (iv) partner diversification.

6) **Investments, labor and productivity:** The neoclassical models of long-term growth stressed out the importance of investments in determining growth (see, e.g. Solow 1956; Swan 1956; Gupta et al. 2005) while the endogenous-growth models stressed out the importance of human capital and productivity (see, e.g. Romer 1986, 1987; Lucas 1988; Barro 1991; Joshua 2015; Gupta et al. 2005). I, therefore, include in this category: (i) domestic investment (both private and public investments), (ii) foreign direct investment, welfare-relevant total factor productivity, and (iii) human capital index. These factors are more direct determinants of growth, and may also be determined by the other determinants 1) to 5).

My list of the six broad growth determinants is quite extensive and will allow identifying what matters for igniting growth surges. Table C.2 reports the full list of growth determinants and their sources, and table C.3 presents the summary statistics of all variables.

4.3.2 Identifying significant changes or improvements of growth determinants

As said in the chapeau of this section, the second step in my strategy consists of identifying significant country-specific changes or improvements in each of the growth determinants. To do so, I employ the noise-to-signal ratio introduced by Kaminsky et al. (1998) to predict currency crises, and used, e.g. by Balducci et al. (2011); Berti et al. (2012); Cerovic et al. (2018); Atsebi et al. (2020) to predict fiscal crises and construct an index of fiscal space. More specifically, for each indicator and country, I draw the country-specific percentile distribution of the change of each indicator and identify thresholds in the upper tail of the distribution beyond which a signal is issued (higher changes of the determinants). Thus, the distribution is divided into two parts, with and without a signal. The threshold that divides the distribution is a percentile that is endogenously determined by minimizing the total misspecification errors (sum of type I and II

errors) and ensuring a balance of the two types of statistical errors.[6] [7] [8] The use of percentiles to define thresholds, instead of absolute values, takes into consideration structural differences across countries and identifies significant changes in a country-specific fashion, based on the country's history.

Table 4.2: Illustration of the signals approach method

	No Growth surge (T)	Growth surge (T)
No signal (T-h,T)	**A (true negative)**	**B (missed or error type II)**
Signal (T-h,T)	**C (false alarms or error type I)**	**D (true positive)**

The results of the signal analysis can be summarized in a matrix as in table 4.2 in which the occurrence of growth surges and the issuance of signals of each indicator are measured against each other. I assume that it may take time to initial growth surge, and then I consider that a genuine signal is the one occurring in the five years before the growth surge (i.e., $max(h) = 5$). The error type I or share of false alarms among non-growth surges is defined as $C/(A + C)$, and the error type II or share of missed growth surges among growth surges is defined as $B/(B+D)$. Then, the total misspecification error is the sum of errors type I and II, i.e. $TME = C/(A+C)+B/(B+D)$, and the predictive power is one minus the total misspecification error, i.e. $PW = 1 - TME$. I can also define two other performance indicators: the effectiveness defined as the share of true positive among all signals, i.e. effectiveness= $D/(C+D)$, and the incidence defined as the share of true positive among all growth surges, i.e. incidence= $D/(B + D)$. After identifying optimal thresholds beyond which signals are issued (i.e., significant changes of growth determinants occurred), I construct six indexes of broad determinants of growth as presented in the previous section. These indexes GD_j are the weighted average of all signals in sub-determinants i where the weights w_i are the predictive powers $(1 - TME)$, i.e.:

$$GD_{jt} = \sum_{i=1}^{n} w_i \times d_{it} \; where \; d_{it} = 1 \; if \; signal \; and \; 0 \; otherwise \tag{4.1}$$

One can notice that the indexes of each broad determinant of growth surges are increasing with significant changes or improvements in the sub-determinants of this broad determinant. For

[6] Clearly, this strategy does not apply to dichotomic variables like the end of financial crises or normal recessions. In this case, I use the year in which the end of the financial crisis or normal recessions occurred as the signal.

[7] Determinants that harm growth such as public debt and inflation are multiplied by minus (-) so that improvements of these determinants also fall in the upper tail of its new distribution. A lower threshold (the model sends fewer signals) is associated with an increase of type II errors or missed crises, but at the same time, a decrease of type I errors or false alarms.

[8] A higher threshold (the model sends more signals) is associated with a decrease of type II errors or missed crises, but at the same time, an increase of type I errors or false alarms. The thresholds are determined endogenously between the 70^{th} and 90^{th} percentiles.

instance, if there is a significant reduction of the level of debt, deficit, and inflation, coupled with a depreciation of real exchange rate to boost competitiveness, and an end of a financial crisis, the macroeconomic stability index will increase. The results of the noise-to-signal approach, as well as the assumption on the direction of effects for the sub-determinants, are reported in table C.4. These results show that almost all the sub-determinants have a good predictive power (see, incidence and effectiveness indicators, and total misspecification errors) of growth surges. This means that I have identified good determinants and that my optimization strategy is capturing significant changes or improvements in determinants related to growth surges. Hereafter, I will focus on the results of the broad determinants.

4.3.3 Advanced stylized facts on growth surges

Now that I identify significant changes for each of the six broad determinants of growth surges, I can characterize growth surges by looking at the incidence or the probability that growth surges were preceded by significant changes of determinants, and the effectiveness or the probability that significant changes were followed by growth surges. From the theoretical standpoint, one can think of incidence as a necessary condition to ignite growth surges while the effectiveness relates to a sufficient condition. As in the unconditional probability analysis, I drop non-starting years of growth surges as growth surges cannot occur in these years when analyzing the performance of growth determinants.

Table 4.3 displays the incidence and effectiveness of all the six broad determinants. I find that the probability that growth surges were preceded by significant changes in each broad determinant is very high for all broad categories (it varies between 84 and 98.5%). This shows that many of growth determinants should significantly improve to create favorable conditions to jump-start growth in countries. Saying differently, all the different growth strategies found in the literature seem vindicated. This should not surprise given that the analysis focuses on the significant country-specific changes endogenously identified through an optimization process. Some caveats need to be done at this stage. These findings are challenging the existing results in the literature while reconciling them. For instance, Hausmann et al. (2005) found that “most growth accelerations are not preceded [. . .] by major changes in economic policies", in contrast to what I find here. Indeed, their findings were already questioned by Jong-A-Pin and de Haan (2011); Berg et al. (2012); Prati et al. (2013); IMF (2019); Peruzzi and Terzi (2018); Libman et al. (2019) who highlighted the critical role of macroeconomic stability. If one wants to highlight any difference between the broad determinants in terms of incidence, external factors, and endowments (98.5%) come first (as found by Easterly et al. 1993, who attested that “good luck" matters more macroeconomic and political stability); macroeconomic stability (91%),

investments, labor and productivity (91%), and trade diversification and quality (89%) come in the second position, followed by institutions (86%) and structural reforms (84%). However, as already stated above, an analysis of the effectiveness is needed to have a broader view of the performance of all the six broad determinants.

Table 4.3: Incidence and Effectiveness by broad determinants of growth surges

Broad determinants of Growth surges	# of GSs	Incidence	# of signals	Effectiveness
External factors and endowments	130	0.985	307	0.315
Institutions	113	0.856	272	0.304
Macroeconomic stability	120	0.909	301	0.372
Structural reforms	111	0.841	291	0.345
Trade diversification and quality	118	0.894	292	0.292
Investments, labor and productivity	120	0.909	243	0.321
Unexplained	0	0.000	-	-
Total # of GSs		**132**		

Notes: Numbers of GSs in the table are those preceded by a signal in each broad determinant. Similarly, number of signals are those followed by a growth surge.

When comparing the values found for incidence and effectiveness, I show that while many of the growth surges were preceded by a significant improvement in all of the six broad determinants, around 65% of the signals for each of broad determinants were not followed by a growth surge. However, the effectiveness found here remains quite higher compared to other papers (see, e.g. Peruzzi and Terzi 2018), perhaps because they set ad-hoc values for the thresholds while I find them through an optimization process. In a nutshell, I find that 37.2% of the significant improvements in macroeconomic stability were followed by a growth surge; this figure stands at 34.5% for structural reforms, around 30% for investments, labor and productivity, external factors and endowments, institutions, and trade diversification and quality. As a complementary analysis, I present how the general findings highlighted in this section vary by decades, regions, and levels of development (see, Tables C.5 to C.7).

When looking at the incidence by decades, regions, and levels of development, the general picture found above remains true, i.e., almost all the growth surges were preceded by significant changes or improvements in each of my six broad determinants. In contrast, there is a notable variation of the effectiveness of the six broad determinants by decades, regions, and levels of development (in line with the unconditional probabilities shown above). First, the effectiveness of all the six broad determinants has increased over decades; especially for structural reforms, trade diversification and quality, and investments, labor and productivity that more than doubled between 1980-1989 and 1990-1999 and were multiplied by more than 3 between 1980-1989 and 2000-2010. The other determinants also increased and were multiplied by around 1.5 between 1980-1989 and 1990-1999, and more than doubled between 1980-1989 and 2000-2010. Second,

the effectiveness was quite similar in Europe, the Middle East and Central Asia, and Asia and the Pacific, with minor exception, and stands between 36 and 60% in these regions. Unfortunately, it was importantly lower in Africa, and the Americas and Caribbean, between 16 and 23%, depending on the determinants, compared to the other regions. Finally, when looking at effectiveness by levels of development, I find that it was higher in emerging economies, between 36 and 45% while it was relatively lower in low-income countries and advanced economies (between 20 and 34%).

Here, two caveats are worth noting. First, while growth surges are rare phenomena (unconditional probability is low and is equal to 3.6%), significant improvements of the broad determinants of growth lead to a relatively good probability of igniting growth surges. Again, achieving significant improvements in the growth determinants may not be an easy task for policymakers. Second, the noise-to-signal ratio analyzes each of the six broad determinants and does not account for the possible correlation between them (especially as I show that many of the growth surges were preceded by almost all the broad determinants). This states that a more comprehensive analysis is needed to fully weight the power of each of determinants one against another before making conclusive recommendations on how to ignite growth surges.

4.4 Empirical analysis

4.4.1 Methodology

I now turn to a more comprehensive analysis of the growth surges determinants by employing binary outcomes models (logit in baseline and many others as robustness checks). My dependent is a dummy that takes the value one the three years centered on the first year of the growth surges identified by my filters and zero otherwise. The years were a growth surge cannot take place are excluded, i.e. I exclude all the non-starting years of the growth surges because I am interested in their initiation. For robustness purposes, I also present the baseline results where they are not excluded. Given that, my comparison group includes all country-years observations where a growth surge did not occur, including all countries that never experienced a surge. These practices are common in the literature (see e.g., Hausmann et al. 2005; Jong-A-Pin and de Haan 2011; Libman et al. 2019). The sample period covers the years 1980-2010, as restrained by my filters. The explanatory variables are the average of each of the six broad determinants constructed in the previous section calculated over the previous five years. I also use different horizons in the robustness checks. I, therefore, account for the size of the significant changes and assume that time is needed to ignite growth surges. Finally, I also include dummies for decades, regions, and levels of development to capture the heterogeneities found in the previous

section. This empirical setting is exempted from a reserve causality issue as I am looking at the forward-looking effects of significant changes in growth determinants.

4.4.2 Baseline results

Table 4.4 shows the baseline results, and fig. C.1 depicts the average marginal effects graphically. First, my models have a good predictive performance as presented in the bottom of the table (classification power equals around 90%, Area under the ROC is close to 0.8, and Pseudo R^2 equals 0.18 in my preferred model). Here one notable difference with the existing literature is worth noting. While I find here that the predictive power is quite high, the literature generally highlighted a very poor predictive power. I solve this "poor predictive power" problem of the literature by accounting for country-specificity and focusing on significant improvements of the growth surge determinants using an optimization process.[9] Also, the BIC criterion suggests that removing all non-starting years of growth surges improves the specification.

Second, I find that all growth determinants have a significant and positive effect on the probability of initiating growth, which is robust across the two specifications.[10] This finding is in contrast with many papers in the literature that generally stressed out the beneficial effects of few determinants while others have no significant effects (see, e.g. Hausmann et al. 2005; Jong-A-Pin and de Haan 2011; Berg et al. 2012). My identification strategy, which consists of grouping determinants in six broad determinants and identifying their country-specific and endogenous significant improvements, allows me to reconcile the findings in the literature: all determinants matter, but in different orders.

Third, I find that improvements in macroeconomic stability and external factors and endowments favor a higher probability of growth surge. A one-unit increase in each of these

[9]Indeed, Hausmann et al. (2005) sustained that "a lot of takeoffs take place when [...] conditions appear not to be particularly favorable [...] And growth takeoffs typically fail to materialize when the conditions are indeed favorable". Gupta et al. (2005) reinforced by stating that "The in-sample predictive power of both the acceleration and sustained acceleration models, however, is relatively poor. Thus, many acceleration episodes occur when the explanatory factors in the model would not predict an acceleration, and many times, even though the variables associated with accelerations are conducive, an episode does not take place. There are factors the model is not capturing, as well as country-level idiosyncratic factors that warrant further investigation to better guide policy. Predicting the timing, or onset, of growth accelerations is even more difficult.", and Peruzzi and Terzi (2018) concluded that "growth accelerations are extremely hard to engineer with a high degree of certainty [...] roughly 9 out of 10 instances failed to ignite a take-off". While I cherish the precautionary conclusion of Gupta et al. (2005), overall, these findings are completely misleading. Indeed, their studies fall short to identify growth surges determinants while accounting for the specificity of each country. Furthermore, they focus on a simple level of the growth determinants or set ad-hoc thresholds to identify favorable conditions while I identify the significant improvements beyond a certain threshold of the growth surges determinants through an optimization process. In a nutshell, accounting for country-specificity and focusing on significant and endogenous improvements of the growth surge determinants solve the "poor predictive power" problem of the literature.

[10]The lower average marginal effects found when non-starting years of growth surges are included shows that significant changes in growth determinants also occur during the growth surges, which may be necessary to sustain them. I address this research question in a separate paper this is forthcoming.

Table 4.4: Predicting growth surges, baseline results

	(1)	(2)
	All	**Drop GSs period**
External factors and endowments index, average [T-5,T]	0.341***	0.403***
	(0.066)	(0.083)
Institutions index, average [T-5,T]	0.053*	0.086**
	(0.029)	(0.038)
Macroeconomic stability index, average [T-5,T]	0.325***	0.439***
	(0.048)	(0.063)
Structural reforms index, average [T-5,T]	0.179***	0.263***
	(0.053)	(0.066)
Trade diversification and quality index, average [T-5,T]	0.152***	0.147***
	(0.038)	(0.048)
Investments, labor and productivity index, average [T-5,T]	0.082**	0.173***
	(0.038)	(0.050)
Africa (Base level)		
Asia and Pacific	0.057***	0.111***
	(0.013)	(0.019)
Europe	0.021*	0.053***
	(0.013)	(0.017)
Middle East and Central Asia	0.026**	0.042***
	(0.013)	(0.016)
Americas and Caribbean	0.000	-0.002
	(0.010)	(0.011)
1980-1989 (Base level)		
1990-1999	0.001	0.003
	(0.009)	(0.011)
2000-2010	0.030***	0.079***
	(0.011)	(0.015)
Advanced Economies (Base level)		
Low-Income Developing Countries	0.019	0.034**
	(0.013)	(0.015)
Emerging Economies	0.045***	0.090***
	(0.011)	(0.014)
Observations	4832	3763
# of GSs	132	132
Pseudo R2	0.118	0.181
Classification power	91.867	90.088
AUROC	0.752	0.794
BIC	2547.718	2200.353

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. In column (1), the non-starting period of growth surges are not deleted for robustness checks. Column (2) shows my preferred results were country-years observations in which growth surges may be occurred are removed.

determinants raises the probability of a growth surge by around 40%. They are followed by structural reforms; investments, labor, and productivity; and trade diversification and quality, for which a one-unit increase leads to a probability of a growth surge of 26.3, 17.3, and 14.7%, respectively. Last, improvements in institutions also increase the probability of growth surges,

but in a lower magnitude: a one-unit increase is associated with a probability of growth surge of 8.6%.[11] [12]

Fourth, as suggested by the descriptive analysis, I show that the likelihood of growth surges was higher in Asia and the Pacific, Europe, and the Middle East and Central Asia as opposed to Africa and the Americas and Caribbean. Besides, it increases in the decade 2000-2010 compared to the period 1980-1999. It was also higher in emerging countries than in low-income and advanced countries. Below, I analyze the sensitivity of the findings by decades, regions, and levels of development.

In sum, in the eyes of a policymaker of a typical country with issues in many of the growth determinants seeking to ignite growth surge, the best strategies will be to restore macroeconomic stability and benefit from favorable external factors and endowments. Next, implementing structural reforms, increasing investments, human capital, and productivity, and diversifying its production and trading partners will also be a good option. Finally, fighting corruption, and improving government accountability, civil liberties and rule of law may also be needed, but less efficient to ignite growth surge.

4.4.3 Robustness checks

I check the robustness of my baseline results to alternative timing conventions, estimation techniques, and sets of growth surges. First, I modify the timing needed for a growth determinant to ignite growth surge from five years, to seven (column 2) and three (column 3) years. The results are reported in table C.8. My results are qualitatively identical but slightly different in terms of magnitude. The average marginal effects increase, especially for external factors and endowments, and except for investments, labor, and productivity determinant, when I raise the timing convention from five to seven years. In contrast, the average marginal effects decrease when I consider a smaller duration of three years. This shows that it may take some years after the significant improvements in growth determinants to ignite growth surges and that five years seems reasonable (the BIC criterion suggests using this timing convention).

Second, I employ different estimation techniques. I estimate a pooled probit (column 2), a tobit (column 3) treating non-growth surges period as censored at zero, and Random-effects logit (column 4) and probit (column 5). The results presented in table C.9 in all cases are not

[11] The lowest beneficial effect found for institutions may be because they are highly inertial and do not vary a lot over time. One other possible explanation may be that we cannot put in place good institutions in five years; it may take more time to alter them while more than five years may be needed after improvements in institutions to ignite growth surges.

[12] For more accurate interpretation, and as my index varies between zero and one, and that the values never reached one, the readers can refer to fig. C.1 that shows the average marginal effects for attainable values of all indexes.

only qualitatively, but also quantitatively similar. This is reassuring and suggests that the logit results reported in the baseline are broadly representative.

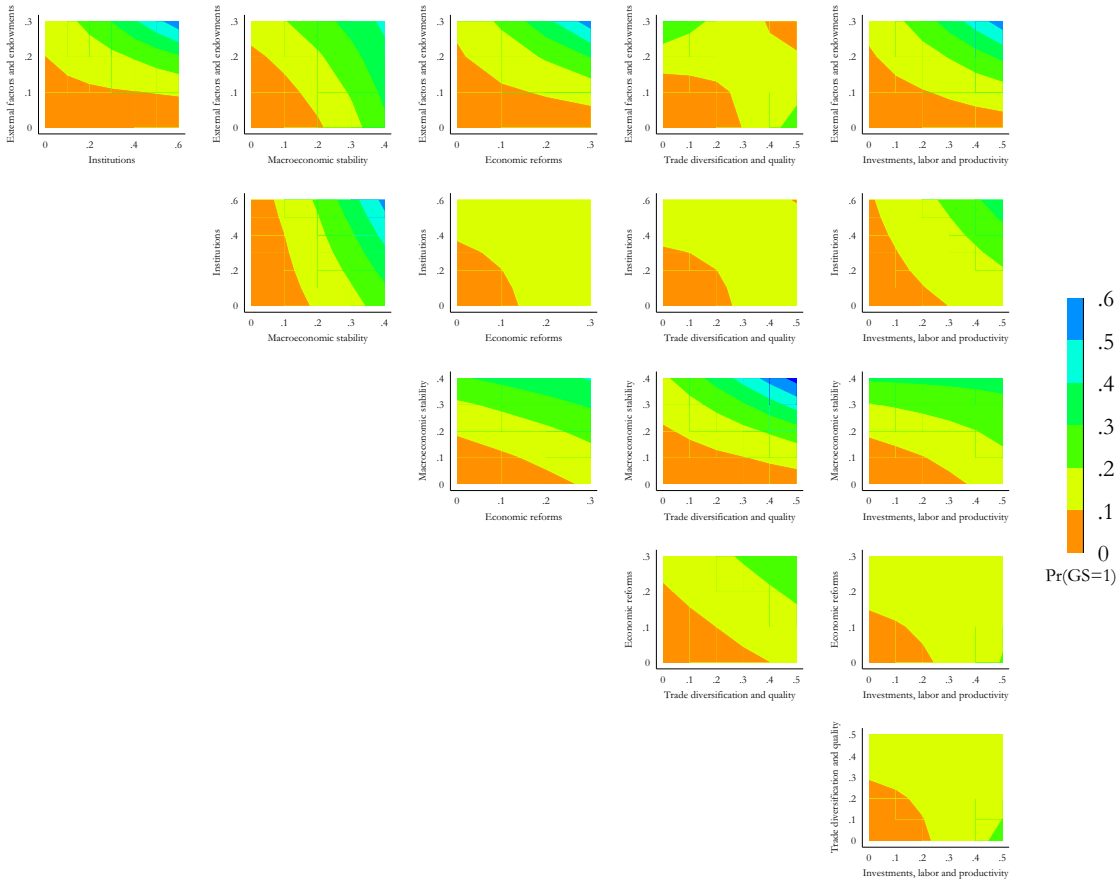
Third, I test the validity of my results to the modification of the filters used in the identification of growth surges. By changing the parameters, I get a different set of growth surges. In column 2 of table C.10, I apply the same criteria as in Hausmann et al. (2005) and identify 159 growth surges. In columns 3 and 4, I set the minimum duration of growth surge to 6 (144 growth surges) and 10 (125 growth surges) years, respectively, instead of 8 years. In columns 5 and 6, I change the "growth is rapid" criterion from 2 pp. to 1 (135 growth surges) and 3 (97 growth surges) pp., respectively. In columns 7 and 8, I change the growth accelerates criterion from 3.5 pp. to 2.5 (141 growth surges) and 4.5 (104 growth surges) pp., respectively. Indeed, the number of growth surges identified is reduced when the minimum duration of growth surge, the "growth is rapid", and the "growth accelerates" criteria are set to a high value. In general, the main results hold, but some remarks are needed. Compared to the Hausmann et al. 2005 criteria, mine are less likely to capture recovery from bad shocks like crises or natural disasters. I show that using their initial criteria, the average marginal effects of macroeconomic stability is almost doubled signaling the need to restore macroeconomic stability. However, this finding is contrary to their conclusion as they found little effect of good policies as opposed to good luck. There is little change in other determinants. Besides, as in the baseline, significant improvements in macroeconomic stability, external factors and endowments, and structural reforms are associated with the highest probability of growth surges while improvements in institutions have the lowest power to ignite growth surges and sometimes have no significant effects. Overall, the robustness checks confirm the solidity of my findings.

4.4.4 Paired growth determinants

In the previous section, I weighted the predictive power of one broad determinant of growth surge to the others, contrary to what was done using the Noise-to-Signal ratio. To dig deeper into the analysis, I study the two-way interaction between all the six broad determinants. This analysis will allow me to answer two critical questions. Do joint improvements in two broad determinants raise the likelihood of a growth surge? Does the growth-enhancing effect of one determinant conditional to improvements in another? In order words, I want to check whether joint and significant improvements in external factors and macroeconomic stability raise the likelihood of a growth surge and whether countries could experience a growth surge following significant improvements in institutions when they struggle to achieve macroeconomic stability (concerns do not come alone; a country that needs improvements in institutions may also need to clean its macro-economy). The results of the average marginal effects of two-way interactions

are reported in fig. 4.2.

Figure 4.2: Paired average marginal effects of the six broad determinants of growth surges



Notes: The figures show the average marginal effects of the interaction of each pair of broad determinants of growth surges.

To answer the first question, I find that countries can maximize the likelihood to ignite growth surges if they jointly achieve significant improvements in macroeconomic stability, on one hand, and trade diversification and quality, institutions, external factors and endowments, structural reforms, and investments, labor, and productivity, on the other hand. Also, they can significantly improve their institutions, implement reforms, increase investments, human capital, and productivity while experiencing good and favorable external conditions and endowments. In all the previous cases, the likelihood of a growth surge may reach 40-60%. In contrast, the likelihood of a growth surge when combining significant changes in institutions, on one hand, and structural reforms, and trade diversification and quality, in the other hand, or investments, labor, and productivity, on one hand, and structural reforms, and trade diversification and quality, in the other hand, cannot exceed 20%.

To answer the second question, I find that significant changes in either macroeconomic

stability or external factors are needed to have a positive effect on many of the other broad determinants. For instance, even if institutions and trade diversification and quality improve significantly and even reach their highest values without any improvement in macroeconomic stability, the likelihood of having a growth surge is lower than 10%. Similarly, for significant improvements in institutions, structural reforms, and investments, labor, and productivity when there are no favorable external conditions or endowments. In sum, macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges.

4.4.5 Sensitivity

Before concluding, I present in this section, the sensitivity of my results by running the main model by decades, regions, and levels of development, as the growth determinants may have played a different role over the decades, across regions, and levels of development.

First, when looking at the results by decades, I show that the role of significant changes in broad determinants has significantly evolved. Out of the six determinants, only macroeconomic stability was consistently higher and significant over the decades (see, table C.11). In the 1980s, only significant changes in macroeconomic stability and institutions were associated with a positive and significant probability of a growth surge, respectively 52 and 12.1% following a one-unit increase in each determinant. In the 1990s, I find that a one-unit increase in macroeconomic stability, structural reforms, and trade diversification and quality raise the probability of a growth surge by 36.8, 18.2, and 14%, respectively, while the other determinants display a negative or non-significant effect (which is quite intriguing) maybe because all the pre-conditions were not fulfilled. In the 2000s, all the determinants turn to have a higher, positive, and significant effect on the probability of a growth surge. This is in line with the literature on the Great moderation. One key lesson emanating from this finding is that significant changes should occur in many of the determinants that are needed, or the pre-conditions of take-off should be reunited to ignite a growth surge.

Second, when looking at the results by regions (see, table C.12), I find that not all significant changes in broad determinants have raised the likelihood of growth surge in all regions. In Africa, except for institutions, and trade diversification and quality, significant changes in all other determinants were followed by a positive and significant increase in the probability of a growth surge. In this region, external factors and endowments have the highest power to ignite growth surge (49.6%), followed by macroeconomic stability (34.4%), and structural reforms (29.1%). In Asia and the Pacific, what counted was structural reforms and trade diversification

and quality (as illustrated, e.g. by the case of China, India, and Korea). A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 96.8 and 28.5%, respectively. In Europe, macroeconomic stability, and external factors and endowments mattered the most (as illustrated by the case of transition economies in Eastern Europe). A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 98.4% and 30.7%, respectively. In the Middle East and Central Asia, significant improvements in macroeconomic stability, trade diversification and quality, and institutions were effective to increase the likelihood of a growth surge. A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 60.4, 33.3, and 26.3%, respectively. In the Americas and Caribbean, growth surges were mainly determined by significant improvements in external factors and endowments, followed by macroeconomic stability and institutions. A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 65.9, 16.4, and 11.2%, respectively. Indeed, the constraints and realities of the regions are quite different. These findings suggest that policymakers should carefully target the main concerns of countries while adjusting the policies to their realities.

Third, when looking at the results by levels of development (see, table C.13), a clear difference between low-income countries and emerging markets, on one hand, and advanced economies, on the other hand, is striking, showing that different policies may be needed to boost growth at different levels of development. In low-income countries, what counted was significant improvements in external factors and endowments, followed by macroeconomic stability, structural reforms, and investments, labor, and productivity. A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 54.7, 48.8, 36.9, and 23.5%, respectively. In emerging markets, all of the determinants were associated with an increase of the likelihood of a growth surge, and the most important were external factors and endowments (60.2%) and macroeconomic stability (46%), followed by structural reforms (33.3%), trade diversification and quality (24.6%), investments, labor and productivity (21.2%), and finally institutions (13.3%). In Advanced economies, growth surges were mainly determined by significant improvements of macroeconomic stability, trade diversification and quality, and institutions. A one-unit increase in each of the determinants is associated with an increase in the likelihood of a growth surge of 93.2, 34.2, and 24.1%, respectively.

4.5 Concluding remarks

Since the seminal paper of Pritchett (2000), many researchers have been searching for the anatomy of growth surges to characterize them, understand their determinants, and make policy

recommendations to jump-start growth in countries. This paper falls into this agenda. I identified 132 growth surges in 117 countries over the period 1980-2010. The unconditional probability of growth surges was higher in the decade 2000-2010, in emerging countries, in Asia and the Pacific, the Middle East and Central Asia, and Europe.

In this paper, I develop a strategy to answer the question: "What, exactly" can countries do to initiate an episode of growth surge? First, it consists of identifying growth determinants in the literature, then calculating significant changes of these determinants in a way that accounts for country specificity through an optimization process, and constructing six indexes used as broad determinants of growth surges. These determinants include (i) external factors and endowments, (ii) institutions, (iii) macroeconomic stability, (iv) structural reforms, (v) trade diversification and quality, and (vi) investments, labor, and productivity. Second, it further analyzes how the significant changes in these determinants relate to growth surges. This strategy allows me to solve the "poor predictive power" problem of the literature by accounting for country-specificity and focusing on significant improvements of the growth surge determinants using an optimization process (see, for the "poor predictive power" problem, Hausmann et al. 2005; Gupta et al. 2005; Peruzzi and Terzi 2018). Indeed, the most striking different results of this paper compared to the literature may come from this improved strategy.

First, I find that the probability that growth surges were preceded by significant changes in each broad determinant is very high (it varies between 84 and 98.5%). This shows that many of growth determinants should significantly improve to jump-start growth in countries. This finding contradicts the results of Hausmann et al. (2005) and Peruzzi and Terzi (2018) who find that "growth accelerations are not preceded or accompanied by major changes in economic policies, institutional arrangements, political circumstances, or external conditions" or "most successful growth accelerations follow the relaxation of few binding constraints in key dimensions, rather than jointly unlocking several growth channels". This difference may come from the fact that they define an ad-hoc threshold to identify disproportionate changes in growth determinants and/or focus on non-aggregated determinants.

Second, while growth surges are somewhat rare phenomena (unconditional probability is low and is equal to 3.6%), significant improvements of the broad determinants of growth lead to a good probability of igniting growth surges (around 30%). This also contradicts the findings of Hausmann et al. (2005), Gupta et al. (2005) and Peruzzi and Terzi (2018) that states that "on the whole, those determinants do a very poor job of predicting the turning points [...] growth accelerations are caused predominantly by idiosyncratic, and often small-scale changes", "many acceleration episodes occur when the explanatory factors in the model would not predict an acceleration, and many times, even though the variables associated with accelerations are conducive, an episode does not take place. There are clearly factors the model is not capturing,

as well as country-level idiosyncratic factors that warrant further investigation in order to better guide policy. Predicting the timing, or onset, of growth accelerations is even more difficult." and "growth accelerations are extremely hard to engineer with a high degree of certainty [...] roughly 9 out of 10 instances failed to ignite a take-off", respectively.

Third, when applying a more comprehensive empirical analysis, I find that all growth determinants have a significant and positive effect on the probability of initiating growth, in line with the non-parametric analysis. However, improvements in macroeconomic stability, and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. When looking at the two-way interactions of growth determinants, I show that countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Besides, I find that significant changes in macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges. This is in contrast with Peruzzi and Terzi (2018) that found "no strictly dominant strategy to ignite a growth acceleration". My results are robust to alternative assumptions on the timing needed to ignite growth surges, filters criteria applied to identify surges, and estimations techniques.

Fourth, there is a notable difference between decades, regions, and levels of development. Out of the six determinants, only macroeconomic stability was consistently higher and significant over the decades. In the 2000s, all the determinants turn to have a higher, positive, and significant effect on the probability of a growth surge, in line with the literature on the Great moderation. Besides, I find that not all significant changes in broad determinants have raised the likelihood of growth surge in all regions. Finally, the difference between low-income countries and emerging markets, on one hand, and advanced economies, on the other hand, is striking. This calls for careful tailoring of policies aiming at igniting growth surges to local conditions, which is also found in the literature. One clear takeaway from this analysis is that the capacity to ignite growth surges relies on the capacity to restore or preserve macroeconomic stability, although other determinants also matter.

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APPENDIX C

APPENDIX TO CHAPTER 4

C.1 Sample and Data

C.1.1 List of growth surges and their determinants

Table C.1: List of growth surges and their broad determinants

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	External and Endow.	Insti-tution	Macro. stabiliy	Structural Reforms	Trade Div. Qual.	Labor Inv. Prod.	Unex-plained	# of deter-minants
Albania	ALB	1997	2013	17	5.78	3750.85	9744.54	1	1	1	1	1	1	0	6
Argentina	ARG	1984	1999	16	6.88	4539.50	13165.25	1	1	1	1	1	1	0	6
Armenia	ARM	2001	2011	11	9.05	3299.73	8561.05	1	1	1	1	1	1	0	6
Antigua and Barbuda	ATG	1980	1992	13	6.09	5525.09	11922.56	1	0	1	1	1	1	0	5
Antigua and Barbuda	ATG	1999	2009	11	3.44	13606.24	19736.20	1	0	0	0	1	1	0	3
Austria	AUT	1984	1995	12	3.96	18864.98	30071.43	1	1	1	1	1	1	0	6
Azerbaijan	AZE	2002	2013	12	15.72	2885.62	16638.21	1	1	1	1	1	1	0	6
Benin	BEN	1998	2006	9	3.66	1296.16	1790.50	1	1	1	1	1	1	0	6
Bangladesh	BGD	2005	2016	12	6.87	1461.44	3244.94	1	1	0	1	0	1	0	4
Bulgaria	BGR	2001	2011	11	5.77	8595.34	15924.35	1	0	1	1	1	1	0	5
Bahrain	BHR	1994	2008	15	6.86	16157.99	43683.36	1	1	1	1	1	0	0	5
Belarus	BLR	2001	2013	13	5.63	8563.25	17451.27	1	1	1	1	1	1	0	6
Bolivia	BOL	1992	2013	22	4.47	2318.15	6064.79	1	1	1	1	1	1	0	6
Brazil	BRA	1988	2000	13	2.53	6229.40	8617.32	1	1	1	1	1	1	0	6
Brazil	BRA	2006	2015	10	4.27	9515.43	14450.07	1	1	0	1	1	1	0	5
Bhutan	BTN	1980	1988	9	3.78	1588.82	2218.84	1	1	1	1	0	1	0	5
Bhutan	BTN	1994	2002	9	5.81	2858.74	4751.92	1	1	1	0	0	1	0	4
Chile	CHL	1989	1998	10	4.09	7580.75	11316.55	1	1	1	1	1	1	0	6
Chile	CHL	2005	2013	9	5.81	13403.45	22291.56	1	0	1	1	0	0	0	3
China	CHN	1981	1989	9	3.78	1826.95	2551.46	1	1	0	1	1	1	0	5
China	CHN	1992	2012	21	6.51	2820.92	10596.49	0	1	1	1	1	1	0	5
Cote d'Ivoire	CIV	2010	2017	9	3.71	2596.71	3605.62	1	1	1	1	1	1	0	6
Democratic Republic of Congo	COD	2008	2016	9	3.21	593.80	789.17	1	1	0	0	1	1	0	4
Congo	COG	2001	2015	15	3.76	2150.79	3742.83	1	1	1	1	1	1	0	6
Colombia	COL	2005	2014	10	5.12	7615.52	12551.27	1	1	0	1	1	1	0	5
Cape Verde	CPV	1993	2005	13	4.85	2195.28	4065.04	1	1	1	1	1	1	0	6
Czech Republic	CZE	2002	2010	9	3.28	21373.60	28586.14	1	1	1	1	1	1	0	6

Continued on next page

Table C.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	External and Endow.	Insti-tution	Macro. stabiliy	Structural Reforms	Trade Div. Qual.	Labor Inv. Prod.	Unex-plained	# of deter-minants
Germany	DEU	1987	1995	9	3.58	21827.08	29964.79	1	1	1	1	1	1	0	6
Djibouti	DJI	2009	2017	9	3.87	2518.06	3545.14	1	1	1	0	1	1	0	5
Denmark	DNK	1993	2001	9	3.24	26015.11	34667.70	1	1	1	1	1	1	0	6
Dominican Republic	DOM	1994	2003	10	3.36	5509.98	7666.43	1	1	1	1	1	1	0	6
Ecuador	ECU	2003	2012	10	5.42	5995.55	10168.40	1	0	1	1	1	1	0	5
Egypt	EGY	1990	2000	11	7.99	2012.93	4689.53	1	1	1	1	1	1	0	6
Egypt	EGY	2002	2014	13	5.53	4870.15	9800.33	1	1	0	1	1	0	0	4
Spain	ESP	1988	1996	9	3.66	15182.61	20985.94	1	1	1	1	1	1	0	6
Estonia	EST	1999	2009	11	6.48	10772.34	21484.39	1	1	1	1	1	1	0	6
Ethiopia	ETH	2005	2016	12	7.65	630.05	1525.76	1	1	1	1	1	1	0	6
Gabon	GAB	1997	2009	13	2.83	7926.84	11391.84	1	1	1	1	1	1	0	6
United Kingdom	GBR	1991	1999	9	3.72	22394.56	31109.63	0	1	1	1	1	1	0	5
Georgia	GEO	2002	2013	12	8.96	3303.57	9254.34	1	1	1	1	1	1	0	6
Ghana	GHA	2001	2015	15	3.86	2763.52	4875.04	1	1	1	1	1	1	0	6
Equatorial Guinea	GNQ	1998	2006	9	17.77	4414.16	19244.54	1	1	1	0	1	1	0	5
Grenada	GRD	1986	1995	10	5.66	3275.58	5678.77	1	0	1	0	1	1	0	4
Croatia	HRV	1998	2007	10	6.00	11329.04	20286.04	1	1	1	1	1	1	0	6
Hungary	HUN	1997	2005	9	3.56	13906.95	19052.27	1	0	1	1	1	1	0	5
Indonesia	IDN	1988	1997	10	5.66	2701.54	4683.11	1	1	0	1	1	1	0	5
Indonesia	IDN	2006	2015	10	7.94	4655.27	9995.35	1	1	1	0	1	1	0	5
India	IND	1989	1997	9	3.91	1232.19	1740.69	0	1	1	1	1	1	0	5
India	IND	2000	2013	14	6.77	1988.44	4975.78	1	1	0	1	1	1	0	5
Ireland	IRL	1985	2002	18	6.05	13596.22	39118.39	1	1	1	1	1	0	0	5
Iran (Islamic Republic of)	IRN	1992	2008	17	8.97	3780.05	16272.63	1	1	1	1	1	1	0	6
Iraq	IRQ	2007	2017	11	9.98	5857.15	16683.30	1	1	1	0	1	1	0	5
Israel	ISR	1989	1997	9	4.34	19920.69	29204.98	1	1	1	1	1	1	0	6
Jordan	JOR	1998	2013	16	5.89	3477.85	8694.40	1	1	1	1	1	1	0	6

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Table C.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	External and Endow.	Insti-tution	Macro. stabiliy	Structural Reforms	Trade Div. Qual.	Labor Inv. Prod.	Unex-plained	# of deter-minants
Japan	JPN	1987	1996	10	5.00	20731.03	33783.33	1	1	1	1	1	1	0	6
Kazakhstan	KAZ	2002	2012	11	10.92	7025.24	21973.73	1	1	1	1	1	1	0	6
Kenya	KEN	2008	2016	9	3.81	2110.15	2954.55	1	1	0	1	1	1	0	5
Kyrgyzstan	KGZ	2005	2015	11	5.32	2078.63	3676.88	1	1	1	1	1	1	0	6
Cambodia	KHM	1996	2010	15	5.46	1106.33	2454.98	1	1	1	1	1	1	0	6
Saint Kitts and Nevis	KNA	2003	2011	9	4.63	14277.05	21456.82	1	0	1	0	1	0	0	3
Kuwait	KWT	2004	2012	9	5.12	50362.33	78921.14	1	1	1	0	1	0	0	4
Laos	LAO	1999	2013	15	7.83	1668.57	5168.18	1	1	1	1	1	1	0	6
Lebanon	LBN	1997	2008	12	8.16	5609.58	14384.55	1	1	1	1	1	0	0	5
Sri Lanka	LKA	1991	1999	9	4.64	2926.83	4400.57	1	1	1	1	1	1	0	6
Sri Lanka	LKA	2003	2016	14	6.52	4928.79	11938.07	1	1	0	0	0	0	0	2
Lesotho	LSO	2009	2017	9	3.40	2219.47	2999.39	1	1	1	0	1	1	0	5
Lithuania	LTU	1999	2009	11	5.66	10373.28	19002.57	1	1	1	1	1	1	0	6
Luxembourg	LUX	1987	1995	9	4.61	33788.35	50686.89	1	1	1	1	0	1	0	5
Latvia	LVA	2000	2009	10	5.64	10149.85	17565.06	1	1	1	1	1	1	0	6
Morocco	MAR	1983	1992	10	3.91	2938.51	4312.25	1	1	1	1	1	1	0	6
Morocco	MAR	2007	2016	10	4.77	4890.71	7794.08	1	1	0	1	1	1	0	5
Republic of Moldova	MDA	2005	2013	9	6.72	2613.28	4692.14	1	1	1	1	1	1	0	6
Maldives	MDV	1999	2009	11	4.85	7078.55	11915.82	1	1	1	1	1	1	0	6
Macedonia	MKD	2002	2010	9	5.01	7204.47	11186.78	1	1	1	1	1	0	0	5
Mali	MLI	2004	2012	9	4.92	1279.95	1972.09	1	1	1	1	1	0	0	5
Malta	MLT	2009	2017	9	5.08	26791.83	41846.75	1	1	1	0	1	1	0	5
Myanmar	MMR	1996	2013	18	9.18	972.27	4724.25	1	1	1	1	1	1	0	6
Montenegro	MNE	1999	2013	15	5.00	6593.54	13708.59	1	1	1	0	0	0	0	3
Mongolia	MNG	2001	2012	12	10.40	2999.55	9837.12	1	1	1	1	1	0	0	5
Mozambique	MOZ	1998	2006	9	4.62	636.84	956.51	1	1	1	1	1	1	0	6
Mauritania	MRT	2004	2012	9	3.46	2160.34	2934.04	1	1	1	1	0	1	0	5

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Table C.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	External and Endow.	Insti-tution	Macro. stabiliy	Structural Reforms	Trade Div. Qual.	Labor Inv. Prod.	Unex-plained	# of deter-minants
Mauritius	MUS	1985	1994	10	6.22	6517.16	11913.08	1	1	1	1	1	1	0	6
Mauritius	MUS	2008	2017	10	4.18	15046.94	22656.92	1	1	1	0	1	1	0	5
Malaysia	MYS	1991	1999	9	4.50	8634.60	12831.60	1	1	1	1	1	1	0	6
Malaysia	MYS	2001	2012	12	4.61	12988.60	22309.81	1	1	1	0	1	1	0	5
Namibia	NAM	1999	2013	15	4.57	5210.98	10187.25	1	1	1	1	1	1	0	6
Nigeria	NGA	2000	2010	11	19.08	764.37	5220.41	1	1	1	1	1	1	0	6
Nicaragua	NIC	2009	2017	10	3.38	3842.90	5360.22	1	1	1	0	1	1	0	5
Netherlands	NLD	1993	2001	9	4.33	27501.26	40264.48	0	1	1	1	1	1	0	5
Norway	NOR	1992	2002	11	3.95	26847.29	41098.06	1	1	1	1	1	1	0	6
Nepal	NPL	2007	2016	10	5.12	1385.00	2282.06	1	1	1	1	1	1	0	6
Oman	OMN	1997	2009	13	9.54	11783.72	38537.52	1	1	1	1	1	1	0	6
Pakistan	PAK	2001	2013	13	3.93	2691.64	4443.65	1	1	1	1	0	1	0	5
Panama	PAN	2004	2015	12	5.60	10706.26	20581.41	1	1	0	1	1	1	0	5
Peru	PER	2003	2013	11	6.57	5473.57	11017.94	1	1	0	1	1	1	0	5
Philippines	PHL	1989	1997	9	3.55	3341.16	4575.10	1	1	1	1	1	1	0	6
Philippines	PHL	2008	2017	10	4.77	4786.09	7628.83	1	1	0	1	0	0	0	3
Poland	POL	2003	2014	12	4.63	14221.34	24486.63	1	0	1	1	1	1	0	5
Portugal	PRT	1987	1995	9	5.07	11483.73	17914.56	1	1	1	1	1	1	0	6
Paraguay	PRY	2003	2013	11	4.76	4836.60	8069.16	1	1	1	1	1	0	0	5
Qatar	QAT	1998	2006	9	17.12	27383.73	113521.60	1	1	1	0	1	1	0	5
Romania	ROU	1997	2013	17	5.80	7431.81	19386.61	1	1	1	1	0	0	0	4
Russian Federation	RUS	2001	2012	12	8.06	10110.36	25619.79	1	1	1	1	1	1	0	6
Rwanda	RWA	2003	2011	9	5.69	869.08	1430.40	1	1	1	1	1	0	0	5
Saudi Arabia	SAU	2001	2012	12	9.27	18371.23	53258.21	1	1	1	1	1	1	0	6
Sudan	SDN	2001	2012	12	6.72	1771.62	3866.80	1	1	1	1	0	1	0	5
Singapore	SGP	1989	2006	18	6.68	18517.77	59335.18	1	1	1	1	1	1	0	6
El Salvador	SLV	1989	2001	13	4.37	2574.11	4485.95	1	1	1	1	1	1	0	6

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Table C.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	External and Endow.	Insti-tution	Macro. stabiliy	Structural Reforms	Trade Div. Qual.	Labor Inv. Prod.	Unex-plained	# of deter-minants
Serbia	SRB	2001	2009	9	7.22	6463.14	12108.22	1	1	1	0	1	1	0	5
Suriname	SUR	1999	2013	15	6.17	6214.47	15265.44	1	1	1	0	1	1	0	5
Slovakia	SVK	1999	2012	14	4.65	14190.14	26829.84	1	1	1	1	1	1	0	6
Swaziland	SWZ	1984	1992	9	4.81	4008.31	6117.52	1	1	1	1	0	1	0	5
Seychelles	SYC	2008	2016	9	4.52	18685.85	27809.93	1	0	1	1	1	1	0	5
Syrian Arab Republic	SYR	1999	2009	11	13.75	1262.98	5210.16	1	1	1	1	1	1	0	6
Thailand	THA	1985	1997	13	6.11	3724.57	8054.27	1	1	1	1	1	1	0	6
Thailand	THA	2004	2012	9	5.21	9062.08	14313.67	1	1	1	1	0	1	0	5
Tajikistan	TJK	2005	2013	9	5.75	1742.64	2883.01	1	1	1	1	1	1	0	6
Turkmenistan	TKM	2001	2016	16	7.12	7392.68	22206.43	1	1	1	1	1	1	0	6
Trinidad and Tobago	TTO	2000	2009	10	6.31	13134.31	24215.21	1	1	1	1	1	1	0	6
Tunisia	TUN	1988	1999	12	4.06	4988.72	8041.53	1	1	1	1	1	1	0	6
Turkey	TUR	2005	2013	9	6.08	12793.70	21770.43	1	1	1	1	1	1	0	6
Tanzania	TZA	1999	2008	10	4.67	1072.20	1692.30	1	0	1	1	1	1	0	5
Uganda	UGA	2003	2012	10	3.86	1181.26	1725.91	1	1	1	0	1	1	0	5
Ukraine	UKR	2003	2011	9	6.16	5568.72	9533.93	1	1	1	1	1	1	0	6
Uruguay	URY	2008	2016	9	4.76	13373.23	20315.02	1	1	1	0	1	1	0	5
Uzbekistan	UZB	2002	2016	15	5.43	4150.66	9175.98	1	1	1	1	1	1	0	6
St. Vincent and the Grenadines	VCT	2001	2009	9	3.16	7201.51	9527.03	1	0	0	1	1	1	0	4
Viet Nam	VNM	1989	1998	10	4.73	1206.85	1915.78	1	1	1	1	1	1	0	6
Viet Nam	VNM	2003	2012	10	7.36	2417.06	4916.68	1	1	0	1	1	1	0	5
Yemen	YEM	1997	2011	15	10.60	837.43	3793.34	1	1	1	1	1	1	0	6
Zambia	ZMB	2001	2013	13	8.62	1222.85	3584.72	1	1	1	0	1	1	0	5
Zimbabwe	ZWE	1982	1990	9	3.62	3206.79	4417.75	1	1	1	1	1	1	0	6

C.1.2 List of variables and sources

Table C.2: List of variables, and their sources

Variable Labels	Sources
Real GDP per capita in 2010 PPP terms	**Penn World Tables 9.1**
External factors and endowments	**Authors' calculations based on following sources**
Trading partners' growth (%)	Global Economic Environment, IMF
Terms of trade (export price / import price)	Penn World Tables 9.1
Nominal US FED interest rate (%)	Bank of International Settlements
Volatility of S&P 500 index returns	Standard and Poor's
Total natural resources rents (% of GDP)	World Development Indicators, World Bank
Institutions	**Authors' calculations based on following sources**
Accountability index	Varieties of Democracy (V-Dem) project
Civil liberties index	Varieties of Democracy (V-Dem) project
Political corruption index	Varieties of Democracy (V-Dem) project
Rule of law index	Varieties of Democracy (V-Dem) project
Demand-side economic policy and macroeconomic stability	**Authors' calculations based on following sources**
Financial crises at end	Authors' calculations based on Frankel and Rose (1996), Reinhart and Rogoff (2009), Laeven and Valencia (2018), and Medas et al. (2018).
Normal recession at end	Authors' calculations based on Bry and Boschan (1971)
Public debt (% of GDP)	Global Debt Database, IMF, Mbaye et al. (2018)
Current Account (% of GDP)	World Economic Outlook, IMF
Inflation (%)	World Economic Outlook, IMF
Change of REER (%)	Authors' calculations based on International Financial Statistics
Supply-side economic policy and economic reforms	**Authors' calculations based on following sources**
Agriculture reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Product market reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Labor market reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Financial reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Trade-Tariff reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Current account reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Capital account reform	Chinn and Ito (2008)
Trade diversification and quality	**Authors' calculations based on following sources**
Export Quality Index	Export Diversification and Quality database, IMF
Average Quality Index of Importers	Export Diversification and Quality database, IMF
Product diversification index	Export Diversification and Quality database, IMF
Partner diversification index	Export Diversification and Quality database, IMF
Investments, labor and productivity	**Authors' calculations based on following sources**
Domestic investment (% of GDP)	Investment and Capital Stock dataset 1960-2015, IMF
Foreign Direct Investment (% of GDP)	World Economic Outlook, IMF
Welfare-relevant TFP index (USA=1)	Penn World Tables 9.1
Human Capital index	Penn World Tables 9.1

C.2 Summary statistics

Table C.3: Summary statistics for all variables

Variables	Obs.	Mean	Sd	Min	Max
All Growth surges					
Income per capita at start of GS (USD PPP)	132	7884.7	7969.6	593.8	50362.3
Income per capita at end of GS (USD PPP)	132	15074.6	15804.0	789.2	114000.0
Duration of GSs (years)	132	11.4	2.7	9.0	22.0
Avg. growth of income per capita 7 years before GSs	132	1.9	1.5	-1.2	12.0
Avg. growth of income per capita 7 years after GSs	132	6.3	3.4	3.5	24.7
Avg. growth of income per capita during GSs	132	5.9	2.8	2.5	19.1
% of years with a IMF-supported program in effect during GSs	132	43.8	40.8	0.0	100.0
All variables					
GSs dummy, 1 at starting year and 0 otherwise	3763	0.035	0.184	0.000	1.000
Aggregate index of all GSs' predictors	3763	0.230	0.198	0.000	1.000
External factors and endowments index	3763	0.186	0.180	0.000	0.793
Institutions index	3763	0.199	0.275	0.000	1.000
Macroeconomic stability index	3763	0.204	0.189	0.000	0.937
Economic reforms index	3763	0.097	0.144	0.000	0.890
Trade diversification and quality index	3763	0.232	0.257	0.000	1.000
Investments, labor and productivity index	3763	0.179	0.228	0.000	1.000
External factors and endowments index, average over [T-5,T]	3763	0.103	0.059	0.000	0.347
Institutions index, average over [T-5,T]	3763	0.142	0.127	0.000	0.640
Macroeconomic stability index, average over [T-5,T]	3763	0.096	0.078	0.000	0.450
Economic reforms index, average over [T-5,T]	3763	0.067	0.069	0.000	0.374
Trade diversification and quality index, average over [T-5,T]	3763	0.155	0.101	0.000	0.566
Investments, labor and productivity index [T-5,T]	3763	0.105	0.091	0.000	0.526
Trading partners' growth (%)	3763	3.689	2.072	-12.685	18.077
Terms of trade (export price / import price)	3763	1.008	0.118	0.327	1.715
Nominal US FED interest rate (%)	3763	5.999	4.394	0.125	22.000
Volatility of S&P 500 index returns	3763	42.839	36.425	5.335	171.639
Total natural resources rents (% of GDP)	3596	7.021	10.383	0.000	86.453
Accountability index	3531	0.463	0.982	-1.647	2.063
Civil liberties index	3531	0.625	0.274	0.023	0.968
Political corruption index	3515	-0.501	0.309	-0.971	-0.005
Rule of law index	3531	0.540	0.314	0.034	0.998
Financial crises at end	3763	0.144	0.351	0.000	1.000
Normal recession at end	3763	0.052	0.221	0.000	1.000
Public debt (% of GDP)	3504	65.433	66.104	0.0E+00	2092.920
Current Account (% of GDP)	3644	-3.302	11.687	-242.188	106.836
Inflation (%)	3663	49.280	6.6E+02	-4.5E+01	2.4E+04
Change of REER (%)	3447	-140.971	9.5E+04	-4.2E+06	3.7E+06
Agriculture reform	3763	0.224	0.359	0.000	1.000
Product market reform	3763	0.291	0.531	0.000	2.000
Labor market reform	3763	0.365	0.381	0.000	1.000
Financial reform	3763	0.282	0.349	0.000	1.000
Trade-Tariff reform	3763	0.556	0.389	-0.040	1.002
Current account reform	3763	0.343	0.395	0.000	1.000
Capital account reform	3763	0.411	0.366	0.000	1.000
Export Quality Index	3554	0.809	0.162	0.232	1.152
Average Quality Index of Importers	3554	0.919	0.086	0.562	1.155
Product diversification index	3572	3.492	1.257	1.138	6.401
Partner diversification index	3565	2.882	0.643	1.651	5.437
Domestic investment (% of GDP)	3684	18.202	9.762	0.792	98.115
Foreign Direct Investment (% of GDP)	3487	3.097	13.350	-55.234	502.761
Welfare-relevant TFP index (USA=1)	2549	0.684	0.277	0.108	1.934
Human Capital index	3175	2.142	0.710	1.014	3.703

C.3 Supplementary results

C.3.1 Results of Noise-to-Signal ratio

Table C.4: Noise to Signal ratio, optimizing the predictions of growth surges

Variables' labels	Direction	NSR	Threshold	Effectiveness	Incidence	Error Type I	Error Type II	TME	# of GSs	# of signals
Trading partners' growth (%)	+	0.164	75	0.258	0.942	0.154	0.058	0.212	139	920
Terms of trade (export price / import price)	+	0.215	74	0.217	0.964	0.207	0.036	0.243	139	1173
Nominal US FED interest rate (%)	-	0.087	88	0.246	0.935	0.081	0.065	0.146	139	476
Volatility of S&P 500 index returns	-	0.165	79	0.268	0.978	0.162	0.022	0.183	139	979
Total natural resources rents (% of GDP)	+	0.206	71	0.263	0.914	0.189	0.086	0.275	139	1134
Accountability index	+	0.271	70	0.230	0.856	0.232	0.144	0.376	139	1336
Civil liberties index	+	0.215	72	0.239	0.856	0.184	0.144	0.328	139	1074
Political corruption index	+	0.162	71	0.277	0.568	0.092	0.432	0.524	139	566
Rule of law index	+	0.200	70	0.268	0.791	0.158	0.209	0.367	139	956
Financial crises at end	+	0.156	70	0.277	0.669	0.104	0.331	0.435	139	639
Normal recession at end	+	0.150	70	0.227	0.266	0.040	0.734	0.774	139	229
Public debt (% of GDP)	-	0.203	71	0.282	0.935	0.190	0.065	0.255	139	1174
Current Account (% of GDP)	+	0.228	72	0.244	0.935	0.213	0.065	0.278	139	1248
Inflation (%)	-	0.254	71	0.243	0.863	0.220	0.137	0.356	139	1286
Change of REER (%) (+ means depreciation)	+	0.234	71	0.224	0.892	0.209	0.108	0.316	139	1191
Agriculture reform	+	0.091	70	0.310	0.072	0.007	0.928	0.935	139	42
Product market reform	+	0.086	88	0.309	0.345	0.030	0.655	0.684	139	191
Labor market reform	+	0.064	90	0.312	0.187	0.012	0.813	0.825	139	77
Financial reform	+	0.176	77	0.301	0.475	0.084	0.525	0.609	139	529
Trade-Tariff reform	+	0.235	73	0.267	0.712	0.167	0.288	0.455	139	1012
Current account reform	+	0.156	74	0.265	0.374	0.058	0.626	0.684	139	351
Capital account reform	+	0.149	85	0.251	0.453	0.067	0.547	0.614	139	399
Export Quality Index	+	0.246	71	0.212	0.871	0.214	0.129	0.343	139	1203
Average Quality Index of Importers	+	0.244	71	0.228	0.885	0.216	0.115	0.331	139	1241
Product diversification index	+	0.256	73	0.224	0.827	0.212	0.173	0.385	139	1210
Partner diversification index	+	0.276	70	0.222	0.842	0.232	0.158	0.391	139	1322
Domestic investment (% of GDP)	+	0.219	74	0.234	0.899	0.197	0.101	0.297	139	1137
Foreign Direct Investment (% of GDP)	+	0.186	76	0.277	0.871	0.162	0.129	0.291	139	990
Welfare-relevant TFP index (USA=1)	+	0.214	74	0.205	0.640	0.137	0.360	0.497	139	764
Human Capital index	+	0.382	75	0.229	0.446	0.170	0.554	0.724	139	979

Table C.5: Incidence and Effectiveness by broad determinants of growth surges, and by decades

Panel A: by decades					
	Broad determinants of Growth surges	**# of GSs**	**Incidence**	**# of signals**	**Effectiveness**
1980-1989	**External factors and endowments**	27	1.000	43	0.149
	Institutions	21	0.778	52	0.197
	Macroeconomic stability	26	0.963	55	0.233
	Structural reforms	26	0.963	34	0.161
	Trade diversification and quality	24	0.889	63	0.154
	Investments, labor and productivity	25	0.926	33	0.152
	# of GSs			**27**	
1990-1999	**External factors and endowments**	38	0.950	67	0.269
	Institutions	36	0.900	108	0.267
	Macroeconomic stability	39	0.975	126	0.356
	Structural reforms	34	0.850	136	0.343
	Trade diversification and quality	37	0.925	127	0.343
	Investments, labor and productivity	37	0.925	106	0.324
	# of GSs			**40**	
2000-2010	**External factors and endowments**	65	1.000	197	0.449
	Institutions	56	0.862	112	0.496
	Macroeconomic stability	55	0.846	120	0.548
	Structural reforms	51	0.785	121	0.513
	Trade diversification and quality	57	0.877	102	0.462
	Investments, labor and productivity	58	0.892	104	0.491
	# of GSs			**65**	

Table C.6: Incidence and Effectiveness by broad determinants of growth surges, and by regions

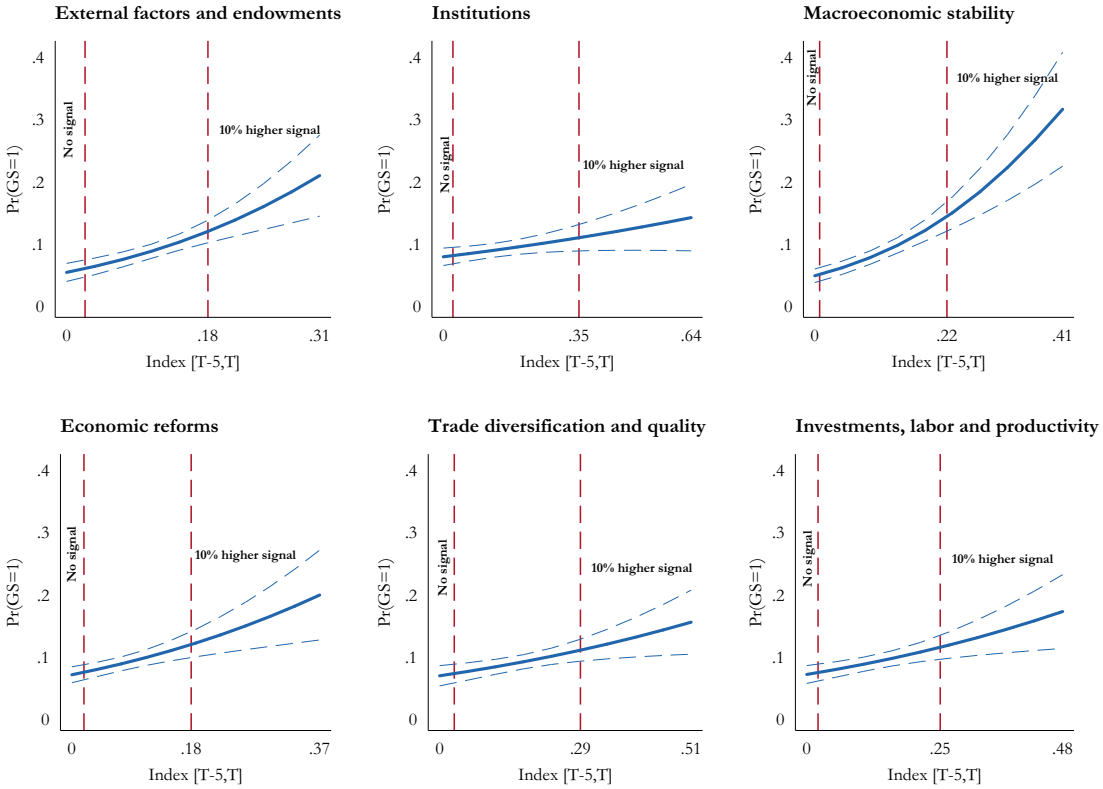
	Broad determinants of Growth surges	# of GSs	Incidence	# of signals	Effectiveness
Africa	**External factors and endowments**	26	1.000	49	0.172
	Institutions	24	0.923	51	0.165
	Macroeconomic stability	25	0.962	52	0.212
	Structural reforms	21	0.808	60	0.223
	Trade diversification and quality	23	0.885	48	0.161
	Investments, labor and productivity	25	0.962	54	0.231
	# of GSs			**26**	
Asia and Pacific	**External factors and endowments**	28	1.000	54	0.432
	Institutions	24	0.857	47	0.435
	Macroeconomic stability	24	0.857	44	0.468
	Structural reforms	26	0.929	54	0.607
	Trade diversification and quality	22	0.786	57	0.479
	Investments, labor and productivity	26	0.929	41	0.461
	# of GSs			**28**	
Europe	**External factors and endowments**	33	0.971	103	0.419
	Institutions	32	0.941	92	0.451
	Macroeconomic stability	34	1.000	117	0.563
	Structural reforms	31	0.912	113	0.483
	Trade diversification and quality	31	0.912	100	0.415
	Investments, labor and productivity	31	0.912	86	0.457
	# of GSs			**34**	
Middle East and Central Asia	**External factors and endowments**	21	0.955	55	0.444
	Institutions	20	0.909	47	0.416
	Macroeconomic stability	21	0.955	53	0.530
	Structural reforms	18	0.818	33	0.471
	Trade diversification and quality	21	0.955	51	0.367
	Investments, labor and productivity	17	0.773	34	0.362
	# of GSs			**22**	
Americas and Caribbean	**External factors and endowments**	22	1.000	46	0.235
	Institutions	13	0.591	35	0.219
	Macroeconomic stability	16	0.727	35	0.216
	Structural reforms	15	0.682	31	0.170
	Trade diversification and quality	21	0.955	36	0.179
	Investments, labor and productivity	21	0.955	28	0.185
	# of GSs			**22**	

Table C.7: Incidence and Effectiveness by broad determinants of growth surges, and by levels of income

	Broad determinants of Growth surges	# of GSs	Incidence	# of signals	Effectiveness
LICs	**External factors and endowments**	34	1.000	90	0.272
	Institutions	30	0.882	68	0.205
	Macroeconomic stability	31	0.912	77	0.279
	Structural reforms	28	0.824	83	0.268
	Trade diversification and quality	29	0.853	75	0.219
	Investments, labor and productivity	33	0.971	73	0.292
	# of GSs			**34**	
EMs	**External factors and endowments**	78	0.987	178	0.396
	Institutions	64	0.810	161	0.398
	Macroeconomic stability	70	0.886	172	0.451
	Structural reforms	65	0.823	155	0.449
	Trade diversification and quality	71	0.899	167	0.359
	Investments, labor and productivity	69	0.873	129	0.376
	# of GSs			**79**	
AEs	**External factors and endowments**	18	0.947	39	0.199
	Institutions	19	1.000	43	0.274
	Macroeconomic stability	19	1.000	52	0.342
	Structural reforms	18	0.947	53	0.280
	Trade diversification and quality	18	0.947	50	0.260
	Investments, labor and productivity	18	0.947	41	0.252
	# of GSs			**19**	

C.3.2 Baseline : Figure of average marginal effects

Figure C.1: Average marginal effects of the six broad determinants of growth surges



Notes: The figures show the average marginal effects based on the column (2) of table 4.4.

C.3.3 Robustness checks

Table C.8: Predicting growth surges, robustness checks, alternative timing convention for growth determinants

	(1)	(2)	(3)
	Baseline H=[T-5,T]	**H=[T-7,T]**	**H=[T-3,T]**
External factors and endowments index, average H	0.403***	0.679***	0.207***
	(0.083)	(0.104)	(0.063)
Institutions index, average H	0.086**	0.116***	0.074**
	(0.038)	(0.042)	(0.033)
Macroeconomic stability index, average H	0.439***	0.490***	0.347***
	(0.063)	(0.072)	(0.053)
Structural reforms index, average H	0.263***	0.276***	0.183***
	(0.066)	(0.074)	(0.059)
Trade diversification and quality index, average H	0.147***	0.170***	0.050
	(0.048)	(0.054)	(0.043)
Investments, labor and productivity index, average H	0.173***	0.133**	0.244***
	(0.050)	(0.057)	(0.041)
Africa (Base level)			
Asia and Pacific	0.111***	0.111***	0.108***
	(0.019)	(0.018)	(0.018)
Europe	0.053***	0.068***	0.058***
	(0.017)	(0.018)	(0.017)
Middle East and Central Asia	0.042***	0.044***	0.046***
	(0.016)	(0.016)	(0.016)
Americas and Caribbean	-0.002	-0.001	0.000
	(0.011)	(0.011)	(0.011)
1980-1989 (Base level)			
1990-1999	0.003	-0.002	0.002
	(0.011)	(0.011)	(0.010)
2000-2010	0.079***	0.064***	0.091***
	(0.015)	(0.015)	(0.015)
Advanced Economies (Base level)			
Low-Income Developing Countries	0.034**	0.040***	0.038**
	(0.015)	(0.015)	(0.015)
Emerging Economies	0.090***	0.097***	0.089***
	(0.014)	(0.013)	(0.013)
Observations	3763	3763	3763
# of GSs	132	132	132
Pseudo R2	0.181	0.179	0.171
Classification power	90.088	90.221	89.769
AUROC	0.794	0.792	0.794
BIC	2200.353	2204.954	2225.273

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

Table C.9: Predicting growth surges, robustness checks, alternative estimators

	(1)	(2)	(3)	(4)	(5)
	Baseline: Logit	**Pooled Probit**	**Tobit**	**RE Logit**	**RE Probit**
External factors and endowments index, average [T-5,T]	0.403***	0.418***	0.546***	0.454***	0.437***
	(0.083)	(0.085)	(0.089)	(0.094)	(0.092)
Institutions index, average [T-5,T]	0.086**	0.081**	0.094**	0.065	0.066
	(0.038)	(0.038)	(0.040)	(0.044)	(0.043)
Macroeconomic stability index, average [T-5,T]	0.439***	0.489***	0.579***	0.641***	0.646***
	(0.063)	(0.064)	(0.067)	(0.077)	(0.076)
Structural reforms index, average [T-5,T]	0.263***	0.257***	0.403***	0.212**	0.213**
	(0.066)	(0.069)	(0.077)	(0.084)	(0.084)
Trade diversification and quality index, average [T-5,T]	0.147***	0.140***	0.137***	0.138**	0.142**
	(0.048)	(0.048)	(0.050)	(0.058)	(0.056)
Investments, labor and productivity index, average [T-5,T]	0.173***	0.181***	0.219***	0.252***	0.251***
	(0.050)	(0.051)	(0.056)	(0.059)	(0.058)
Africa (Base level)					
Asia and Pacific	0.111***	0.117***	0.135***	0.145***	0.146***
	(0.019)	(0.018)	(0.017)	(0.042)	(0.041)
Europe	0.053***	0.065***	0.107***	0.086**	0.092**
	(0.017)	(0.018)	(0.020)	(0.039)	(0.039)
Middle East and Central Asia	0.042***	0.043***	0.059***	0.068*	0.069*
	(0.016)	(0.016)	(0.018)	(0.037)	(0.037)
Americas and Caribbean	-0.002	-0.003	-0.012	-0.003	-0.003
	(0.011)	(0.011)	(0.016)	(0.026)	(0.026)
1980-1989 (Base level)					
1990-1999	0.003	0.000	-0.019	0.003	0.000
	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
2000-2010	0.079***	0.075***	0.084***	0.105***	0.099***
	(0.015)	(0.015)	(0.013)	(0.017)	(0.016)
Advanced Economies (Base level)					
Low-Income Developing Countries	0.034**	0.037**	0.093***	0.042	0.041
	(0.015)	(0.016)	(0.020)	(0.029)	(0.029)
Emerging Economies	0.090***	0.098***	0.142***	0.109***	0.109***
	(0.014)	(0.014)	(0.017)	(0.027)	(0.027)
Observations	3763	3763	3763	3763	3763
# of GSs	132	132	132	132	132
Pseudo R2	0.181	0.182	0.309	-	-
Classification power	90.088	90.088	-	-	-
AUROC	0.794	0.795	0.791	0.794	0.794
BIC	2200.353	2198.787	1373.410	2074.058	2068.716
Random effects	No	No	No	Yes	Yes

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

Table C.10: Predicting growth surges, robustness checks, alternative growth surges identification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline	**Hausmann et al. (2005)**	**5-year horizon**	**10-year horizon**	**Difference =1 ppa.**	**Difference =3 ppa.**	**Post-acc growth =2.5 ppa**	**Post-acc growth =4.5 ppa**
External factors and endowments index, average [T-5,T]	0.403***	0.421***	0.281***	0.421***	0.232***	0.211***	0.367***	0.408***
	(0.083)	(0.114)	(0.080)	(0.085)	(0.090)	(0.059)	(0.088)	(0.072)
Institutions index, average [T-5,T]	0.086**	0.029	0.043	0.036	0.079*	0.063**	0.109***	0.044
	(0.038)	(0.052)	(0.035)	(0.039)	(0.040)	(0.028)	(0.039)	(0.029)
Macroeconomic stability index, average [T-5,T]	0.439***	0.852***	0.399***	0.540***	0.522***	0.284***	0.427***	0.245***
	(0.063)	(0.097)	(0.062)	(0.074)	(0.071)	(0.051)	(0.066)	(0.051)
Economic reforms index, average [T-5,T]	0.263***	0.184*	0.294***	0.189**	0.245***	0.167***	0.211***	0.174***
	(0.066)	(0.106)	(0.073)	(0.078)	(0.069)	(0.053)	(0.067)	(0.054)
Trade diversification and quality index, average [T-5,T]	0.147***	0.267***	0.178***	0.191***	0.214***	0.088**	0.169***	0.055
	(0.048)	(0.070)	(0.050)	(0.053)	(0.053)	(0.037)	(0.051)	(0.036)
Investments, labor and productivity index, average [T-5,T]	0.173***	0.191***	0.039	0.127**	0.188***	0.177***	0.222***	0.179***
	(0.050)	(0.071)	(0.047)	(0.052)	(0.055)	(0.038)	(0.052)	(0.036)
Africa (Base level)								
Asia and Pacific	0.111***	0.133***	0.063***	0.099***	0.086***	0.054***	0.118***	0.075***
	(0.019)	(0.025)	(0.019)	(0.021)	(0.021)	(0.014)	(0.020)	(0.014)
Europe	0.053***	0.123***	0.012	0.044**	0.070***	0.005	0.067***	0.021*
	(0.017)	(0.028)	(0.017)	(0.019)	(0.021)	(0.011)	(0.018)	(0.011)
Middle East and Central Asia	0.042***	0.044**	0.001	0.012	0.022	0.038***	0.038**	0.048***
	(0.016)	(0.021)	(0.016)	(0.016)	(0.016)	(0.014)	(0.016)	(0.013)
Americas and Caribbean	-0.002	-0.002	-0.029**	-0.009	-0.011	-0.006	0.008	0.007
	(0.011)	(0.016)	(0.013)	(0.013)	(0.012)	(0.009)	(0.012)	(0.008)
1980-1989 (Base level)								
1990-1999	0.003	0.058***	-0.006	-0.008	-0.005	0.008	-0.002	0.006
	(0.011)	(0.015)	(0.010)	(0.011)	(0.011)	(0.008)	(0.011)	(0.008)
2000-2010	0.079***	0.097***	0.086***	0.074***	0.085***	0.061***	0.088***	0.064***
	(0.015)	(0.019)	(0.015)	(0.015)	(0.016)	(0.011)	(0.016)	(0.012)
Advanced Economies (Base level)								
Low-Income Developing Countries	0.034**	0.071***	-0.017	0.025	0.032*	0.002	0.047***	0.021*
	(0.015)	(0.022)	(0.015)	(0.016)	(0.017)	(0.011)	(0.016)	(0.011)
Emerging Economies	0.090***	0.146***	0.067***	0.103***	0.106***	0.060***	0.100***	0.069***
	(0.014)	(0.019)	(0.015)	(0.015)	(0.015)	(0.011)	(0.014)	(0.010)
Observations	3763	2981	3896	3413	3534	4094	3682	4031
# of GSs	132	159	144	125	135	97	141	104
Unconditional probablity	0.035	0.053	0.037	0.037	0.038	0.024	0.038	0.026
Mean(duration of GSs)	11.356	13.906	9.313	13.784	12.630	10.835	11.362	10.942
Mean(Avg. growth during GSs)	5.900	5.220	6.310	5.636	5.606	6.711	5.664	6.557
Pseudo R2	0.181	0.139	0.127	0.165	0.155	0.171	0.164	0.198
Classification power	90.088	85.039	89.605	90.097	89.304	93.405	89.109	92.955
AUROC	0.794	0.755	0.741	0.778	0.765	0.791	0.773	0.806
BIC	2200.353	2359.462	2482.337	2048.995	2244.434	1864.434	2322.122	1890.496

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

C.3.4 Sensitivity

Table C.11: Predicting growth surges, sensitivity by decades

	(1)	(2)	(3)
	1980-1989	**1990-1999**	**2000-2010**
External factors and endowments index, average [T-5,T]	0.214	-0.291**	0.970***
	(0.160)	(0.130)	(0.121)
Institutions index, average [T-5,T]	0.121**	-0.087*	0.363***
	(0.059)	(0.051)	(0.089)
Macroeconomic stability index, average [T-5,T]	0.520***	0.368***	0.437***
	(0.132)	(0.079)	(0.117)
Structural reforms index, average [T-5,T]	-0.104	0.182**	0.606***
	(0.139)	(0.077)	(0.137)
Trade diversification and quality index, average [T-5,T]	-0.038	0.170**	0.254**
	(0.071)	(0.066)	(0.115)
Investments, labor and productivity index, average [T-5,T]	0.050	0.076	0.278***
	(0.088)	(0.068)	(0.098)
Africa (Base level)			
Asia and Pacific	0.090***	0.091***	0.142***
	(0.018)	(0.018)	(0.026)
Europe	0.032**	0.032**	0.056**
	(0.014)	(0.014)	(0.024)
Middle East and Central Asia	0.023*	0.023*	0.041*
	(0.012)	(0.012)	(0.021)
Americas and Caribbean	-0.002	-0.002	-0.004
	(0.009)	(0.009)	(0.017)
1980-1989 (Base level)			
1990-1999	-0.001	-0.001	-0.001
	(0.012)	(0.012)	(0.012)
2000-2010	0.075***	0.075***	0.075***
	(0.016)	(0.016)	(0.016)
Advanced Economies (Base level)			
Low-Income Developing Countries	0.020	0.020	0.036
	(0.013)	(0.012)	(0.022)
Emerging Economies	0.070***	0.070***	0.114***
	(0.014)	(0.013)	(0.021)
Observations	3763	3763	3763
# of GSs	27	40	65
Pseudo R2	0.212	0.212	0.212
Classification power	90.566	90.566	90.566
AUROC	0.816	0.816	0.816
BIC	2220.634	2220.634	2220.634

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

Table C.12: Predicting growth surges, sensitivity by regions

	(1)	(2)	(3)	(4)	(5)
	Africa	**Asia and Pacific**	**Europe**	**Middle East and Central Asia**	**Americas and Caribbean**
External factors and endowments index, average [T-5,T]	0.496***	-0.044	0.307*	0.291	0.659***
	(0.125)	(0.297)	(0.172)	(0.183)	(0.165)
Institutions index, average [T-5,T]	0.013	0.068	0.111	0.263**	0.112**
	(0.053)	(0.137)	(0.106)	(0.123)	(0.054)
Macroeconomic stability index, average [T-5,T]	0.344***	0.267	0.984***	0.604***	0.164*
	(0.085)	(0.269)	(0.188)	(0.167)	(0.085)
Structural reforms index, average [T-5,T]	0.291**	0.968***	0.203	0.309	-0.079
	(0.115)	(0.273)	(0.131)	(0.210)	(0.119)
Trade diversification and quality index, average [T-5,T]	0.000	0.285*	0.233	0.333***	0.000
	(0.071)	(0.163)	(0.146)	(0.119)	(0.077)
Investments, labor and productivity index, average [T-5,T]	0.211***	0.198	0.138	0.036	0.107
	(0.072)	(0.193)	(0.125)	(0.149)	(0.086)
Africa (Base level)					
Asia and Pacific	0.111***	0.111***	0.111***	0.111***	0.111***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Europe	0.056***	0.056***	0.056***	0.056***	0.056***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Middle East and Central Asia	0.045**	0.045**	0.045**	0.045**	0.045**
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Americas and Caribbean	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
1980-1989 (Base level)					
1990-1999	0.003	0.008	0.005	0.005	0.003
	(0.008)	(0.020)	(0.013)	(0.013)	(0.007)
2000-2010	0.050***	0.126***	0.085***	0.082***	0.051***
	(0.012)	(0.028)	(0.019)	(0.020)	(0.012)
Advanced Economies (Base level)					
Low-Income Developing Countries	0.021**	0.056*	0.037*	0.035*	0.021*
	(0.010)	(0.029)	(0.022)	(0.019)	(0.011)
Emerging Economies	0.056***	0.142***	0.096***	0.092***	0.057***
	(0.011)	(0.027)	(0.023)	(0.016)	(0.010)
Observations	3763	3763	3763	3763	3763
# of GSs	26	28	34	22	22
Pseudo R2	0.206	0.206	0.206	0.206	0.206
Classification power	90.167	90.167	90.167	90.167	90.167
AUROC	0.809	0.809	0.809	0.809	0.809
BIC	2334.679	2334.679	2334.679	2334.679	2334.679

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

Table C.13: Predicting growth surges, sensitivity by levels of development

	(1)	(2)	(3)
	LICs	**EMs**	**AEs**
External factors and endowments index, average [T-5,T]	0.547***	0.602***	-0.085
	(0.126)	(0.153)	(0.166)
Institutions index, average [T-5,T]	0.011	0.133*	0.241**
	(0.068)	(0.068)	(0.110)
Macroeconomic stability index, average [T-5,T]	0.488***	0.460***	0.932***
	(0.107)	(0.112)	(0.186)
Structural reforms index, average [T-5,T]	0.369***	0.333**	0.134
	(0.125)	(0.130)	(0.119)
Trade diversification and quality index, average [T-5,T]	-0.017	0.246***	0.342***
	(0.085)	(0.093)	(0.115)
Investments, labor and productivity index, average [T-5,T]	0.235***	0.212**	0.048
	(0.089)	(0.100)	(0.111)
Africa (Base level)			
Asia and Pacific	0.100***	0.164***	0.091***
	(0.021)	(0.027)	(0.017)
Europe	0.046**	0.077***	0.043***
	(0.019)	(0.027)	(0.014)
Middle East and Central Asia	0.032**	0.053**	0.030**
	(0.015)	(0.022)	(0.014)
Americas and Caribbean	-0.005	-0.009	-0.005
	(0.010)	(0.018)	(0.010)
1980-1989 (Base level)			
1990-1999	0.009	0.015	0.009
	(0.010)	(0.016)	(0.010)
2000-2010	0.083***	0.136***	0.076***
	(0.015)	(0.023)	(0.016)
Advanced Economies (Base level)			
Low-Income Developing Countries	-0.003	-0.003	-0.003
	(0.020)	(0.020)	(0.020)
Emerging Economies	0.055***	0.055***	0.055***
	(0.018)	(0.018)	(0.018)
Observations	3763	3763	3763
# of GSs	34.000	79.000	19.000
Pseudo R2	0.200	0.200	0.200
Classification power	90.699	90.699	90.699
AUROC	0.805	0.805	0.805
BIC	2251.304	2251.304	2251.304

Notes: Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges. All country-years observations in which growth surges may be occurred are removed.

CHAPTER 5

THE INTERNATIONAL MONETARY FUND'S ROLE IN IGNITING GROWTH SURGES

This chapter is joint work with Joshua WOJNILOWER (IMF).[1]

[1]This chapter has been prepared for the IEO's evaluation on Adjustment and Growth in IMF-supported programs. The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management. The usual disclaimer applies.

Abstract

The International Monetary Fund (IMF) described as the "lender of last resort" or the "financial firefighter" has been both criticized and lauded for its effort to promote financial stability. In this paper, we engage and contribute to the debate on the effectiveness of the IMF in promoting growth by assessing the IMF's role in igniting growth surges using a panel data of 169 countries over the period 1980-2010. By employing various sets of non-parametric and empirical methods, we conclude that IMF-supported programs (more PRGT than GRA programs) have significantly and positively contributed to boosting medium- to long-term growth in countries, particularly in the 2000s than previous decades, and in all countries around the world, regardless of their geographical location and levels of development. It has done so by pursuing macroeconomic stability and implementing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions.

Keywords: IMF-supported programs; Macroeconomic stability; Structural reforms; Noise-to-signal Ratio; Binary outcomes models
JEL Codes: O19; O11; O47; F43; E65

5.1 Introduction

"But such IMF pressure is very much helpful for me to push such a, you know, reform. So in this sense, I think the IMF is very much helpful for alien society."
—Kim Dae-Jung, Former President of the Republic of Korea, 1998-2003

"There were times when there were riots in Africa, demonstrations against the IMF because of the policy advice they were giving, the conditionalities they were imposing, and the difficulties that arose out of the implementation of those conditionalities."
—Jakaya M. Kikwete, Former President of the United Republic of Tanzania, 2005-2015

The International Monetary Fund (IMF) described as the "lender of last resort" or the "financial firefighter", both criticized and lauded for its effort to promote financial stability, continues to find itself at the forefront of global economic crises management, especially following the 2008-09 Global financial crisis and 2019-20 Coronavirus disease (Covid-19) pandemic.[2] As

[2]Historically, since its inception in 1944, the IMF has been assisting more than 150 countries through 1,300 IMF-supported programs. This includes the reconstruction of the international system payments system in the post-world war II, the transition of Former Soviet Union nations to market-based economies, and the management of the diverse crises in countries affecting by the 1970s' oil shocks, the 1980s' Latin American and African debt crises, the 1990s' Asian financial crisis, the European debt crisis in the Aftermath of the 2008-09 global financial crisis, and the 2019-2020 Covid-19 Pandemic crisis.

stated in the IMF's Guidelines on Conditionality (2002), "Fund-supported programs should be directed primarily toward the following macroeconomic goals: (a) solving the member's balance of payments problem without recourse to measures destructive of national or international prosperity; and (b) achieving medium-term external viability while fostering sustainable economic growth". However, lackluster growth under IMF-supported programs relative to non-program countries or periods has often been criticized as indicative of an excessive tightening bias and resulted in a perceived stigma, potentially discouraging the use of IMF financing and challenging the Fund's reputation. Meanwhile, IMF's economists argue that restoring macroeconomic stability even painful in the short-term will create the conditions for higher medium to longer-term growth.

In practice, the IMF has been reinventing itself to pay more attention to growth in its lending programs. For instance, it creates the Extended Fund Facility (EFF) in 1974 provided scope for structural policies over longer program and repayment periods to support deeper adjustment and achieve greater growth impact; the Enhanced Structural Adjustment Facility (ESAF) in 1987, renamed the Poverty Reduction and Growth Trust (PRGT) in 1999 provided a greater emphasis on growth and poverty reduction in low-income countries through concessional loans and structural reforms. These greater emphases on growth outcomes—both during the program period and afterward—implied increasing attention to growth-friendly policies such as protection of public investment, growth-enhancing structural reforms, and debt operations to alleviate the extent of fiscal adjustment needed to achieve viability.

However, others dismiss the suggestion that the IMF's approach changed. They sustain that the IMF's remedy has always been straight out of the structural adjustment playbook: cut salaries and benefits, privatize state-owned enterprises, reduce public spending, reduce minimum wages, and restrict collective bargaining. In other words, the IMF has put too much effort into adjustments and relegates growth to a secondary objective. Indeed, renowned economist and Nobel Prize winner Joseph E. Stiglitz severely criticized the IMF's work in its book *Globalization and its Discontents* (2002), which looks more like *"the IMF and its discontents"*. He denounced the IMF as a primary culprit in the failed development policies implemented in some countries. He argues that many of the economic reforms the IMF required as conditions for its lending—fiscal austerity, high-interest rates, trade liberalization, privatization, and open capital markets—have often been counterproductive for target economies and devastating for local populations.

This controversy debate on the IMF's effectiveness, particularly on promoting growth, has led to several analyses in the literature. Not surprising, this literature is very inconclusive, reflecting in part significant empirical challenges involved in identifying appropriate counterfactuals and isolating the impact of programs on growth from influences of other factors, and because of

varying data and methods employed by the researchers.

The class of papers highlighting a positive effect of IMF-supported programs on growth encompasses, e.g. Dicks-Mireaux et al. (2000); Hutchison (2004); Atoyan and Conway (2006); Bas and Stone (2014); Bal Gündüz (2016) and Bird and Rowlands (2017). First, Dicks-Mireaux et al. (2000) focus on a sample of low-income countries that engaged in the IMF's Enhanced Structural Adjustment Facility (ESAF) over the period 1986-1991. They reveal significant beneficial effects of IMF support on output growth and debt but no effects on inflation. Second, Hutchison (2004), using a variety of matching methods, also shows a positive association between growth and IMF-supported programs. He argues that the sample selection bias is mainly responsible for the common perception that real output growth declines because countries choose to participate in IMF programs. Third, Atoyan and Conway (2006) find little statistical support that IMF programs contemporaneously improve real economic growth in participating countries but stronger evidence of an improvement in economic growth in years following a program. Fourth, Bas and Stone (2014), after addressing the selection bias problem, show that countries benefit from IMF programs on average in terms of higher growth rates. This positive effect is pronounced in long-term users than among short-term users' countries; in contrast with the previous literature. Fifth, Bal Gündüz (2016) find that the short-term IMF engagement is positively associated with a wide range of macroeconomic outcomes. Notably, the impact on short-term growth is the greatest and becomes significant only for low-income countries facing substantial macroeconomic imbalances or large exogenous shocks. Finally, Bird and Rowlands (2017) adopt a propensity score matching method and show that concessional programs have had a generally positive effect on growth for up to two years after agreements were signed in the context of low-income countries.

In contrast, the second class of papers rather sustains a negative effect of the IMF-supported program on growth. It encompasses Przeworski and Vreeland (2000); IEO and IMF (2002); Hutchison and Noy (2003); Barro and Lee (2005); Butkiewicz and Yanikkaya (2005); Easterly (2005) and Dreher (2006). First, Przeworski and Vreeland (2000) reveal that program participation lowers growth rates for as long as countries remain under a program. Once countries leave the program, they grow faster than if they had remained, but not faster than they would have without participation. Second, the same vein, IEO and IMF's first evaluation report on the prolonged use of IMF resources (2002) finds more adverse effects of IMF-supported programs on growth for prolonged users than for "temporary" users. The adverse consequences for the growth of prolonged use appear to be concentrated in programs supported under general resources, and not in those under concessional facilities. Third, Hutchison and Noy (2003) focus on the IMF experience in Latin American countries. They reveal higher short-run output costs of IMF-supported programs in this region compared to other regions. Fourth, Barro and Lee

(2005) show that IMF lending policy is sensitive to political-economy variables like the proximity of countries with the United States and major European countries. Using an instrumental strategy, they point out that higher IMF loan-participation rates reduce economic growth, partly explained by their negative association with the rule of law. Also, IMF lending does not affect investment, inflation, government consumption, and international openness. Fifth, Butkiewicz and Yanikkaya (2005) sustain a negative or neutral effect of the IMF lending programs because of their detrimental impact on both public and private investment. Meanwhile, they find that the World Bank lending stimulates growth in some cases, primarily by increasing public investment. Sixth, Easterly (2005) finds that none of the top 20 recipients of repeated IMF-supported programs over 1980-99 were to achieve reasonable growth and macroeconomic stability. Finally, Dreher (2006) supports the negative impact of the IMF-supported programs using a panel of 98 countries over the period 1970-2000. It also shows that compliance with IMF conditionalities helps to mitigate this negative effect.

Aside from the IMF's assessment literature, our analysis also falls into the literature on growth surges and its determinants (see, e.g. Hausmann et al. 2005; Gupta et al. 2005; Hausmann et al. 2008; Kerekes 2007; Jones and Olken 2008; Aizenman and Spiegel 2010; Jong-A-Pin and de Haan 2011; Berg et al. 2012; Peruzzi and Terzi 2018; Atsebi 2020). This literature does not reach a consensus on the determinants of growth surges in countries, and Atsebi (2020) tries to reconcile them. Also, it ranges into the general literature on growth (see, e.g. Solow 1956; Swan 1956; Romer 1986; Edwards and Van Wijnbergen 1987; Romer 1987; Barro 1991; Easterly et al. 1993; Dornbusch et al. 1995; Bruno and Easterly 1998; Acemoglu et al. 2001; Ahluwalia 2002; Hamann and Prati 2002; Barro 2003; Panagariya 2004; Sala-i Martin et al. 2004; Hausmann et al. 2007; Cadot et al. 2013; Giuliano et al. 2013; Hausmann et al. 2011; IMF 2019).

We engage and contribute to this debate on the effectiveness of the IMF in promoting growth by taking a different route. While most of the papers in the literature focus on the short-term effects of the IMF-supported programs; therefore, confronting to the "selection bias" issue, we focus more on the medium- to long-term effect. Also, while they focus on the annual growth rate, we choose to focus on the initiation of periods of growth surges, i.e., periods of sustained growth for a prolonged period. We also make sure to document how the IMF has played a role in igniting growth surges. To do so, we use longitudinal data comprising 169 countries and spanning 1980-2010. Our strategy consisted of identifying growth surges applying filters method as in Hausmann et al. (2005), identifying growth determinants in the literature, setting an optimization process to identify significant improvements in growth surges determinants by accounting for country-specificity, and analyzing the effects of these improvements when occurring during an IMF-supported program or not through various sets of non-parametric and empirical methods. To the best of our knowledge, this is the first analysis that exclusively focuses

on the IMF's role in igniting periods of growth surges.

One key takeaway is that all the analyzes carried out in this paper show that having an IMF-supported program is enhancing the probability of igniting a growth surge. They support that the IMF has contributed to boosting medium- to long-term growth in countries while pursuing macroeconomic stability and implementing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions.

In detail, the non-parametric analyses show that 28% of all IMF-supported programs (starting outside the episodes of growth surges) were followed by a growth surge (25.1% for GRA programs, and 32.7% PRGT programs); out of the 132 growth surges identified in 117 countries, 56% occurred during or 2 years after IMF-supported programs in 72 countries (32.6% for GRA programs, and 26.5% for PRGT programs); the average unconditional probability of growth surges is higher for growth surges associated with an IMF-supported program (4.7%) compared to growth surges without an IMF-supported program (2.8%); the occurrence and magnitude of the significant improvements in growth surges determinants were higher during periods of IMF-supported programs than in periods without IMF-supported programs. Besides, the analysis of the effectiveness reveals that the probability that significant improvements in growth surges determinants were followed by a growth surge is between 1.4 and 1.8 times higher when these improvements occur during IMF-supported programs (both GRA and PRGT programs).[3] Moreover, these findings sustain some disparities across decades, regions, and levels of development.

Expectedly, there are few changes when shifting the analysis from non-parametric to parametric methods. For example, the non-parametric analysis shows that having an IMF-supported program similarly accentuates and magnifies the predictive power of all the growth surges determinants whereas the parametric estimation, accounting for the link between the determinants, shows that these benefits of an IMF-supported program are different in magnitude and significance. Indeed, from the biggest to the smallest effect, improvements in external factors and endowments, macroeconomic stability, structural reforms and investments, labor, and productivity associated with an IMF-supported program help to jump-start growth in countries. When looking at the benefits of having either a GRA or PRGT program, we globally reveal that the benefits of having a PRGT than a GRA program are higher because the significant improvements in growth determinants occurring during a PRGT program have a higher intensity and further increase the likelihood of igniting a growth surge. This is not surprising as PRGT programs have

[3]GRA programs stand for General Resources Account programs that comprise a variety of lending programs with different disbursement schedules and maturities depending on the balance of payment needs of the member. PRGT programs stand for Poverty Reduction Growth Trust programs that represent lending programs providing concessional financing support to low-income countries.

a longer duration than GRA programs and provide concessional assistance better tailored to the diversity and needs of low-income countries. At a more granular level, we find that the IMF may have been more efficient in triggering growth surges in the 2000s than previous decades, in line with its reinvention to pay more attention to growth as stated in the IMF's Guidelines on Conditionality (2002). Also, it has played a role in igniting growth surges in all countries around the world, regardless of their geographical location and levels of development.

Some caveats are worth noting. First and most importantly, the IMF's role in igniting growth surges may also capture the action of other multilateral institutions like the World Bank, the EU, and Regional Development Banks as they have intertwined and joint interventions in countries. Therefore, the IMF's role here may be overestimated. Nevertheless, this issue may be less important for the growth determinants that are part of the IMF's core activities such as macroeconomic stability and policies and some areas of structural reforms. Second, our findings may be subject to the "selection bias" problem because periods with and without an IMF-supported program are importantly different, and the IMF has been routinely identified with economic hardship and political ferment. However, we have two reasons to believe this problem is of the least concern for our study. Primarily, we focus on the medium- to the long-term effect of IMF's interventions rather than their short-term effect, at the time of the crisis. Secondary, as IMF-supported programs have consistently been associated with economic and financial turmoil and their consequences, we believe that it may be more difficult to engineer higher growth in this time; therefore the positive IMF's role in igniting growth surges found here may serve as a lower-bound effect. Third, we capture the role of the IMF using the presence of an IMF-supported program or not. However, this does not tell anything about the structure and depth of the IMF conditionalities (e.g., fiscal and growth-oriented), the compliance of countries with these conditionalities, whether the programs went off-track or not. These analyses are left for further research. Finally, the positive results may not be fully attributed to the IMF as igniting growth surges is also a matter of country ownership as well as domestic political interests and institutional constraints. Therefore, the benefits found here are the result of both the IMF and the countries' coordination. Nevertheless, while focusing on disproportionate improvements in growth surges determinants, we do not think that country ownership would have caused an upward bias in the IMF's effect of igniting growth because they must be strong to achieve these changes regardless of the IMF presence.

The remainder of this paper proceeds as follows. Section 5.2 identifies growth surges. Section 5.3 presents the growth determinants and the strategy used to determine significant changes in these determinants as well as the non-parametric analyzes of the IMF's role in igniting growth surges. Section 5.4 describes the empirical analysis, baseline results, robustness checks, and sensitivity analysis. Section 5.5 concludes and provides some recommendations.

5.2 Growth surges identification and stylized facts

5.2.1 Growth surges identification

Our main goal is to assess the IMF's role in igniting growth surges. Therefore, we first identify growth surges and then separate them into two groups: (i) those associated with an IMF-supported program and (ii) those not associated with an IMF-supported program. We define a growth surge associated with an IMF-supported program as a growth surge that occurs during an IMF-supported program or 2 years after the completion of an IMF-supported program.

In the literature, three types of approaches have been used to identify growth surges : (i) a filter-based approach (see, e.g. Hausmann et al. 2005; Gupta et al. 2005; Aizenman and Spiegel 2010; Hausmann et al. 2011; Libman et al. 2019; Atsebi 2020), (ii) a statistical structural breaks approach (see, e.g. Kerekes 2007; Jones and Olken 2008; Berg et al. 2012), and (iii) a combination of the two previous approaches (see, e.g. Kar et al. 2013a,b; Munro 2020). None of these approaches is perfect, and each of them has some drawbacks. First, the filter-based approach is said to be ad-hoc and may lead to a lack of consistency across studies that use this method. Second, the statistical structural breaks approach or Bai and Perron (1998) method may capture "growth spells" following a period of sharply negative growth where the level of per capita income fails to reach its previous height, "growth spells" where the average growth rate during the spell differs relatively little from the growth rate before the spell and has a low power so that it is unable to identify genuine breaks in highly volatile series (the "true negative" problem). Third, the method that combines these two previous approaches may have their shortcomings (i.e., being ad-hoc and cannot identify genuine breaks) and generally leads to similar identification than the filter-based approach when applying the same criteria.

Against this backdrop, the filter-based approach remains the parsimonious and easiest way of detecting growth surges and having a clear understanding of the process that leads to their determination by setting reasonable criteria. Also, it allows us to set different criteria and identify multiple sets of growth surges to be used in robustness checks. In line with most of the papers in the literature, we assume that a growth surge lasts a minimum of 8 years (i.e., $n = 7$).[4] Moreover, growth surges are identified by the level of 8-year forward-looking per capita income growth rate, a comparison of 8-year backward- and forward-looking per capita income growth rates, and an additional criterion on the level of per capita income to avoid capturing pure recovery from past-shocks. We employ the same criteria as in Atsebi (2020); they are as

[4]The use of shorter periods (e.g. between 3 or 5 years) may capture pure recovery from a bad shock or business cycles. The use of longer duration may significantly reduce the number of episodes that can be identified. However, we test the robustness of our findings to using episodes of at least 5 or 10 years.

follows

1) $g_{t,t+n} \geq 3.5$ pp., i.e., growth is rapid: the average annual growth rate of real income per capita over the next 8 years is at least 3.5 percentage points.

2) $\Delta g_{t,n} = g_{t,t+n} - g_{t-n,t} \geq 2.0$ pp., i.e., growth accelerates: the average annual growth rate over the next 8 years is at least 2 percentage points above the one of the previous 8 years period.

3) $y_{t-1} >= max(y_{t-n}, ..., y_{t-1})$, i.e., the level of income per capita one year before the start of the growth surge is the peak of the pre-episode period.

A few comments are in order here. First, our first-two criteria are like those in Hausmann et al. (2005), but the third one is different. Indeed, Hausmann et al. (2005) set the criteria to be $y_{t+n} >= max(y_{t-n}, ..., y_{t-1})$, i.e., the income level the eighth year after the surge exceeds its pre-episode peak. By doing so, they may capture episodes in which the first years are "pure recovery" from previous bad shocks (like natural disasters, major political upheavals, or wars). The more stringent criterion used in this analysis helps avoid identifying growth surges capturing recovery from bad shocks. Second, when these criteria are met in consecutive years, we deem the first instance to be the "best" starting date. Third, we do not allow countries to have overlapping growth surges. If these criteria are met within an overlapping period of 8 years, then we extend the end date of the surge.[5] To check the robustness of our results, we employ the same criteria than Hausmann et al. (2005), or "stricter" or "looser" filters.

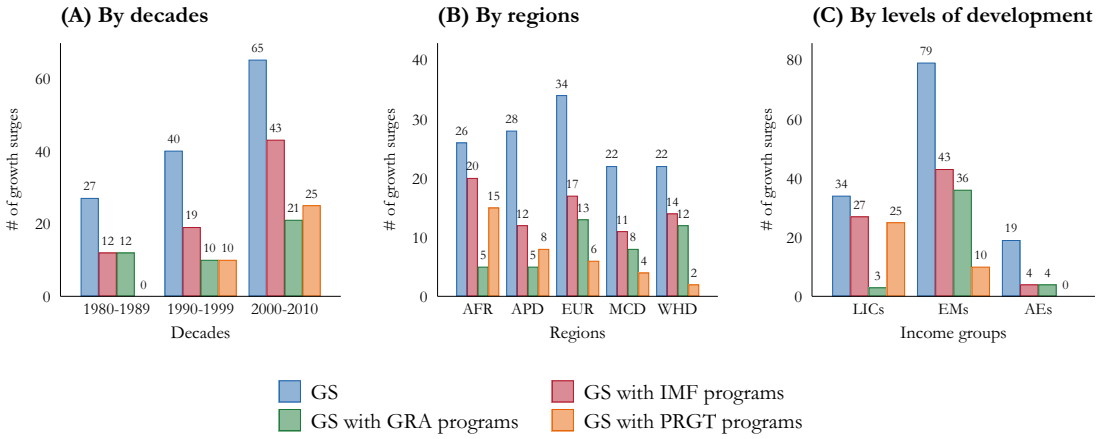
5.2.2 Stylized facts on growth surges associated with an IMF-supported program

5.2.2.1 Overview of growth surges associated with an IMF-supported program

After applying our filters on the real income per capita at PPP values from the Penn World Tables for 169 countries (eliminating countries that do not have enough data series), we identify 132 episodes of growth surges in 117 countries over the period 1980-2010. Out of them, 74 (56%) occurred during or 2 years after IMF-supported programs in 72 countries. This figure stands at 43 (32.6%) for GRA programs and 35 (26.5%) for PRGT programs (some GRA and PRGT programs are blended or consecutive programs) in 42 and 34 countries, respectively.

[5] More specifically, if these criteria are met within overlapping periods, then the final year of the latter period has deemed the end of the growth surge (e.g. if the criteria are met in 1980 and 1986 then the end of the growth surge would be 1993).

Figure 5.1: Stylized facts on growth surges and their association with IMF-supported programs by decades, regions, and levels of development



Notes: The figures show the numbers of all growth surges and growth surges associated with an IMF-supported program by decades, regions, and levels of development. A growth surge is associated with an IMF-supported program if it occurs during or 2 years after an IMF-supported program. AFR, APD, EUR, MCD, and WHD stand for Africa, the Asia and Pacific, Europe, the Middle East, and Central Asia, and Western Hemisphere or the Americas and Caribbean, respectively. LICs, EMs, and AEs stand for Low-income countries, Emerging markets, and Advanced economies, respectively.

Figure 5.1 presents the numbers of all growth surges and growth surges associated with an IMF-supported program (further split by GRA and PRGT programs) by decades, regions, and levels of development. First, growth surges have increasingly been associated with an IMF-supported program over decades, from 44.4% of growth surges in the 1980s to 47.5% in the 1990s, and 66.1% in the 2000s. Second, a considerable number of growth surges in Africa, and the Americas and Caribbean were associated with an IMF-supported program, 76.9 and 63.6%, respectively. This is also true in Europe and the Middle East and Central Asia in which 50% of the growth surges were associated with an IMF-supported program, and in Asia and Pacific were 42.8% of growth surges were associated with an IMF-supported program. Third, growth surges have been more associated with an IMF-supported program in low-income countries (79.4%) and emerging markets (54.4%) than in advanced countries (21%). In sum, the IMF has been involved in growth surges, more in the 2000s compared to previous decades, in all regions of the world, and particularly in low-income countries and emerging markets.

5.2.2.2 Unconditional probability of growth surges

As a first insight of the IMF's role in igniting growth surges, we present in table 5.1 the unconditional probability of igniting growth surges associated with an IMF-supported program (Panel A) and without an IMF-supported program (Panel B) by decades, regions, and levels of

development. The unconditional probability of growth surges with an IMF-supported program is the number of growth surges associated with an IMF-supported program over the number of years of IMF-supported programs excluding non-starting years of growth surges. Similarly, the unconditional probability of growth surges without an IMF-supported program is the number of growth surges without an IMF-supported program over the number of years where an IMF-supported program was not in place excluding non-starting years of growth surges. We exclude the non-starting years of growth surges because an episode cannot take place then. We find that the average unconditional probability is higher for growth surges associated with an IMF-supported program (4.7%) compared to growth surges without an IMF-supported program (2.8%).[6] Saying differently, it means that the probability of a typical country to experience a growth surge in a decade is higher by 19 percentage points if the IMF is present in all the years of the decade.

Table 5.1: Unconditional probability, by decades, regions, and levels of development

	Panel A: With IMF-supported programs				**Panel B: Without IMF-supported programs**			
	Decades				**Decades**			
	1980-1989	**1990-1999**	**2000-2010**	**Total**	**1980-1989**	**1990-1999**	**2000-2010**	**Total**
Regions								
Africa	0.008	0.017	0.055	0.026	0.006	0.015	0.026	0.015
Asia and Pacific	0.050	0.060	0.176	0.083	0.052	0.060	0.053	0.054
Europe	0.032	0.075	0.196	0.105	0.029	0.039	0.020	0.028
Middle East and Central Asia	0.074	0.059	0.207	0.103	0.000	0.055	0.062	0.033
Americas and Caribbean	0.027	0.016	0.072	0.037	0.014	0.015	0.030	0.019
Levels of development								
LICs	0.004	0.017	0.068	0.030	0.013	0.019	0.041	0.021
EMs	0.043	0.047	0.141	0.069	0.013	0.042	0.056	0.036
AEs	0.063	0.143	0.100	0.100	0.034	0.027	0.007	0.021
Total	0.024	0.032	0.093	0.047	0.019	0.034	0.033	0.028

Although quite informative, this general picture hides some disparities by decades, regions, and levels of development. Indeed, the unconditional probability of growth surges was remarkably higher when associated with an IMF-supported program in the 2000s (9.3% versus 3.3%), which was less true in the 1980s (2.4% versus 1.9%) and the 1990s (3.2% versus 3.4%). This finding is confirmed across regions and levels of development and pronounced in Europe, the Middle East and Central Asia, Asia and the Pacific, and in emerging markets and advanced countries. Besides, the unconditional probability of growth surges with an IMF-supported program was higher by more than 7 pp. in Europe, and the Middle East and Central Asia, 2.9 pp. in Asia and the Pacific, and less than 2 pp. in the Americas and Caribbean and Africa compared to the probability of growth surges without an IMF-supported program. Finally,

[6] Recall that the average unconditional probability of all growth surges is 3.6% (slightly above the 2.8% found in Hausmann et al. (2005) over the period 1957-1992).

the gains of the probability of growth surge when associated with an IMF-supported program decrease with the levels of development. The unconditional probability of growth surges with an IMF-supported program was higher by 7.9 pp. in advanced economies, 3.3 pp. in emerging markets, and only 0.9 pp. in low-income countries. Overall, this non-parametric analysis of the unconditional probability of growth surges shows that the IMF may have played a role in igniting growth surges, particularly in the 2000s, and more in Europe, the Middle East and Central Asia, and the Asia and Pacific than the Americas and Caribbean and Africa, and more in emerging markets and advanced countries than in low-income countries. Using these stylized facts as a clue of the IMF's role in igniting growth surges, we pursue our analysis by employing a non-parametric noise-to-signal ratio method to identify disproportionate improvements in determinants of growth surges and how they affect the probabilities of growth surges. We also analyze whether the IMF-supported programs contribute to achieving the needed improvements in the run-up of the growth surges, and how they influence the predictive power of growth surges determinants. This non-parametric analysis is supplemented by an empirical strategy using binary outcome models that account for the correlation among all the determinants of the growth surges.

5.3 Determinants of growth surges

Following closely the strategy in Atsebi (2020), and as in Rodrik (2019) and Hausmann et al. (2008), we consider that a growth surge may occur in one country if the country can significantly eliminate its "binding constraints". These bindings constraints may be either a high level of inflation, debt, or deficit for some countries, or the lack of infrastructures or a corrupted political system, and so on, for other countries. Consequently, the significant improvements in the growth surges determinants should be country-specific and could systematically be identified into a set of standard growth determinants that the literature found to be crucial for predicting medium to long-term growth. In other words, first, we start by identifying the main determinants of growth without looking at the specific economic situation of a country. Second, we identify significant changes at the country-level for all the determinants and focus on the period before the growth surge (five years before the start). Third, if we find that in the run-up of a growth surge, there were significant changes or improvements in one determinant, we assume that this determinant was potentially an impediment to growth in this country. Briefly, this strategy allows identifying ex-post potential country-specific bottlenecks to growth surge in each country. Finally, after identifying the significant improvements in the growth surges determinants, we look at whether they happened during an IMF-supported program or not or how the IMF contributes to creating the conditions necessary to jump-start growth.

5.3.1 Categorization of growth determinants

To identify growth determinants, we rely on the existing growth surges literature (see, e.g. Hausmann et al. 2005; Gupta et al. 2005; Hausmann et al. 2008; Kerekes 2007; Jones and Olken 2008; Aizenman and Spiegel 2010; Jong-A-Pin and de Haan 2011; Berg et al. 2012; Peruzzi and Terzi 2018; Atsebi 2020) and general literature on growth (see below). Following Atsebi (2020), we group them in six broad categories of determinants.[7]

1) **External factors and Endowments:** many papers have shown the importance of external factors (see, e.g. Edwards and Van Wijnbergen 1987; Easterly et al. 1993; Barro 2003; Hamann and Prati 2002; Gupta et al. 2005; Atsebi 2020) and natural resources endowments (see, e.g. Manzano and Rigobon 2001; Mehlum et al. 2006; Sala-i Martin et al. 2004; Mideksa 2013; Atsebi 2020) for growth. This broad determinant captures the effects of "good luck" (favorable external conditions or discoveries of natural resources). We, therefore, include in this category: (i) trading partners' growth, (ii) terms of trade, (iii) nominal US FED interest rate, (iv) volatility of S&P 500 index returns, and (v) total natural resources rents.

2) **Institutions:** Institutional factors have proven to be central and critical for growth through its direct effects on growth or its conditional effects on other growth determinants (see, e.g. Acemoglu et al. 2001; Hamann and Prati 2002; Barro 2003; Gupta et al. 2005; Mehlum et al. 2006; Jong-A-Pin and de Haan 2011; Berg et al. 2012; Giuliano et al. 2013; Atsebi 2020). However, the literature that focuses on the political regime (democracy versus autocracy) is very inconclusive and sometimes points toward a higher likelihood of growth surges in autocracy or democracy. We think that beyond everything, what matters for growth is not the political regime, but rather the quality of institutions (accountability, corruption, civil liberties, economic freedom, rule of law) and how they organize or affect the economic choices. Thus, we rely on different indexes that measure: (i) government's accountability, (ii) civil liberties, (iii) political corruption, and (iv) the rule of law.

3) **Macroeconomic stability:** Macroeconomic stability is a prerequisite to ignite and sustain growth, a view that is cherished by multilateral institutions (see, e.g. Mussa and Savastano 1999; Collier and Hoeffler 2004; Easterly 2005). Many papers have highlighted the significant role of macroeconomic stability for growth (see, e.g. Dornbusch et al. 1995; Bruno and Easterly 1998; Gupta et al. 2005; Berg et al. 2012; Darvas 2012; Libman et al. 2019; Atsebi 2020). For countries with significant macroeconomic stability, demand-restraining

[7] This practice is uncommon in the literature and was applied in Atsebi (2020) and Peruzzi and Terzi (2018). However, the set of variables that we use in this analysis is quite extensive compared to what is done in the literature.

measures, sometimes combined with exchange rate depreciation may be needed before take-off takes place. Consequently, we include in this category: (i) end of financial crises and normal recessions, (ii) public debt, (iii) current account, (iv) inflation, and (v) change of real effective exchange rate.

4) **Structural Reforms:** Igniting growth surges heavily depends on the structure of the economy and the capacity to implement structural reforms to eliminate the bottlenecks of the economy (see, e.g. Ahluwalia 2002; Panagariya 2004; Gupta et al. 2005; Giuliano et al. 2013; Prati et al. 2013; IMF 2019; Libman et al. 2019; Atsebi 2020). Moreover, while achieving macroeconomic stability (which is not without any cost for the economy), structural reforms may be needed to significantly increase the allocation of resources and their effectiveness that would have a medium to long-term effect on growth; this has been the strategy adopted in IMF-supported programs (see, e.g. Mussa and Savastano 1999). We therefore include in this category different sets of reforms including: (i) agriculture-, (ii) product market-, (iii) labor market-, (iv) financial-, (v) trade-tariff-, (vi) current account-, and (vii) capital account reform.

5) **Trade diversification and quality:** Many countries achieved a higher level of development because they succeeded the diversification of their exports and trading' partners while improving the quality of the products they export and import (machinery and highly technological products) (see, e.g. Hausmann et al. 2007, 2011; Berg et al. 2012; Cadot et al. 2013; Atsebi 2020). Therefore, we use in this category: (i) export and (ii) import quality, (iii) product, and (iv) partner diversification.

6) **Investments, labor and productivity:** The neoclassical models of long-term growth stressed out the importance of investments in determining growth (see, e.g. Solow 1956; Swan 1956; Gupta et al. 2005) while the endogenous-growth models stressed out the importance of human capital and productivity (see, e.g. Romer 1986, 1987; Lucas 1988; Barro 1991; Joshua 2015; Gupta et al. 2005; Atsebi 2020). We, therefore, include in this category: (i) domestic investment (both private and public investments), (ii) foreign direct investment, welfare-relevant total factor productivity, and (iii) human capital index. These factors are more direct determinants of growth and may also be determined by the other determinants 1) to 5).

Our list of the six broad growth determinants is quite extensive and will allow identifying what matters for igniting growth surges. Table D.2 reports the full list of growth determinants and their sources, and table D.3 presents the summary statistics of all variables. As illustrated in the case of Africa by Gupta et al. (2005) and based on our assumptions, we posit that if the IMF

has played any role, it should have been through restoring macroeconomic stability in countries facing debt, banking or currency crises or affecting by bad external shocks, and implementing comprehensive structural reforms in diverse sectors of the economy. Also, the IMF may have pushed for or accompanied changes in economic institutions towards more neoliberal policies.

5.3.2 Identifying significant changes or improvements of growth determinants

After identifying the set of growth surges determinants, we now proceed with the identification of the significant country-specific changes or improvements in each of the growth determinants. To do so, we employ the noise-to-signal ratio as in Atsebi (2020). More specifically, for each indicator and country, we draw the country-specific percentile distribution of the change of each indicator and identify thresholds in the upper tail of the distribution beyond which a signal is issued (higher changes of the determinants). Thus, the distribution is divided into two parts, with and without a signal. The threshold that divides the distribution is a percentile that is endogenously determined by minimizing the total misspecification errors (sum of type I and II errors) and ensuring a balance of the two types of statistical errors.[8][9][10] The use of percentiles to define thresholds, instead of absolute values, takes into consideration structural differences across countries and identifies significant changes in a country-specific fashion, based on the country's history.

Table 5.2: Illustration of the signals approach method

	No Growth surge (T)	Growth surge (T)
No signal (T-h,T)	**A (true negative)**	**B (missed or error type II)**
Signal (T-h,T)	**C (false alarms or error type I)**	**D (true positive)**

The results of the signaling analysis can be summarized in a matrix as in table 5.2 in which the occurrence of growth surges and the issuance of signals of each indicator are measured against each other. We assume that it may take time to initial growth surge, and then we consider that a genuine signal is the one occurring in the 5 years before the growth surge (i.e., $max(h) = 5$).[11]

[8] Clearly, this strategy does not apply to dichotomic variables like the end of financial crises or normal recessions. In this case, we use the year in which the end of the financial crisis or normal recessions occurred as the signal.

[9] Determinants that harm growth such as public debt and inflation are multiplied by minus (-) so that improvements of these determinants also fall in the upper tail of its new distribution.

[10] A lower threshold (the model sends fewer signals) is associated with an increase of type II errors or missed crises, but at the same time, a decrease of type I errors or false alarms. A higher threshold (the model sends more signals) is associated with a decrease of type II errors or missed crises, but at the same time, an increase of type I errors or false alarms. The thresholds are determined endogenously between the 70^{th} and 90^{th} percentiles.

[11] We use a horizon of 7 and 3 years in the robustness checks.

The error type I or share of false alarms among non-growth surges is defined as $C/(A+C)$, and the error type II or share of missed growth surges among growth surges is defined as $B/(B+D)$. Then, the total misspecification error is the sum of errors type I and II, i.e. TME= $C/(A+C)+B/(B+D)$, and the predictive power is one minus the total misspecification error, i.e. $PW = 1 - TME$. We can also define two other performance indicators: the effectiveness defined as the share of true positive among all signals, i.e. effectiveness= $D/(C+D)$, and the incidence defined as the share of true positive among all growth surges, i.e. incidence= $D/(B+D)$. After identifying optimal thresholds beyond which signals are issued (i.e., significant changes of growth determinants occurred), we construct six indexes of broad determinants of growth as presented in the previous section. These indexes GD_j are the weighted average of all signals in sub-determinants i where the weights w_i are the predictive powers (1-TME), i.e.:

$$GD_{jt} = \sum_{i=1}^{n} w_i \times d_{it} \; where \; d_{it} = 1 \; if \; signal \; and \; 0 \; otherwise \tag{5.1}$$

One can notice that the indexes of each broad determinant of growth surges are increasing when there are significant changes or improvements in the sub-determinants of this broad determinant. For instance, if there is a significant reduction of the level of debt, deficit, and inflation, coupled with a depreciation of real exchange rate to boost competitiveness, and an end of a financial crisis, the macroeconomic stability index will increase. The results of the noise-to-signal approach, as well as the assumption on the direction of effects for the sub-determinants, are reported in table D.4. These results show that almost all the sub-determinants have a good predictive power (see, incidence and effectiveness indicators, and total misspecification errors) of growth surges. This means that we have identified good determinants and that our optimization strategy is capturing significant changes or improvements in determinants related to growth surges. Hereafter, we will focus on the results of the broad determinants.

5.3.3 Advanced stylized facts on growth surges determinants

5.3.3.1 Unconditional probability of significant improvements in broad growth surges determinants

Compared to Atsebi (2020), in this paper, we go one step forward to analyze the IMF's role in igniting growth surges. To do so, after identifying the significant changes in growth surges determinants, we disentangle them between significant changes occurring during an IMF-supported program and those that do not and look at their unconditional probability as reported in table 5.3. Data of IMF-supported programs are from the IMF Strategy and Policy Review department that follows all the programs since 1952. Surprisingly good, it is more likely that significant improve-

ments in all the six broad determinants occur during periods of IMF-supported programs than in periods without IMF-supported programs. Indeed, the unconditional probability of significant changes of the growth surges determinants when associated with an IMF-supported program is higher by 11.3 pp. for structural reforms, 9.3 pp. for macroeconomic stability, 9.0 pp. for external factors and endowments, 8.2 pp. for institutions, 7.9 pp. for investments, labor, and productivity, and 7.1 pp. for trade diversification and quality, than when not associated with an IMF-supported program. While there is no evident reason that this finding holds for external factors and endowments compared to other determinants, the higher numbers observed for structural reforms, macroeconomic stability, and institutions reveal that the IMF may have played an important role to create an environment suitable to jump-start growth through restoring macroeconomic stability, implementing structural reforms, and pushing for institutional improvements. Also, these improvements may have supported other improvements in investments, labor and productivity, and trade diversification and quality. For instance, Gupta et al. (2005) show that an increase in total factor productivity growth in the run-up of growth acceleration in Africa was significantly influenced by improvements in countries with on-track IMF-supported programs. Besides, we do not find any significant difference between the unconditional probability of the significant changes in the growth surges determinants for GRA and PRGT programs.

Table 5.3: Unconditional probability of the significant improvements in growth surges determinants

	(1) GSs and no IMF		(2) GSs and IMF		(3) GSs and GRA		(4) GSs and PRGT	
Broad determinants of Growth surges	**# Signals**	**Unc Prob**	**# Signals**	**Unc Prob**	**# Signals**	**Unc Prob**	**# Signals**	**Unc Prob**
External factors and endowments	120	0.043	187	0.133	111	0.104	86	0.115
Institutions	104	0.038	168	0.120	107	0.100	70	0.093
Macroeconomic stability	113	0.041	188	0.134	120	0.113	81	0.108
Structural reforms	88	0.032	203	0.145	129	0.121	91	0.121
Trade diversification and quality	128	0.046	164	0.117	102	0.096	77	0.103
Investments, labor and productivity	88	0.032	155	0.110	88	0.083	74	0.099
# of candidate years	**2767**		**1403**		**1065**		**750**	

Notes: The unconditional probability are calculated as the number of significant changes of growth surges determinants (associated with or without an IMF-supported program) over the number of years (with and without an IMF-supported program) excluding years of non-starting growth surges.

5.3.3.2 Incidence and Effectiveness by association with an IMF-supported program or not

However, the occurrence of the significant improvements in growth surges determinants is not the whole story. Another supplementary analysis is to look at how often the growth surges were preceded by the significant improvements in growth surges determinants or the incidence, or how often the significant improvements in growth surges determinants were followed by a growth surge or the effectiveness. We then analyze the incidence and effectiveness of each of the broad

determinants when associated with an IMF-supported program or not.[12] Table 5.4 displays the results of this analysis. First, the analysis of the incidence shows that the probability that growth surges were preceded by significant changes in each broad determinant is very high for all broad categories (between 79 and 100%), and this independently of the presence of an IMF-supported program. This finding shows that, in general, significant improvements in almost all the broad determinants may be required to jump-start growth, and this does not vary significantly with the presence of IMF-supported programs. Second, the analysis of the effectiveness reveals that the probability that significant improvements in growth surges determinants were followed by a growth surges is between 1.4 and 1.8 times higher when these improvements occur during IMF-supported programs. This finding is verified for both GRA and PRGT programs. In other words, the effectiveness of the significant improvements in growth surges determinants is magnified when occurring during an IMF-supported program. Third, we find also that 28% of all IMF-supported programs (starting outside the episodes of growth surges) were followed by a growth surge. This stands at 25.1% for GRA programs, and 32.7% PRGT programs. These findings show that not only the significant changes in the growth surges determinants occur more often during an IMF-supported program but also these more frequent changes are more likely to be followed by an IMF-supported program. Besides, we look at the relative importance of each of the determinants by ranking them by their effectiveness. For significant changes occurring during an IMF-supported program, structural reforms (44.3%) and macroeconomic stability (42.6%) have the highest effectiveness. They are closely followed by investments, labor, and productivity (41.7%) and external factors and endowments (39.9%), and finally by trade diversification and quality and institutions (around 35% each). For significant changes occurring in periods without an IMF-supported program, macroeconomic stability also takes the lead (with 29.4%), followed by other determinants (between 23 and 25%).

As a complementary analysis, we present how the general findings highlighted in this section vary by decades, regions, and levels of development (see for further detail, tables D.5 to D.7 for incidence and tables D.8 to D.10 for effectiveness,). Briefly, the findings for incidence remain valid across decades, regions, and levels of development. In contrast, there is a notable variation of the effectiveness by decades, regions, and levels of development (in line with the unconditional probabilities of growth surges). First, both the effectiveness of all determinants and the gains when they are associated with an IMF-supported program increase over decades. In the 1980s, the association with IMF-supported programs has no significant effects. It turns to be positive for structural reforms, macroeconomic stability, and investments, labor and productivity in the

[12]Note that the incidence is the probability that growth surges were preceded by significant changes of determinants while the effectiveness is the probability that significant changes were followed by growth surges. From the theoretical standpoint, one can think of incidence as a necessary condition to ignite growth surges while the effectiveness relates to a sufficient condition.

Table 5.4: Incidence and Effectiveness by broad determinants of growth surges, with and without IMF-supported programs

Panel A: Incidence														
	(1) GSs and no IMF		**(2) GSs and IMF**		**(3) = (2) - (1)**		**(4) GSs and GRA**		**(5) = (4) - (1)**		**(6) GSs and PRGT**		**(7) = (6) - (1)**	
Broad determinants of Growth surges	**# GSs**	**Inc**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**
External factors and endowments	56	0.966	74	1.000	0.034	0.109	43	1.000	0.034	0.223	35	1.000	0.034	0.272
Institutions	48	0.828	65	0.878	0.051	0.413	37	0.860	0.033	0.658	32	0.914	0.087	0.247
Macroeconomic stability	53	0.914	67	0.905	-0.008	0.869	39	0.907	-0.007	0.907	32	0.914	0.000	0.994
Structural reforms	46	0.793	65	0.878	0.085	0.186	39	0.907	0.114	0.124	30	0.857	0.064	0.444
Trade diversification and quality	49	0.845	69	0.932	0.088	0.106	40	0.930	0.085	0.193	32	0.914	0.069	0.338
Investments, labor and productivity	52	0.897	68	0.919	0.022	0.660	38	0.884	-0.013	0.840	32	0.914	0.018	0.782
# of GSs	**58**		**74**		**-**		**43**		**-**		**35**		**-**	

Panel B: Effectiveness														
	(1') GSs and no IMF		**(2') GSs and IMF**		**(3') = (2') - (1')**		**(4') GSs and GRA**		**(5') = (4') - (1')**		**(6') GSs and PRGT**		**(7') = (6') - (1')**	
Broad determinants of Growth surges	**# Signals**	**Eff**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**
External factors and endowments	120	0.237	187	0.399	0.162	0.000	111	0.385	0.149	0.000	86	0.426	0.189	0.000
Institutions	104	0.249	168	0.352	0.103	0.001	107	0.366	0.117	0.001	70	0.311	0.062	0.094
Macroeconomic stability	113	0.294	188	0.443	0.150	0.000	120	0.441	0.148	0.000	81	0.429	0.135	0.001
Structural reforms	88	0.240	203	0.426	0.186	0.000	129	0.431	0.192	0.000	91	0.408	0.168	0.000
Trade diversification and quality	128	0.239	164	0.354	0.115	0.000	102	0.333	0.095	0.003	77	0.399	0.160	0.000
Investments, labor and productivity	88	0.229	155	0.417	0.188	0.000	88	0.415	0.186	0.000	74	0.418	0.189	0.000
# of GSs	**58**		**74**		**-**		**43**		**-**		**35**		**-**	

Notes: Numbers of GSs in the table are those preceded by a signal in each broad determinant. Similarly, number of signals are those followed by a growth surge.

1990s. In the 2000s, the effectiveness of all the determinants was higher when the significant changes occur during an IMF-supported program (in line with the general picture). Second, the effectiveness of the significant changes in almost all growth surges determinants was particularly higher in Europe, the Middle East and Central Asia, and Asia and the Pacific, with minor exception, when occurring during an IMF-supported program. Smaller gains are also found in the Americas and Caribbean while no gains are found for Africa. Third, we find that the effectiveness gains of the significant changes in growth surges determinants when associated with an IMF-supported program appears only in advanced countries and emerging markets while no gains are found in low-income countries.

Here, two caveats are worth noting. First, the analysis so far has focused on employing non-parametric analyses (the unconditional probability of the growth surges, the unconditional probability, incidence, and effectiveness of the growth surges determinants) to draw general lessons on the IMF's role in igniting growth surge. All of them point towards a significant and positive role of the IMF in contributing to creating favorable conditions necessary to jump-start growth in countries, notably through restoring macroeconomic stability, implementing structural reforms, and pushing for institutional improvements. Moreover, this role tends to be more pronounced in the 2000s, in Europe, the Middle East and Central Asia, and Asia and the Pacific, and emerging markets and advanced countries. Second, all these analyses do not consider the possible correlation between all the broad determinants, especially as we show that many of the significant improvements of these determinants tend to occur simultaneously. This states that a more comprehensive analysis is needed to fully weight the power of each of determinants one against another and assess the IMF's role in igniting growth surges before making conclusive

recommendations. We, therefore, check the consistency of these findings using an empirical strategy.

5.4 Empirical analysis

5.4.1 Methodology

Our empirical investigation sought to verify the consistency of our previous analysis, assess the IMF's role in igniting growth surges, and tell a story on how it helps countries to jump-start growth in a sustained manner for a prolonged period. To do so, we employ binary outcomes models (mainly logit in the benchmark and many others as robustness checks).

As it is common in the literature (see e.g., Hausmann et al. 2005; Jong-A-Pin and de Haan 2011; Libman et al. 2019; Atsebi 2020), our dependent is a dummy that takes the value one the 3 years centered on the first year of the growth surges identified by our filters and zero otherwise, given the uncertainty on the exact timing of the start of growth surges. The years were a growth surge cannot take place are excluded, i.e. we exclude all the non-starting years of the growth surges because we are interested in their initiation. Given that, our comparison group includes all country-years observations where a growth surge did not occur, including all countries that never experienced a surge. The sample period covers the years 1980-2010, as restrained by our filters. Our set of explanatory variables includes the dummy that takes the value one if the country is under an IMF-supported program or 2 years after one is completed, and zero otherwise (we further split the analysis by GRA and PRGT programs), the average of each of the six broad determinants constructed in the previous section calculated over the previous 5 years, and six interaction terms between the IMF-supported program dummy and all the six broad determinants. These interaction terms will capture the probability of starting a growth surge following the significant changes in each of the broad determinants when occurring during an IMF-supported program or 2 years after or not. Finally, we also include dummies for decades, regions, and levels of development to capture the heterogeneities found in the previous section. Many robustness checks are also undertaken to check the validity of our main findings to alternative samples, timing conventions, estimators, sets of growth surges based on alternative filters. Also, the sensitivity of our findings across decades, regions, levels of development are presented.

5.4.2 Benchmark results

Our benchmark findings are reported in table 5.5. It shows the average marginal effects of all the broad determinants when their significant changes occur during an IMF-supported program (column 2, 4, and 5) or do not (column 1, 3, and 4). Figures D.1 to D.3 depict these average marginal effects graphically for more accurate interpretation (indeed, our indexes of broad determinants never reach the maximum value of one). First, our models have a good predictive performance as presented in the bottom of the table (classification power above 90%, Area under the ROC close to 0.8, and Pseudo R^2 around 0.18). Also, the BIC criterion suggests that carrying out the analysis by GRA and PRGT programs brings more information than in the specification when all IMF-supported programs are analyzed altogether.[13]

Second, our empirical analysis sustains a notable difference in the predictive power of the growth surges determinants when their significant improvements occur during an IMF-supported program. The presence of an IMF-supported program accentuates and magnifies the positive association between growth surges and significant improvements in external factors and endowments, structural reforms, investments, labor and productivity, and macroeconomic stability. In contrast, it does not affect trade diversification and quality, and institutions for which significant changes occurring outside of an IMF-supported program are more effective to predict growth surges. In detail, a one-unit increase in external factors and endowments raises the probability of a growth surge by 19.6% when not associated with an IMF-supported program, which is quite magnified to 67.3% percent when associated with an IMF-supported program. While structural reforms and investments, labor, and productivity changes do not significantly raise the probability of a growth surge (although positive) when not associated with an IMF-supported program, they turn out to have a significant and positive effect when occurring under an IMF-supported

[13]Here one notable difference with the existing literature is worth noting. While we find here that predictive power is quite high, the literature generally highlighted a very poor predictive power. Indeed, Hausmann et al. (2005) sustained that "a lot of takeoffs take place when [...] conditions appear not to be particularly favorable [...] And growth takeoffs typically fail to materialize when the conditions are indeed favorable". Gupta et al. (2005) reinforced by stating that "The in-sample predictive power of both the acceleration and sustained acceleration models, however, is relatively poor. Thus, many acceleration episodes occur when the explanatory factors in the model would not predict an acceleration, and many times, even though the variables associated with accelerations are conducive, an episode does not take place. There are factors the model is not capturing, as well as country-level idiosyncratic factors that warrant further investigation to better guide policy. Predicting the timing, or onset, of growth accelerations is even more difficult.", and Peruzzi and Terzi (2018) concluded that "growth accelerations are extremely hard to engineer with a high degree of certainty [...] roughly 9 out of 10 instances failed to ignite a take-off". While we cherish the precautionary conclusion of Gupta et al. (2005), overall, these findings are completely misleading. Indeed, their studies fall short to identify growth surges determinants while accounting for the specificity of each country. Furthermore, they focus on the level of the growth determinants or set ad-hoc thresholds to identify favorable conditions while we identify the significant improvements beyond a certain threshold of the growth surges determinants through an optimization process. Briefly, accounting for country-specificity and focusing on significant and endogenous improvements of the growth surges determinants solve the "poor predictive power" of the literature.

program; in this case, a one-unit increase of these indexes are associated with a probability of growth surge of 33.1 and 23.4%, respectively. Finally, a one-unit increase in the macroeconomic stability index raises the probability of growth surges by 49.8% when occurring during an IMF-supported program and by 40.8% when not associated with an IMF-supported program. In contrast to non-parametric findings, changes in trade diversification and quality and institutions when occurring during an IMF-supported program have no significant effect on the probability of growth surges; a one-unit increase of these determinants is associated with a probability of 19 and 9.7% when not associated with an IMF-supported program, respectively. These findings are in line with Gupta et al. (2005) that shows that, in the context of Africa, improvements in macroeconomic and structural policies and total factor productivity were more pronounced in countries with on-track IMF-supported programs, and they generally lead to faster growth. When looking at the benefits of having either a GRA or PRGT program, we globally reveal that the benefits of having a PRGT than a GRA program are higher because the significant improvements in growth determinants occurring during a PRGT program have a higher intensity and further increase the likelihood of igniting a growth surge. This is not surprising as PRGT programs have a longer duration than GRA programs and provide concessional assistance better tailored to the diversity and needs of low-income countries to achieve their objectives of solving balance of payments problems, reaching higher growth, and reducing poverty.

Third, the analysis of the relative importance of each of the growth surges determinants shows that countries, when they have no IMF-supported programs, can maximize their probability of having a growth surge by privileging improvements in macroeconomic stability, and trade diversification and quality as well as by benefiting from favorable external and endowments conditions. When countries are under an IMF-supported program, they can achieve a higher probability of growth surges if they benefit from favorable external and endowments conditions and significantly improve their macroeconomic stability, implement structural reforms, and increase investments, labor and productivity.

Fourth, as suggested by descriptive analysis, we show the likelihood of growth surges was higher in Asia and the Pacific, Europe, and the Middle East and Central Asia as opposed to Africa and the Americas and Caribbean. Besides, it increases in the decade 2000-2010 compared to the period 1980-1999. It was also higher in emerging countries than in low-income and advanced countries. Below, we analyze the sensitivity of the results by decades, regions, and levels of development.

Overall, all the analysis carried out in this paper, from the non-parametric analyses of unconditional probability, incidence, effectiveness to the parametric estimations show that having an IMF-supported is somewhat enhancing the probability of igniting a growth surge. Expectedly, there are few changes when shifting the analysis from non-parametric to parametric methods.

For example, the non-parametric analysis shows that having an IMF-supported program similarly accentuates and magnifies the predictive power of all the growth surges determinants whereas the parametric estimation that accounts for the link between the determinants shows that these benefits of an IMF-supported program are different in magnitude and significance. Indeed, from the biggest to the smallest effect, improvements in external factors and endowments, macroeconomic stability, structural reforms and investments, labor, and productivity associated with an IMF-supported program help to jump-start growth in countries. This supports that the IMF may have contributed to boosting medium- to long-term growth in countries while pursuing macroeconomic stability and implementing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions.

5.4.2.1 The intensity of the significant improvements in growth surges determinants under an IMF-supported program

One possible explanation of the benefits of having significant improvements of growth surges determinants during an IMF-supported program may be that these improvements, even if they are already disproportionately large, may be of higher intensity when executing under the IMF lending and assistance. To check that, we compute the mean difference of the 5-year average of the broad growth surges determinants when occurring during an IMF-supported program or not at the start of growth surges in table 5.6. We found that except for trade diversification and quality for all types of programs, and investments, labor, and productivity for GRA programs, all other significant improvements in growth surges determinants have a higher intensity when occurring during an IMF-supported program or 2 years after (both GRA and PRGT programs). The highest difference in intensity is found for institutions (driven mainly by GRA programs) and structural reforms (both GRA and PRGT programs). They are followed by macroeconomic stability (both GRA and PRGT programs), investments, labor, and productivity (only for PRGT programs), and finally by external factors and endowments (mainly driven by PRGT programs). In other words, this finding shows that in the 5 years running up to growth surges while we focus on significant improvements in growth surges determinants regardless of the presence of the IMF, when the IMF is there, these significant changes will more recurrent and intense.[14]

[14]This means that the IMF and countries through their agreement may pursue their objective of large improvements in countries' corruption, civil liberties, accountability, and rule of law; large reduction of debt, public deficit, and inflation, exchange rate depreciation to boost competitiveness, and end of financial crises or normal recessions; large structural reforms in agriculture, product market, labor, financial market, trade, and current account openness; and foreign and domestic investments, human capital, and overall productivity.

Table 5.5: Predicting growth surges, baseline results, with and without IMF-supported programs

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.021*	0.021*	0.006	0.006	0.034*	0.034*
	(0.011)	(0.011)	(0.011)	(0.011)	(0.017)	(0.017)
External factors and endowments index, average [T-5,T]	0.196*	0.673***	0.232**	0.557***	0.207**	0.670***
	(0.103)	(0.123)	(0.099)	(0.147)	(0.096)	(0.172)
Institutions index, average [T-5,T]	0.097*	0.055	0.085	0.085	0.075	-0.079
	(0.056)	(0.054)	(0.052)	(0.055)	(0.049)	(0.091)
Macroeconomic stability index, average [T-5,T]	0.408***	0.498***	0.378***	0.390***	0.353***	0.555***
	(0.082)	(0.097)	(0.076)	(0.112)	(0.075)	(0.139)
Structural reforms index, average [T-5,T]	0.158	0.331***	0.140	0.269***	0.129	0.429***
	(0.097)	(0.093)	(0.090)	(0.101)	(0.087)	(0.145)
Trade diversification and quality index, average [T-5,T]	0.190***	0.065	0.153***	0.032	0.177***	0.027
	(0.062)	(0.075)	(0.058)	(0.085)	(0.056)	(0.108)
Investments, labor and productivity index, average [T-5,T]	0.104	0.234***	0.103*	0.110	0.088	0.364***
	(0.065)	(0.081)	(0.062)	(0.093)	(0.060)	(0.119)
Africa (Base level)						
Asia and Pacific	0.107***	0.119***	0.084***	0.086***	0.136***	0.161***
	(0.019)	(0.022)	(0.020)	(0.022)	(0.021)	(0.029)
Europe	0.041**	0.048**	0.040**	0.041**	0.072***	0.091***
	(0.017)	(0.019)	(0.018)	(0.019)	(0.021)	(0.027)
Middle East and Central Asia	0.036**	0.042**	0.034**	0.035**	0.016	0.022
	(0.015)	(0.018)	(0.017)	(0.018)	(0.012)	(0.017)
Americas and Caribbean	-0.007	-0.008	-0.007	-0.007	-0.004	-0.005
	(0.010)	(0.013)	(0.012)	(0.013)	(0.010)	(0.014)
1980-1989 (Base level)						
1990-1999	0.004	0.004	0.001	0.001	0.016	0.022
	(0.010)	(0.012)	(0.010)	(0.011)	(0.011)	(0.014)
2000-2010	0.078***	0.087***	0.053***	0.055***	0.068***	0.084***
	(0.015)	(0.017)	(0.016)	(0.017)	(0.016)	(0.020)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.012	0.014	0.003	0.003	0.028*	0.038*
	(0.016)	(0.019)	(0.017)	(0.018)	(0.016)	(0.019)
Emerging Economies	0.074***	0.083***	0.072***	0.073***	0.101***	0.124***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.023)
Observations	3763	3763	3136	3136	2875	2875
# of GSs	132	132	101	101	93	93
# of Countries	169	169	168	168	165	165
Pseudo R2	0.189	0.189	0.162	0.162	0.190	0.190
Classification power	90.380	90.380	90.848	90.848	91.235	91.235
AUROC	0.795	0.795	0.779	0.779	0.790	0.790
BIC	2237.996	2237.996	1858.329	1858.329	1673.873	1673.873

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

5.4.2.2 Discussion on the endogeneity of IMF's role in igniting growth surges

Throughout the paper, we implicitly assume that the IMF's role in igniting growth surges to be exogenous. However, this assumption may be weakened in different manners. First and most importantly, our effect may also capture the action of other multilateral institutions like the World Bank, the EU, and Regional Development Banks as they have intertwined and joint interventions in countries. Therefore, the IMF's role here may be overestimated. Nevertheless, this may be of a least concern for the growth determinants that are part of the IMF's core activities such

Table 5.6: Mean difference between broad growth surges determinants occurring during an IMF-supported program or not at the start of growth surges

	(1)		(2)		(3)	
Broad determinants of Growth surges	**All**		**GRA**		**PRGT**	
External factors and endowments index, average [T-5,T]	0.027***	(0.008)	0.019**	(0.008)	0.035***	(0.010)
Institutions index, average [T-5,T]	0.077***	(0.011)	0.091***	(0.013)	0.058***	(0.013)
Macroeconomic stability index, average [T-5,T]	0.035***	(0.008)	0.035***	(0.009)	0.035***	(0.010)
Structural reforms index, average [T-5,T]	0.054***	(0.008)	0.060***	(0.009)	0.051***	(0.009)
Trade diversification and quality index, average [T-5,T]	0.014	(0.010)	0.009	(0.012)	0.016	(0.013)
Investments, labor and productivity index, average [T-5,T]	0.030***	(0.011)	0.020	(0.013)	0.038***	(0.014)
Observations	397		306		283	
# of GSs with IMF	74		43		35	
Mean(External factors and endowments) with IMF	0.152		0.143		0.160	
Mean(Institutions) with IMF	0.202		0.217		0.183	
Mean(Macroeconomic stability) with IMF	0.161		0.161		0.161	
Mean(Structural reforms) with IMF	0.123		0.128		0.119	
Mean(Trade diversification and quality) with IMF	0.180		0.175		0.182	
Mean(Investments, labor and productivity) with IMF	0.158		0.148		0.166	

as macroeconomic stability and policies and some structural reforms in the product market, financial market, trade, and capital and current account.

Second, one can advance that periods with and without periods of an IMF-supported program are importantly different. Indeed, countries that come to the IMF for requesting a program face some difficulties in the balance of payments emanating from structural problems or financial crises or external and natural disaster shocks. This is one reason the IMF has been routinely identified with economic hardship and political ferment, which makes the IMF's evaluation a very difficult task. In econometrics, this concerns raised here is known as the "selection bias" problem. We have two reasons to believe this problem is of the least concern for our study. Primarily, we focus on the medium- to the long-term effect of IMF interventions rather than their short-term effect at the time of the crisis. Secondary, as IMF-supported programs have consistently been associated with economic and financial turmoil and their consequences, we believe that it may be more difficult to engineer higher growth in this time; therefore the positive IMF's role in igniting growth surges found here may serve as a lower-bound effect.

Third, we capture the role of the IMF using the presence of an IMF-supported program or not. However, this does not tell anything about the structure and depth of the IMF conditionalities (e.g., fiscal and growth-oriented), the compliance of countries with these conditionalities, whether the programs went off-track or not. These analyses are left for further research.

Finally, the positive results may not be fully attributed to the IMF as igniting growth surges is also a matter of country ownership as well as domestic political interests and institutional constraints. The IMF cannot simply impose its agenda on program countries. Its programs are conditional on countries' commitment to carry out the agreed program of economic policies. Therefore, the benefits found here are the result of both the IMF and the countries' coordination.

Nevertheless, while focusing on disproportionate improvements in growth surges determinants, we do not think that country ownership would have played a critical role in shaping the higher probability of igniting growth surges under an IMF-supported program because they have to be strong regardless of the IMF presence to achieve these changes.

5.4.3 Robustness checks

In this section, we check the validity of our benchmark results to alternative country samples, timing conventions, estimation techniques, and sets of growth surges. First, we increase the homogeneity of our sample by dropping (i) all countries that have never had an IMF-supported program throughout the studied period, and (ii) both countries that have never had an IMF-supported program throughout the studied period and the prolonged user of IMF-supported programs (i.e., countries with the top 10% highest number of IMF-supported programs). The results are reported in table D.11 and table D.12, respectively. Our benchmark results are qualitatively and somewhat quantitatively robust.

Second, while we consider significant improvements in growth surges determinants to be associated with an IMF-supported program when they occur during it or 2 years after its completion, we now define association by (i) occurrence during an IMF-supported program only (see, table D.13), and (ii) occurrence during an IMF-supported program or 4 years after its completion (see, table D.14). These alternatives definitions do not alter our main findings both qualitatively and quantitatively.

Third, we modify the timing needed for a growth determinant to ignite growth surge from 5 years, to 7 and 3 years. The results are reported in table D.15 and table D.16, respectively. Our results are qualitatively identical but slightly different in terms of magnitude. While the gains of the IMF programs remains consistent, we find that the probabilities of igniting growth surges following significant changes in external factors and endowments, macroeconomic stability, and structural reforms are higher, regardless of the presence of the IMF, when we raise the timing convention from 5 to 7 years. In contrast, the probabilities are reduced for these growth surges determinants when reducing the timing convention from 5 to 3 years.

Fourth, we employ different estimation techniques: (i) a pooled probit model (see, table D.17), and (ii) a tobit model (see, table D.18) treating non-growth surges period as censored at zero. The results in all cases are not only qualitatively, but also quantitatively similar.

Fifth, we set different criteria in the determination of growth surges and identify alternative sets of growth surges. In table D.19, we apply the same criteria as in Hausmann et al. (2005) and identify 159 growth surges. In table D.20 and table D.21, we set the minimum duration of growth surge to 6 (144 growth surges) and 10 (125 growth surges) years, respectively, instead of

8 years. In table D.22 and table D.23, we change the “growth is rapid" criterion from 2 pp. to 1 (135 growth surges) and 3 (97 growth surges) pp., respectively. In table D.24 and table D.25, we change the growth accelerates criterion from 3.5 pp. to 2.5 (141 growth surges) and 4.5 (104 growth surges) pp., respectively. Overall, our main results are not altered using alternative sets of growth surges.

5.4.4 Sensitivity

The descriptive analysis highlighted the disparities of growth surges across decades, regions, and levels of development. We now turn to analyze whether the IMF's role in igniting growth surges was also different according to this disaggregation.

First, the IMF's role in igniting growth surges has positively evolved over the decades (see, table D.26). In the 1980s, only the effects of the significant changes in external factors and endowments and macroeconomic stability were magnified by GRA-supported programs. We find no beneficial effect for structural reforms and investments, labor, and productivity as in the benchmark results. In the 1990s, the benefits of having an IMF-supported program was true for only macroeconomic stability and structural reforms. In the 2000s, all the determinants were positively and significantly associated with growth surges, with higher amplitude than in the benchmark results, except for the trade diversification and quality under an IMF-supported program. This shows that this decade was particularly different from the 1980s and 1990s in line with the Great moderation literature. More importantly, over this decade, the benefits of having an IMF-supported program was even accentuated and magnified for external factors and endowments, macroeconomic stability, and structural reforms. As a result, the IMF may have been more efficient in triggering growth surges in the 2000s, in line with its reinvention to pay more attention to growth as stated in the IMF's Guidelines on Conditionality (2002).

Second, we look at the results by regions (see, table D.27). We find that both the effects of IMF and the significant changes in growth determinants in igniting growth surges vary across regions. In Africa, we find that IMF-supported programs accentuate and magnify the positive association between significant improvements in external factors and endowments, macroeconomic stability, structural reforms (only PRGT programs), and investments, labor, and productivity. The other determinants have no significant effect regardless of the IMF presence. These results for the case of Africa are quite in line with our benchmark results. In Asia and the Pacific, we find that significant changes in structural reforms, macroeconomic stability, and trade diversification were the driving force of growth surges. The predictive power of structural reforms and macroeconomic stability was reinforced under IMF-supported programs (only PRGT for macroeconomic stability) while only significant changes in trade diversification

and quality carried out without an IMF intervention paid off. In Europe, we find qualitatively similar results as in Africa and the benchmark findings, except for the non-significance of investments, labor, and productivity. IMF-supported programs accentuate and magnify the positive association between significant improvements in external factors and endowments, macroeconomic stability, and structural reforms. The other determinants have no significant effects (even if positive). In the Middle East and Central Asia, we show all determinants except for structural reforms and investments, labor and productivity are driving force of growth surges. Importantly, as in other regions, we find that association of the significant improvements in external factors and endowments and macroeconomic stability with an IMF-supported program induce a greater likelihood of growth surges. Finally, in the Americas and Caribbean, we find that external factors and endowments, macroeconomic stability, and institutions were the drivers of growth surges. The effects of two first determinants were magnified when occurring IMF-supported programs. One key takeaway is that the IMF may have played a role in igniting growth surges, especially through macroeconomic stability in all regions, except in Asia and the Pacific, structural reforms in different areas in Africa, Asia, and the Pacific and Europe, creating good conditions while benefiting from favorable external factors and endowments in all regions, except in Asia and the Pacific, and pursue investments, labor and productivity policies in Africa.

Third, we present the results by levels of development (see, table D.28). We show the varying association between the significant changes in growth determinants with and without IMF and growth surges across levels of development. In low-income countries and emerging markets, the results are like our benchmark results but of different magnitudes. Indeed, the positive effects of the significant improvements in external factors and endowments, macroeconomic stability, structural reforms, and investments, labor, and productivity are magnified and accentuated by IMF-supported programs. The positive gains of having an IMF-supported program are higher in emerging countries than low-income countries, except for structural reforms. Besides, the effects of institutions and trade diversification and quality are non-significant regardless of the presence of the IMF, except for the positive and significant association between trade diversification and quality and growth surges in emerging markets outside IMF-supported programs (as in the benchmark results). In advanced countries, only the effects of significant changes in macroeconomic stability were reinforced when achieving under an IMF-supported program (higher than in low-income countries and less than in emerging markets). Also, Institutions and trade diversification and quality induce an increase of the likelihood of growth surges of the same magnitude regardless of the IMF presence. In sum, the IMF may have played a significant role in igniting growth surges through restoring macroeconomic stability in all countries regardless of their levels of development, implementing structural reforms and policies enhancing investments, labor, and productivity, and creating conditions to jump-start growth when favorable

external and endowments conditions happen (except for advanced countries).

5.5 Concluding remarks

This paper contributes to the debate on the effectiveness of the IMF in promoting growth by taking a different route. While most of the papers in the literature focus on the short-term effects of the IMF-supported programs; therefore, confronting to the “selection bias" issue, we focus more on the medium- to long-term effect. Also, while they focus on the annual growth rate, we choose to focus on the initiation of periods of growth surges, i.e., periods of sustained growth for a prolonged period. We also make sure to explain how the IMF has played a role by looking at its demand-management and supply-side policies. To do so, we use longitudinal data comprising 169 countries and spanning 1980-2010. Our strategy consisted of identifying growth surges applying filters method as in Hausmann et al. (2005), identifying growth determinants in the literature, setting an optimization process to identify significant improvements in growth surges determinants by accounting for country-specificity, and analyzing the effects of these improvements when occurring during an IMF-supported program or 2 years after or not through various sets of non-parametric and empirical methods. To the best of our knowledge, this is the first analysis that exclusively focuses on the IMF’s role in igniting periods of growth surges. Our results enrich the literature and establish a panorama of the IMF’s role in igniting growth surges.

One key takeaway is that all the analyzes carried out in this paper show that having an IMF-supported program is enhancing the probability of igniting a growth surge. They support that the IMF has contributed to boosting medium- to long-term growth in countries while pursuing macroeconomic stability and implementing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions. At a more granular level, we find that the IMF has been more efficient in triggering growth surges in the 2000s than in previous decades, in line with its reinvention to pay more attention to growth as stated in the IMF’s Guidelines on Conditionality (2002). Also, it has played a role in igniting growth surges in all countries around the world, regardless of their geographical location and levels of development. However, it was through different determinants.

Since its inception in 1944, the IMF has been amid a major and perpetual reinvention to pay more attention to growth by reforming its governance, its objectives, and operational works in its member countries. Our study finds that these improvements have paid off and lead to a pronounced role of the IMF’s in igniting growth surges in all regions of the world, and more recent decades. This shows that the IMF as a learning organization has a lot to gain in its role as a “financial firefighter" when reinventing its policies and objectives. While macroeconomic

stability matters for growth surges, structural reforms and investments, labor, and productivity are also valuable tools. Therefore, this paper acknowledges that IMF's structural conditionalities must be designed to address structural concerns of countries and be of higher depth while achieving macroeconomic stability and enhancing investments, labor, and productivity to support medium- to longer-term growth. Also, our study calls for careful tailoring of policies aiming at igniting growth surges to country-specific conditions. Besides, the success of IMF-supported programs in igniting growth surges is highly dependent on the country ownership; therefore, the IMF should be attention to country's urgent economic needs and includes their policies into integrated national reform plan while maintaining better coordination with other international financial institutions.

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APPENDIX D

APPENDIX TO CHAPTER 5

D.1 Sample and Data

D.1.1 List of growth surges and their determinants

Table D.1: List of growth surges and their broad determinants

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	FP	GRA	PRGT	Exter. and Endow.	Insti-tution	Macro. stabiliy	Struc-tural Reforms	Trade Div. Qual.	Labor Inv. Prod.	# of deter-minants
Albania	ALB	1997	2013	17	5.78	3750.85	9744.54	1	0	1	1	1	1	1	1	1	6
Argentina	ARG	1984	1999	16	6.88	4539.50	13165.25	1	1	0	1	1	1	1	1	1	6
Armenia	ARM	2001	2011	11	9.05	3299.73	8561.05	1	0	1	1	1	1	1	1	1	6
Antigua and Barbuda	ATG	1980	1992	13	6.09	5525.09	11922.56	0	0	0	1	0	1	1	1	1	5
Antigua and Barbuda	ATG	1999	2009	11	3.44	13606.24	19736.20	0	0	0	1	0	0	0	1	1	3
Austria	AUT	1984	1995	12	3.96	18864.98	30071.43	0	0	0	1	1	1	1	1	1	6
Azerbaijan	AZE	2002	2013	12	15.72	2885.62	16638.21	1	0	1	1	1	1	1	1	1	6
Benin	BEN	1998	2006	9	3.66	1296.16	1790.50	0	0	0	1	1	1	1	1	1	6
Bangladesh	BGD	2005	2016	12	6.87	1461.44	3244.94	1	0	1	1	1	0	1	0	1	4
Bulgaria	BGR	2001	2011	11	5.77	8595.34	15924.35	1	1	0	1	0	1	1	1	1	5
Bahrain	BHR	1994	2008	15	6.86	16157.99	43683.36	0	0	0	1	1	1	1	1	0	5
Belarus	BLR	2001	2013	13	5.63	8563.25	17451.27	0	0	0	1	1	1	1	1	1	6
Bolivia	BOL	1992	2013	22	4.47	2318.15	6064.79	0	0	0	1	1	1	1	1	1	6
Brazil	BRA	1988	2000	13	2.53	6229.40	8617.32	1	1	0	1	1	1	1	1	1	6
Brazil	BRA	2006	2015	10	4.27	9515.43	14450.07	0	0	0	1	1	0	1	1	1	5
Bhutan	BTN	1980	1988	9	3.78	1588.82	2218.84	0	0	0	1	1	1	1	0	1	5
Bhutan	BTN	1994	2002	9	5.81	2858.74	4751.92	0	0	0	1	1	1	0	0	1	4
Chile	CHL	1989	1998	10	4.09	7580.75	11316.55	1	1	0	1	1	1	1	1	1	6
Chile	CHL	2005	2013	9	5.81	13403.45	22291.56	0	0	0	1	0	1	1	0	0	3
China	CHN	1981	1989	9	3.78	1826.95	2551.46	1	1	0	1	1	0	1	1	1	5
China	CHN	1992	2012	21	6.51	2820.92	10596.49	0	0	0	0	1	1	1	1	1	5
Cote d'Ivoire	CIV	2010	2017	9	3.71	2596.71	3605.62	1	0	1	1	1	1	1	1	1	6
DR of Congo	COD	2008	2016	9	3.21	593.80	789.17	1	0	1	1	1	0	0	1	1	4
Congo	COG	2001	2015	15	3.76	2150.79	3742.83	1	0	1	1	1	1	1	1	1	6
Colombia	COL	2005	2014	10	5.12	7615.52	12551.27	1	1	0	1	1	0	1	1	1	5
Cape Verde	CPV	1993	2005	13	4.85	2195.28	4065.04	1	1	0	1	1	1	1	1	1	6
Czech Republic	CZE	2002	2010	9	3.28	21373.60	28586.14	0	0	0	1	1	1	1	1	1	6

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Table D.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	FP	GRA	PRGT	Exter. and Endow.	Insti-tution	Macro. stabiliy	Struc-tural Reforms	Trade Div. Qual.	Labor Inv. Prod.	# of deter-minants
Germany	DEU	1987	1995	9	3.58	21827.08	29964.79	0	0	0	1	1	1	1	1	1	6
Djibouti	DJI	2009	2017	9	3.87	2518.06	3545.14	1	0	1	1	1	1	0	1	1	5
Denmark	DNK	1993	2001	9	3.24	26015.11	34667.70	0	0	0	1	1	1	1	1	1	6
Dominican Republic	DOM	1994	2003	10	3.36	5509.98	7666.43	0	0	0	1	1	1	1	1	1	6
Ecuador	ECU	2003	2012	10	5.42	5995.55	10168.40	1	1	0	1	0	1	1	1	1	5
Egypt	EGY	1990	2000	11	7.99	2012.93	4689.53	1	1	0	1	1	1	1	1	1	6
Egypt	EGY	2002	2014	13	5.53	4870.15	9800.33	0	0	0	1	1	0	1	1	0	4
Spain	ESP	1988	1996	9	3.66	15182.61	20985.94	0	0	0	1	1	1	1	1	1	6
Estonia	EST	1999	2009	11	6.48	10772.34	21484.39	1	1	0	1	1	1	1	1	1	6
Ethiopia	ETH	2005	2016	12	7.65	630.05	1525.76	1	0	1	1	1	1	1	1	1	6
Gabon	GAB	1997	2009	13	2.83	7926.84	11391.84	1	1	0	1	1	1	1	1	1	6
United Kingdom	GBR	1991	1999	9	3.72	22394.56	31109.63	0	0	0	0	1	1	1	1	1	5
Georgia	GEO	2002	2013	12	8.96	3303.57	9254.34	1	0	1	1	1	1	1	1	1	6
Ghana	GHA	2001	2015	15	3.86	2763.52	4875.04	1	0	1	1	1	1	1	1	1	6
Equatorial Guinea	GNQ	1998	2006	9	17.77	4414.16	19244.54	0	0	0	1	1	1	0	1	1	5
Grenada	GRD	1986	1995	10	5.66	3275.58	5678.77	0	0	0	1	0	1	0	1	1	4
Croatia	HRV	1998	2007	10	6.00	11329.04	20286.04	1	1	0	1	1	1	1	1	1	6
Hungary	HUN	1997	2005	9	3.56	13906.95	19052.27	1	1	0	1	0	1	1	1	1	5
Indonesia	IDN	1988	1997	10	5.66	2701.54	4683.11	0	0	0	1	1	0	1	1	1	5
Indonesia	IDN	2006	2015	10	7.94	4655.27	9995.35	0	0	0	1	1	1	0	1	1	5
India	IND	1989	1997	9	3.91	1232.19	1740.69	1	1	0	0	1	1	1	1	1	5
India	IND	2000	2013	14	6.77	1988.44	4975.78	0	0	0	1	1	0	1	1	1	5
Ireland	IRL	1985	2002	18	6.05	13596.22	39118.39	0	0	0	1	1	1	1	1	0	5
Iran	IRN	1992	2008	17	8.97	3780.05	16272.63	0	0	0	1	1	1	1	1	1	6
Iraq	IRQ	2007	2017	11	9.98	5857.15	16683.30	1	1	0	1	1	1	0	1	1	5
Israel	ISR	1989	1997	9	4.34	19920.69	29204.98	0	0	0	1	1	1	1	1	1	6
Jordan	JOR	1998	2013	16	5.89	3477.85	8694.40	0	0	0	1	1	1	1	1	1	6

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Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	FP	GRA	PRGT	Exter. and Endow.	Insti-tution	Macro. stabiliy	Struc-tural Reforms	Trade Div. Qual.	Labor Inv. Prod.	# of deter-minants
Japan	JPN	1987	1996	10	5.00	20731.03	33783.33	0	0	0	1	1	1	1	1	1	6
Kazakhstan	KAZ	2002	2012	11	10.92	7025.24	21973.73	0	0	0	1	1	1	1	1	1	6
Kenya	KEN	2008	2016	9	3.81	2110.15	2954.55	1	0	1	1	1	0	1	1	1	5
Kyrgyzstan	KGZ	2005	2015	11	5.32	2078.63	3676.88	0	0	0	1	1	1	1	1	1	6
Cambodia	KHM	1996	2010	15	5.46	1106.33	2454.98	1	0	1	1	1	1	1	1	1	6
St. Kitts and Nevis	KNA	2003	2011	9	4.63	14277.05	21456.82	0	0	0	1	0	1	0	1	0	3
Kuwait	KWT	2004	2012	9	5.12	50362.33	78921.14	0	0	0	1	1	1	0	1	0	4
Laos	LAO	1999	2013	15	7.83	1668.57	5168.18	1	0	1	1	1	1	1	1	1	6
Lebanon	LBN	1997	2008	12	8.16	5609.58	14384.55	0	0	0	1	1	1	1	1	0	5
Sri Lanka	LKA	1991	1999	9	4.64	2926.83	4400.57	0	0	0	1	1	1	1	1	1	6
Sri Lanka	LKA	2003	2016	14	6.52	4928.79	11938.07	1	1	1	1	1	0	0	0	0	2
Lesotho	LSO	2009	2017	9	3.40	2219.47	2999.39	1	0	1	1	1	1	0	1	1	5
Lithuania	LTU	1999	2009	11	5.66	10373.28	19002.57	1	1	0	1	1	1	1	1	1	6
Luxembourg	LUX	1987	1995	9	4.61	33788.35	50686.89	0	0	0	1	1	1	1	0	1	5
Latvia	LVA	2000	2009	10	5.64	10149.85	17565.06	0	0	0	1	1	1	1	1	1	6
Morocco	MAR	1983	1992	10	3.91	2938.51	4312.25	0	0	0	1	1	1	1	1	1	6
Morocco	MAR	2007	2016	10	4.77	4890.71	7794.08	1	1	0	1	1	0	1	1	1	5
Republic of Moldova	MDA	2005	2013	9	6.72	2613.28	4692.14	1	0	1	1	1	1	1	1	1	6
Maldives	MDV	1999	2009	11	4.85	7078.55	11915.82	0	0	0	1	1	1	1	1	1	6
Macedonia	MKD	2002	2010	9	5.01	7204.47	11186.78	1	1	1	1	1	1	1	1	0	5
Mali	MLI	2004	2012	9	4.92	1279.95	1972.09	1	0	1	1	1	1	1	1	0	5
Malta	MLT	2009	2017	9	5.08	26791.83	41846.75	0	0	0	1	1	1	0	1	1	5
Myanmar	MMR	1996	2013	18	9.18	972.27	4724.25	0	0	0	1	1	1	1	1	1	6
Montenegro	MNE	1999	2013	15	5.00	6593.54	13708.59	0	0	0	1	1	1	0	0	0	3
Mongolia	MNG	2001	2012	12	10.40	2999.55	9837.12	1	0	1	1	1	1	1	1	0	5
Mozambique	MOZ	1998	2006	9	4.62	636.84	956.51	1	0	1	1	1	1	1	1	1	6
Mauritania	MRT	2004	2012	9	3.46	2160.34	2934.04	1	0	1	1	1	1	1	0	1	5

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Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	FP	GRA	PRGT	Exter. and Endow.	Insti-tution	Macro. stabiliy	Struc-tural Reforms	Trade Div. Qual.	Labor Inv. Prod.	# of deter-minants
Mauritius	MUS	1985	1994	10	6.22	6517.16	11913.08	1	1	0	1	1	1	1	1	1	6
Mauritius	MUS	2008	2017	10	4.18	15046.94	22656.92	0	0	0	1	1	1	0	1	1	5
Malaysia	MYS	1991	1999	9	4.50	8634.60	12831.60	0	0	0	1	1	1	1	1	1	6
Malaysia	MYS	2001	2012	12	4.61	12988.60	22309.81	0	0	0	1	1	1	0	1	1	5
Namibia	NAM	1999	2013	15	4.57	5210.98	10187.25	0	0	0	1	1	1	1	1	1	6
Nigeria	NGA	2000	2010	11	19.08	764.37	5220.41	1	1	0	1	1	1	1	1	1	6
Nicaragua	NIC	2009	2017	10	3.38	3842.90	5360.22	1	0	1	1	1	1	0	1	1	5
Netherlands	NLD	1993	2001	9	4.33	27501.26	40264.48	0	0	0	0	1	1	1	1	1	5
Norway	NOR	1992	2002	11	3.95	26847.29	41098.06	0	0	0	1	1	1	1	1	1	6
Nepal	NPL	2007	2016	10	5.12	1385.00	2282.06	0	0	0	1	1	1	1	1	1	6
Oman	OMN	1997	2009	13	9.54	11783.72	38537.52	0	0	0	1	1	1	1	1	1	6
Pakistan	PAK	2001	2013	13	3.93	2691.64	4443.65	0	0	0	1	1	1	1	0	1	5
Panama	PAN	2004	2015	12	5.60	10706.26	20581.41	0	0	0	1	1	0	1	1	1	5
Peru	PER	2003	2013	11	6.57	5473.57	11017.94	1	1	0	1	1	0	1	1	1	5
Philippines	PHL	1989	1997	9	3.55	3341.16	4575.10	1	1	0	1	1	1	1	1	1	6
Philippines	PHL	2008	2017	10	4.77	4786.09	7628.83	0	0	0	1	1	0	1	0	0	3
Poland	POL	2003	2014	12	4.63	14221.34	24486.63	0	0	0	1	0	1	1	1	1	5
Portugal	PRT	1987	1995	9	5.07	11483.73	17914.56	0	0	0	1	1	1	1	1	1	6
Paraguay	PRY	2003	2013	11	4.76	4836.60	8069.16	1	1	0	1	1	1	1	1	0	5
Qatar	QAT	1998	2006	9	17.12	27383.73	113521.60	0	0	0	1	1	1	0	1	1	5
Romania	ROU	1997	2013	17	5.80	7431.81	19386.61	1	1	0	1	1	1	1	0	0	4
Russian Federation	RUS	2001	2012	12	8.06	10110.36	25619.79	0	0	0	1	1	1	1	1	1	6
Rwanda	RWA	2003	2011	9	5.69	869.08	1430.40	0	0	0	1	1	1	1	1	0	5
Saudi Arabia	SAU	2001	2012	12	9.27	18371.23	53258.21	0	0	0	1	1	1	1	1	1	6
Sudan	SDN	2001	2012	12	6.72	1771.62	3866.80	0	0	0	1	1	1	1	0	1	5
Singapore	SGP	1989	2006	18	6.68	18517.77	59335.18	0	0	0	1	1	1	1	1	1	6
El Salvador	SLV	1989	2001	13	4.37	2574.11	4485.95	1	1	0	1	1	1	1	1	1	6

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Table D.1 – continued from previous page

Country	ISO	Start	End	Dur.	Avg. Growth	Income per capita (start)	Income per capita (end)	FP	GRA	PRGT	Exter. and Endow.	Insti-tution	Macro. stabiliy	Struc-tural Reforms	Trade Div. Qual.	Labor Inv. Prod.	# of deter-minants
Serbia	SRB	2001	2009	9	7.22	6463.14	12108.22	1	1	0	1	1	1	0	1	1	5
Suriname	SUR	1999	2013	15	6.17	6214.47	15265.44	0	0	0	1	1	1	0	1	1	5
Slovakia	SVK	1999	2012	14	4.65	14190.14	26829.84	0	0	0	1	1	1	1	1	1	6
Swaziland	SWZ	1984	1992	9	4.81	4008.31	6117.52	0	0	0	1	1	1	1	0	1	5
Seychelles	SYC	2008	2016	9	4.52	18685.85	27809.93	1	1	0	1	0	1	1	1	1	5
Syrian Arab Republic	SYR	1999	2009	11	13.75	1262.98	5210.16	0	0	0	1	1	1	1	1	1	6
Thailand	THA	1985	1997	13	6.11	3724.57	8054.27	1	1	0	1	1	1	1	1	1	6
Thailand	THA	2004	2012	9	5.21	9062.08	14313.67	0	0	0	1	1	1	1	0	1	5
Tajikistan	TJK	2005	2013	9	5.75	1742.64	2883.01	1	0	1	1	1	1	1	1	1	6
Turkmenistan	TKM	2001	2016	16	7.12	7392.68	22206.43	0	0	0	1	1	1	1	1	1	6
Trinidad and Tobago	TTO	2000	2009	10	6.31	13134.31	24215.21	0	0	0	1	1	1	1	1	1	6
Tunisia	TUN	1988	1999	12	4.06	4988.72	8041.53	1	1	0	1	1	1	1	1	1	6
Turkey	TUR	2005	2013	9	6.08	12793.70	21770.43	0	0	0	1	1	1	1	1	1	6
Tanzania	TZA	1999	2008	10	4.67	1072.20	1692.30	0	0	0	1	0	1	1	1	1	5
Uganda	UGA	2003	2012	10	3.86	1181.26	1725.91	1	0	1	1	1	1	0	1	1	5
Ukraine	UKR	2003	2011	9	6.16	5568.72	9533.93	1	1	0	1	1	1	1	1	1	6
Uruguay	URY	2008	2016	9	4.76	13373.23	20315.02	0	0	0	1	1	1	0	1	1	5
Uzbekistan	UZB	2002	2016	15	5.43	4150.66	9175.98	0	0	0	1	1	1	1	1	1	6
St. Vincent & Grenadines	VCT	2001	2009	9	3.16	7201.51	9527.03	0	0	0	1	0	0	1	1	1	4
Viet Nam	VNM	1989	1998	10	4.73	1206.85	1915.78	1	1	0	1	1	1	1	1	1	6
Viet Nam	VNM	2003	2012	10	7.36	2417.06	4916.68	1	0	1	1	1	0	1	1	1	5
Yemen	YEM	1997	2011	15	10.60	837.43	3793.34	1	1	1	1	1	1	1	1	1	6
Zambia	ZMB	2001	2013	13	8.62	1222.85	3584.72	1	0	1	1	1	1	0	1	1	5
Zimbabwe	ZWE	1982	1990	9	3.62	3206.79	4417.75	1	1	0	1	1	1	1	1	1	6

D.1.2 List of variables and sources

Table D.2: List of variables, and their sources

Variable Labels	Sources
Real GDP per capita in 2010 PPP terms	**Penn World Tables 9.1**
IMF-supported programs dummy	**IMF Strategy and Policy Review department**
External factors and endowments	**Authors' calculations based on following sources**
Trading partners' growth (%)	Global Economic Environment, IMF
Terms of trade (export price / import price)	Penn World Tables 9.1
Nominal US FED interest rate (%)	Bank of International Settlements
Volatility of S&P 500 index returns	Standard and Poor's
Total natural resources rents (% of GDP)	World Development Indicators, World Bank
Institutions	**Authors' calculations based on following sources**
Accountability index	Varieties of Democracy (V-Dem) project
Civil liberties index	Varieties of Democracy (V-Dem) project
Political corruption index	Varieties of Democracy (V-Dem) project
Rule of law index	Varieties of Democracy (V-Dem) project
Demand-side economic policy and macroeconomic stability	**Authors' calculations based on following sources**
Financial crises at end	Authors' calculations based on Frankel and Rose (1996), Reinhart and Rogoff (2009), Laeven and Valencia (2018), and Medas et al. (2018).
Normal recession at end	Authors' calculations based on Bry and Boschan (1971)
Public debt (% of GDP)	Global Debt Database, IMF, Mbaye et al. (2018)
Current Account (% of GDP)	World Economic Outlook, IMF
Inflation (%)	World Economic Outlook, IMF
Change of REER (%)	Authors' calculations based on International Financial Statistics
Supply-side economic policy and economic reforms	**Authors' calculations based on following sources**
Agriculture reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Product market reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Labor market reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Financial reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Trade-Tariff reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Current account reform	Authors' calculations based on Giuliano et al. (2013), Alesina et al. (2020), and IMF Research department
Capital account reform	Chinn and Ito (2008)
Trade diversification and quality	**Authors' calculations based on following sources**
Export Quality Index	Export Diversification and Quality database, IMF
Average Quality Index of Importers	Export Diversification and Quality database, IMF
Product diversification index	Export Diversification and Quality database, IMF
Partner diversification index	Export Diversification and Quality database, IMF
Investments, labor and productivity	**Authors' calculations based on following sources**
Domestic investment (% of GDP)	Investment and Capital Stock dataset 1960-2015, IMF
Foreign Direct Investment (% of GDP)	World Economic Outlook, IMF
Welfare-relevant TFP index (USA=1)	Penn World Tables 9.1
Human Capital index	Penn World Tables 9.1

D.2 Summary statistics

Table D.3: Summary statistics for all variables

Variables	Obs.	Mean	Sd	Min	Max
All Growth surges					
Income per capita at start of GS (USD PPP)	132	7884.7	7969.6	593.8	50362.3
Income per capita at end of GS (USD PPP)	132	15074.6	15804.0	789.2	114000.0
Duration of GSs (years)	132	11.4	2.7	9.0	22.0
Avg. growth of income per capita 7 years before GSs	132	1.9	1.5	-1.2	12.0
Avg. growth of income per capita 7 years after GSs	132	6.3	3.4	3.5	24.7
Avg. growth of income per capita during GSs	132	5.9	2.8	2.5	19.1
% of years with a IMF-supported program in effect during GSs	132	43.8	40.8	0.0	100.0
Growth surges with IMF (during IMF- supported programs or 2 years after completion)					
Income per capita at start of GS (USD PPP)	74	4849.8	3848.6	593.8	18685.9
Income per capita at end of GS (USD PPP)	74	9330.9	6904.3	789.2	27809.9
Duration of GSs (years)	74	11.1	2.5	9.0	22.0
Avg. growth of income per capita 7 years before GSs	74	2.0	1.8	-1.2	12.0
Avg. growth of income per capita 7 years after GSs	74	6.7	3.8	3.5	24.7
Avg. growth of income per capita during GSs	74	6.1	3.0	2.5	19.1
% of years with a IMF-supported program in effect during GSs	74	71.5	29.8	8.3	100.0
Growth surges without IMF-supported programs					
Income per capita at start of GS (USD PPP)	58	11756.9	9989.4	972.3	50362.3
Income per capita at end of GS (USD PPP)	58	22402.8	20383.8	1740.7	114000.0
Duration of GSs (years)	58	11.6	3.0	9.0	21.0
Avg. growth of income per capita 7 years before GSs	58	1.8	1.1	-0.6	4.7
Avg. growth of income per capita 7 years after GSs	58	5.8	2.9	3.6	18.6
Avg. growth of income per capita during GSs	58	5.7	2.5	3.2	17.1
% of years with a IMF-supported program in effect during GSs	58	8.4	20.4	0.0	92.3
All variables					
GSs dummy, 1 at starting year and 0 otherwise	3763	0.035	0.184	0.000	1.000
Aggregate index of all GSs' predictors	3763	0.230	0.198	0.000	1.000
External factors and endowments index	3763	0.186	0.180	0.000	0.793
Institutions index	3763	0.199	0.275	0.000	1.000
Macroeconomic stability index	3763	0.204	0.189	0.000	0.937
Economic reforms index	3763	0.097	0.144	0.000	0.890
Trade diversification and quality index	3763	0.232	0.257	0.000	1.000
Investments, labor and productivity index	3763	0.179	0.228	0.000	1.000
External factors and endowments index, average over [T-5,T]	3763	0.103	0.059	0.000	0.347
Institutions index, average over [T-5,T]	3763	0.142	0.127	0.000	0.640
Macroeconomic stability index, average over [T-5,T]	3763	0.096	0.078	0.000	0.450
Economic reforms index, average over [T-5,T]	3763	0.067	0.069	0.000	0.374
Trade diversification and quality index, average over [T-5,T]	3763	0.155	0.101	0.000	0.566
Investments, labor and productivity index [T-5,T]	3763	0.105	0.091	0.000	0.526
Trading partners' growth (%)	3763	3.689	2.072	-12.685	18.077
Terms of trade (export price / import price)	3763	1.008	0.118	0.327	1.715
Nominal US FED interest rate (%)	3763	5.999	4.394	0.125	22.000
Volatility of S&P 500 index returns	3763	42.839	36.425	5.335	171.639
Total natural resources rents (% of GDP)	3596	7.021	10.383	0.000	86.453
Accountability index	3531	0.463	0.982	-1.647	2.063
Civil liberties index	3531	0.625	0.274	0.023	0.968
Political corruption index	3515	-0.501	0.309	-0.971	-0.005
Rule of law index	3531	0.540	0.314	0.034	0.998
Financial crises at end	3763	0.144	0.351	0.000	1.000
Normal recession at end	3763	0.052	0.221	0.000	1.000
Public debt (% of GDP)	3504	65.433	66.104	0.0E+00	2092.920
Current Account (% of GDP)	3644	-3.302	11.687	-242.188	106.836
Inflation (%)	3663	49.280	6.6E+02	-4.5E+01	2.4E+04
Change of REER (%)	3447	-140.971	9.5E+04	-4.2E+06	3.7E+06
Agriculture reform	3763	0.224	0.359	0.000	1.000
Product market reform	3763	0.291	0.531	0.000	2.000
Labor market reform	3763	0.365	0.381	0.000	1.000
Financial reform	3763	0.282	0.349	0.000	1.000
Trade-Tariff reform	3763	0.556	0.389	-0.040	1.002
Current account reform	3763	0.343	0.395	0.000	1.000
Capital account reform	3763	0.411	0.366	0.000	1.000
Export Quality Index	3554	0.809	0.162	0.232	1.152
Average Quality Index of Importers	3554	0.919	0.086	0.562	1.155
Product diversification index	3572	3.492	1.257	1.138	6.401
Partner diversification index	3565	2.882	0.643	1.651	5.437
Domestic investment (% of GDP)	3684	18.202	9.762	0.792	98.115
Foreign Direct Investment (% of GDP)	3487	3.097	13.350	-55.234	502.761
Welfare-relevant TFP index (USA=1)	2549	0.684	0.277	0.108	1.934
Human Capital index	3175	2.142	0.710	1.014	3.703

D.3 Supplementary results

D.3.1 Results of Noise-to-Signal ratio

Table D.4: Noise to Signal ratio, optimizing the predictions of growth surges

Variables' labels	Direction	NSR	Threshold	Effectiveness	Incidence	Error Type I	Error Type II	TME	# of GSs	# of signals
Trading partners' growth (%)	+	0.164	75	0.258	0.942	0.154	0.058	0.212	139	920
Terms of trade (export price / import price)	+	0.215	74	0.217	0.964	0.207	0.036	0.243	139	1173
Nominal US FED interest rate (%)	-	0.087	88	0.246	0.935	0.081	0.065	0.146	139	476
Volatility of S&P 500 index returns	-	0.165	79	0.268	0.978	0.162	0.022	0.183	139	979
Total natural resources rents (% of GDP)	+	0.206	71	0.263	0.914	0.189	0.086	0.275	139	1134
Accountability index	+	0.271	70	0.230	0.856	0.232	0.144	0.376	139	1336
Civil liberties index	+	0.215	72	0.239	0.856	0.184	0.144	0.328	139	1074
Political corruption index	+	0.162	71	0.277	0.568	0.092	0.432	0.524	139	566
Rule of law index	+	0.200	70	0.268	0.791	0.158	0.209	0.367	139	956
Financial crises at end	+	0.156	70	0.277	0.669	0.104	0.331	0.435	139	639
Normal recession at end	+	0.150	70	0.227	0.266	0.040	0.734	0.774	139	229
Public debt (% of GDP)	-	0.203	71	0.282	0.935	0.190	0.065	0.255	139	1174
Current Account (% of GDP)	+	0.228	72	0.244	0.935	0.213	0.065	0.278	139	1248
Inflation (%)	-	0.254	71	0.243	0.863	0.220	0.137	0.356	139	1286
Change of REER (%) (+ means depreciation)	+	0.234	71	0.224	0.892	0.209	0.108	0.316	139	1191
Agriculture reform	+	0.091	70	0.310	0.072	0.007	0.928	0.935	139	42
Product market reform	+	0.086	88	0.309	0.345	0.030	0.655	0.684	139	191
Labor market reform	+	0.064	90	0.312	0.187	0.012	0.813	0.825	139	77
Financial reform	+	0.176	77	0.301	0.475	0.084	0.525	0.609	139	529
Trade-Tariff reform	+	0.235	73	0.267	0.712	0.167	0.288	0.455	139	1012
Current account reform	+	0.156	74	0.265	0.374	0.058	0.626	0.684	139	351
Capital account reform	+	0.149	85	0.251	0.453	0.067	0.547	0.614	139	399
Export Quality Index	+	0.246	71	0.212	0.871	0.214	0.129	0.343	139	1203
Average Quality Index of Importers	+	0.244	71	0.228	0.885	0.216	0.115	0.331	139	1241
Product diversification index	+	0.256	73	0.224	0.827	0.212	0.173	0.385	139	1210
Partner diversification index	+	0.276	70	0.222	0.842	0.232	0.158	0.391	139	1322
Domestic investment (% of GDP)	+	0.219	74	0.234	0.899	0.197	0.101	0.297	139	1137
Foreign Direct Investment (% of GDP)	+	0.186	76	0.277	0.871	0.162	0.129	0.291	139	990
Welfare-relevant TFP index (USA=1)	+	0.214	74	0.205	0.640	0.137	0.360	0.497	139	764
Human Capital index	+	0.382	75	0.229	0.446	0.170	0.554	0.724	139	979

Table D.5: Incidence by broad determinants of growth surges and by decades, with and without IMF-supported programs

	(1) GSs and no IMF		**(2) GSs and IMF**		**(3) = (2) - (1)**		**(4) GSs and GRA**		**(5) = (4) - (1)**		**(6) GSs and PRGT**		**(7) = (6) - (1)**	
Broad determinants of Growth surges	**# GSs**	**Inc**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**
Panel A: 1980-1989														
External factors and endowments	15	1.000	12	1.000	0.000	0.000	12	1.000	0.000	0.000	-	-	-	-
Institutions	11	0.733	10	0.833	0.100	0.553	10	0.833	0.100	0.553	-	-	-	-
Macroeconomic stability	15	1.000	11	0.917	-0.083	0.272	11	0.917	-0.083	0.272	-	-	-	-
Structural reforms	15	1.000	11	0.917	-0.083	0.272	11	0.917	-0.083	0.272	-	-	-	-
Trade diversification and quality	12	0.800	12	1.000	0.200	0.108	12	1.000	0.200	0.108	-	-	-	-
Investments, labor and productivity	14	0.933	11	0.917	-0.017	0.876	11	0.917	-0.017	0.876	-	-	-	-
# of GSs	**15**		**12**		**-**		**12**		**-**		**0**		**-**	
Panel B: 1990-1999														
External factors and endowments	19	0.905	19	1.000	0.095	0.176	10	1.000	0.095	0.329	10	1.000	0.095	0.329
Institutions	20	0.952	16	0.842	-0.110	0.257	9	0.900	-0.052	0.594	8	0.800	-0.152	0.192
Macroeconomic stability	20	0.952	19	1.000	0.048	0.348	10	1.000	0.048	0.499	10	1.000	0.048	0.499
Structural reforms	16	0.762	18	0.947	0.185	0.106	10	1.000	0.238	0.098	9	0.900	0.138	0.380
Trade diversification and quality	19	0.905	18	0.947	0.043	0.620	9	0.900	-0.005	0.968	10	1.000	0.095	0.329
Investments, labor and productivity	19	0.905	18	0.947	0.043	0.620	9	0.900	-0.005	0.968	10	1.000	0.095	0.329
# of GSs	**21**		**19**		**-**		**10**		**-**		**10**		**-**	
Panel C: 2000-2010														
External factors and endowments	22	1.000	43	1.000	0.000	0.000	21	1.000	0.000	0.000	25	1.000	0.000	0.000
Institutions	17	0.773	39	0.907	0.134	0.142	18	0.857	0.084	0.489	24	0.960	0.187	0.057
Macroeconomic stability	18	0.818	37	0.860	0.042	0.661	18	0.857	0.039	0.737	22	0.880	0.062	0.563
Structural reforms	15	0.682	36	0.837	0.155	0.154	18	0.857	0.175	0.182	21	0.840	0.158	0.210
Trade diversification and quality	18	0.818	39	0.907	0.089	0.310	19	0.905	0.087	0.425	22	0.880	0.062	0.563
Investments, labor and productivity	19	0.864	39	0.907	0.043	0.601	18	0.857	-0.006	0.952	22	0.880	0.016	0.870
# of GSs	**22**		**43**		**-**		**21**		**-**		**25**		**-**	

Table D.6: Incidence by broad determinants of growth surges and by regions, with and without IMF-supported programs

	(1) GSs and no IMF		(2) GSs and IMF		(3) = (2) - (1)		(4) GSs and GRA		(5) = (4) - (1)		(6) GSs and PRGT		(7) = (6) - (1)	
Broad determinants of Growth surges	**# GSs**	**Inc**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**
Panel A: Africa														
External factors and endowments	6	1.000	20	1.000	0.000	0.000	5	1.000	0.000	0.000	15	1.000	0.000	0.000
Institutions	5	0.833	19	0.950	0.117	0.367	5	1.000	0.167	0.389	14	0.933	0.100	0.505
Macroeconomic stability	6	1.000	19	0.950	-0.050	0.594	5	1.000	0.000	0.000	14	0.933	-0.067	0.541
Structural reforms	4	0.667	17	0.850	0.183	0.337	5	1.000	0.333	0.186	12	0.800	0.133	0.541
Trade diversification and quality	4	0.667	19	0.950	0.283	0.060	5	1.000	0.333	0.186	14	0.933	0.267	0.126
Investments, labor and productivity	6	1.000	19	0.950	-0.050	0.594	5	1.000	0.000	0.000	14	0.933	-0.067	0.541
# of GSs	**6**		**20**		**-**		**5**		**-**		**15**		**-**	
Panel B: Asia and Pacific														
External factors and endowments	16	1.000	12	1.000	0.000	0.000	5	1.000	0.000	0.000	8	1.000	0.000	0.000
Institutions	13	0.813	11	0.917	0.104	0.454	5	1.000	0.188	0.320	7	0.875	0.063	0.713
Macroeconomic stability	15	0.938	9	0.750	-0.188	0.173	4	0.800	-0.138	0.386	6	0.750	-0.188	0.207
Structural reforms	14	0.875	12	1.000	0.125	0.218	5	1.000	0.125	0.431	8	1.000	0.125	0.317
Trade diversification and quality	12	0.750	10	0.833	0.083	0.611	4	0.800	0.050	0.830	6	0.750	0.000	1.000
Investments, labor and productivity	15	0.938	11	0.917	-0.021	0.840	4	0.800	-0.138	0.386	7	0.875	-0.063	0.620
# of GSs	**16**		**12**		**-**		**5**		**-**		**8**		**-**	
Panel C: Europe														
External factors and endowments	16	0.941	17	1.000	0.059	0.325	13	1.000	0.059	0.391	6	1.000	0.059	0.565
Institutions	16	0.941	16	0.941	0.000	1.000	12	0.923	-0.018	0.850	6	1.000	0.059	0.565
Macroeconomic stability	17	1.000	17	1.000	0.000	0.000	13	1.000	0.000	0.000	6	1.000	0.000	0.000
Structural reforms	15	0.882	16	0.941	0.059	0.559	12	0.923	0.041	0.724	6	1.000	0.118	0.402
Trade diversification and quality	15	0.882	16	0.941	0.059	0.559	12	0.923	0.041	0.724	6	1.000	0.118	0.402
Investments, labor and productivity	15	0.882	16	0.941	0.059	0.559	12	0.923	0.041	0.724	5	0.833	-0.049	0.772
# of GSs	**17**		**17**		**-**		**13**		**-**		**6**		**-**	
Panel D: Middle East and Central Asia														
External factors and endowments	10	0.909	11	1.000	0.091	0.329	8	1.000	0.091	0.409	4	1.000	0.091	0.566
Institutions	11	1.000	9	0.818	-0.182	0.152	7	0.875	-0.125	0.252	3	0.750	-0.250	0.098
Macroeconomic stability	10	0.909	11	1.000	0.091	0.329	8	1.000	0.091	0.409	4	1.000	0.091	0.566
Structural reforms	9	0.818	9	0.818	0.000	1.000	7	0.875	0.057	0.754	3	0.750	-0.068	0.789
Trade diversification and quality	11	1.000	10	0.909	-0.091	0.329	7	0.875	-0.125	0.252	4	1.000	0.000	0.000
Investments, labor and productivity	8	0.727	9	0.818	0.091	0.631	6	0.750	0.023	0.918	4	1.000	0.273	0.275
# of GSs	**11**		**11**		**-**		**8**		**-**		**4**		**-**	
Panel E: Americas and Caribbean														
External factors and endowments	8	1.000	14	1.000	0.000	0.000	12	1.000	0.000	0.000	2	1.000	0.000	0.000
Institutions	3	0.375	10	0.714	0.339	0.131	8	0.667	0.292	0.220	2	1.000	0.625	0.141
Macroeconomic stability	5	0.625	11	0.786	0.161	0.440	9	0.750	0.125	0.574	2	1.000	0.375	0.356
Structural reforms	4	0.500	11	0.786	0.286	0.182	10	0.833	0.333	0.123	1	0.500	0.000	1.000
Trade diversification and quality	7	0.875	14	1.000	0.125	0.193	12	1.000	0.125	0.230	2	1.000	0.125	0.645
Investments, labor and productivity	8	1.000	13	0.929	-0.071	0.463	11	0.917	-0.083	0.429	2	1.000	0.000	0.000
# of GSs	**8**		**14**		**-**		**12**		**-**		**2**		**-**	

Table D.7: Incidence by broad determinants of growth surges and by levels of development, with and without IMF-supported programs

	(1) GSs and no IMF		(2) GSs and IMF		(3) = (2) - (1)		(4) GSs and GRA		(5) = (4) - (1)		(6) GSs and PRGT		(7) = (6) - (1)	
Broad determinants of Growth surges	**# GSs**	**Inc**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**	**# GSs**	**Inc**	**Coeff**	**P-value**
Panel A: Low-income countries														
External factors and endowments	7	1.000	27	1.000	0.000	0.000	3	1.000	0.000	0.000	25	1.000	0.000	0.000
Institutions	6	0.857	24	0.889	0.032	0.823	3	1.000	0.143	0.545	22	0.880	0.023	0.877
Macroeconomic stability	7	1.000	24	0.889	-0.111	0.371	3	1.000	0.000	0.000	22	0.880	-0.120	0.352
Structural reforms	5	0.714	23	0.852	0.138	0.410	3	1.000	0.286	0.356	21	0.840	0.126	0.468
Trade diversification and quality	4	0.571	25	0.926	0.355	0.018	3	1.000	0.429	0.217	23	0.920	0.349	0.025
Investments, labor and productivity	7	1.000	26	0.963	-0.037	0.618	3	1.000	0.000	0.000	24	0.960	-0.040	0.605
# of GSs	**7**		**27**		**-**		**3**		**-**		**25**		**-**	
Panel B: Emerging markets														
External factors and endowments	35	0.972	43	1.000	0.028	0.277	36	1.000	0.028	0.321	10	1.000	0.028	0.604
Institutions	27	0.750	37	0.860	0.110	0.218	30	0.833	0.083	0.391	10	1.000	0.250	0.081
Macroeconomic stability	31	0.861	39	0.907	0.046	0.529	32	0.889	0.028	0.726	10	1.000	0.139	0.221
Structural reforms	27	0.750	38	0.884	0.134	0.124	32	0.889	0.139	0.129	9	0.900	0.150	0.320
Trade diversification and quality	31	0.861	40	0.930	0.069	0.317	33	0.917	0.056	0.460	9	0.900	0.039	0.753
Investments, labor and productivity	31	0.861	38	0.884	0.023	0.767	31	0.861	0.000	1.000	8	0.800	-0.061	0.643
# of GSs	**36**		**43**		**-**		**36**		**-**		**10**		**-**	
Panel C: Advanced economies														
External factors and endowments	14	0.933	4	1.000	0.067	0.620	4	1.000	0.067	0.620	-	-	-	-
Institutions	15	1.000	4	1.000	0.000	0.000	4	1.000	0.000	0.000	-	-	-	-
Macroeconomic stability	15	1.000	4	1.000	0.000	0.000	4	1.000	0.000	0.000	-	-	-	-
Structural reforms	14	0.933	4	1.000	0.067	0.620	4	1.000	0.067	0.620	-	-	-	-
Trade diversification and quality	14	0.933	4	1.000	0.067	0.620	4	1.000	0.067	0.620	-	-	-	-
Investments, labor and productivity	14	0.933	4	1.000	0.067	0.620	4	1.000	0.067	0.620	-	-	-	-
# of GSs	**15**		**4**		**-**		**4**		**-**		**0**		**-**	

D.3.2 Baseline : Figure of average marginal effects

Table D.8: Effectiveness by broad determinants of growth surges and by decades, with and without IMF-supported programs

	(1) GSs and no IMF		(2) GSs and IMF		(3) = (2) - (1)		(4) GSs and GRA		(5) = (4) - (1)		(6) GSs and PRGT		(7) = (6) - (1)	
Broad determinants of Growth surges	**# Signals**	**Eff**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**
Panel A: 1980-1989														
External factors and endowments	24	0.146	19	0.153	0.007	0.872	19	0.153	0.007	0.872	-	-	-	-
Institutions	27	0.176	25	0.225	0.049	0.327	25	0.225	0.049	0.327	-	-	-	-
Macroeconomic stability	31	0.248	24	0.216	-0.032	0.566	24	0.216	-0.032	0.566	-	-	-	-
Structural reforms	22	0.188	12	0.128	-0.060	0.238	12	0.128	-0.060	0.238	-	-	-	-
Trade diversification and quality	37	0.153	26	0.157	0.004	0.919	26	0.157	0.004	0.919	-	-	-	-
Investments, labor and productivity	20	0.153	13	0.151	-0.002	0.976	13	0.151	-0.002	0.976	-	-	-	-
# of GSs	**15**		**12**		**-**		**12**		**-**		**0**		**-**	
Panel B: 1990-1999														
External factors and endowments	28	0.269	39	0.269	0.000	0.996	30	0.370	0.101	0.143	11	0.153	-0.116	0.068
Institutions	46	0.275	62	0.262	-0.014	0.758	40	0.305	0.030	0.573	25	0.188	-0.087	0.077
Macroeconomic stability	46	0.305	80	0.394	0.089	0.083	54	0.470	0.165	0.006	32	0.308	0.003	0.959
Structural reforms	34	0.219	102	0.421	0.202	0.000	71	0.473	0.254	0.000	41	0.357	0.137	0.013
Trade diversification and quality	58	0.319	69	0.367	0.048	0.329	44	0.423	0.104	0.077	32	0.320	0.001	0.982
Investments, labor and productivity	39	0.247	67	0.396	0.150	0.004	43	0.478	0.231	0.000	28	0.315	0.068	0.252
# of GSs	**21**		**19**		**-**		**10**		**-**		**10**		**-**	
Panel C: 2000-2010														
External factors and endowments	68	0.285	129	0.645	0.360	0.000	62	0.721	0.436	0.000	75	0.610	0.325	0.000
Institutions	31	0.320	81	0.628	0.308	0.000	42	0.792	0.473	0.000	44	0.537	0.217	0.003
Macroeconomic stability	36	0.330	84	0.764	0.433	0.000	42	0.875	0.545	0.000	47	0.701	0.371	0.000
Structural reforms	32	0.337	89	0.631	0.294	0.000	46	0.793	0.456	0.000	48	0.539	0.202	0.005
Trade diversification and quality	33	0.295	69	0.633	0.338	0.000	32	0.762	0.467	0.000	43	0.589	0.294	0.000
Investments, labor and productivity	29	0.305	75	0.641	0.336	0.000	32	0.780	0.475	0.000	45	0.577	0.272	0.000
# of GSs	**22**		**43**		**-**		**21**		**-**		**25**		**-**	

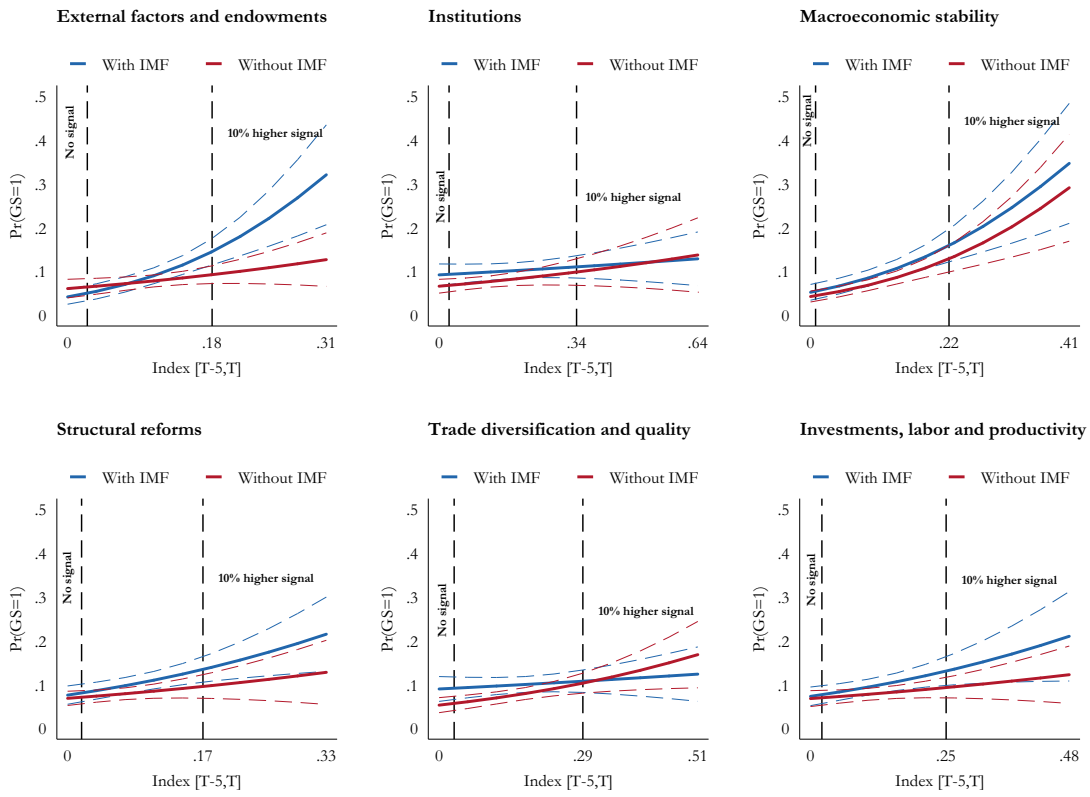
Table D.9: Effectiveness by broad determinants of growth surges and by regions, with and without IMF-supported programs

	(1) GSs and no IMF		(2) GSs and IMF		(3) = (2) - (1)		(4) GSs and GRA		(5) = (4) - (1)		(6) GSs and PRGT		(7) = (6) - (1)	
Broad determinants of Growth surges	**# Signals**	**Eff**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**
Panel A: Africa														
External factors and endowments	13	0.148	36	0.183	0.035	0.471	5	0.068	-0.079	0.114	31	0.235	0.087	0.115
Institutions	14	0.146	37	0.174	0.028	0.543	4	0.058	-0.088	0.075	33	0.199	0.053	0.283
Macroeconomic stability	14	0.177	38	0.229	0.052	0.357	7	0.109	-0.068	0.258	31	0.256	0.079	0.193
Structural reforms	12	0.176	48	0.239	0.062	0.288	9	0.123	-0.053	0.379	40	0.267	0.090	0.149
Trade diversification and quality	11	0.112	37	0.184	0.072	0.113	6	0.069	-0.043	0.312	31	0.238	0.126	0.015
Investments, labor and productivity	14	0.189	40	0.250	0.061	0.307	4	0.083	-0.106	0.109	36	0.303	0.113	0.081
# of GSs	**6**		**20**		**-**		**5**		**-**		**15**		**-**	
Panel B: Asia and Pacific														
External factors and endowments	26	0.347	28	0.560	0.213	0.018	17	0.486	0.139	0.167	11	0.733	0.387	0.005
Institutions	18	0.321	29	0.558	0.236	0.013	18	0.545	0.224	0.038	12	0.545	0.224	0.069
Macroeconomic stability	21	0.375	23	0.605	0.230	0.028	13	0.591	0.216	0.086	10	0.588	0.213	0.123
Structural reforms	22	0.478	32	0.744	0.266	0.010	16	0.667	0.188	0.137	17	0.850	0.372	0.004
Trade diversification and quality	31	0.449	26	0.520	0.071	0.450	16	0.457	0.008	0.940	10	0.526	0.077	0.556
Investments, labor and productivity	22	0.361	19	0.679	0.318	0.005	10	0.625	0.264	0.057	9	0.750	0.389	0.012
# of GSs	**16**		**12**		**-**		**5**		**-**		**8**		**-**	
Panel C: Europe														
External factors and endowments	41	0.248	62	0.765	0.517	0.000	47	0.712	0.464	0.000	23	1.000	0.752	0.000
Institutions	34	0.270	58	0.744	0.474	0.000	50	0.725	0.455	0.000	14	0.933	0.663	0.000
Macroeconomic stability	42	0.362	75	0.815	0.453	0.000	62	0.795	0.433	0.000	21	0.955	0.592	0.000
Structural reforms	33	0.241	80	0.825	0.584	0.000	70	0.805	0.564	0.000	19	1.000	0.759	0.000
Trade diversification and quality	40	0.252	60	0.732	0.480	0.000	50	0.694	0.443	0.000	20	1.000	0.748	0.000
Investments, labor and productivity	26	0.222	60	0.845	0.623	0.000	48	0.828	0.605	0.000	15	0.938	0.715	0.000
# of GSs	**17**		**17**		**-**		**13**		**-**		**6**		**-**	
Panel D: Middle East and Central Asia														
External factors and endowments	25	0.298	30	0.750	0.452	0.000	15	0.600	0.302	0.006	17	0.944	0.647	0.000
Institutions	30	0.390	17	0.472	0.083	0.411	10	0.357	-0.032	0.765	8	0.800	0.410	0.014
Macroeconomic stability	25	0.410	28	0.718	0.308	0.002	16	0.615	0.206	0.080	15	0.938	0.528	0.000
Structural reforms	12	0.316	21	0.656	0.340	0.004	12	0.522	0.206	0.114	13	1.000	0.684	0.000
Trade diversification and quality	30	0.286	21	0.618	0.332	0.000	13	0.520	0.234	0.025	11	0.846	0.560	0.000
Investments, labor and productivity	17	0.258	17	0.607	0.350	0.001	11	0.550	0.292	0.014	9	0.750	0.492	0.001
# of GSs	**11**		**11**		**-**		**8**		**-**		**4**		**-**	
Panel E: Americas and Caribbean														
External factors and endowments	15	0.158	31	0.307	0.149	0.014	27	0.303	0.145	0.019	4	0.286	0.128	0.243
Institutions	8	0.129	27	0.276	0.146	0.029	25	0.269	0.140	0.037	3	0.250	0.121	0.287
Macroeconomic stability	11	0.151	24	0.270	0.119	0.068	22	0.268	0.118	0.075	4	0.308	0.157	0.173
Structural reforms	9	0.115	22	0.212	0.096	0.089	22	0.239	0.124	0.038	2	0.095	-0.020	0.797
Trade diversification and quality	16	0.152	20	0.208	0.056	0.304	17	0.195	0.043	0.434	5	0.455	0.302	0.013
Investments, labor and productivity	9	0.136	19	0.224	0.087	0.174	15	0.214	0.078	0.237	5	0.278	0.141	0.157
# of GSs	**8**		**14**		**-**		**12**		**-**		**2**		**-**	

Table D.10: Effectiveness by broad determinants of growth surges and by levels of development, with and without IMF-supported programs

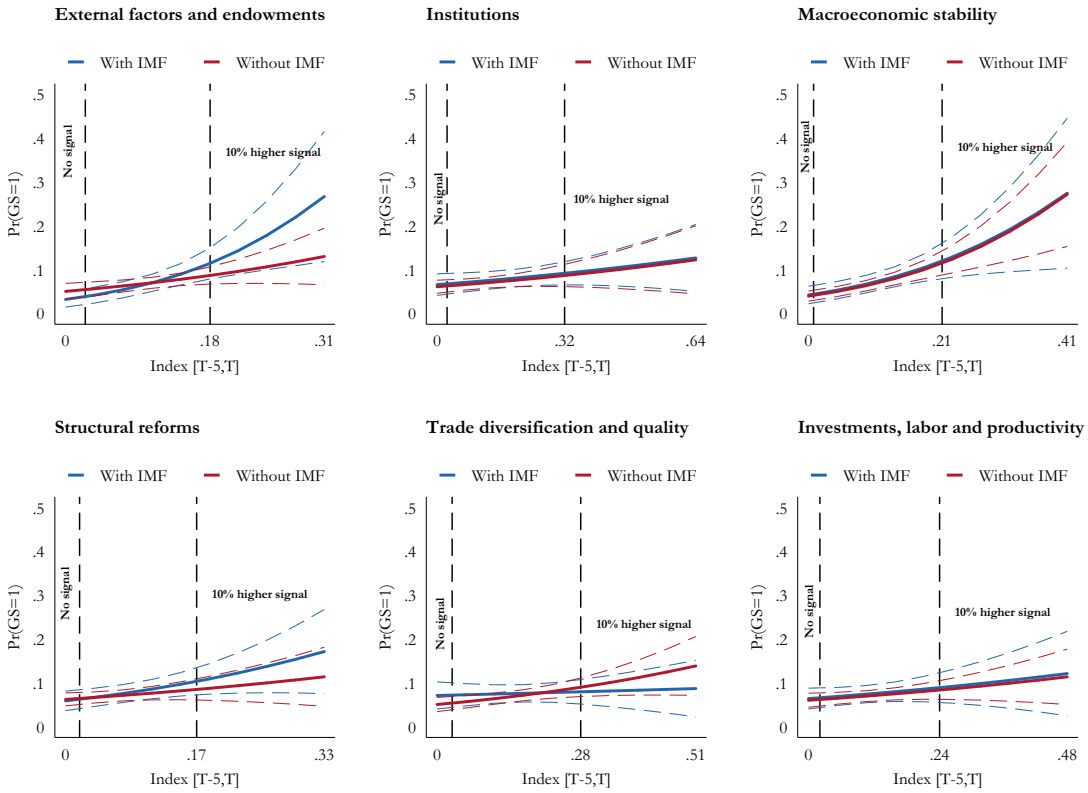
	(1) GSs and no IMF		(2) GSs and IMF		(3) = (2) - (1)		(4) GSs and GRA		(5) = (4) - (1)		(6) GSs and PRGT		(7) = (6) - (1)	
Broad determinants of Growth surges	**# Signals**	**Eff**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**	**# Signals**	**Eff**	**Coeff**	**P-value**
Panel A: Low-income countries														
External factors and endowments	23	0.284	67	0.268	-0.016	0.780	6	0.068	-0.216	0.000	63	0.360	0.076	0.233
Institutions	16	0.200	52	0.206	0.006	0.903	4	0.049	-0.151	0.004	49	0.244	0.044	0.434
Macroeconomic stability	19	0.264	58	0.284	0.020	0.741	7	0.096	-0.168	0.008	53	0.342	0.078	0.242
Structural reforms	18	0.273	65	0.266	-0.006	0.918	6	0.073	-0.200	0.001	62	0.325	0.052	0.435
Trade diversification and quality	19	0.190	56	0.231	0.041	0.401	7	0.071	-0.119	0.012	52	0.317	0.127	0.024
Investments, labor and productivity	16	0.286	57	0.294	0.008	0.907	3	0.061	-0.224	0.003	54	0.351	0.065	0.380
# of GSs	**7**		**27**		**-**		**3**		**-**		**25**		**-**	
Panel B: Emerging markets														
External factors and endowments	72	0.287	106	0.535	0.249	0.000	91	0.508	0.222	0.000	23	0.852	0.565	0.000
Institutions	62	0.307	99	0.488	0.181	0.000	86	0.455	0.148	0.002	21	0.875	0.568	0.000
Macroeconomic stability	61	0.333	111	0.561	0.227	0.000	94	0.531	0.198	0.000	28	0.824	0.490	0.000
Structural reforms	43	0.305	112	0.549	0.244	0.000	97	0.516	0.211	0.000	29	0.906	0.601	0.000
Trade diversification and quality	76	0.285	91	0.460	0.175	0.000	78	0.424	0.139	0.002	25	0.862	0.577	0.000
Investments, labor and productivity	48	0.259	81	0.513	0.253	0.000	68	0.476	0.216	0.000	20	0.870	0.610	0.000
# of GSs	**36**		**43**		**-**		**36**		**-**		**10**		**-**	
Panel C: Advanced economies														
External factors and endowments	25	0.143	14	0.667	0.524	0.000	14	0.667	0.524	0.000	-	-	-	-
Institutions	26	0.193	17	0.773	0.580	0.000	17	0.773	0.580	0.000	-	-	-	-
Macroeconomic stability	33	0.254	19	0.864	0.610	0.000	19	0.864	0.610	0.000	-	-	-	-
Structural reforms	27	0.169	26	0.897	0.728	0.000	26	0.897	0.728	0.000	-	-	-	-
Trade diversification and quality	33	0.195	17	0.739	0.544	0.000	17	0.739	0.544	0.000	-	-	-	-
Investments, labor and productivity	24	0.168	17	0.850	0.682	0.000	17	0.850	0.682	0.000	-	-	-	-
# of GSs	**15**		**4**		**-**		**4**		**-**		**0**		**-**	

Figure D.1: Average marginal effects of the broad determinants of growth surges, with and without all IMF-supported programs



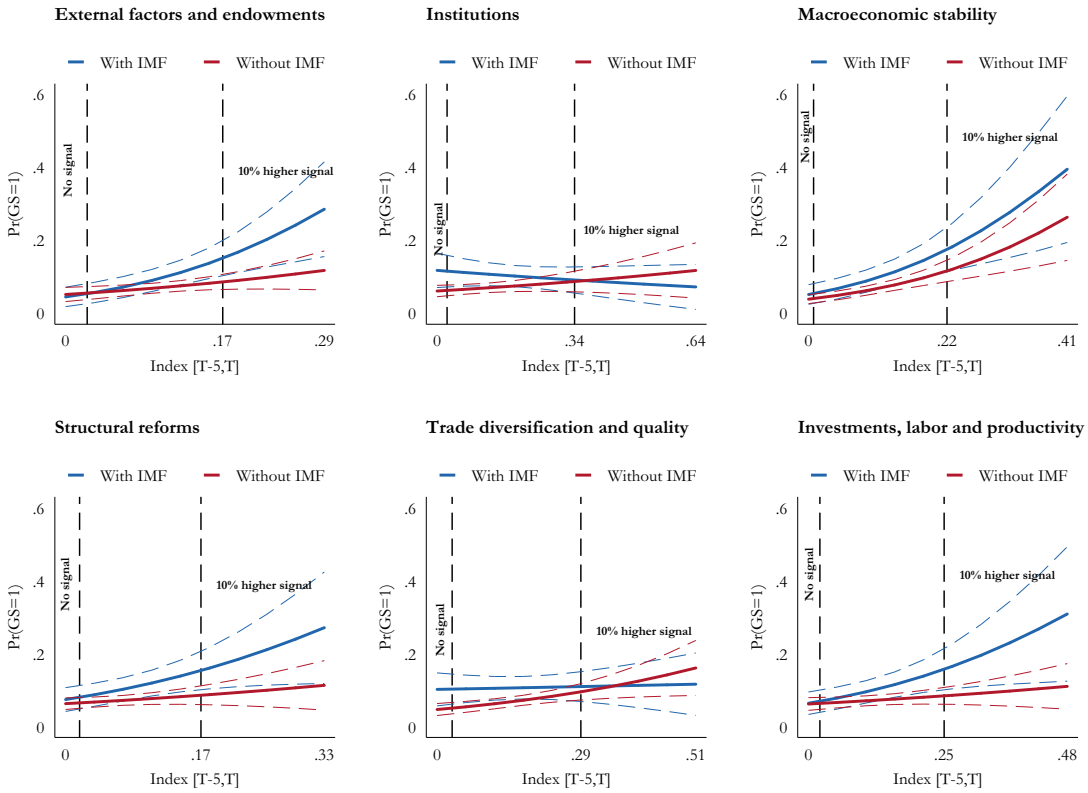
Notes: The figures show average marginal effects based on the column (1) and (2) of table 5.4.

Figure D.2: Average marginal effects of the broad determinants of growth surges, with and without GRA programs



Notes: The figures show average marginal effects based on the column (3) and (4) of table 5.4.

Figure D.3: Average marginal effects of the broad determinants of growth surges, with and without PRGT programs



Notes: The figures show average marginal effects based on the column (5) and (6) of table 5.4.

D.3.3 Robustness checks

D.3.3.1 Alternative samples

Table D.11: Predicting growth surges, robustness checks, drop countries without any IMF-supported programs

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.029**	0.029**	0.013	0.013	0.040**	0.040**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.018)	(0.018)
External factors and endowments index, average [T-5,T]	0.364***	0.591***	0.358***	0.446***	0.331***	0.582***
	(0.126)	(0.126)	(0.119)	(0.148)	(0.113)	(0.170)
Institutions index, average [T-5,T]	0.049	0.081	0.047	0.111*	0.036	-0.035
	(0.064)	(0.056)	(0.060)	(0.058)	(0.054)	(0.088)
Macroeconomic stability index, average [T-5,T]	0.384***	0.556***	0.365***	0.462***	0.298***	0.602***
	(0.095)	(0.101)	(0.089)	(0.119)	(0.082)	(0.141)
Structural reforms index, average [T-5,T]	0.218**	0.378***	0.196*	0.340***	0.199**	0.434***
	(0.109)	(0.099)	(0.103)	(0.109)	(0.093)	(0.149)
Trade diversification and quality index, average [T-5,T]	0.345***	0.100	0.303***	0.078	0.316***	0.051
	(0.078)	(0.079)	(0.075)	(0.090)	(0.071)	(0.107)
Investments, labor and productivity index, average [T-5,T]	0.085	0.227***	0.084	0.078	0.079	0.365***
	(0.075)	(0.083)	(0.071)	(0.096)	(0.065)	(0.119)
Africa (Base level)						
Asia and Pacific	0.103***	0.126***	0.076***	0.085***	0.143***	0.187***
	(0.020)	(0.024)	(0.022)	(0.025)	(0.024)	(0.033)
Europe	0.027*	0.034*	0.024	0.027	0.045**	0.065**
	(0.016)	(0.020)	(0.018)	(0.020)	(0.018)	(0.026)
Middle East and Central Asia	0.039**	0.049**	0.040**	0.046**	0.007	0.011
	(0.018)	(0.022)	(0.020)	(0.023)	(0.013)	(0.020)
Americas and Caribbean	-0.003	-0.004	-0.003	-0.003	0.003	0.004
	(0.011)	(0.014)	(0.013)	(0.015)	(0.010)	(0.015)
1980-1989 (Base level)						
1990-1999	-0.003	-0.003	-0.009	-0.010	0.010	0.015
	(0.010)	(0.013)	(0.010)	(0.012)	(0.011)	(0.016)
2000-2010	0.103***	0.126***	0.083***	0.093***	0.098***	0.133***
	(0.018)	(0.022)	(0.020)	(0.024)	(0.020)	(0.026)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.006	0.008	-0.005	-0.005	0.022	0.033
	(0.017)	(0.022)	(0.018)	(0.021)	(0.016)	(0.022)
Emerging Economies	0.070***	0.087***	0.067***	0.075***	0.101***	0.138***
	(0.017)	(0.019)	(0.018)	(0.018)	(0.017)	(0.026)
Observations	3081	3081	2454	2454	2193	2193
# of GSs	110	110	79	79	71	71
# of Countries	139	139	138	138	135	135
Pseudo R2	0.234	0.234	0.212	0.212	0.257	0.257
Classification power	90.230	90.230	90.872	90.872	91.701	91.701
AUROC	0.831	0.831	0.821	0.821	0.837	0.837
BIC	1787.348	1787.348	1410.098	1410.098	1221.804	1221.804

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.12: Predicting growth surges, robustness checks, drop countries without any IMF-supported programs and top 10% countries with higher number of IMF-supported programs

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.027**	0.027**	0.019	0.019	0.035*	0.035*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.019)	(0.019)
External factors and endowments index, average [T-5,T]	0.367***	0.635***	0.357***	0.529***	0.330***	0.566***
	(0.130)	(0.144)	(0.128)	(0.173)	(0.114)	(0.196)
Institutions index, average [T-5,T]	0.053	0.120*	0.055	0.118*	0.036	0.074
	(0.066)	(0.064)	(0.065)	(0.068)	(0.053)	(0.109)
Macroeconomic stability index, average [T-5,T]	0.374***	0.426***	0.371***	0.466***	0.280***	0.360**
	(0.097)	(0.117)	(0.095)	(0.137)	(0.080)	(0.174)
Structural reforms index, average [T-5,T]	0.228**	0.396***	0.225**	0.386***	0.195**	0.414**
	(0.112)	(0.110)	(0.111)	(0.123)	(0.092)	(0.180)
Trade diversification and quality index, average [T-5,T]	0.341***	0.124	0.325***	0.126	0.292***	0.019
	(0.080)	(0.095)	(0.080)	(0.102)	(0.069)	(0.149)
Investments, labor and productivity index, average [T-5,T]	0.098	0.167*	0.097	0.073	0.091	0.282*
	(0.077)	(0.095)	(0.076)	(0.111)	(0.065)	(0.146)
Africa (Base level)						
Asia and Pacific	0.103***	0.127***	0.078***	0.091***	0.135***	0.183***
	(0.021)	(0.025)	(0.023)	(0.026)	(0.023)	(0.036)
Europe	0.035**	0.044**	0.026	0.030	0.053***	0.076***
	(0.017)	(0.021)	(0.019)	(0.022)	(0.019)	(0.028)
Middle East and Central Asia	0.045**	0.057**	0.045**	0.053**	0.014	0.020
	(0.019)	(0.023)	(0.022)	(0.026)	(0.013)	(0.020)
Americas and Caribbean	0.002	0.003	-0.001	-0.001	0.007	0.011
	(0.012)	(0.016)	(0.015)	(0.018)	(0.011)	(0.016)
1980-1989 (Base level)						
1990-1999	-0.004	-0.005	-0.011	-0.013	0.008	0.012
	(0.011)	(0.014)	(0.012)	(0.014)	(0.012)	(0.017)
2000-2010	0.098***	0.120***	0.090***	0.104***	0.084***	0.117***
	(0.019)	(0.024)	(0.021)	(0.026)	(0.020)	(0.028)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.018	0.022	0.008	0.009	0.031*	0.045**
	(0.018)	(0.023)	(0.020)	(0.024)	(0.017)	(0.021)
Emerging Economies	0.069***	0.086***	0.064***	0.075***	0.097***	0.135***
	(0.017)	(0.019)	(0.018)	(0.019)	(0.016)	(0.028)
Observations	2529	2529	2173	2173	1823	1823
# of GSs	97.000	97.000	76.000	76.000	61.000	61.000
# of Countries	118.000	118.000	117.000	117.000	114.000	114.000
Pseudo R2	0.223	0.223	0.200	0.200	0.246	0.246
Classification power	89.719	89.719	90.244	90.244	91.882	91.882
AUROC	0.818	0.818	0.809	0.809	0.824	0.824
BIC	1581.439	1581.439	1346.260	1346.260	1074.304	1074.304

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

D.3.3.2 Alternative association of signals with IMF-supported programs

Table D.13: Predicting growth surges, robustness checks, signals associated with IMF-supported programs are those occurring during programs period only

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (no years after included)	0.016	0.016	0.004	0.004	0.037**	0.037**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.018)	(0.018)
External factors and endowments index, average [T-5,T]	0.226**	0.660***	0.228**	0.554***	0.237**	0.701***
	(0.102)	(0.124)	(0.100)	(0.147)	(0.096)	(0.176)
Institutions index, average [T-5,T]	0.104*	0.054	0.086*	0.087	0.085*	-0.080
	(0.054)	(0.055)	(0.052)	(0.055)	(0.048)	(0.094)
Macroeconomic stability index, average [T-5,T]	0.433***	0.471***	0.388***	0.391***	0.373***	0.574***
	(0.081)	(0.099)	(0.077)	(0.113)	(0.075)	(0.143)
Structural reforms index, average [T-5,T]	0.160*	0.350***	0.144	0.272***	0.123	0.440***
	(0.094)	(0.094)	(0.091)	(0.101)	(0.084)	(0.148)
Trade diversification and quality index, average [T-5,T]	0.190***	0.061	0.163***	0.035	0.175***	0.030
	(0.061)	(0.077)	(0.059)	(0.086)	(0.056)	(0.111)
Investments, labor and productivity index, average [T-5,T]	0.120*	0.226***	0.110*	0.114	0.095	0.369***
	(0.064)	(0.083)	(0.062)	(0.094)	(0.059)	(0.122)
Africa (Base level)						
Asia and Pacific	0.109***	0.117***	0.085***	0.085***	0.135***	0.163***
	(0.019)	(0.021)	(0.020)	(0.021)	(0.021)	(0.029)
Europe	0.044***	0.049***	0.040**	0.041**	0.069***	0.089***
	(0.017)	(0.018)	(0.019)	(0.019)	(0.020)	(0.026)
Middle East and Central Asia	0.037**	0.041**	0.032*	0.033*	0.017	0.024
	(0.016)	(0.018)	(0.017)	(0.017)	(0.013)	(0.018)
Americas and Caribbean	-0.006	-0.007	-0.008	-0.009	-0.001	-0.001
	(0.011)	(0.012)	(0.012)	(0.013)	(0.010)	(0.014)
1980-1989 (Base level)						
1990-1999	0.003	0.004	0.002	0.002	0.017	0.023
	(0.010)	(0.011)	(0.010)	(0.011)	(0.011)	(0.015)
2000-2010	0.079***	0.085***	0.058***	0.058***	0.068***	0.086***
	(0.015)	(0.017)	(0.016)	(0.017)	(0.016)	(0.020)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.016	0.018	0.008	0.008	0.023	0.031
	(0.017)	(0.018)	(0.017)	(0.017)	(0.016)	(0.020)
Emerging Economies	0.078***	0.084***	0.075***	0.075***	0.095***	0.119***
	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.023)
Observations	3763	3763	3172	3172	2958	2958
# of GSs	132	132	106	106	99	99
# of Countries	169	169	168	168	166	166
Pseudo R2	0.188	0.188	0.160	0.160	0.190	0.190
Classification power	90.433	90.433	90.763	90.763	91.176	91.176
AUROC	0.795	0.795	0.778	0.778	0.792	0.792
BIC	2240.909	2240.909	1889.442	1889.442	1723.421	1723.421

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.14: Predicting growth surges, robustness checks, signals associated with IMF-supported programs are those occurring during programs period or four years after program completion

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 4 years after)	0.019*	0.019*	0.005	0.005	0.030*	0.030*
	(0.012)	(0.012)	(0.011)	(0.011)	(0.018)	(0.018)
External factors and endowments index, average [T-5,T]	0.089	0.697***	0.139	0.560***	0.118	0.650***
	(0.108)	(0.116)	(0.103)	(0.145)	(0.100)	(0.170)
Institutions index, average [T-5,T]	0.071	0.077	0.060	0.084	0.048	-0.078
	(0.058)	(0.050)	(0.054)	(0.054)	(0.051)	(0.089)
Macroeconomic stability index, average [T-5,T]	0.429***	0.461***	0.396***	0.375***	0.373***	0.535***
	(0.088)	(0.089)	(0.082)	(0.110)	(0.081)	(0.137)
Structural reforms index, average [T-5,T]	0.198*	0.286***	0.176*	0.264***	0.175*	0.412***
	(0.105)	(0.087)	(0.098)	(0.099)	(0.094)	(0.141)
Trade diversification and quality index, average [T-5,T]	0.185***	0.092	0.137**	0.029	0.168***	0.026
	(0.064)	(0.071)	(0.060)	(0.084)	(0.058)	(0.105)
Investments, labor and productivity index, average [T-5,T]	0.061	0.257***	0.073	0.110	0.059	0.349***
	(0.069)	(0.075)	(0.065)	(0.091)	(0.063)	(0.117)
Africa (Base level)						
Asia and Pacific	0.104***	0.113***	0.079***	0.079***	0.133***	0.156***
	(0.020)	(0.021)	(0.021)	(0.022)	(0.022)	(0.029)
Europe	0.039**	0.044**	0.042**	0.043**	0.080***	0.098***
	(0.017)	(0.018)	(0.019)	(0.019)	(0.023)	(0.028)
Middle East and Central Asia	0.035**	0.040**	0.036**	0.037**	0.016	0.022
	(0.015)	(0.018)	(0.017)	(0.018)	(0.012)	(0.017)
Americas and Caribbean	-0.008	-0.010	-0.005	-0.005	-0.002	-0.003
	(0.010)	(0.012)	(0.012)	(0.013)	(0.010)	(0.013)
1980-1989 (Base level)						
1990-1999	0.004	0.005	0.001	0.001	0.016	0.021
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.014)
2000-2010	0.078***	0.086***	0.049***	0.049***	0.065***	0.079***
	(0.015)	(0.017)	(0.016)	(0.017)	(0.016)	(0.019)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.010	0.012	0.007	0.007	0.037**	0.048**
	(0.016)	(0.019)	(0.018)	(0.018)	(0.018)	(0.020)
Emerging Economies	0.074***	0.082***	0.074***	0.074***	0.107***	0.128***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.024)
Observations	3763	3763	2959	2959	2698	2698
# of GSs	132	132	97	97	89	89
# of Countries	169	169	168	168	159	159
Pseudo R2	0.191	0.191	0.155	0.155	0.184	0.184
Classification power	90.194	90.194	90.875	90.875	91.253	91.253
AUROC	0.796	0.796	0.772	0.772	0.784	0.784
BIC	2232.549	2232.549	1765.156	1765.156	1580.903	1580.903

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

D.3.3.3 Alternative horizons of growth determinants

Table D.15: Predicting growth surges, robustness checks, alternative horizons of growth determinants, average over the post-7 years of growth surges

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.024**	0.024**	0.014	0.014	0.029*	0.029*
	(0.011)	(0.011)	(0.012)	(0.012)	(0.017)	(0.017)
External factors and endowments index, average [T-7,T]	0.344***	1.090***	0.376***	0.933***	0.320***	1.008***
	(0.127)	(0.157)	(0.120)	(0.199)	(0.119)	(0.211)
Institutions index, average [T-7,T]	0.115*	0.092	0.098*	0.058	0.092*	0.056
	(0.061)	(0.062)	(0.055)	(0.069)	(0.054)	(0.091)
Macroeconomic stability index, average [T-7,T]	0.461***	0.553***	0.422***	0.444***	0.403***	0.578***
	(0.092)	(0.113)	(0.085)	(0.136)	(0.086)	(0.157)
Structural reforms index, average [T-7,T]	0.121	0.413***	0.106	0.300**	0.110	0.578***
	(0.102)	(0.106)	(0.095)	(0.121)	(0.093)	(0.159)
Trade diversification and quality index, average [T-7,T]	0.193***	0.100	0.155**	0.037	0.191***	0.087
	(0.067)	(0.086)	(0.063)	(0.102)	(0.061)	(0.115)
Investments, labor and productivity index, average [T-7,T]	0.061	0.191**	0.066	0.100	0.052	0.310**
	(0.073)	(0.093)	(0.069)	(0.112)	(0.067)	(0.131)
Africa (Base level)						
Asia and Pacific	0.105***	0.118***	0.086***	0.094***	0.133***	0.148***
	(0.019)	(0.021)	(0.020)	(0.023)	(0.021)	(0.027)
Europe	0.053***	0.062***	0.051***	0.057***	0.085***	0.099***
	(0.017)	(0.019)	(0.019)	(0.020)	(0.022)	(0.026)
Middle East and Central Asia	0.039**	0.046**	0.035**	0.039**	0.018	0.023
	(0.015)	(0.018)	(0.016)	(0.018)	(0.012)	(0.016)
Americas and Caribbean	-0.006	-0.007	-0.006	-0.007	-0.003	-0.005
	(0.010)	(0.012)	(0.011)	(0.013)	(0.009)	(0.012)
1980-1989 (Base level)						
1990-1999	-0.001	-0.002	-0.001	-0.001	0.012	0.015
	(0.010)	(0.012)	(0.010)	(0.012)	(0.011)	(0.014)
2000-2010	0.063***	0.071***	0.042***	0.046***	0.060***	0.070***
	(0.015)	(0.017)	(0.015)	(0.017)	(0.016)	(0.018)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.015	0.018	0.009	0.010	0.031*	0.039**
	(0.016)	(0.019)	(0.017)	(0.019)	(0.017)	(0.018)
Emerging Economies	0.078***	0.089***	0.075***	0.082***	0.107***	0.122***
	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.022)
Observations	3763	3763	3136	3136	2875	2875
# of GSs	132	132	101	101	93	93
# of Countries	169	169	168	168	165	165
Pseudo R2	0.190	0.190	0.158	0.158	0.191	0.191
Classification power	90.221	90.221	90.657	90.657	91.409	91.409
AUROC	0.796	0.796	0.777	0.777	0.792	0.792
BIC	2236.553	2236.553	1866.295	1866.295	1671.191	1671.191

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.16: Predicting growth surges, robustness checks, alternative horizons of growth determinants, average over the post-3 years of growth surges

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.021*	0.021*	0.005	0.005	0.037**	0.037**
	(0.012)	(0.012)	(0.011)	(0.011)	(0.018)	(0.018)
External factors and endowments index, average [T-3,T]	0.145	0.429***	0.185**	0.362***	0.156*	0.473***
	(0.089)	(0.107)	(0.086)	(0.122)	(0.083)	(0.155)
Institutions index, average [T-3,T]	0.098*	0.053	0.086*	0.089*	0.076*	-0.090
	(0.052)	(0.051)	(0.048)	(0.051)	(0.046)	(0.089)
Macroeconomic stability index, average [T-3,T]	0.341***	0.481***	0.314***	0.352***	0.292***	0.574***
	(0.076)	(0.090)	(0.071)	(0.102)	(0.069)	(0.132)
Structural reforms index, average [T-3,T]	0.144	0.249***	0.128	0.231**	0.113	0.279**
	(0.093)	(0.088)	(0.087)	(0.093)	(0.083)	(0.140)
Trade diversification and quality index, average [T-3,T]	0.174***	0.011	0.138**	-0.015	0.158***	-0.038
	(0.059)	(0.072)	(0.055)	(0.081)	(0.053)	(0.107)
Investments, labor and productivity index, average [T-3,T]	0.148**	0.274***	0.142**	0.144*	0.129**	0.378***
	(0.060)	(0.076)	(0.056)	(0.085)	(0.055)	(0.115)
Africa (Base level)						
Asia and Pacific	0.107***	0.122***	0.083***	0.085***	0.134***	0.168***
	(0.019)	(0.022)	(0.020)	(0.022)	(0.021)	(0.030)
Europe	0.044***	0.052***	0.040**	0.042**	0.075***	0.100***
	(0.016)	(0.019)	(0.018)	(0.018)	(0.021)	(0.028)
Middle East and Central Asia	0.039**	0.046**	0.035**	0.036**	0.019	0.028
	(0.015)	(0.018)	(0.017)	(0.018)	(0.012)	(0.018)
Americas and Caribbean	-0.005	-0.007	-0.005	-0.006	-0.001	-0.001
	(0.010)	(0.013)	(0.012)	(0.013)	(0.010)	(0.014)
1980-1989 (Base level)						
1990-1999	0.003	0.004	0.000	0.000	0.015	0.021
	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)	(0.015)
2000-2010	0.087***	0.100***	0.060***	0.062***	0.074***	0.097***
	(0.016)	(0.018)	(0.016)	(0.017)	(0.016)	(0.021)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.015	0.018	0.004	0.004	0.031*	0.044**
	(0.016)	(0.019)	(0.017)	(0.018)	(0.016)	(0.020)
Emerging Economies	0.074***	0.085***	0.072***	0.074***	0.100***	0.130***
	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.024)
Observations	3763	3763	3136	3136	2875	2875
# of GSs	132	132	101	101	93	93
# of Countries	169	169	168	168	165	165
Pseudo R2	0.183	0.183	0.157	0.157	0.184	0.184
Classification power	90.194	90.194	90.784	90.784	91.061	91.061
AUROC	0.794	0.794	0.778	0.778	0.789	0.789
BIC	2254.189	2254.189	1866.805	1866.805	1684.705	1684.705

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

D.3.3.4 Alternative estimators

Table D.17: Predicting growth surges, robustness checks, Probit estimator

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)=1	0.022*	0.022*	0.006	0.006	0.035**	0.035**
	(0.012)	(0.012)	(0.011)	(0.011)	(0.018)	(0.018)
External factors and endowments index, average over [T-5,T]	0.184*	0.723***	0.229**	0.622***	0.203**	0.713***
	(0.105)	(0.125)	(0.102)	(0.153)	(0.100)	(0.173)
Institutions index, average over [T-5,T]	0.085	0.053	0.071	0.092	0.071	-0.089
	(0.056)	(0.054)	(0.053)	(0.056)	(0.051)	(0.092)
Macroeconomic stability index, average over [T-5,T]	0.459***	0.527***	0.426***	0.416***	0.411***	0.576***
	(0.083)	(0.098)	(0.078)	(0.114)	(0.078)	(0.141)
Structural reforms index, average over [T-5,T]	0.132	0.340***	0.123	0.280***	0.100	0.442***
	(0.099)	(0.097)	(0.093)	(0.106)	(0.091)	(0.151)
Trade diversification and quality index, average over [T-5,T]	0.158***	0.084	0.129**	0.043	0.151***	0.059
	(0.060)	(0.076)	(0.057)	(0.087)	(0.056)	(0.111)
Investments, labor and productivity index, average over [T-5,T]	0.117*	0.236***	0.115*	0.115	0.113*	0.361***
	(0.064)	(0.083)	(0.061)	(0.097)	(0.060)	(0.121)
APD	0.111***	0.120***	0.090***	0.090***	0.140***	0.160***
	(0.019)	(0.021)	(0.020)	(0.021)	(0.021)	(0.028)
EUR	0.053***	0.059***	0.049***	0.050***	0.090***	0.107***
	(0.018)	(0.019)	(0.019)	(0.019)	(0.022)	(0.028)
MCD	0.039**	0.043**	0.036**	0.036**	0.016	0.021
	(0.015)	(0.017)	(0.016)	(0.017)	(0.013)	(0.017)
WHD	-0.007	-0.008	-0.007	-0.008	-0.002	-0.003
	(0.010)	(0.012)	(0.012)	(0.012)	(0.010)	(0.013)
decade=2	0.001	0.001	-0.000	-0.000	0.013	0.016
	(0.010)	(0.011)	(0.010)	(0.011)	(0.011)	(0.014)
decade=3	0.073***	0.079***	0.050***	0.050***	0.063***	0.075***
	(0.015)	(0.016)	(0.015)	(0.016)	(0.015)	(0.018)
Low-Income Developing Countries	0.017	0.019	0.009	0.009	0.035**	0.045**
	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)	(0.019)
Emerging Economies	0.083***	0.090***	0.080***	0.080***	0.111***	0.131***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.023)
Observations	3763	3763	3136	3136	2875	2875
# of GSs	132	132	101	101	93	93
# of Countries	169	169	168	168	165	165
Pseudo R2	0.190	0.190	0.163	0.163	0.189	0.189
Classification power	90.300	90.300	90.689	90.689	91.096	91.096
AUROC	0.797	0.797	0.782	0.782	0.793	0.793
BIC	2235.462	2235.462	1855.712	1855.712	1674.777	1674.777

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.18: Predicting growth surges, robustness checks, Tobit estimator

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.025**	0.025**	0.014	0.014	0.036**	0.036**
	(0.012)	(0.012)	(0.013)	(0.013)	(0.017)	(0.017)
External factors and endowments index, average [T-5,T]	0.182	1.046***	0.236**	1.033***	0.237**	1.052***
	(0.115)	(0.128)	(0.115)	(0.171)	(0.113)	(0.171)
Institutions index, average [T-5,T]	0.119**	0.028	0.101*	0.105	0.107*	-0.147*
	(0.057)	(0.056)	(0.056)	(0.069)	(0.056)	(0.084)
Macroeconomic stability index, average [T-5,T]	0.543***	0.611***	0.530***	0.543***	0.510***	0.663***
	(0.089)	(0.099)	(0.087)	(0.130)	(0.087)	(0.138)
Structural reforms index, average [T-5,T]	0.216*	0.511***	0.204*	0.474***	0.195*	0.619***
	(0.110)	(0.107)	(0.109)	(0.132)	(0.108)	(0.159)
Trade diversification and quality index, average [T-5,T]	0.187***	0.044	0.172***	0.011	0.178***	0.031
	(0.064)	(0.075)	(0.064)	(0.097)	(0.063)	(0.107)
Investments, labor and productivity index, average [T-5,T]	0.133*	0.289***	0.129*	0.228**	0.143*	0.354***
	(0.075)	(0.085)	(0.073)	(0.113)	(0.073)	(0.118)
Africa (Base level)						
Asia and Pacific	0.131***	0.131***	0.101***	0.101***	0.176***	0.176***
	(0.017)	(0.017)	(0.019)	(0.019)	(0.019)	(0.019)
Europe	0.094***	0.094***	0.072***	0.072***	0.140***	0.140***
	(0.020)	(0.020)	(0.022)	(0.022)	(0.023)	(0.023)
Middle East and Central Asia	0.054***	0.054***	0.041**	0.041**	0.037*	0.037*
	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)
Americas and Caribbean	-0.019	-0.019	-0.029	-0.029	0.001	0.001
	(0.016)	(0.016)	(0.018)	(0.018)	(0.019)	(0.019)
1980-1989 (Base level)						
1990-1999	-0.016	-0.016	-0.012	-0.012	0.004	0.004
	(0.012)	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)
2000-2010	0.085***	0.085***	0.072***	0.072***	0.078***	0.078***
	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)
Advanced Economies (Base level)						
Low-Income Developing Countries	0.060***	0.060***	0.047**	0.047**	0.097***	0.097***
	(0.022)	(0.022)	(0.023)	(0.023)	(0.025)	(0.025)
Emerging Economies	0.120***	0.120***	0.106***	0.106***	0.163***	0.163***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.020)
Observations	3763	3763	3136	3136	2875	2875
# of GSs	132	132	101	101	93	93
# of Countries	169	169	168	168	165	165
Pseudo R2	0.336	0.336	0.313	0.313	0.368	0.368
AUROC	0.791	0.791	0.775	0.775	0.786	0.786
BIC	1382.418	1382.418	1063.798	1063.798	938.579	938.579

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

D.3.3.5 Alternative sets of growth surges (based on different criteria of filters)

Table D.19: Predicting growth surges, robustness checks, alternative set of growth surges, Hausmann et al. (2005) criteria

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	-0.013	-0.013	-0.034**	-0.034**	0.029	0.029
	(0.016)	(0.016)	(0.015)	(0.015)	(0.024)	(0.024)
External factors and endowments index, average [T-5,T]	0.416***	0.661***	0.504***	0.514***	0.482***	0.937***
	(0.151)	(0.159)	(0.150)	(0.175)	(0.137)	(0.257)
Institutions index, average [T-5,T]	0.122	-0.049	0.117	-0.090	0.094	-0.126
	(0.075)	(0.070)	(0.072)	(0.076)	(0.066)	(0.117)
Macroeconomic stability index, average [T-5,T]	0.895***	0.921***	0.810***	0.885***	0.791***	0.934***
	(0.136)	(0.129)	(0.132)	(0.149)	(0.124)	(0.206)
Structural reforms index, average [T-5,T]	0.086	0.309**	0.083	0.253*	0.066	0.524**
	(0.163)	(0.134)	(0.157)	(0.139)	(0.147)	(0.217)
Trade diversification and quality index, average [T-5,T]	0.361***	0.122	0.290***	-0.091	0.293***	0.433***
	(0.094)	(0.098)	(0.092)	(0.109)	(0.085)	(0.151)
Investments, labor and productivity index, average [T-5,T]	-0.009	0.387***	0.002	0.222*	-0.003	0.280*
	(0.097)	(0.109)	(0.094)	(0.132)	(0.086)	(0.160)
Africa (Base level)						
Asia and Pacific	0.138***	0.122***	0.134***	0.102***	0.137***	0.146***
	(0.026)	(0.024)	(0.028)	(0.024)	(0.026)	(0.031)
Europe	0.115***	0.102***	0.132***	0.100***	0.193***	0.201***
	(0.030)	(0.027)	(0.032)	(0.025)	(0.040)	(0.045)
Middle East and Central Asia	0.035	0.031	0.035	0.027	0.000	0.000
	(0.022)	(0.020)	(0.023)	(0.018)	(0.018)	(0.021)
Americas and Caribbean	-0.009	-0.008	0.009	0.007	-0.007	-0.008
	(0.017)	(0.016)	(0.019)	(0.014)	(0.016)	(0.019)
1980-1989 (Base level)						
1990-1999	0.062***	0.055***	0.056***	0.042***	0.067***	0.073***
	(0.016)	(0.015)	(0.018)	(0.014)	(0.017)	(0.019)
2000-2010						
	0.101***	0.089***	0.059***	0.044***	0.061***	0.066***
Advanced Economies (Base level)	(0.020)	(0.018)	(0.021)	(0.017)	(0.019)	(0.021)
Low-Income Developing Countries	0.065**	0.058***	0.058**	0.044**	0.089***	0.100***
	(0.027)	(0.022)	(0.028)	(0.020)	(0.028)	(0.027)
Emerging Economies	0.141***	0.124***	0.146***	0.111***	0.186***	0.199***
	(0.023)	(0.020)	(0.023)	(0.018)	(0.024)	(0.033)
Observations	2981	2981	2515	2515	2288	2288
# of GSs	159	159	128	128	119	119
Unconditional probability	0.053	0.053	0.053	0.053	0.053	0.053
Mean(duration of GSs)	13.906	13.906	13.906	13.906	13.906	13.906
Mean(Avg. growth during GSs)	5.220	5.220	5.220	5.220	5.220	5.220
# of Countries	168	168	167	167	161	161
Pseudo R2	0.163	0.163	0.162	0.162	0.146	0.146
Classification power	85.340	85.340	85.646	85.646	85.490	85.490
AUROC	0.772	0.772	0.775	0.775	0.762	0.762
BIC	2353.763	2353.763	1968.490	1968.490	1853.077	1853.077

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.20: Predicting growth surges, robustness checks, alternative set of growth surges, minimum duration of growth surges sets to 6 years

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.014	0.014	0.004	0.004	0.020	0.020
	(0.011)	(0.011)	(0.011)	(0.011)	(0.017)	(0.017)
External factors and endowments index, average [T-5,T]	0.149	0.474***	0.154	0.468***	0.240**	0.385**
	(0.097)	(0.123)	(0.098)	(0.151)	(0.096)	(0.178)
Institutions index, average [T-5,T]	0.091*	-0.011	0.084*	0.022	0.067	-0.145
	(0.050)	(0.052)	(0.049)	(0.059)	(0.046)	(0.091)
Macroeconomic stability index, average [T-5,T]	0.317***	0.429***	0.320***	0.486***	0.279***	0.295**
	(0.084)	(0.091)	(0.082)	(0.111)	(0.079)	(0.136)
Structural reforms index, average [T-5,T]	0.151	0.341***	0.143	0.262**	0.105	0.393**
	(0.109)	(0.097)	(0.108)	(0.107)	(0.103)	(0.159)
Trade diversification and quality index, average [T-5,T]	0.190***	0.138*	0.168***	0.007	0.178***	0.211*
	(0.065)	(0.076)	(0.065)	(0.092)	(0.061)	(0.113)
Investments, labor and productivity index, average [T-5,T]	-0.085	0.244***	-0.074	0.193**	-0.070	0.282***
	(0.065)	(0.069)	(0.065)	(0.084)	(0.061)	(0.105)
Africa (Base level)						
Asia and Pacific	0.063***	0.066***	0.035*	0.033*	0.084***	0.095***
	(0.019)	(0.020)	(0.021)	(0.020)	(0.021)	(0.026)
Europe	0.001	0.001	0.001	0.001	0.029	0.034
	(0.016)	(0.018)	(0.020)	(0.019)	(0.020)	(0.023)
Middle East and Central Asia	-0.003	-0.003	-0.005	-0.005	-0.019	-0.023
	(0.016)	(0.017)	(0.018)	(0.018)	(0.014)	(0.017)
Americas and Caribbean	-0.032***	-0.036**	-0.036**	-0.036**	-0.027**	-0.032**
	(0.012)	(0.014)	(0.015)	(0.015)	(0.013)	(0.016)
1980-1989 (Base level)						
1990-1999	-0.004	-0.004	-0.008	-0.008	0.008	0.009
	(0.010)	(0.011)	(0.011)	(0.010)	(0.012)	(0.014)
2000-2010						
	0.077***	0.082***	0.068***	0.065***	0.048***	0.055***
Advanced Economies (Base level)	(0.015)	(0.016)	(0.016)	(0.017)	(0.015)	(0.017)
Low-Income Developing Countries	-0.036**	-0.039**	-0.030*	-0.030	-0.006	-0.007
	(0.016)	(0.019)	(0.018)	(0.019)	(0.016)	(0.020)
Emerging Economies	0.048***	0.050***	0.045**	0.043***	0.079***	0.090***
	(0.017)	(0.017)	(0.018)	(0.016)	(0.017)	(0.022)
Observations	3896	3896	3238	3238	2951	2951
# of GSs	144	144	116	116	101	101
Unconditional probability	0.037	0.037	0.037	0.037	0.037	0.037
Mean(duration of GSs)	9.313	9.313	9.313	9.313	9.313	9.313
Mean(Avg. growth during GSs)	6.310	6.310	6.310	6.310	6.310	6.310
# of Countries	169	169	169	169	166	166
Pseudo R2	0.141	0.141	0.127	0.127	0.102	0.102
Classification power	90.092	90.092	90.426	90.426	90.003	90.003
AUROC	0.742	0.742	0.722	0.722	0.711	0.711
BIC	2501.914	2501.914	2096.050	2096.050	1932.626	1932.626

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.21: Predicting growth surges, robustness checks, alternative set of growth surges, minimum duration of growth surges sets to 10 years

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.010	0.010	-0.001	-0.001	0.023	0.023
	(0.011)	(0.011)	(0.011)	(0.011)	(0.018)	(0.018)
External factors and endowments index, average [T-5,T]	0.283**	0.547***	0.311***	0.409***	0.312***	0.760***
	(0.113)	(0.114)	(0.109)	(0.128)	(0.101)	(0.191)
Institutions index, average [T-5,T]	0.052	0.028	0.041	0.036	0.024	-0.094
	(0.057)	(0.053)	(0.053)	(0.055)	(0.050)	(0.094)
Macroeconomic stability index, average [T-5,T]	0.449***	0.587***	0.416***	0.505***	0.384***	0.639***
	(0.099)	(0.107)	(0.093)	(0.121)	(0.089)	(0.166)
Structural reforms index, average [T-5,T]	-0.026	0.264***	-0.025	0.187*	-0.028	0.337**
	(0.122)	(0.101)	(0.115)	(0.109)	(0.108)	(0.160)
Trade diversification and quality index, average [T-5,T]	0.210***	0.152**	0.170***	0.162*	0.181***	0.028
	(0.068)	(0.076)	(0.065)	(0.086)	(0.061)	(0.115)
Investments, labor and productivity index, average [T-5,T]	0.083	0.239***	0.079	0.177**	0.059	0.296**
	(0.068)	(0.078)	(0.065)	(0.087)	(0.061)	(0.123)
Africa (Base level)						
Asia and Pacific	0.098***	0.097***	0.067***	0.062***	0.123***	0.132***
	(0.022)	(0.022)	(0.022)	(0.021)	(0.023)	(0.030)
Europe	0.034*	0.034*	0.023	0.021	0.064***	0.072***
	(0.019)	(0.019)	(0.021)	(0.019)	(0.023)	(0.028)
Middle East and Central Asia	0.009	0.009	0.004	0.004	-0.008	-0.010
	(0.016)	(0.016)	(0.017)	(0.016)	(0.013)	(0.015)
Americas and Caribbean	-0.012	-0.012	-0.011	-0.011	-0.012	-0.015
	(0.013)	(0.013)	(0.015)	(0.014)	(0.012)	(0.014)
1980-1989 (Base level)						
1990-1999	-0.008	-0.008	-0.005	-0.005	0.007	0.008
	(0.011)	(0.011)	(0.011)	(0.010)	(0.012)	(0.014)
2000-2010						
	0.070***	0.069***	0.049***	0.046***	0.044***	0.050***
Advanced Economies (Base level)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.017)
Low-Income Developing Countries	0.015	0.015	-0.002	-0.002	0.031*	0.037**
	(0.017)	(0.017)	(0.018)	(0.017)	(0.017)	(0.018)
Emerging Economies	0.089***	0.089***	0.083***	0.077***	0.118***	0.131***
	(0.017)	(0.016)	(0.018)	(0.016)	(0.017)	(0.025)
Observations	3413	3413	2862	2862	2599	2599
# of GSs	125	125	100	100	87	87
Unconditional probability	0.037	0.037	0.037	0.037	0.037	0.037
Mean(duration of GSs)	13.784	13.784	13.784	13.784	13.784	13.784
Mean(Avg. growth during GSs)	5.636	5.636	5.636	5.636	5.636	5.636
# of Countries	169	169	165	165	160	160
Pseudo R2	0.174	0.174	0.145	0.145	0.169	0.169
Classification power	90.214	90.214	90.321	90.321	90.997	90.997
AUROC	0.779	0.779	0.760	0.760	0.776	0.776
BIC	2085.833	2085.833	1788.677	1788.677	1563.211	1563.211

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.22: Predicting growth surges, robustness checks, alternative set of growth surges, per capita income growth accelerates by at least 1 percentage point

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.007	0.007	-0.008	-0.008	0.036*	0.036*
	(0.012)	(0.012)	(0.011)	(0.011)	(0.020)	(0.020)
External factors and endowments index, average [T-5,T]	0.044	0.597***	0.108	0.429***	0.075	0.723***
	(0.116)	(0.121)	(0.108)	(0.132)	(0.109)	(0.198)
Institutions index, average [T-5,T]	0.091	0.049	0.070	0.073	0.070	-0.081
	(0.060)	(0.053)	(0.054)	(0.052)	(0.053)	(0.099)
Macroeconomic stability index, average [T-5,T]	0.386***	0.528***	0.347***	0.383***	0.346***	0.682***
	(0.098)	(0.100)	(0.089)	(0.110)	(0.089)	(0.160)
Structural reforms index, average [T-5,T]	0.240**	0.330***	0.211**	0.272***	0.240**	0.446***
	(0.110)	(0.086)	(0.101)	(0.088)	(0.100)	(0.159)
Trade diversification and quality index, average [T-5,T]	0.243***	0.154**	0.201***	0.081	0.212***	0.148
	(0.069)	(0.075)	(0.064)	(0.082)	(0.063)	(0.123)
Investments, labor and productivity index, average [T-5,T]	0.155**	0.159*	0.131*	0.087	0.140**	0.235*
	(0.076)	(0.081)	(0.070)	(0.093)	(0.070)	(0.130)
Africa (Base level)						
Asia and Pacific	0.084***	0.082***	0.047**	0.041**	0.116***	0.139***
	(0.022)	(0.021)	(0.022)	(0.020)	(0.024)	(0.032)
Europe	0.050**	0.050**	0.035	0.031	0.081***	0.100***
	(0.021)	(0.020)	(0.023)	(0.020)	(0.025)	(0.032)
Middle East and Central Asia	0.016	0.016	0.003	0.002	0.005	0.007
	(0.017)	(0.017)	(0.018)	(0.016)	(0.014)	(0.019)
Americas and Caribbean	-0.017	-0.018	-0.025*	-0.022*	-0.013	-0.018
	(0.013)	(0.013)	(0.015)	(0.013)	(0.012)	(0.016)
1980-1989 (Base level)						
1990-1999	-0.004	-0.004	-0.005	-0.004	-0.000	-0.000
	(0.011)	(0.011)	(0.011)	(0.010)	(0.012)	(0.016)
2000-2010						
	0.079***	0.077***	0.051***	0.044***	0.058***	0.072***
Advanced Economies (Base level)	(0.017)	(0.017)	(0.017)	(0.016)	(0.017)	(0.021)
Low-Income Developing Countries	0.017	0.017	-0.005	-0.005	0.024	0.032
	(0.019)	(0.018)	(0.019)	(0.017)	(0.018)	(0.022)
Emerging Economies	0.096***	0.094***	0.093***	0.081***	0.129***	0.156***
	(0.018)	(0.016)	(0.019)	(0.016)	(0.019)	(0.029)
Observations	3534	3534	2936	2936	2692	2692
# of GSs	135	135	103	103	95	95
Unconditional probability	0.038	0.038	0.038	0.038	0.038	0.038
Mean(duration of GSs)	12.630	12.630	12.630	12.630	12.630	12.630
Mean(Avg. growth during GSs)	5.606	5.606	5.606	5.606	5.606	5.606
# of Countries	168	168	167	167	163	163
Pseudo R2	0.167	0.167	0.140	0.140	0.155	0.155
Classification power	89.360	89.360	89.952	89.952	90.045	90.045
AUROC	0.768	0.768	0.745	0.745	0.756	0.756
BIC	2271.786	2271.786	1885.306	1885.306	1731.230	1731.230

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.23: Predicting growth surges, robustness checks, alternative set of growth surges, per capita income growth accelerates by at least 3 percentage points

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.021**	0.021**	0.012	0.012	0.035**	0.035**
	(0.008)	(0.008)	(0.009)	(0.009)	(0.014)	(0.014)
External factors and endowments index, average [T-5,T]	0.098	0.337***	0.105	0.282***	0.106*	0.352**
	(0.067)	(0.092)	(0.068)	(0.108)	(0.059)	(0.140)
Institutions index, average [T-5,T]	0.084**	0.021	0.079**	0.056	0.059*	-0.104
	(0.039)	(0.042)	(0.038)	(0.044)	(0.032)	(0.086)
Macroeconomic stability index, average [T-5,T]	0.183***	0.362***	0.179***	0.373***	0.147***	0.340**
	(0.061)	(0.084)	(0.060)	(0.100)	(0.052)	(0.138)
Structural reforms index, average [T-5,T]	0.148*	0.244***	0.148*	0.201**	0.123*	0.280**
	(0.079)	(0.073)	(0.078)	(0.080)	(0.067)	(0.128)
Trade diversification and quality index, average [T-5,T]	0.041	0.169***	0.033	0.035	0.021	0.272***
	(0.046)	(0.058)	(0.046)	(0.067)	(0.039)	(0.101)
Investments, labor and productivity index, average [T-5,T]	0.092**	0.252***	0.096**	0.193**	0.081**	0.245**
	(0.046)	(0.066)	(0.046)	(0.076)	(0.040)	(0.116)
Africa (Base level)						
Asia and Pacific	0.048***	0.059***	0.020	0.022	0.059***	0.093***
	(0.013)	(0.017)	(0.015)	(0.017)	(0.013)	(0.024)
Europe	-0.005	-0.006	-0.017	-0.020	0.022*	0.037*
	(0.010)	(0.013)	(0.012)	(0.015)	(0.012)	(0.020)
Middle East and Central Asia	0.033**	0.042**	0.022	0.024	0.020**	0.033*
	(0.013)	(0.017)	(0.015)	(0.017)	(0.010)	(0.018)
Americas and Caribbean	-0.010	-0.013	-0.021**	-0.025*	-0.002	-0.003
	(0.008)	(0.011)	(0.011)	(0.013)	(0.007)	(0.012)
1980-1989 (Base level)						
1990-1999	0.008	0.011	0.004	0.004	0.005	0.009
	(0.007)	(0.009)	(0.007)	(0.009)	(0.008)	(0.013)
2000-2010	0.055***	0.069***	0.046***	0.052***	0.030***	0.048***
Advanced Economies (Base level)	(0.011)	(0.013)	(0.011)	(0.014)	(0.010)	(0.016)
Low-Income Developing Countries	-0.014	-0.018	-0.020	-0.024	0.010	0.018
	(0.011)	(0.015)	(0.012)	(0.016)	(0.010)	(0.016)
Emerging Economies	0.043***	0.053***	0.037***	0.041***	0.078***	0.122***
	(0.012)	(0.014)	(0.013)	(0.014)	(0.012)	(0.025)
Observations	4094	4094	3418	3418	3123	3123
# of GSs	97	97	77	77	66	66
Unconditional probability	0.024	0.024	0.024	0.024	0.024	0.024
Mean(duration of GSs)	10.835	10.835	10.835	10.835	10.835	10.835
Mean(Avg. growth during GSs)	6.711	6.711	6.711	6.711	6.711	6.711
# of Countries	169	169	168	168	165	165
Pseudo R2	0.189	0.189	0.156	0.156	0.181	0.181
Classification power	93.454	93.454	93.739	93.739	94.012	94.012
AUROC	0.796	0.796	0.774	0.774	0.798	0.798
BIC	1886.153	1886.153	1605.683	1605.683	1394.186	1394.186

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.24: Predicting growth surges, robustness checks, alternative set of growth surges, post-7 years of growth surges per capita income growth exceeds 2.5 percentage points

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.015	0.015	-0.003	-0.003	0.039**	0.039**
	(0.012)	(0.012)	(0.011)	(0.011)	(0.019)	(0.019)
External factors and endowments index, average [T-5,T]	0.232**	0.545***	0.269**	0.353**	0.256**	0.658***
	(0.112)	(0.123)	(0.108)	(0.141)	(0.105)	(0.182)
Institutions index, average [T-5,T]	0.124**	0.081	0.115**	0.103*	0.105**	-0.056
	(0.058)	(0.054)	(0.054)	(0.053)	(0.052)	(0.099)
Macroeconomic stability index, average [T-5,T]	0.365***	0.522***	0.341***	0.461***	0.315***	0.618***
	(0.086)	(0.100)	(0.081)	(0.116)	(0.079)	(0.152)
Structural reforms index, average [T-5,T]	0.119	0.245***	0.106	0.249**	0.102	0.271*
	(0.100)	(0.093)	(0.094)	(0.099)	(0.090)	(0.151)
Trade diversification and quality index, average [T-5,T]	0.249***	0.050	0.208***	0.080	0.229***	-0.091
	(0.066)	(0.077)	(0.063)	(0.085)	(0.060)	(0.118)
Investments, labor and productivity index, average [T-5,T]	0.135*	0.303***	0.134**	0.062	0.123*	0.488***
	(0.069)	(0.081)	(0.066)	(0.092)	(0.064)	(0.124)
Africa (Base level)						
Asia and Pacific	0.118***	0.124***	0.100***	0.094***	0.148***	0.180***
	(0.020)	(0.022)	(0.021)	(0.022)	(0.022)	(0.031)
Europe	0.055***	0.060***	0.055***	0.052***	0.082***	0.105***
	(0.018)	(0.019)	(0.020)	(0.018)	(0.022)	(0.029)
Middle East and Central Asia	0.030**	0.033*	0.030*	0.029*	0.011	0.015
	(0.015)	(0.017)	(0.016)	(0.016)	(0.012)	(0.017)
Americas and Caribbean	0.002	0.002	0.007	0.007	0.006	0.009
	(0.011)	(0.013)	(0.013)	(0.012)	(0.011)	(0.016)
1980-1989 (Base level)						
1990-1999	-0.000	-0.000	-0.002	-0.002	0.006	0.008
	(0.011)	(0.012)	(0.011)	(0.010)	(0.012)	(0.016)
2000-2010	0.089***	0.094***	0.066***	0.062***	0.072***	0.090***
Advanced Economies (Base level)	(0.016)	(0.018)	(0.017)	(0.017)	(0.017)	(0.021)
Low-Income Developing Countries	0.027	0.030	0.018	0.017	0.038**	0.051**
	(0.018)	(0.019)	(0.019)	(0.017)	(0.018)	(0.021)
Emerging Economies	0.088***	0.094***	0.086***	0.081***	0.117***	0.147***
	(0.016)	(0.016)	(0.016)	(0.014)	(0.016)	(0.025)
Observations	3682	3682	3068	3068	2828	2828
# of GSs	141	141	109	109	102	102
Unconditional probability	0.038	0.038	0.038	0.038	0.038	0.038
Mean(duration of GSs)	11.362	11.362	11.362	11.362	11.362	11.362
Mean(Avg. growth during GSs)	5.664	5.664	5.664	5.664	5.664	5.664
# of Countries	169	169	168	168	165	165
Pseudo R2	0.170	0.170	0.145	0.145	0.173	0.173
Classification power	89.272	89.272	89.668	89.668	90.559	90.559
AUROC	0.775	0.775	0.757	0.757	0.770	0.770
BIC	2362.890	2362.890	1963.763	1963.763	1788.261	1788.261

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.25: Predicting growth surges, robustness checks, alternative set of growth surges, post-7 years of growth surges per capita income growth exceeds 4.5 percentage points

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
IMF-supported programs dummy (include 2 years after)	0.012	0.012	0.004	0.004	0.019	0.019
	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)
External factors and endowments index, average [T-5,T]	0.331***	0.568***	0.349***	0.466***	0.306***	0.581***
	(0.087)	(0.100)	(0.086)	(0.120)	(0.082)	(0.146)
Institutions index, average [T-5,T]	0.061	0.016	0.052	0.041	0.041	-0.061
	(0.042)	(0.039)	(0.040)	(0.040)	(0.036)	(0.069)
Macroeconomic stability index, average [T-5,T]	0.217***	0.341***	0.208***	0.340***	0.173***	0.292***
	(0.064)	(0.074)	(0.061)	(0.087)	(0.057)	(0.107)
Structural reforms index, average [T-5,T]	0.005	0.263***	0.005	0.178**	0.002	0.315***
	(0.085)	(0.068)	(0.082)	(0.073)	(0.075)	(0.112)
Trade diversification and quality index, average [T-5,T]	0.035	0.054	0.021	0.042	0.032	-0.016
	(0.046)	(0.054)	(0.045)	(0.061)	(0.040)	(0.081)
Investments, labor and productivity index, average [T-5,T]	0.124***	0.198***	0.123***	0.133**	0.103**	0.247***
	(0.045)	(0.055)	(0.043)	(0.066)	(0.041)	(0.082)
Africa (Base level)						
Asia and Pacific	0.072***	0.076***	0.039***	0.038**	0.089***	0.105***
	(0.015)	(0.016)	(0.015)	(0.015)	(0.016)	(0.023)
Europe	0.011	0.013	-0.002	-0.002	0.034***	0.044***
	(0.010)	(0.011)	(0.012)	(0.012)	(0.013)	(0.017)
Middle East and Central Asia	0.039***	0.043***	0.027*	0.027*	0.028***	0.036**
	(0.013)	(0.014)	(0.014)	(0.014)	(0.010)	(0.014)
Americas and Caribbean	0.003	0.004	-0.004	-0.004	0.005	0.007
	(0.008)	(0.009)	(0.011)	(0.011)	(0.007)	(0.010)
1980-1989 (Base level)						
1990-1999	0.006	0.007	0.008	0.008	0.011	0.014
	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.011)
2000-2010	0.057***	0.061***	0.045***	0.044***	0.046***	0.056***
Advanced Economies (Base level)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.014)
Low-Income Developing Countries	0.006	0.007	-0.004	-0.005	0.024**	0.032**
	(0.012)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)
Emerging Economies	0.055***	0.058***	0.048***	0.047***	0.080***	0.096***
	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)	(0.019)
Observations	4031	4031	3351	3351	3074	3074
# of GSs	104	104	81	81	73	73
Unconditional probability	0.026	0.026	0.026	0.026	0.026	0.026
Mean(duration of GSs)	10.942	10.942	10.942	10.942	10.942	10.942
Mean(Avg. growth during GSs)	6.557	6.557	6.557	6.557	6.557	6.557
# of Countries	169	169	168	168	165	165
Pseudo R2	0.218	0.218	0.177	0.177	0.221	0.221
Classification power	93.004	93.004	93.405	93.405	93.656	93.656
AUROC	0.815	0.815	0.789	0.789	0.816	0.816
BIC	1903.412	1903.412	1621.958	1621.958	1418.953	1418.953

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

D.3.4 Sensitivity

Table D.26: Predicting growth surges, sensitivity by decades

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
Panel A: 1980-1989						
IMF-supported programs dummy (include 2 years after)	0.021**	0.021**	0.006	0.006	-	-
	(0.010)	(0.010)	(0.010)	(0.010)	-	-
External factors and endowments index, average [T-5,T]	0.133	0.406**	0.177	0.371**	-	-
	(0.149)	(0.204)	(0.155)	(0.187)	-	-
Institutions index, average [T-5,T]	0.116*	0.131*	0.111*	0.139**	-	-
	(0.063)	(0.074)	(0.063)	(0.066)	-	-
Macroeconomic stability index, average [T-5,T]	0.418***	0.659***	0.455***	0.540***	-	-
	(0.128)	(0.163)	(0.130)	(0.149)	-	-
Structural reforms index, average [T-5,T]	-0.190	-0.048	-0.204	-0.030	-	-
	(0.137)	(0.171)	(0.141)	(0.155)	-	-
Trade diversification and quality index, average [T-5,T]	0.002	-0.126	-0.006	-0.063	-	-
	(0.067)	(0.100)	(0.070)	(0.092)	-	-
Investments, labor and productivity index, average [T-5,T]	0.004	0.085	0.036	0.039	-	-
	(0.086)	(0.112)	(0.089)	(0.102)	-	-
# of GSs	15	12	15	12	-	-
Panel B: 1990-1999						
IMF-supported programs dummy (include 2 years after)	0.012	0.012	0.000	0.000	0.024	0.024
	(0.010)	(0.010)	(0.010)	(0.010)	(0.017)	(0.017)
External factors and endowments index, average [T-5,T]	-0.366***	-0.189	-0.302**	-0.123	-0.391***	-0.319
	(0.137)	(0.160)	(0.146)	(0.163)	(0.149)	(0.227)
Institutions index, average [T-5,T]	-0.086	-0.112	-0.050	-0.028	-0.058	-0.259**
	(0.058)	(0.069)	(0.058)	(0.062)	(0.059)	(0.129)
Macroeconomic stability index, average [T-5,T]	0.269***	0.451***	0.287***	0.346***	0.248***	0.586***
	(0.087)	(0.106)	(0.091)	(0.110)	(0.091)	(0.170)
Structural reforms index, average [T-5,T]	0.042	0.231**	0.045	0.219**	0.002	0.249
	(0.100)	(0.093)	(0.102)	(0.093)	(0.106)	(0.158)
Trade diversification and quality index, average [T-5,T]	0.217***	0.126	0.169**	0.114	0.232***	0.012
	(0.074)	(0.084)	(0.077)	(0.093)	(0.078)	(0.113)
Investments, labor and productivity index, average [T-5,T]	0.034	0.117	0.012	0.014	0.026	0.275**
	(0.074)	(0.089)	(0.078)	(0.091)	(0.076)	(0.131)
# of GSs	21	19	21	10	21	10
Panel C: 2000-2010						
IMF-supported programs dummy (include 2 years after)	0.036**	0.036**	0.013	0.013	0.037	0.037
	(0.016)	(0.016)	(0.015)	(0.015)	(0.022)	(0.022)
External factors and endowments index, average [T-5,T]	0.768***	1.217***	0.674***	0.960***	0.855***	1.255***
	(0.151)	(0.164)	(0.144)	(0.207)	(0.148)	(0.220)
Institutions index, average [T-5,T]	0.328***	0.336***	0.250**	0.287**	0.488***	0.291**
	(0.111)	(0.102)	(0.109)	(0.115)	(0.120)	(0.136)
Macroeconomic stability index, average [T-5,T]	0.365***	0.622***	0.297**	0.396**	0.242*	0.652***
	(0.131)	(0.155)	(0.129)	(0.184)	(0.130)	(0.187)
Structural reforms index, average [T-5,T]	0.441***	0.775***	0.425***	0.707***	0.338**	0.740***
	(0.162)	(0.174)	(0.159)	(0.198)	(0.160)	(0.222)
Trade diversification and quality index, average [T-5,T]	0.309**	0.132	0.322**	0.235	0.330**	-0.046
	(0.135)	(0.136)	(0.144)	(0.164)	(0.140)	(0.163)
Investments, labor and productivity index, average [T-5,T]	0.195*	0.337**	0.205*	0.208	0.067	0.424***
	(0.112)	(0.132)	(0.109)	(0.154)	(0.115)	(0.162)
# of GSs	22	43	22	21	22	25
Observations	3763	3763	3136	3136	2875	2875
# of Countries	169	169	168	168	165	165
Pseudo R2	0.220	0.220	0.188	0.188	0.232	0.232
Classification power	90.539	90.539	91.231	91.231	91.652	91.652
AUROC	0.820	0.820	0.800	0.800	0.821	0.821
BIC	2259.240	2259.240	1901.365	1901.365	1691.199	1691.199
Decades dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regions dummies	Yes	Yes	Yes	Yes	Yes	Yes
Levels of development dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.27: Predicting growth surges, sensitivity by regions

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
Panel A: Africa						
IMF-supported programs dummy (include 2 years after)	0.020**	0.020**	0.008	0.008	0.029***	0.029***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.011)	(0.011)
External factors and endowments index, average [T-5,T]	0.316**	0.656***	0.338**	0.584***	0.356***	0.620***
	(0.129)	(0.149)	(0.172)	(0.217)	(0.119)	(0.160)
Institutions index, average [T-5,T]	0.011	0.006	0.018	0.052	0.038	-0.027
	(0.062)	(0.061)	(0.082)	(0.091)	(0.052)	(0.064)
Macroeconomic stability index, average [T-5,T]	0.293***	0.410***	0.199	0.239	0.134*	0.371***
	(0.098)	(0.101)	(0.123)	(0.147)	(0.081)	(0.106)
Structural reforms index, average [T-5,T]	0.208	0.330**	0.252	0.332*	0.078	0.254*
	(0.130)	(0.129)	(0.189)	(0.198)	(0.108)	(0.132)
Trade diversification and quality index, average [T-5,T]	0.008	-0.029	0.005	-0.034	-0.044	-0.069
	(0.080)	(0.083)	(0.109)	(0.123)	(0.066)	(0.086)
Investments, labor and productivity index, average [T-5,T]	0.183**	0.271***	0.267***	0.288**	0.098	0.318***
	(0.079)	(0.091)	(0.101)	(0.137)	(0.062)	(0.098)
# of GSs	6	20	6	5	6	15
Panel B: Asia and Pacific						
IMF-supported programs dummy (include 2 years after)	0.020	0.020	-0.005	-0.005	0.057*	0.057*
	(0.021)	(0.021)	(0.020)	(0.020)	(0.034)	(0.034)
External factors and endowments index, average [T-5,T]	-0.343	0.297	-0.375	0.148	-0.114	0.095
	(0.319)	(0.330)	(0.318)	(0.317)	(0.379)	(0.469)
Institutions index, average [T-5,T]	0.056	0.044	0.036	0.105	-0.022	-0.250
	(0.157)	(0.156)	(0.151)	(0.140)	(0.191)	(0.253)
Macroeconomic stability index, average [T-5,T]	0.194	0.343	0.289	0.342	0.237	0.697*
	(0.283)	(0.308)	(0.278)	(0.295)	(0.333)	(0.410)
Structural reforms index, average [T-5,T]	0.829***	1.053***	0.564*	0.683**	1.717***	2.142***
	(0.297)	(0.305)	(0.291)	(0.305)	(0.319)	(0.370)
Trade diversification and quality index, average [T-5,T]	0.277	0.196	0.237	0.139	0.458**	0.466
	(0.170)	(0.205)	(0.162)	(0.191)	(0.184)	(0.296)
Investments, labor and productivity index, average [T-5,T]	0.178	0.308	0.189	0.203	0.037	0.495
	(0.197)	(0.238)	(0.185)	(0.234)	(0.220)	(0.309)
# of GSs	16	12	16	5	16	8
Panel C: Europe						
IMF-supported programs dummy (include 2 years after)	0.021	0.021	0.004	0.004	0.052*	0.052*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.028)	(0.028)
External factors and endowments index, average [T-5,T]	0.146	0.587***	0.259	0.596***	0.004	0.185
	(0.178)	(0.203)	(0.176)	(0.210)	(0.264)	(0.371)
Institutions index, average [T-5,T]	0.077	0.075	0.048	0.095	0.268	0.107
	(0.110)	(0.118)	(0.103)	(0.100)	(0.174)	(0.260)
Macroeconomic stability index, average [T-5,T]	0.831***	0.997***	0.797***	0.827***	1.283***	1.814***
	(0.193)	(0.209)	(0.187)	(0.196)	(0.274)	(0.355)
Structural reforms index, average [T-5,T]	0.118	0.253*	0.107	0.209	-0.094	0.206
	(0.149)	(0.154)	(0.143)	(0.141)	(0.225)	(0.348)
Trade diversification and quality index, average [T-5,T]	0.203	0.161	0.166	0.105	0.053	0.053
	(0.142)	(0.166)	(0.135)	(0.150)	(0.205)	(0.301)
Investments, labor and productivity index, average [T-5,T]	0.076	0.163	0.047	0.063	0.058	0.451
	(0.125)	(0.149)	(0.123)	(0.143)	(0.181)	(0.284)
# of GSs	17	17	17	13	17	6

Continued on next page

Table D.27 – continued from previous page

(1)	(2)	(3)	(4)	(5)	(6)	
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
Panel D: Middle East and Central Asia						
IMF-supported programs dummy (include 2 years after)	0.018	0.018	0.002	0.002	0.031*	0.031*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.018)	(0.018)
External factors and endowments index, average [T-5,T]	0.122	0.562**	0.090	0.434*	0.226	0.403*
	(0.188)	(0.226)	(0.194)	(0.237)	(0.152)	(0.236)
Institutions index, average [T-5,T]	0.241*	0.253*	0.253**	0.294**	0.305**	0.272
	(0.126)	(0.136)	(0.121)	(0.121)	(0.130)	(0.184)
Macroeconomic stability index, average [T-5,T]	0.540***	0.681***	0.502***	0.535***	0.430***	0.791***
	(0.168)	(0.203)	(0.163)	(0.190)	(0.150)	(0.260)
Structural reforms index, average [T-5,T]	0.211	0.355	0.298	0.395	0.044	0.250
	(0.217)	(0.243)	(0.233)	(0.247)	(0.168)	(0.251)
Trade diversification and quality index, average [T-5,T]	0.342***	0.313**	0.318***	0.251*	0.125	0.156
	(0.120)	(0.151)	(0.121)	(0.149)	(0.099)	(0.179)
Investments, labor and productivity index, average [T-5,T]	-0.028	0.050	-0.097	-0.076	0.005	0.248
	(0.149)	(0.183)	(0.150)	(0.171)	(0.122)	(0.210)
# of GSs	11	11	11	8	11	4
Panel E: Americas and Caribbean						
IMF-supported programs dummy (include 2 years after)	0.017**	0.017**	0.007	0.007	0.023*	0.023*
	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)
External factors and endowments index, average [T-5,T]	0.452***	0.818***	0.482***	0.730***	0.200	0.389*
	(0.156)	(0.190)	(0.157)	(0.183)	(0.128)	(0.231)
Institutions index, average [T-5,T]	0.100*	0.114*	0.075	0.110**	-0.068	-0.186
	(0.057)	(0.064)	(0.052)	(0.054)	(0.059)	(0.127)
Macroeconomic stability index, average [T-5,T]	0.135	0.222**	0.123	0.161*	0.078	0.280*
	(0.083)	(0.106)	(0.080)	(0.094)	(0.063)	(0.161)
Structural reforms index, average [T-5,T]	-0.131	-0.079	-0.054	0.008	-0.059	0.035
	(0.122)	(0.135)	(0.115)	(0.119)	(0.111)	(0.189)
Trade diversification and quality index, average [T-5,T]	0.018	-0.016	-0.057	-0.097	0.049	0.073
	(0.076)	(0.089)	(0.077)	(0.084)	(0.063)	(0.120)
Investments, labor and productivity index, average [T-5,T]	0.041	0.101	-0.001	0.010	0.067	0.264*
	(0.089)	(0.097)	(0.093)	(0.091)	(0.076)	(0.139)
# of GSs	8	14	8	12	8	2
Observations	3763	3763	3136	3136	2875	2875
# of Countries	169	169	168	168	165	165
Pseudo R2	0.211	0.211	0.191	0.191	0.227	0.227
Classification power	90.114	90.114	90.976	90.976	91.304	91.304
AUROC	0.81	0.81	0.799	0.799	0.813	0.813
BIC	2379.062	2379.062	1991.916	1991.916	1796.554	1796.554
Decades dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regions dummies	Yes	Yes	Yes	Yes	Yes	Yes
Levels of development dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

Table D.28: Predicting growth surges, sensitivity by levels of development

	(1)	(2)	(3)	(4)	(5)	(6)
	All programs		**GRA programs**		**PRGT programs**	
	No IMF	**IMF**	**No IMF**	**GRA**	**No IMF**	**PRGT**
Panel A: Low-income countries						
IMF-supported programs dummy (include 2 years after)	0.024**	0.024**	0.011	0.011	0.029**	0.029**
	(0.009)	(0.009)	(0.011)	(0.011)	(0.014)	(0.014)
External factors and endowments index, average [T-5,T]	0.303**	0.609***	0.098	0.284	0.452**	0.622***
	(0.146)	(0.132)	(0.188)	(0.222)	(0.190)	(0.150)
Institutions index, average [T-5,T]	-0.004	-0.004	-0.068	-0.060	0.033	-0.056
	(0.077)	(0.071)	(0.110)	(0.119)	(0.093)	(0.083)
Macroeconomic stability index, average [T-5,T]	0.345***	0.521***	0.419***	0.564***	0.352**	0.509***
	(0.124)	(0.113)	(0.151)	(0.181)	(0.158)	(0.128)
Structural reforms index, average [T-5,T]	0.267*	0.361***	0.134	0.171	0.152	0.367***
	(0.143)	(0.129)	(0.198)	(0.218)	(0.178)	(0.140)
Trade diversification and quality index, average [T-5,T]	0.003	-0.041	0.018	-0.069	-0.105	-0.036
	(0.094)	(0.088)	(0.128)	(0.143)	(0.118)	(0.099)
Investments, labor and productivity index, average [T-5,T]	0.129	0.257***	0.235*	0.298*	0.079	0.306***
	(0.100)	(0.095)	(0.136)	(0.164)	(0.114)	(0.108)
# of GSs	7	27	7	3	7	25
Panel B: Emerging markets						
IMF-supported programs dummy (include 2 years after)	0.030*	0.030*	0.011	0.011	0.052	0.052
	(0.017)	(0.017)	(0.018)	(0.018)	(0.032)	(0.032)
External factors and endowments index, average [T-5,T]	0.408**	0.872***	0.533***	0.860***	0.495**	0.638
	(0.176)	(0.215)	(0.180)	(0.222)	(0.195)	(0.443)
Institutions index, average [T-5,T]	0.099	0.112	0.105	0.130	0.065	-0.107
	(0.091)	(0.094)	(0.090)	(0.089)	(0.098)	(0.233)
Macroeconomic stability index, average [T-5,T]	0.356***	0.576***	0.319**	0.519***	0.343**	0.493
	(0.128)	(0.170)	(0.128)	(0.171)	(0.140)	(0.376)
Structural reforms index, average [T-5,T]	0.229	0.322*	0.231	0.281*	0.409**	0.793**
	(0.168)	(0.169)	(0.168)	(0.171)	(0.193)	(0.388)
Trade diversification and quality index, average [T-5,T]	0.252**	0.204	0.209**	0.058	0.345***	0.595*
	(0.105)	(0.138)	(0.106)	(0.138)	(0.115)	(0.319)
Investments, labor and productivity index, average [T-5,T]	0.119	0.306**	0.099	0.177	0.124	0.523*
	(0.119)	(0.145)	(0.122)	(0.148)	(0.130)	(0.292)
# of GSs	36	43	36	36	36	10
Panel C: Advanced economies						
IMF-supported programs dummy (include 2 years after)	0.021*	0.021*	0.009	0.009	-	-
	(0.012)	(0.012)	(0.011)	(0.011)	-	-
External factors and endowments index, average [T-5,T]	-0.110	0.132	-0.047	0.131	-	-
	(0.171)	(0.239)	(0.159)	(0.215)	-	-
Institutions index, average [T-5,T]	0.236**	0.264*	0.211**	0.231*	-	-
	(0.114)	(0.141)	(0.102)	(0.122)	-	-
Macroeconomic stability index, average [T-5,T]	0.931***	1.143***	0.842***	0.979***	-	-
	(0.191)	(0.244)	(0.179)	(0.239)	-	-
Structural reforms index, average [T-5,T]	0.062	0.110	0.072	0.100	-	-
	(0.133)	(0.165)	(0.122)	(0.144)	-	-
Trade diversification and quality index, average [T-5,T]	0.348***	0.341**	0.303***	0.222	-	-
	(0.118)	(0.158)	(0.110)	(0.140)	-	-
Investments, labor and productivity index, average [T-5,T]	0.050	0.161	0.052	0.097	-	-
	(0.114)	(0.163)	(0.104)	(0.147)	-	-
# of GSs	15	4	15	4	-	-
Observations	3763	3763	3136	3136	2875	2875
# of Countries	169	169	168	168	165	165
Pseudo R2	0.204	0.204	0.18	0.18	0.21	0.21
Classification power	90.539	90.539	91.04	91.04	91.409	91.409
AUROC	0.806	0.806	0.792	0.792	0.807	0.807
BIC	2298.035	2298.035	1917.444	1917.444	1731.014	1731.014
Decades dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regions dummies	Yes	Yes	Yes	Yes	Yes	Yes
Levels of development dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Logit estimations. Robust standards errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. The table shows the average marginal effect of all of the six broad determinants of growth surges with and with IMF-supported programs.

CHAPTER 6

GENERAL CONCLUSION

We have come to the end of a journey that has taken us through the episodes of financial crises, normal recessions, and growth surges, that are widespread phenomena in different countries, regardless of their geographical location and levels of development. We have learned that what makes financial crises and recessions spectacular events is the direct connection they have with the real economy, in particular by inducing protracted and long-lasting disruption of international trade and economic growth. From a micro-perspective, this thesis states that financial crises while exerting a large contraction of a variety of traded goods and protracted loss of economic growth is not only a nightmare for policymakers and political leaders but more importantly a serious thread at the doors of everyone, even of small-farmers in small regions of the world. Besides, rather than having only a dark-side, financial crises unveil the non-performing macroeconomic policies, political, economic, and social dysfunctions of the economies, which allows considering serious and well-targeted macroeconomic and structural reforms to increase the country's resilience to crises, but more importantly to embark on a tour of sustained growth. Indeed, the history as shown that igniting growth surges is not easy, but not impossible. Countries when addressing the economic bottlenecks to growth, particularly in the aftermath of financial crises can significantly jump-start a sustained period of economic growth, which can have quantitatively huge implications for national income, poverty, and more broadly, for population well-being.[1]

[1] Pritchett et al. (2016) estimate that the top 20 acceleration in the last six decades had a net present value of 30 trillion dollars: twice the size of US GDP, and Chen and Ravallion (2010) and Radelet (2016) show that growth surges in China and India, and also in Indonesia, Pakistan, and Vietnam contributed to the reduction in global poverty since 1981.

This dissertation comes to a period where, following the Covid-19 pandemic crisis, necessary containment measures put a drag on businesses and jobs, uncertainty is rising and market sentiment is freaking, capital flows are pulling back, commodity prices are decreasing, countries are engaging in large recourse plans amounting to about $8 trillion (as estimated by the IMF), despite a lower fiscal space than the pre-GFC crisis, and monetary policies are constrained by the zero lower bound interest rate. Overall, we have come to a time where the crisis looming on the horizon is closer than what we think. Indeed, this “time is different" as said by Reinhart and Rogoff (2009), not the ironical “this time is different" from the Great moderation; this is a serious threat to the global economy. And, just as the health crisis hits vulnerable people hardest, the unfolding economic crisis that it has generated is expected to hit vulnerable countries hardest.

Yet, the future is unknowable; indeed forecasting crises has claimed only modest success to date. However, the “Lucas critique" is not always verified, by training and temperament, and with historical analyses, there is a tremendous scope to think ahead. The analyses of this dissertation allow us to think ahead of the possible consequences of the crisis that is materializing. But more importantly, to draw some key takeaways from history.

Chapter 2 suggests that, if not appropriate policies are taken, the “Great Lockdown" crisis may be associated with a far larger collapse of international trade never recorded, in particular of the trade in manufacturing goods and services compared to the 2008-09 GFC crisis. This may happen because this crisis is associated with both a demand-side and supply-side shock while the GFC crisis was only a demand-side shock. More specifically, this chapter studies the response of different types of trade (i.e. agricultural, mining, and manufactured goods, and services) following various types of financial crises (i.e. debt, banking, and currency crises) in 41 emerging countries over the period 1980-2018. It uses a combination of impact assessment and local projections to capture a causal dynamic effect running from financial crises to the trade activity. It reveals that the collapse of total trade in the aftermath of financial crises is long-lasting and mainly driven by the fall of manufacturing trade. However, the impact of financial crises on the other types of traded goods and especially on services is far from being negligible. Trade in both mining goods and services also declines following several types of financial crises, while trade in agricultural goods seems to benefit from a possible substitution effect particularly following debt crises. When looking at the costs of combined crises, it shows that they exert a significant and higher decline of trade, compared to crises occurring without any other crisis in the years around. Also, financial crises exert an adverse effect on total and sectoral trade through compositional and structural, demand-side, and supply-side channels. In detail, about the compositional and structural channel, this chapter sustains that financial crises may act as an impediment of structural transformation as they hurt more manufacturing exports in countries where the share of manufacturing exports is relatively lower. Also, by diversifying

their exports and partners, countries will increase their resilience to financial crises. About the demand-side channel, it shows that financial crises associated with a lower demand of goods and services from trading partners will have more adverse trade costs; therefore they can generate an unprecedented collapse of international trade when they are generalized within regions and at the global level as witnessed in the post-GFC period, which is of particular interest in this time of Covid-19 pandemic. Finally, it supports the idea that the supply-side channel is critical to understand the way financial crises shape the dynamics of international trade. When associated with a deterioration of the domestic financial development and external financial conditions, and sudden stops, financial crises will exert a significant and detrimental collapse on international trade.

Chapter 3 would predict that (i) some countries while pursuing a bailout of their economy to overcome the adverse consequences of the Covid-19 crisis may rapidly trade their stabilization policies out to address debt sustainability and external viability issues, at the worse possible time,[2] and (ii) while fiscal space is constrained and monetary policy is accommodative but also constrained in many countries around the world, e.g. due to higher debt, permanent deficit resulting from the GFC and nominal interest rates close to zero, countries may suffer a prolonged collapse of economic growth than previously witnessed, again if appropriate and coordinated policies not implemented. More specifically, this chapter studies how fiscal policy space shapes the dynamics of output losses in the aftermath of financial crises and normal recessions in a sample of 35 developing and 56 emerging countries over the period 1985-2017. It builds a new index of fiscal space and applies a combination of local projections models and impact assessment to identify a causal effect. It reveals that the availability of fiscal space in the aftermath of financial crises and normal recessions generates a mixed fiscal environment with different output losses of shocks. In countries with enough fiscal space, governments can enact credible fiscal policy expansion by increasing their deficit and using their fiscal space to alleviate the costs of financial crises and normal recessions. In such a situation, private consumption and investment, as well as net capital inflows, increase, which favors a rapid recovery. In countries with limited fiscal space, the story is different and painful; governments immediately trade output stabilization goals out to address the debt sustainability issues while implementing fiscal consolidations, which deepens the recessionary forces. Besides, in these countries, private consumption and investment, as well as net capital inflows, are depressed, and recovery, if any, is a distant and uncertain prospect. Just like in physics, i.e., momentum naturally winds down rather than up unless outside energy is applied, countries that neglect the right disciplines will

[2] As shown, e.g. by Auerbach and Gorodnichenko (2012, 2013); Fazzari et al. (2015), fiscal multipliers are higher in downturns. Besides, as shown, e.g., by DeLong and Summers (2012); Jordà and Taylor (2016) and Fatás and Summers (2018), fiscal consolidations may be self-defeating in downturns as they depress growth and investment further, then failing to reduce and stabilize debt levels.

not only fall but will slope there unless they have fiscal space that allows them to boost their economy in downturns. This chapter suggests that governments and policymakers need to be more than proactive to learn lessons from the past, fix the roof while the sun is shining, build fiscal buffers, reduce debt and deficit, increase tax base and revenues, and lock the drinks cabinet when the economy is starting to improve substantially to be able to appropriately respond to the next crisis looming on the horizon.

Chapter 4 gives hope in this difficult time; it shows some successful stories of economic growth and discusses what drives them. It identifies 132 episodes of growth surges in 117 countries over the period 1980-2010. It applies non-parametric and binary outcomes model and finds that many growth determinants have a significant and positive effect on the probability of initiating growth. Specifically, improvements in macroeconomic stability and external factors and endowments favor a higher probability of growth surge. They are followed by structural reforms, investments, labor and productivity, trade diversification and quality, and lastly by institutions. When looking at the two-way interactions of growth determinants, it shows that countries can maximize the likelihood of igniting growth surges if they jointly achieve significant improvements in macroeconomic stability and external conditions and endowments, on one hand, and other determinants, on the other hand. Besides, it reveals that significant changes in macroeconomic stability, and to some extent, external factors and endowments may be considered as dominant strategies to ignite a growth surge, as no improvements in these determinants, generally constraint the other determinants to have a smaller effect on growth surges. Therefore, macroeconomic policies and structural reforms work. Unfortunately, we have witnessed a significant decrease in the pace of structural reforms and an increase in deregulations leading to excessive build-up of risks in countries since the 2000s. With the recommendation of chapter 3 in mind, fix the roof when the sun is shining,[3] countries have to engage in large reforms programs following the Covid-19 crisis to strengthen their resilience to shocks and jump-start sustained growth and reconnect with economic wealth.

Chapter 5 reveals that the countries' collaboration and joint work with multilateral institutions like the IMF could deliver sizable medium- to long-term output gains. More specifically, this chapter by focusing on the sample and methodology of chapter 4 engages and contributes to the debate on the effectiveness of the IMF in promoting growth. It concludes that IMF-supported programs (more PRGT than GRA programs) have significantly and positively contributed to boosting medium- to long-term growth in countries, particularly in the 2000s than previous

[3] Also, the IMF (2019) shows that "reforms take several years to deliver, and some of them [...] may entail greater short-term costs when carried out in bad times; these are best implemented under favorable economic conditions and early in authorities' electoral mandate. Reform gains also tend to be larger when governance and access to credit—two binding constraints on growth—are strong, and where labor market informality is higher—because reforms help reduce it.

decades, and in all countries around the world, regardless of their geographical location and levels of development. It has done so by pursuing macroeconomic stability and designing structural reforms, but also creating the pre-conditions to boost investments, labor, and productivity and benefit more from favorable external and endowments conditions. In this difficult time, in the words of the IMF's Managing Director, Kristalina Georgieva, "the IMF has secured $1 trillion in lending capacity, serving our members and responding fast to an unprecedented number of emergency financing requests—from over 90 countries so far". This is indeed a turning point for the IMF policy recommendations and its support to countries in times of hardship, and a great challenge to reinvent itself, learn from its past mistakes, and take the opportunity to contribute to economic prosperities in countries while pursuing its role of "financial firefighter".

This dissertation provides opportunities for interesting research in various ways. It is not the end of the journey, but the beginning of an avenue for future research in macroeconomic and general topics that have demonstrated to be quite valuable to improve the well-being of people around the world.

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Résumé extensif en français

CHAPTER 0

RÉSUMÉ EXTENSIF EN FRANÇAIS

0.1 Argentine, 2001 et Inde, 1991, deux histoires différentes

L'Argentine en 2001 et L'Inde en 1991, deux pays, deux histoires différentes qui sont assez attrayantes pour cette thèse. L'un illustre l'histoire de plusieurs pays qui ont subi les conséquences néfastes des crises, l'autre illustre les réussites des poussées de croissance économique soutenue et leurs avantages dans de nombreux pays.

0.1.1 La crise de l'Argentine en 2001

À partir de 2001, l'Argentine a connu l'une des pires crises économiques de l'histoire. L'Argentine a suspendu ses paiements d'obligations d'une valeur de 81 milliards de dollars en décembre 2001, les deux tiers du PIB du pays ont été perdus en quatre ans, des émeutes ont éclaté, les populations clamaient « tous doivent partir! » et « nous mourons de faim! », le pays a eu cinq présidents en deux semaines, l'inflation est repartie à la hausse, le système bancaire a été paralysé, le chômage a dépassé les 20%, des millions de vies ont été appauvries et la caisse d'émission ou office de stabilisation des changes s'est effondrée. L'année précédant la crise, l'Argentine a été saluée et citée comme un modèle de réforme économique réussie qui a résisté à la tempête de la crise de la Tequila. Comme il était courant en Amérique latine, la crise de l'Argentine de 2001 n'était pas due à d'importants déficits financés par le seigneuriage ou à l'hyperinflation, mais à une accumulation excessive de la dette extérieure et à un déficit persistant du secteur public, couplée à des activités hors budget élevées (notamment des entreprises étatiques avec une contrainte budgétaire souple). En effet, la dette publique a augmenté à un

rythme plus rapide, de 18 points de pourcentage du PIB au cours des cinq années précédant le défaut de paiement de 2001, alimentée par des déficits publics plus élevés sur la même période. Avec l'effondrement de l'économie, la dette publique a atteint 152,2% du PIB et le déficit public a chuté à 25% du PIB en 2002. L'Argentine a demandé un appui du FMI à travers un program et un financement de 14 milliards de dollars et un programme de soutien international de 40 milliards de dollars. Elle a également renégocié sa dette avec ses créanciers en 2005.[1]

0.1.2 Les poussées de croissance de l'Inde

A la suite des grandes réformes économiques des années 90, la croissance économique à long terme de l'Inde s'est régulièrement accélérée de 4,4% par an au cours des années 90, puis de 6,5% par an entre 2000 et 2017. Son revenu par habitant en termes de parité de pouvoir d'achat a été multiplié par 4,9 sur cette période.[2] Dans le même temps, la croissance de l'Inde est devenue plus stable et plus résistante aux chocs. Cela a contribué à une réduction significative de la pauvreté qui est passée d'environ 45 à 22% entre 1991 et 2012. Qu'est-ce qui explique cette poussée de croissance en Inde ? Le succès de l'Inde reposait sur d'importantes réformes économiques en faveur de l'ouverture et de la libéralisation. Cela a marqué un tournant pour l'Inde et son peuple. À la suite de la crise macroéconomique de 1991-1992, dans la même veine des réformes de libéralisation des années 80,[3] l'Inde a entrepris une vague de réformes dans deux domaines clés : l'industrie et le commerce extérieur. Ces réformes comprenaient la déréglementation

[1] Il s'agit en effet d'une illustration de diverses crises financières qui ont constamment animé la vie des pays du monde entier depuis la Grande dépression de 1932, jusqu'à ce jour. Ces crises comprennent, entre autres, la crise du canal de Suez des années 1950, les chocs pétroliers des années 1970, la crises internationale de la dette des années 1980 ou la «décennie perdue», notamment en Amérique latine, en Europe de l'Est et en Afrique, la crise de la Tequila commencée au Mexique au milieu des années 90, les crises financière asiatique et russe de la seconde moitié des années 90, la crise financière mondiale de 2008-2009, la crise de la dette européenne et la crise de la pandémie de Covid-19.

[2] Rappelons que le taux de croissance annuel n'était que de 0,7% par an sur la période 1960-1990.

[3] Avec l'aide des institutions multilatérales et un fort engagement du gouvernement indien, l'Inde a discrètement entrepris une vague de libéralisations dans les années 80, connue sous le nom de "liberalization by stealth". Premièrement, l'Inde a poursuivi l'assouplissement des contrôles à l'importation par le biais de l'Open General Licensing (OGL), principalement accompagné d'une réduction des droits de douane. Ayant disparu, l'Inde a réintroduit en 1976 la liste OGL avec 79 biens d'équipement. La liste a été étendue à environ 1329 biens d'équipement et 949 biens intermédiaires en 1990. Deuxièmement, la libéralisation a consisté en la réduction des importations canalisées, c'est-à-dire la réduction des droits monopolistiques du gouvernement pour l'importation de certains articles. Par exemple, les importations canalisées de gaz, pétrole et lubrifiants sont passées de 44 à 11% du total des importations. Troisièmement, plusieurs incitations à l'exportation ont été introduites (par exemple, en 1985, la loi de finances prévoyait que 50% des bénéfices des entreprises attribuables aux exportations soient déductibles de l'impôt ; ce chiffre a été étendu à 100% dans la loi des finances de 1988) et les politiques de change ont soutenu l'ouverture du pays au commerce à travers une dépréciation favorable à un gain de compétitivité. Cependant, la vague de réformes des années 80 s'est accompagnée d'emprunts et de dépenses publiques insoutenables et d'une augmentation de la dette et du déficit qui ont abouti à une crise macroéconomique en 1991 (par exemple, la dette extérieure est passée de 20,6 milliards de dollars en 1980-1981 à 64,4 milliards de dollars en 1989-1990, la part de la dette non concessionnelle est passée de 42 à 54% entre 1985 et 1990).

de l'industrie, les réductions tarifaires, l'ouverture du compte de capital, la dépréciation de la monnaie pour stimuler la compétitivité, la libéralisation des secteurs commerciaux, bancaires et des NTIC, et l'attraction des investissements directs étrangers. Grâce aux réformes, la croissance s'est accélérée le plus rapidement dans les services, suivie par l'industrie. Elle était tirée par une part croissante des investissements et des exportations, avec une forte contribution de la consommation, et une augmentation de la diversification des exportations, du travail et de la productivité totale des facteurs.

Ces deux histoires, loin d'être spécifiques à l'Argentine et à l'Inde, ont été des phénomènes répandus dans différents pays indépendamment de leur localisation ou de leur niveau de développement. Elles soulèvent des questions sur les causes et les conséquences des crises financières et des poussées de croissance. Cette thèse apporte quelques réponses à ces questions et enrichit notre connaissance des crises financières et des poussées de croissance. Pour ce faire, elle est divisée en deux parties. La première partie, composée de deux chapitres (chapitres 2 et 3), analyse les coûts commerciaux (au niveau sectoriel et agrégé) et les effets récessifs des crises financières dans les pays en développement et émergents. Elle examine également les canaux par lesquels les crises financières affectent le commerce et la production et évalue le rôle de l'espace et la politique budgétaire dans l'atténuation des effets récessifs des crises. La deuxième partie, comprenant également deux chapitres (chapitres 4 et 5), porte notre attention sur les déterminants des poussées de croissance dans les pays et sur le rôle du Fonds monétaire international dans l'initiation de ces poussées de croissance. Elle tire les leçons du passé et établit des stratégies pouvant aider à déclencher les poussées de croissance. En outre, elle met en lumière le rôle potentiel joué par le FMI dans le déclenchement des poussées de croissance.

0.2 Les crises financières et le commerce international

Les crises financières ont généralement été associées à la contraction des échanges. Baldwin (2011) rapporte que le commerce mondial s'est considérablement contracté sur au moins trois trimestres dans trois des récessions mondiales survenues entre 1965 et 2008 : le choc pétrolier de 1974-75, les crises d'hyperinflation de 1982-83, et la bulle financière des technologies de communications de 2001-02. Cependant, le « grand effondrement du commerce » à la suite de la crise de 2008-2009 est de loin le plus grand effondrement du commerce depuis la Seconde Guerre mondiale. En effet, selon l'OMC et le FMI, la baisse des flux commerciaux mondiaux (environ 12 % du PIB mondial en 2009) a dépassé celui du PIB mondial (environ

5 % en 2009). Compte tenu des avantages mondiaux du commerce,[4] cette grave récession a montré l'importance de l'analyse des coûts commerciaux des crises financières. La littérature empirique, malgré quelques exceptions pour les exportations, aboutit à un consensus sur les conséquences néfastes des crises financières sur le commerce au niveau macroéconomique (Rose 2005; Ma and Cheng 2005; Martinez and Sandleris 2011; Abiad et al. 2014; Asonuma et al. 2016; Atsebi et al. 2019). Au niveau microéconomique, à la suite de l'effondrement du commerce de 2008-09, plusieurs analyses se sont penchées sur les mécanismes par lesquels les crises financières génèrent une contraction du commerce. Ils mettent en évidence, le canal côté demande et le canal côté offre.[5] Cependant, cette littérature peut être développée pour plusieurs raisons. Premièrement, cette littérature a négligé les différences intersectorielles des effets des crises financières, c'est-à-dire les coûts différenciés des crises sur les différents types de biens et services échangés. Deuxièmement, la plupart des analyses traitent les crises financières comme exogènes, par conséquent, elles peuvent ne pas saisir un effet causal. Troisièmement, elles analysent généralement les effets de chaque crise financière séparément sans tenir compte des autres crises, par conséquent, elles peuvent souffrir d'un biais de surestimation car les différentes crises sont liées.

Dans ce contexte, le chapitre 2 étudie l'évolution de différents types de commerce (à savoir les produits agricoles, miniers et manufacturés et les services) à la suite de divers types de crises financières (à savoir les crises de la dette, bancaires et de changes) dans 41 pays émergents sur la période 1980-2018. Il utilise une combinaison d'évaluation d'impact et de projections locales pour saisir un effet dynamique causal allant des crises financières à l'activité commerciale. Il révèle que l'effondrement du commerce total à la suite des crises financières est durable et principalement provoqué par la chute du commerce des biens manufacturiers. Cependant, l'impact des crises financières sur les autres types de biens échangés et notamment sur les services est loin d'être négligeable. Le commerce des biens miniers et des services diminue également à la suite de plusieurs types de crises financières, tandis que le commerce des produits agricoles semble bénéficier d'un éventuel effet de substitution, notamment à la suite des crises de la dette. En examinant les coûts des crises combinées, il montre qu'elles exercent une baisse plus importante des échanges commerciaux, par rapport aux crises non-combinées. En outre, les crises financières exercent un effet négatif sur le commerce total et sectoriel à travers des mécanismes de composition et structurels, du côté de la demande et du côté de l'offre. Dans le

[4]Les premières études de Dollar (1992); Sachs and Warner (1995); Edwards (1998) et Frankel and Romer (1999) suggèrent que le commerce augmente les revenus, résultat confirmé plus récemment par Rodríguez and Rodrik (2000) et Feyrer (2009a,b). En outre, le commerce international a également soutenu la productivité globale et des entreprises ou la consommation réelle et participé à la réduction de la pauvreté (voir par exemple Bernard and Jensen 1999; Pavcnik 2002; Trefler 2004; Burstein and Cravino 2015; Edmond et al. 2015; Johns et al. 2015).

[5]Voir par exemple Berman and Martin (2012) et Ariu (2016) pour une discussion approfondie de ces deux canaux.

détail, concernant le canal de la composition et de la structure du commerce, ce chapitre soutient que les crises financières peuvent constituer un obstacle à la transformation structurelle, car elles affectent davantage les exportations manufacturières dans les pays où la part des exportations manufacturières est relativement plus faible. De plus, en diversifiant leurs exportations et leurs partenaires, les pays pourraient augmenter leur résilience aux crises financières. Concernant le canal de la demande, il montre que les crises financières associées à une baisse de la demande de biens et services des partenaires commerciaux auront des coûts commerciaux plus importants ; par conséquent, elles peuvent générer un effondrement sans précédent du commerce international lorsqu'elles se généralisent au niveau régional ou mondial, comme en témoigne la période post-crise financière globale. Enfin, il soutient l'idée que le canal de l'offre est essentiel pour comprendre comment les crises financières affectent la dynamique du commerce international. Lorsqu'elles sont associées à une détérioration du développement financier intérieur et des conditions financières extérieures, et à une baisse brutale des flux de capitaux entrants, les crises financières entraînent un effondrement plus important du commerce international.

0.3 Les crises financières et la croissance économique

Les crises financières ont également généré des contractions et récessions économiques durables et prolongées dans de nombreux pays (voir, par exemple, Kaminsky and Reinhart 1999; Bordo et al. 2003; Tomz and Wright 2007; Cerra and Saxena 2008; Reinhart and Rogoff 2009; Fatás and Mihov 2013; Borensztein and Panizza 2014; Jordà et al. 2013, 2016; Jordà and Taylor 2016; Asonuma et al. 2016; Trebesch and Zabel 2017; Laeven and Valencia 2018; Romer and Romer 2018; Asonuma et al. 2019; Kuvshinov and Zimmermann 2019; Atsebi et al. 2020). Cependant, l'ampleur de l'effondrement de la production et le rythme auquel la reprise peut se produire dépendent de manière cruciale de la disponibilité de l'espace budgétaire définit comme la marge de manœuvre dans le budget d'un gouvernement qui lui permet de fournir des ressources pour un objectif souhaité sans compromettre la soutenabilité de sa situation financière ou la stabilité de son économie (Heller 2005). En effet, à la suite de la crise financière mondiale de 2008-2009, de nombreux gouvernements ont adopté de vastes plans de relance budgétaire pour stimuler l'activité économique et renouer avec la croissance. Ces plans étaient basés sur la théorie keynésienne selon laquelle les déficits des gouvernements peuvent stimuler leur économie en soutenant la demande globale. Ceci est particulièrement intéressant étant donné la preuve de multiplicateurs budgétaires plus importants dans les récessions que dans les expansions. A contrario, de nombreux autres pays ont été contraints de mettre en œuvre d'importantes consolidations budgétaires afin d'assurer la soutenabilité de leurs finances publiques, et cela au pire moment possible, ce qui a exacerbé les forces récessives de la crise. Une différence

notable entre les pays qui appliquaient une politique budgétaire expansionniste et restrictive réside dans la disponibilité de l'espace budgétaire dont ils disposaient avant la survenance de la crise. Par exemple, Romer and Romer (2018) en analysant les effets de l'espace budgétaire et monétaire sur la dynamique de croissance à la suite d'une crise financière montrent que les pertes de croissance sont inférieures à 1% lorsqu'un pays dispose des deux types d'espaces, mais atteignent 10% quand il n'a ni l'un ni l'autre. L'un des canaux est que les gouvernements peuvent utiliser la politique monétaire et budgétaire de manière plus agressive lorsque lorsqu'ils ont plus de marge de manœuvre. Cependant, ils se concentrent exclusivement sur les pays avancés pour lesquels, après la Seconde Guerre mondiale, les crises et les récessions ont été moins récurrentes et moins graves que dans les pays en développement et émergents. Par ailleurs, Bohn (2002) et Mendoza and Ostry (2008) montrent que la politique budgétaire a tendance à être en moyenne plus expansionniste lorsque la dette publique est faible. Giavazzi and Pagano (1990); Blanchard (1993); Perotti (1999); Minea and Villieu (2010); Corsetti et al. (2012) et Ilzetzki et al. (2013) montrent que la politique budgétaire expansionniste est plus efficace et a des effets keynésiens à des niveaux d'endettement ou de déficit faibles et des effets non keynésiens dans les circonstances opposées. Auerbach and Gorodnichenko (2012, 2013) et Corsetti et al. (2012) révèlent que les multiplicateurs budgétaires sont plus importants pendant les récessions et les crises financières. Dans l'ensemble, ces analyses montrent que la politique budgétaire peut être plus efficace pour atténuer l'ampleur des récessions lorsque les pays disposent de suffisamment d'espace budgétaire pour leur permettre de mettre en œuvre des plans de relance sans détériorer leur situation budgétaire et la confiance des marchés financiers.[6]

Etant donné cette littérature, le chapitre 3 étudie comment l'espace budgétaire affecte la dynamique des contractions ou récessions à la suite des crises financières et des récessions normales sur 35 pays en développement et 56 pays émergents au cours de la période 1985-2017. Il construit un nouvel indice d'espace budgétaire et applique une combinaison de modèles de projections locales et d'évaluation d'impact pour identifier un effet causal. Il révèle que la disponibilité de l'espace budgétaire à la suite des crises financières et des récessions normales génère un environnement mixte en termes de croissance. Dans les pays disposant de suffisamment d'espace budgétaire, les gouvernements peuvent adopter une expansion crédible de la politique budgétaire en augmentant leur déficit et en utilisant leur espace budgétaire pour alléger les coûts des crises financières et des récessions normales. Dans une telle situation, la consommation et l'investissement privés ainsi que les flux nets de capitaux entrants augmentent, ce qui favorise une reprise rapide des activités économiques. Dans les pays où l'espace budgétaire est

[6] A la suite de la récente crise financière mondiale de 2008-2009, il a eu plusieurs travaux sur les multiplicateurs budgétaires lorsque la politique monétaire est contrainte. Dans de telles circonstances, Christiano et al. (2011) constatent que les multiplicateurs budgétaires sur la production dépassent deux, voire trois ; voir aussi, Woodford (2011); Erceg and Lindé (2014).

limité, l'histoire est différente et plus douloureuse ; les gouvernements échangent immédiatement leurs objectifs de stabilisation de l'activité pour résoudre les problèmes de soutenabilité de la dette à travers des consolidations budgétaires, ce qui renforce les forces récessives. En outre, dans ces pays, la consommation et l'investissement privés ainsi que les flux nets de capitaux entrants baissent et la reprise, le cas échéant, est une perspective lointaine et incertaine. Tout comme en physique, les objets tombent à moins qu'une énergie extérieure ne soit appliquée, les pays qui négligent les bonnes disciplines vont connaitre des récessions plus accentuées à moins d'avoir un espace budgétaire qui leur permette de stimuler leur économie en période de ralentissement. Ce chapitre suggère que les gouvernements et les décideurs doivent être plus que proactifs pour tirer les leçons du passé, réparer le toit pendant que le soleil brille, construire des « buffers » budgétaires, réduire la dette et le déficit, augmenter l'assiette fiscale et les revenus lorsque l'économie commence à s'améliorer sensiblement pour être en mesure de répondre de manière appropriée à la prochaine crise qui se profile à l'horizon.

0.4 Les Crises financières et les poussées de croissance

Plusieurs facteurs politiques et économiques peuvent expliquer pourquoi et quand les poussées de croissance se produisent ou non ; l'une d'entre elles, qui est analysée dans la partie I, est la présence d'une crise. Cette liaison est connue sous l'hypothèse de « la crise induit une réforme ». En effet, les crises financières révèlent les politiques macroéconomiques non performantes, les dysfonctionnements politiques, économiques et sociaux des économies, ce qui permet d'envisager des réformes macroéconomiques et structurelles sérieuses et bien ciblées pour accroître la résilience du pays aux crises, mais surtout pour renouer avec une croissance soutenue. Par exemple, IMF (2019) montre que les crises favorisent la libéralisation des échanges, du marché du travail ainsi que la déréglementation financière à moyen terme. En outre, Lora and Olivera (2004) montrent que l'effondrement de la demande intérieure due à une crise peut réduire les oppositions à la libéralisation, notamment celles des industries qui dépendent généralement de la demande intérieure. De même, Duval et al. (2018) constatent que les périodes de chômage élevé peuvent accroître la pression sur les gouvernements pour qu'ils adoptent des réformes qui assouplissent la réglementation du marché du travail dans l'espoir de stimuler l'emploi. Mian et al. (2014) montrent qu'après une crise financière résultant d'une période de déréglementation, les gouvernements sont enclins à reréguler le secteur financier et l'économie. Ces résultats soutiennent l'hypothèse de «la crise induit une réforme » et suggèrent qu'il est possible de relancer la croissance au lendemain des crises financières si les politiques et les réformes appropriées sont entreprises. De plus, les crises financières ne sont pas le seul déterminant des poussées de croissance et de nombreux autres facteurs sont tout aussi

importants.

0.5 Les poussées de croissance et ses déterminants

La littérature existante sur les déterminants des poussées de croissance est très diversifiée et aboutit à des résultats contraires. Entre autres, Hausmann et al. (2005) ont conclu que l'investissement, le commerce, la dépréciation du taux de change réel, les changements de régime politique, les facteurs externes et les réformes économiques, dans l'ensemble, ne prédisent pas assez bien les poussées de croissance. Pour eux, les poussées de croissance sont causées principalement par des petits changements idiosyncratiques. De même, Peruzzi and Terzi (2018) ont souligné que les accélérations de croissance sont extrêmement difficiles à prédire avec un haut degré de certitude. Jong-A-Pin and de Haan (2011) ont démontré le rôle important des libéralisations économiques alors qu'ils ont constaté qu'une adoption de la démocratie réduit la probabilité des poussées de croissance. Berg et al. (2012) ont souligné le rôle essentiel de la stabilité macroéconomique et de la diversification des échanges pour stimuler et soutenir la croissance.

Le chapitre 4 tente de réconcilier les analyses existantes. Pour ce faire, il identifie 132 épisodes de poussées de croissance dans 117 pays au cours de la période 1980-2010 et constate que plusieurs déterminants ont un effet significatif et positif sur la probabilité d'amorcer une croissance soutenue. Plus précisément, les améliorations de la stabilité macroéconomique et des conditions externes et des dotations en ressources sont associées à une probabilité plus élevée des poussées de croissance. Elles sont suivies des réformes structurelles, des gains d'investissements, du travail et de la productivité, de l'amélioration de la diversification et de la qualité des échanges, et enfin de l'amélioration des institutions. En examinant les interactions deux-à-deux des déterminants des poussées de croissance, ce chapitre montre que les pays peuvent maximiser la probabilité de déclencher des poussées de croissance s'ils parviennent conjointement à des améliorations significatives de la stabilité macroéconomique et des conditions externes et dotations en ressources, d'une part, et d'autres déterminants, d'autre part. En outre, il révèle que des améliorations importantes de la stabilité macroéconomique et, dans une certaine mesure, des facteurs externes et des dotations en ressources peuvent être considérés comme des stratégies dominantes pour déclencher une poussée de croissance, car aucune amélioration de ces déterminants empêche généralement les autres déterminants d'avoir un effet plus important sur la probabilité des poussées de croissance. Par conséquent, les politiques macroéconomiques et les réformes structurelles peuvent conduire à des épisodes de croissance soutenue.

0.6 Les poussées de croissance et le FMI

Le Fonds monétaire international (FMI) décrit comme le « prêteur de dernier recours » ou le « pompier financier », à la fois critiqué et salué pour ses efforts pour promouvoir la stabilité financière, continue de se trouver à l'avant-garde de la gestion des crises économiques mondiales.[7] Comme indiqué dans le guide sur les conditionnalités du FMI (voir, IMF 2002), les programmes du FMI devraient viser principalement les objectifs macroéconomiques suivants : (a) résoudre le problème de la balance des paiements du membre sans recourir à des mesures destructrices de la prospérité nationale ou internationale et (b) assurer la viabilité extérieure à moyen terme tout en favorisant une croissance économique durable. Cependant, la croissance médiocre dans le cadre des programmes FMI par rapport aux pays ou périodes sans programme a souvent été critiquée comme révélatrice d'un biais de consolidations excessif et a entraîné une stigmatisation du FMI, ce qui pourrait décourager l'utilisation des financements du FMI et remettre en cause sa réputation du FMI. Cependant, les économistes du FMI soutiennent que le rétablissement de la stabilité macroéconomique, même douloureuse à court terme, créera les conditions d'une croissance plus élevée à moyen et à long terme. Cette controverse a conduit à des analyses toutes aussi controversées. Il n'est pas surprenant que cette littérature n'arrive pas à des résultats communs, ce qui reflète en partie d'importants défis empiriques liés à l'identification des contrefactuels appropriés et à l'isolement de l'impact des programmes sur la croissance des influences d'autres facteurs, mais aussi une diversité de données et de méthodes employées par les chercheurs. Les articles soulignant un effet positif des programmes FMI sur la croissance sont, par exemple : Dicks-Mireaux et al. (2000); Hutchison (2004); Atoyan and Conway (2006); Bas and Stone (2014); Bal Gündüz (2016) et Bird and Rowlands (2017). Ils sont contredits par Przeworski and Vreeland (2000); IEO and IMF (2002); Hutchison and Noy (2003); Barro and Lee (2005); Butkiewicz and Yanikkaya (2005); Easterly (2005) et Dreher (2006).

Sachant que le chapitre 4 a révélé que la stabilité macroéconomique est l'une des conditions préalables aux poussées de croissance, le chapitre 5 contribue au débat sur l'efficacité du FMI à promouvoir la croissance, notamment car il a été impliqué dans la restauration de la stabilité macroéconomique dans plusieurs pays. Il conclut que les programmes soutenus par le FMI (plus les programmes PRGT que GRA) ont contribué de manière significative et positive à stimuler la croissance à moyen et long terme dans les pays, en particulier dans les années 2000

[7] Historiquement, depuis sa création en 1944, le FMI a aidé plus de 150 pays à travers 1300 programmes. Cela comprend la reconstruction du système international de paiements dans l'après-Seconde Guerre mondiale, la transition des pays de l'ex-Union soviétique vers des économies de marché et la gestion des diverses crises, notamment dans les pays touchés par les chocs pétroliers des années 1970, les crises de la dette dans les années 1980 en Amérique latine, en Afrique et en Europe de l'est, les crises asiatique et russe des années 90, la crise de la dette en Europe à la suite de la crise financière mondiale de 2008-2009, et plus récemment, la crise pandémique du Covid-19 en 2019-2020.

par rapport aux décennies précédentes, et dans tous les pays du monde, indépendamment de leur localisation géographique et niveaux de développement. Cela a été possible en poursuivant la stabilité macroéconomique et en mettant en œuvre des réformes structurelles, mais aussi en créant des conditions nécessaires à la stimulation des investissements, du travail et de la productivité et aux améliorations des conditions extérieures et de dotation.

0.7 Quelques applications dans le cadre de la crise de la pandémie du Covid-19

Cette thèse arrive à une période où, suite à la pandémie de Covid-19, les mesures de confinement nécessaires pèsent sur les entreprises et les emplois, l'incertitude augmente et les marchés financiers paniquent, les flux de capitaux reculent, les prix des matières premières diminuent, les pays s'engagent dans les grands plans de relance s'élevant à environ 8000 milliards de dollars (selon les estimations du FMI), malgré un espace budgétaire inférieur à celui d'avant la crise financière de 2008-09, et les politiques monétaires sont contraintes. Dans l'ensemble, nous sommes arrivés à un moment où la crise qui se profile à l'horizon est plus proche que ce que nous pensons. En effet, ce « temps est différent » ; il s'agit d'une grave menace pour l'économie mondiale. Et, tout comme la crise sanitaire frappe le plus durement les personnes vulnérables, la crise économique qui pourrait en découler devrait frapper plus durement les pays vulnérables.

Bien que l'avenir soit difficilement prédictible ; en effet, la prévision des crises n'a jusqu'à présent connu qu'un succès modeste, par la formation et le tempérament, et avec les analyses historiques, on pourrait faire quelques prédictions en se basant sur les résultats de cette thèse. Le chapitre 2 suggérait que, si des politiques appropriées ne sont pas prises, la crise du « grand confinement » pourrait être associée à un effondrement beaucoup plus important du commerce international jamais enregistré, en particulier du commerce des biens manufacturiers et des services par rapport à la crise de 2008-2009. Cela pourrait arriver étant donné que cette crise est associée à la fois à un choc côté demande et côté offre alors que la crise de 2008-09 n'était qu'un choc côté demande. Le chapitre 3 prédirait que (i) certains pays, tout en cherchant à renflouer leur économie pour surmonter les conséquences néfastes de la crise de Covid-19, pourraient rapidement échanger leurs politiques de stabilisation pour résoudre les problèmes de soutenabilité de la dette et de viabilité externe, au plus pire moment possible,[8] et (ii) étant donné que l'espace

[8]Comme indiqué, par exemple par Auerbach and Gorodnichenko (2012, 2013); Fazzari et al. (2015), les multiplicateurs budgétaires sont plus élevés en période de ralentissement. En outre, comme indiqué, par exemple, par DeLong and Summers (2012); Jordà and Taylor (2016) et Fatás and Summers (2018), les consolidations budgétaires peuvent échouer en cas de ralentissement, car elles freinent davantage la croissance et l'investissement, sans pour autant réduire et stabiliser les niveaux d'endettement.

budgétaire est limité et que la politique monétaire est accommodante mais également contrainte dans de nombreux pays à travers le monde, par exemple en raison d'une dette plus élevée, d'un déficit permanent résultant de la crise de 2008-09 et des taux d'intérêt nominaux proches de zéro, les pays pourraient subir un effondrement prolongé de leur croissance économique par rapport à ce qui avait été observé précédemment, là encore si des politiques appropriées et coordonnées ne sont pas mises en œuvre. Le chapitre 4 donne de l'espoir en cette période difficile ; il illustre les épisodes de poussées de croissance et propose les moyens nécessaires pour y parvenir. En gardant à l'esprit la recommandation du chapitre 3, réparer le toit lorsque le soleil brille,[9] les pays doivent s'engager dans de vastes programmes de réformes à la suite de la crise du Covid-19 pour renforcer leur résilience aux chocs et renouer avec une croissance soutenue et une prospérité économique. Le chapitre 5 montre qu'une collaboration avec les institutions internationales telles que le FMI et la réalisation des politiques conjointes pourrait s'avérer bénéfique pour la sortie de crise. En cette période difficile, selon les mots de la directrice générale du FMI, Kristalina Georgieva, le FMI pourrait débourser un trillion de dollars en prêt pour aider les pays et se dit disponible à servir ses pays membres en répondant rapidement à un nombre sans précédent de demandes de financement d'urgence - de plus de 90 pays depuis le début de la crise.

Mots clés : Coûts commerciaux ; Contractions économiques ; Crises financières ; Espace budgétaire ; Poussées de croissance ; Stabilité macroéconomique ; Réformes structurelles ; Fonds Monétaire International
JEL Codes : F14 ; F4 ; G01 ; E6 ; H6 ; O1 ; O4

[9]De plus, IMF (2019) montre que les réformes nécessitent plusieurs années, et certaines d'entre elles peuvent entraîner des coûts à court terme plus importants lorsqu'ils sont exécutés dans des périodes difficiles de récession par exemple ; il est donc préférable de les mettre en œuvre lorsque les conditions économiques sont favorables. De plus, Les gains dus aux réformes structurelles tendent également à être plus importants lorsque la gouvernance, l'accès au crédit et l'informalité - trois contraintes à la croissance - sont élevés.

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