Temporary Migration and Entrepreneurship in Bangladesh *

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Abstract: In the presence of credit constraints, temporary migration becomes an effective strategy for workers to accumulate capital and finance self-employment activities back home. This paper studies temporary migration episodes as explicit components of workers' life cycle decisions where they face high migration costs as well as credit constraints to entrepreneurial activities. Using data from a large-scale survey of temporary migrants from Bangladesh, we construct and estimate a dynamic model of various components of the temporary migration decision process as well as their activities after return. We, then simulate, the effect of changes in migration costs, interest rates and employment conditions on various decisions such as migration duration and savings levels. Our findings imply that changes in migration costs and conditions abroad have important dynamic repercussions on the labor trajectories of workers over their entire life cycle, including their self-employment patterns after their return. Vice versa, better access to credit for entrepreneurs at home actually lowers the extent and duration of migration.

JEL codes: J61, D15, F22, O13

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1 Introduction

Temporary migration is common in many parts of the world. Every year, for instance, millions of workers from South and East Asia go to oil-rich Persian Gulf countries on temporary employment visas and return home once their contracts expire (OECD 2008; World Bank 2018). For these mostly low-skilled workers, such temporary migration episodes are not only meant to increase their current incomes and support their families but are integral to their lifetime human and physical capital accumulation and investment strategies. Many of their decisions, such as when and where to migrate, how long to stay, how much to save, should be viewed and analyzed from this dynamic perspective.

Research on temporary labor migration patterns and their economic outcomes is restricted by the scarcity of suitable data (Wahba 2014; Dustmann and Görlach 2016). Many data sources, such as labor force surveys conducted in destination countries, are unable to identify migrant workers as temporary or permanent. Furthermore, analyzing temporary migration as part of workers' life cycle requires following their labor market trajectories over time. Standard national surveys and administrative data sources do not ask detailed questions about workers' employment histories, focusing on current labor market outcomes and collecting cross-section data instead. Such data constraints limit dynamic analysis of migration episodes. More importantly, we are unable to identify how employment, savings and investment decisions at different stages of the life cycle interact with each other and jointly influence overall economic welfare.

This paper utilizes data collected through a recent labor market survey from Bangladesh specially designed to answer such questions. The dataset includes detailed information on migrants' personal and family backgrounds, labor market outcomes and migration related expectations prior to their departure, their migration expenditures, their migration outcomes in terms of wages and employment history and, finally, their labor market activities and earnings after their return. We investigate the effects of temporary migration outcomes, such as the fees they paid, wages they earned, and their duration abroad, on the workers' lifetime earnings and employment trajectories. Our dynamic framework formalizes the idea that different episodes of employment, which include temporary migration, are highly interlinked and jointly form the same optimization decision set. Our model captures the fact that (i) pre-migration employment outcomes, (ii) timing of departure (iii) migration costs (iv) duration abroad, (v) wages abroad, and (vi) post-return employment outcomes are all intertwined. One cannot explore the decisions regarding any of these variables without explicitly accounting for others. For example, pre-migration employment outcomes and age at departure are linked to duration of stay abroad. Duration of stay, in turn, is affected

by migration costs and wages abroad, which determine how long the migrant needs to stay overseas to achieve a given level of savings. Closing the full cycle, the ability to finance a self-employment activity after return will be affected by the monetary costs of migration, wages abroad, and duration of stay at destination. In addition to these variables, policy interventions that aim to influence any specific decision or outcome will, by the very nature of these dynamic linkages, influence workers' other decisions and economic outcomes. Hence, policymakers should account for such dynamic externalities when designing policies.

The ability to finance self-employment activities plays a central role in temporary migration decisions within this dynamic life cycle model. Using data from Bangladesh, Figure 5 shows that self-employment levels are significantly higher among return-migrants, implying temporary migration enhances transition into self-employment at home for low-skilled workers. The simple intuition behind this stylized fact and our dynamic model is that temporary migration allows workers to save and overcome credit constraints on self-employment back home.

A puzzle emerges when we look at credit constraints faced by potential entrepreneurs. While low-skilled workers typically cannot borrow to finance self-employment activities, they often are able to borrow to pay for migration expenses. Even though they are not as high relative to the capital needed for self-employment, migration related expenses are quite substantial for most potential migrants. We argue that the ability to borrow for migration, but not for self-employment, can be explained by two main factors. First, it is significantly less risky for a lender to finance a worker's migration expenses. Low-skilled labor migrants going to the Persian Gulf countries have valid contracts that specify their wages and initial duration of employment. Such contracts provide the necessary certainty to the lenders that the migrants are likely to earn the income to pay back the loan. In contrast, earnings from entrepreneurship and self-employment are highly uncertain and risky. The likelihood of default on a loan financing a business is much higher. Second, the agency problem faced by lenders is more pronounced in the case of entrepreneurship loans. While earnings abroad are easily verified given the formal nature of labor arrangements and the presence of contracts, it is difficult for lenders to verify earnings from entrepreneurship. The markets for migration loans and entrepreneurship loans can thus be thought as two segmented credit markets, with higher or even prohibitive interest rates in the latter one.

Why is self-employment, then, so attractive for low-skilled workers who do not tend to have access to formal wage employment? While it has been argued that self-employment is a last resort for workers in some contexts in developing countries, evidence from Bangladesh indicates that the vast majority of the self-employed have voluntarily chosen this activity (Gutierrez et al. 2019). Labor markets for formal and informal wage jobs are also segmented

in low-income countries like Bangladesh, where low-skilled workers typically only have access to casual informal wage employment with low wages and physically demanding working conditions (Gutierrez et al. 2019; World Bank 2012). While informal wage employment is immediately available for workers, self-employment requires accumulation enough assets in the presence of tight credit constraints. Finally, we should add that self-employment options available in Bangladesh consist of relatively simple occupations such as owning a small store, driving a taxi or running a small business. We discuss the capital requirements and resulting income levels in greater details in the next section.

The context of temporary migration studied in this paper differs from prior work, which has mostly focused on the Mexico-US corridor (see for instance Thom (2010), Lessem (2018), and Görlach (2020)). There are several critical distinctions. First, migrants from Bangladesh and other Asian countries pay very large upfront fees to intermediary agents to match them with employers in the Persian Gulf or Southeast Asian countries and take care of other bureaucratic steps. While the literature cannot typically account for the role of upfront monetary costs due to a lack of data, these fees play a critical role in temporary migration decisions in our setting. Such high fixed costs of temporary migration are likely to reduce repeat migration and increase incentives to stay longer at the destination once the migrant arrives. Second, low-skilled migration from Bangladesh is entirely contractual, therefore legal, and temporary in the form of guest worker arrangements. This feature is shared by many low-income sending countries in Asia and other regions. Due to regulations in the main destinations in the Gulf and Southeast Asia, stay overseas is strictly conditional on holding an employment contract. Migrants are only able to extend their stay if their employment contract is renewed and must return otherwise. Undocumented stays in Persian Gulf countries are scarce compared to other migration corridors such as Mexico to US or from Africa to Europe. Entry in the main destination countries without a valid work contract and visa is practically impossible and overstay is rare due to tight enforcement and severe punishments.

Our data are collected through a special survey – the Bangladesh Return Migrant Survey (BRMS) 2018/2019. We designed the survey with the idea that temporary migration is an integral part of workers' life cycle employment process. The questionnaire thus includes very detailed retrospective questions on the entire employment and migration history for a sample of 5,000 temporary migrants who had returned to Bangladesh at the time of the data collection. It is one of the very few comprehensive surveys on temporary migrants globally, and the first of this kind in Bangladesh. The survey also includes detailed information on the monetary costs of each migration episode, disaggregated by cost items and the financing methods. Migration related expenses are critical in studying temporary migration behavior

in origin developing countries. They are known to be very high relative to workers' earnings in the home country and abroad (International Labour Organization 2015).[1]

We estimate our model using data from the BRMS which we combine with nationally representative data from various household surveys on income and expenditures. Using our estimated model, we evaluate the effects of changes in policy parameters on temporary migration decisions and lifetime outcomes of low-skilled migrants. Given our dynamic setting, our counterfactual exercises illustrate that policy interventions to influence any of the migration-related decisions will have implications for the other decisions. We find, for example, that a reduction in migration costs by 50 percent would raise self-employment by about 1.5 percentage points (or 5 percent) upon return. At the same time, individuals can afford to become self-employed earlier than they would have with the current cost structures of migration. Vice versa, the ability to finance half of the investment cost required for self-employment via borrowing, reduces emigration level by almost 10 percent. It also shortens the time spent abroad among the now smaller number of migrants.

On a theoretical level, the relation between migration and self-employment under credit constraints has been analyzed by Rapoport et al. (2002), and a number of papers document the high propensity of return migrants to become self-employed empirically (Ilahi 1999; McCormick and Wahba 2001; Dustmann and Kirchkamp 2002; Mesnard 2004; Yang 2008; Wahba and Zenou 2012; Naudé, Siegel, and Marchand 2017). Our paper builds on these studies by modeling and estimating jointly the emigration, destination and migration duration choice, as well as the decision to become self-employed. We explicitly account for the savings accumulated while abroad as a means to overcome credit constraints at home. Methodologically, we further add to the growing literature that uses dynamic behavioral models to examine determinants and effects of international migration (see e.g. Kirdar (2012), Llull (2018), and Lessem (2018)).

The paper is organized as follows. Section 2 provides some background on temporary labor migration from Bangladesh. Section 3 presents our data and reports descriptive statistics of our sample. Section 4 introduces a set of stylized facts that motivate the paper. Section 5 lays out our dynamic model. Section 6 discusses our estimation and identification. Section 7 presents our results. Section 8 concludes.

[1]Southeast Asian economies have been applying very strict deportation measures to address overstay, and it is punished by imprisonment in Saudi Arabia and the United Arab Emirates.

2 Background: Temporary Migration from Bangladesh

Bangladesh is one of the main origin countries of low-skilled labor migrants. It ranked 5th worldwide, with an estimated stock of 7.8 million of workers abroad at the time of our survey in 2018 (World Bank 2018). The incidence of migration among the working age population is also high. As of 2016, about 13% of the total working age male population of Bangladesh (ages 15-64) was employed overseas. Bangladesh is also one of the largest suppliers for low-skilled migrants to the oil-exporting GCC (Gulf Cooperation Council) countries, with over 750,000 workers leaving annually in recent years. The magnitude of migration outflows rose steadily over time, reaching historic levels as the labor demand in the main destination countries increased. Despite the long-term secular trends of emigration, we also observe noticeable variation from year to year. These annual changes are closely tied to fluctuating oil prices, the main income source and determinant of labor demand in the GCC countries. Figure 1 documents this relationship.

[Figure 1 here]

Labor migration from Bangladesh is almost entirely low-skilled, reflecting the average education level in the underlying working-age population (Barro and Lee 2013). Gender distribution among the migrants is also quite skewed with men representing close to 90% of migrants as of 2018. The prevalence of male labor migration is driven by the low labor force participation level of women (Rahman, Islam, et al. 2013), combined with difficult working conditions in the main destination countries.[2] The share of women among temporary migrants has, however increased from less than 5% in 2010 to slightly over 10% in recent years, boosted by the 2015 bilateral agreement with Saudi Arabia.

Due to labor market regulations and residency laws in the main destination countries (GCC members or in South Asia), emigration from Bangladesh is temporary by design. The acquisition of citizenship of these countries is effectively impossible, irrespective of migrants' duration of stay (Wahba 2015; Fargues 2011; Fargues and De Bel-Air 2015).[3] Migration to the GCC and Southeast Asian countries for low-skilled migrants is strictly conditional on holding a valid employment contract. These are typically of fixed duration and tied to a specific employer, but contract renewals are possible to extend duration, again conditional on the continued agreement of the employer. The initial duration of the work permit for low-skilled migrants is one year in Malaysia and two years in Singapore, and they can be renewed

[2] According to the 2016/2017 Bangladesh Labor Force Survey, the labor force participation of females aged 15-64 was 35%, compared to 85% for males in the same age group.

[3] According to the sponsorship system that regulates migration to the GCC, labor migrants can only enter and stay in the country through a sponsor, a local employer which takes on both legal and economic responsibility for the migrant worker.

up to a total duration of 10 years in both countries. There is no explicit cap on total duration of stay of low-skilled migrants in the GCC countries. However, since their employment at the destination is conditional on holding a contract, migrants cannot stay after they have retired. Similarly, a job loss or the expiration of the contract automatically requires a mandatory return to the home country. Furthermore, low-skilled migrants are usually not allowed to migrate with their families. This generates additional costs to migrating and provides further incentives to return.

3 Data

3.1 The Bangladesh Return Migrant Survey(BRMS)

The primary data source in this paper is a newly collected dataset with unique information on employment histories and expectations of migrants. The Bangladesh Return Migrant Survey (BRMS), conducted by the World Bank during 2018-19, covers around 5,000 temporary migrants who had already returned to Bangladesh. It is one of the largest datasets on temporary migration conducted to date. It is also the first comprehensive survey on temporary migrants from Bangladesh, one of the major migrant-sending countries globally. It was designed to be representative of returning temporary migrants in rural and semi-urban areas of Bangladesh, and covers all districts in the country.[4]

The dataset has several features that enables us to explore temporary labor migration issues and fills several data gaps identified in prior work. First, the survey was designed with the understanding that temporary migration decisions are part of a life cycle optimization process by the workers. Thus, the questionnaire included questions on the entire employment histories of migrants both in Bangladesh (before and after their migration episodes) and while they were abroad. Thus, we are able to construct the full employment trajectories of the workers in the sample with detailed information on each migration episode including destination country, dates and duration of stay, labor market outcomes such as wages, occupation, and the reasons for returning.

The survey also records detailed information on the costs of each migration episode, disaggregated by cost categories and the source of financing. Such detailed data are typically not collected in standard household surveys that include migration modules.[5] Those expenses, however, play a critical in migration decisions in the context of Bangladesh and

[4]Bangladesh consists of a total of 64 districts.

[5]One exception is the Labor Market Panel Survey (LMPS) for Egypt, which collects information on intermediary fees paid by migrants. However, this dataset does not collect information on the entire employment and work history of workers.

other South Asian countries, where they are known to be very high relative to worker' earnings (International Labour Organization 2015; Farole et al. 2017).

Questions on expectations at the time of the migration regarding outcomes, such as wages, duration, and savings, allows us to compare them to actual outcomes. Even though recall might be imperfect, to the best of our knowledge, this is the only survey that captures information on expectations of temporary migrants. We are able to measure the incidence and the extent of "disappointment" among temporary migrants, which can be linked to migrants' behavior and choices, such as duration of stay abroad and type of employment after return.

Finally, the survey collects additional information on the migrants' most recent migration episode, such as remittances sent, monthly expenses and savings, difficulties encountered, and overall impressions. The survey also includes a detailed module on household enterprises and assets.

3.2 The Household Income and Expenditure Survey (HIES)

As the BRMS covers only households with returning migrants, we complement the BRMS data with a nationally representative household survey that samples both non-migrants and current international migrants. The Household Income and Expenditure Survey (HIES, 2016-2017 wave) was designed to be representative at the national and division level.[6] It collects information on non-migrants and current international migrants through an absentee module administered to household members who stayed in Bangladesh. The HIES also collects detailed information on the labor market outcomes of each household member such as employment, earnings, and industry of employment, which are comparable to the labor market information captured by the BRMS. The HIES also includes detailed information on the debt and assets of the household, as well as detailed expenditure data that allows to calculate household consumption.

The Census of Population and Housing 2011 was used as sampling frame for both the HIES and the BRMS. While the HIES covers both rural and urban areas, the BRMS sampling was designed to capture a representative sample of recent return migrants in rural and semi-urban areas of Bangladesh. We thus restrict the HIES sample to rural and semi-urban areas in our comparisons. The HIES was carried two years earlier than the BRMS, in 2016-2017.[7] This is an advantage in our context as current migrants in 2016 are likely to be more comparable to the return migrants captured in 2018 by the BRMS. Indeed, the median return migrant in the BRMS had been back in Bangladesh for two years, and majority was

[6] Bangladesh is divided in a total of 8 large administrative units called divisions.
[7] The Bangladesh HIES was carried between April 2016 and March 2017.

thus still abroad in 2016. Ahmed et al. 2020 show that the sample composition of temporary migrants in the HIES and the BRMS are quite similar, and that the characteristics and destinations of migrants in the two surveys are also similar to those in administrative data covering the entire population of legal temporary migrants from Bangladesh.[8]

3.3 Descriptive Statistics

Table 1 reports the summary statistics of the BRMS sample of returning migrants.[9] As mentioned earlier, a clear majority of migrants are men. Women represent only 4% of returnees in the survey sample which is consistent with statistics from administrative data.[10] The low level of female migration can be explained by several factors: the low labor force participation of women in Bangladesh (Farole et al. 2017) and difficult work conditions in the main destinations (International Labour Organization 2015). In addition, there is social pressure on women to stay behind since they bear the household responsibilities and low-skilled temporary migrants are not allowed to take their families with them. Given the small share of female migrants in the sample, combined with the fact that post-migration patterns are likely to differ between genders, we restrict our working sample to men.

[Table 1 here]

Most temporary migrants in the sample have some secondary schooling, while 17% have never attended school and only 2% have some tertiary education. The average years of schooling in the male sample is 6.5 years, which is low compared to average educational attainment across the world (Barro and Lee 2013). Returning migrants, however, have higher level of schooling than the non-migrant male working age population in Bangladesh (5.8 years), but lower than migrants that are currently overseas (7.6 years), according to the HIES 2016. This is partly due to the fact that returnees tend to be older than current migrants and younger cohorts have higher education levels.

Temporary migrants in the sample are primarily coming back from GCC countries, which represent about 75% of migrant destinations in the sample. Saudi Arabia is the most important destination country with about 25% of the migrants, closely followed by the United Arab Emirates. Malaysia represents 13% of temporary migrants and is the largest destination in Southeast Asia. Only a minority of temporary migrants were employed in other high-income countries. Singapore is the leading destination among advanced economies.

[8]The Bureau of Manpower, Employment and Training in Bangladesh publishes aggregate data on the number, composition and destinations of legal migrants from Bangladesh by year of departure.

[9]For a detailed description of the BRMS and its sample characteristics, see Ahmed et al. (2020).

[10]Over the period 1991 to 2014, women represented 4% of total outmigration from Bangladesh, according to the Bureau of Manpower, Employment and Training (BMET) administrative data.

Returning migrants in the sample have been back in Bangladesh for 3 years on average. The mean current age in the sample is 38, with an average age at departure and at return of 29 and 35, respectively. The distribution of migrants' year of departure in the sample closely mimics annual variation in oil prices. As workers from Bangladesh primarily migrate to the GCC countries, this reflects the role played by the oil prices in shaping labor demand, particularly in a context where employment contract is needed before departure.

Despite tight legal restrictions at the destination countries, we observe substantial variation in the duration of migration episodes in the sample (Figure 2 and Table 1). The median and mean duration of stay among migrants to all destinations are of 4.7 years and 6.5 years, respectively. Close to a quarter of migrants stayed abroad for less than two years, while a similar proportion stayed abroad for more than 9 years. As seen in Figure 2, there is substantial variation in duration of stay both across and within destinations, where migrants are subject to very similar regulatory constraints. Repeated temporary migration, as captured at the time of the survey, is actually uncommon: 97% of returning migrants in the BRMS have made only one trip abroad, excluding short visits during holidays. The very high fixed costs of temporary migration is likely to be the driving factor behind the limited incidence of repeated migration.

[Figure 2 here]

Temporary migration represents a considerable investment for workers. The total expenses for any migration episode is quite significant relative to wage earnings in Bangladesh or even overseas (Figure 3). The median total cost reported by returning migrants is close to one year of earnings abroad or three years of earnings of a wage worker in Bangladesh or over two years of household income.[11] Intermediary fees are by far the largest item at 55% of total migration costs. Visa fees are the second largest cost component with about 20% of total migration costs. As a result of these large upfront costs, most migrants in the sample report that they had to borrow to finance their migration.

[Figure 3 here]

The overseas earnings of temporary migrants are considerably higher than their earnings in Bangladesh. The median monthly income abroad was about three times the median earnings of wage workers in Bangladesh.[12] The labor earnings of migrants abroad were also about three times higher than the same individuals' earnings in Bangladesh prior to

[11] The median earnings of male workers in Bangladesh is estimated from the HIES 2016.

[12] Median earnings for wage workers in Bangladesh were estimated from the Bangladesh Household Income and Expenditure Survey (HIES) 2016.

departure (Panel A of Figure 4). While almost all migrants are employed in low-skilled jobs, we observe differences in wage levels across different destinations. For example, the median wage in Malaysia – the destination with the highest wages among the top five destinations – is about 45% higher than it is in Qatar. Finally, expectations of migrants' about their own earnings potential abroad are even higher. As shown in Panel B of Figure 4, prior to their departure, migrants systematically overestimate the wages they will earn abroad by a large margin. The median overestimation is around 50%

[Figure 4 here]

4 Stylized Facts on Temporary Migration and Entrepreneurship

Stylized Fact 1: The rate of self-employment is significantly higher among returning migrants

Three main patterns emerge when we analyze the share of working-age men who are self-employed at a given age and by migration status. As Figure 5 reports, first, self-employment increases with age for both non-migrants and migrants before their migration. This pattern is compatible with the existence of credit constraints people face. Workers need to accumulate a certain level of assets via savings while in wage employment to cover the startup expenses of entrepreneurship. Second, the self-employment rates for both non-migrants and for migrants prior to their move abroad are almost identical for any given age (blue and red lines in Figure 5). Migrants and non-migrants may differ in other dimensions, yet their propensity to become entrepreneurs in the absence of migration is similar. Third, and most importantly for this paper, the rate of self-employment of returning migrants is considerably higher than for non-migrants and migrants before moving, at any age (green line versus the red and blue lines in Figure 5). The gap in self-employment rates between return migrants and non-migrants is the largest at younger ages – for example, it is at 68% versus 25% at age 25. As opposed to the non-migrants, the rates of self-employment for return migrants stay rather constant as they age, ranging between 60 and 70 percent. As a result, the gap in self-employment rates reduce over time but it never closes. In support of these patterns, data from the BRMS show that about 90% of the enterprises owned by return migrants have been established after return. In other words, the self-employment patterns are not driven by other forces such as returning migrants taking over the family businesses when they return. This descriptive

evidence highlights the role played by temporary migration in accelerating transitions of workers into self-employment mainly through faster asset accumulation.

[Figure 5 here]

While self-employment can be a last resort for workers in certain settings (Gindling and Newhouse 2014), evidence from Bangladesh indicates that the vast majority of the self-employed have chosen it voluntarily. Gutierrez et al. (2019) report that 82% of the self-employed list the ability to work independently and earning higher incomes as their main reasons behind their decisions. They also report that the self-employed stay in that activity much longer than casual laborers and wage employees in the private sector.[13] Self-employment thus appears to be an "absorbing state" for many workers in Bangladesh.

Data from the BRMS shows that the self-employed earn higher incomes compared to wage workers, at any given age (Figure 6). The median monthly earnings migrants after they return is 20,000 BDT in the case of entrepreneurs (with paid employees) and 13,000 BDT for the self-employed with no other paid employees. In contrast, the median earnings of returning migrants who work as casual laborers is 10,000 BDT. These earnings patterns by occupational status are consistent with those of non-migrant workers in Bangladesh as shown in the Household Income and Expenditure Survey (HIES) and in Gutierrez et al. (2019). In addition to higher monthly earnings, Figure 6 highlights another important distinction. The income levels of wage workers start to decline at around age 45, presumably due to the physically demanding nature of these jobs, such as in agriculture, construction or other menial jobs. The self-employed workers, in contrast, can sustain their employment and already-higher income levels until age 55. These patterns, combined with the evidence listed earlier, is strongly indicative of the attractiveness of self-employment compared to wage employment.

[Figure 6 here]

Stylized Fact 2: Entrepreneurs face tight credit constraints while migrants are able to borrow to finance migration expenses

As in many other developing countries, individuals who want to start a business need initial capital, but face credit constraints in Bangladesh.[14] Although self-employment appears to

[13] In the sample used by this study, only 6% and 9% of self-employed individuals with and without paid employees, respectively, have ended these activities after 5 years. In contrast, 60% and 30% of causal laborers and regular wage employees in the private sector had left their job after 5 years.

[14] For cross-country evidence on credit constraints to self-employment in developing economies, see Beck et al. (2007).

be the preferred employment option among many low-skilled workers in Bangladesh, most individuals start self-employment at a relatively later age. In the HIES data, the median age of self-employed individuals in Bangladesh is 42, compared to 33 for wage employees, and 36 for daily laborers. In addition, the share of self-employed workers increases steadily with age, from about 20% at age 20 to close to 50% at age 55 (5). This pattern is consistent with the existence of credit constraints preventing individuals to startup self-employment activities at a younger age as they need to accumulate savings.

Several other data sources provide more direct evidence of credit constraints faced by self-employed people. According to the World Bank Bangladesh Informal Firms Survey of 2010, the average startup cost of a self-employment activity represents about two and half years of the average household income. The 2010 Survey of Firms in Bangladesh reports that only 10% of current employers funded their startup capital though Bank loans, a finding found also by Mahmud (2006). For the specific population of returning temporary migrants studied by this paper, the BRMS data show that 70% of individuals who are currently self-employed used their own savings – and primarily savings accumulated abroad – as the main source of finance to start up their business (Figure 7). In contrast, 19% of self-employed return migrants in the BRMS sample report using loans from money lenders as their primary source of finance. These shares do not show much variation across education groups.

[Figure 7 here]

While there is strong evidence of credit constraints faced by start-up entrepreneurial activities in Bangladesh, Figure 8 shows that potential migrants often use credit to pay for their upfront expenses and fees. 56% of migrants from Bangladesh used loans to finance at least a portion of their migration expenditures, and 17% fully covered their migration costs through a loan. Among all migrants who borrowed to finance their migration, on average, 60% of the total costs were covered by a loan.

[Figure 8 here]

The ability to borrow for migration, but not for self-employment, may be seen as a paradox, but this pattern can be explained by at least two main factors. First, it is significantly less risky for lenders to finance a worker's migration expenses for employment abroad. Low-skilled workers going to the Persian Gulf or Southeast Asian countries cannot migrate without a valid contract that specifies a wage and initial duration. Such contracts thus provide the necessary guarantee to the lenders that the migrant will have the income to pay back the loan. In addition, migrants cannot settle permanently in these countries, and almost never migrate with their families. In short, they have relatively secure wages and

they will be coming back home. In contrast, earnings from entrepreneurship are uncertain and risky. The likelihood to default on migration loans is therefore much lower than for a loan to finance a business. Second, the agency problem faced by lenders is more pronounced in the case of entrepreneurship loans. While migrants' earnings abroad are easily verifiable given the formal nature of labor arrangements and the presence of contracts, it is difficult for lenders to verify self-employment earnings. The markets for migration loans and entrepreneurship loans can thus be thought as two separate credit markets, where the interest rates are either very high or prohibitive in the latter.

Stylized Fact 3: Duration of stay overseas increases with migration costs and wages

There is a strong positive association between duration of stay at the destination country with migration costs and wages abroad (Figure 9). First, migrants who pay higher upfront migration expenses tend to stay longer at the destination. This finding is intuitive if migrants aim to achieve a minimum level of net savings during their migration episode. Holding everything else equal, an increase in migration costs raises the length of stay required to reach that level of savings.

Second, migrants who earn higher wages at the destination country also stay there longer. The literature on the relationship between migrants' wages and duration of stay suggest that this relationship could go in either direction. On one hand, higher wages can increase incentives to stay longer to maximize lifetime earnings. On the other hand, migrants with target level of savings can reach this target earlier when they have higher wages. Figure 9 indicates that the first channel tends to prevail when the upfront costs are high. Another possible explanation for the positive association between wages abroad and duration of stay is that that they are both positively affected by migrants' human capital stock. When migrants need to get their contracts renewed to extend their stay at destination, individuals with higher levels of human capital are arguably more likely to see their contract extended.

[Figure 9 here]

Stylized Fact 4: Higher earnings abroad increase the likelihood of self-employment after return

The likelihood of a migrant to become self-employed after returning home increases with his net cumulative earnings abroad. These earnings are a function of migration duration, migration costs, and the wages abroad. Figure 10 indicates that earnings abroad are the main

source of the investment capital for workers who became self-employed after they return. In line with this, Panel A of Figure 10 shows that the self-employment rate increases steeply with the net earnings accumulated abroad. Similarly, as shown in Panel B, both monthly wages abroad and duration of stay increase the probability of self-employment after return.

[Figure 10 here]

Table 2 adds to this descriptive evidence by reporting the results of regressions where self-employment status after return is regressed on total earnings overseas. As shown in column (1) and (4), the association between total earnings abroad and the likelihood of self-employment after return is statistically significant in the OLS specification where we also control for a range of observable characteristics. However, these OLS estimates may be inconsistent, as total earnings at destination are likely to be endogenous to the decision of becoming self-employed after return. In particular, the optimal migration duration and the occupational choice after return are likely to be simultaneously determined by migrants (Dustmann and Kirchkamp 2002).

In this reduced-form setting, we need an instrumental variable to identify the effect of total earnings overseas on occupational choice after return. To yield consistent IV estimates, the instrument needs to be sufficiently correlated with cumulative earnings overseas and it must only affect the likelihood of becoming self-employed indirectly, through its effect on cumulative earnings abroad (exclusion restriction). To instrument cumulative earnings overseas, we use the interaction between the growth rate in oil prices during the migrants' stay overseas, interacted with the oil dependency of GDP in the country of destination. The intuition behind this instrumentation strategy is that presumably exogenous fluctuations in oil prices affect migrants' duration of stay overseas by increasing labor demand by employers, and thus the likelihood to have their labor contract extended. Therefore, we expect fluctuations in oil prices to be correlated with the likelihood to stay longer at destination, increasing total earnings from the migration episode. However, changes in oil prices arguably do not affect the choice between self-employment and wage employment in Bangladesh directly. The identification assumption is that fluctuations in oil prices affect the likelihood of becoming self-employed after return only through their impact on immigrant labor demand in the destination countries which affect duration of stay of migrant workers and their earnings.

One possible violation of the exclusion restriction arises if fluctuations in oil prices directly affect the relative attractiveness of wage- and self-employment activities in Bangladesh. This could arise, for example, if the self-employed and wage workers work in different sectors, which are in turn impacted differently by fluctuations in oil prices. This is however unlikely

for the rural and semi-urban return migrants which we are focusing on. Two thirds of return migrants in the sample are employed either in small scale agriculture or retail businesses. We do observe that the self-employed are more likely to be employed in retail, and less likely to be in construction compared to the wage workers. According to the 2016 industry-level Input Output tables for Bangladesh, however, both sectors have a very small share of input value coming from coke, refined Petroleum, and nuclear fuel which is around 1.2 percent in agriculture and 0.2 percent in retail. We also observe a slightly higher fraction of self-employed return migrants employed in transport (21 percent) compared to wage workers (15 percent) in our sample. Since the transport sector is more dependant to oil-derived inputs compared to other sectors, we also run our IV estimation on the sample of return migrants excluding those employed in transport. The results are report in Table A2, and show that the IV coefficient is virtually unchanged and even slightly increased once the transport sector is excluded.

To further alleviate concerns about the fact that oil prices may directly affect the relative attractiveness of self-employment and wage work in Bangladesh, we look at changes in the share of self-employment in Bangladesh among non-migrants over time, together with fluctuations in oil prices. We do so by using data from the HIES and focusing on workers who have not migrated overseas. As shown in Figure A1, the fraction of non-migrants who are self-employed in rural and semi-urban areas - which are the areas covered by the BRMS survey - is fairly stable over time. We also do not observe any noticeable association between the share of self-employment and large fluctuations in oil prices over time.

Table 2 displays our estimation results using the instrumental variable approach. The first stage results in column (3) and (6) show that our excluded instrument is a significant predictor of cumulative earnings abroad. The coefficient on the oil price instrument has the expected sign; a positive growth in oil prices during the migrant's stay abroad increases the total value of earnings overseas in local currency. The coefficient on the excluded instrument is statistically significant at the one percent level and the first stage F-stat for excluded instrument is large, suggesting that our instrument is powerful enough. Columns (2) and (5) show that results of our 2SLS estimation, once cumulative earnings overseas have been instrumented by fluctuations in oil prices. As in the OLS specification, the estimated effect of cumulative earnings overseas on the likelihood to become self-employed after return is positive and statistically significant at the one-percent level. As shown in Table A2, those findings are robust to excluding return migrants who are employed in the transportation sector, which uses a higher fraction of oil-derived inputs than other sectors of activity. This provides comfort on the causal nature of relationship between labor earnings overseas and the propensity to become self-employed after return.

[Table 2 here]

5 Model

We model emigration, return migration and self-employment decisions by Bangladeshi workers in a dynamic setting. These choices are based on a set of state variables $\Omega_{it} = \{b_i, e_i, a_{it}, A_{it}, s_{it}, l_{it}, ysm_{it}, u^S_{it}, u^W_{it}, \varepsilon^s_{it}, \varepsilon^l_{it}\}$ for individual i at time t. This set includes the individual's birth cohort b_i, education level e_i, age a_{it}, stock of assets A_{it}, an indicator $s_{it} \in \{S, W\}$ for whether the individual is currently self-employed or a wage worker, current location l_{it} and the time spent there (years since migration) ysm_{it}. In addition, the state vector includes unobserved shocks to wages and profits, u^S_{it} and u^W_{it}, as well as taste shocks to the self-employment and location options, ε^s_{it} and ε^l_{it}.

An individual who resides in Bangladesh is either a wage worker or self-employed. At the beginning of a given period, the individual decides on his location $l_{it} \in \{B, M, O, Q, SA, UAE\}$. Besides the option of staying in Bangladesh, he can choose among the top five foreign destinations (Malaysia, Oman, Qatar, Saudi Arabia and the United Arab Emirates) which jointly account for 82 percent of all Bangladeshi migrants in our sample.

Monetary and utility costs of migration: While abroad, migrants suffer an education and destination-specific disutility η^d_e arising from their separation from their family and friends who stay in the home country. Migration requires payment of a destination-specific fee $C^d_{it} = C^d(e_i, a_{it})$ which depends on the individual's age and education level. With probability p^L_e, an individual of education level e has access to credit for migration, so that this cost can be covered by a loan at an interest rate of r_L.

Labor demand in destination countries and individual location choice: Besides the financial cost, migration is constrained by skill-specific labor demand in destination countries. As documented in Figure 1, aggregate migration is strongly related to the price of oil whose exports are the main source of revenue in all major destination countries. We account for this by specifying a function that relates revenues from oil to the share of individuals with education level e who can locate a job and work visa in destination d, conditional on his desire and financial ability to move there:[15]

$$\lambda^d_{et} = f^d_e(oillRevenues_{dt}; \boldsymbol{\varphi})$$

[15]We explain the parameterization of f^d_e with parameter vector $\boldsymbol{\varphi} = (\psi, \phi_1^{Malaysia}, ..., \phi_4^{UAE})$ when discussing identification in Secion 6.

The value $W_{it}^{B,W}$ summarizes the location options for a worker with current employment status $s_{it} = s \in \{S, W\}$ and the probability $\lambda_{et}^{d^*}$ that he can obtain a work visa for his preferred foreign destination:

$$\begin{aligned} W_{it}^{B,W} = \mathbb{E}\max\{ \quad & \hat{V}_{it}^{B,W}, \\ & \lambda_{et}^{M}\tilde{V}_{it}^{M} + (1-\lambda_{et}^{M})\hat{V}_{it}^{B,W}, \\ & \lambda_{et}^{O}\tilde{V}_{it}^{O} + (1-\lambda_{et}^{O})\hat{V}_{it}^{B,W}, \\ & \lambda_{et}^{Q}\tilde{V}_{it}^{Q} + (1-\lambda_{et}^{Q})\hat{V}_{it}^{B,W}, \\ & \lambda_{et}^{SA}\tilde{V}_{it}^{SA} + (1-\lambda_{et}^{SA})\hat{V}_{it}^{B,W}, \\ & \lambda_{et}^{UAE}\tilde{V}_{it}^{UAE} + (1-\lambda_{et}^{UAE})\hat{V}_{it}^{B,W} \quad \} \end{aligned}$$

The optimal location decision d^* is then given by the following expression :

$$d^* = \arg\max_{d}\{\lambda_{et}^{d}\tilde{V}_{it}^{d} + (1-\lambda_{et}^{d})\tilde{V}_{it}^{B,s}\}.$$

Wage employment: Wage employment in any given location l yields labor income $w_{it}^{l} = w^{l}(e_i, age_{it}, u_{it}^{W})$, which depends on education, age, years since migration (if abroad), as well as on unobserved factors $u_{it}^{W} \sim N(0, \sigma_W^2)$. Whereas migrants always earn this wage unless their contract is terminated and they are forced to return (with probability δ_{it}^{d}, see below), wage workers in Bangladesh face a risk of unemployment. Wages in Bangladesh are thus adjusted by employment probability $p_{it}^{w} = p^{w}(e_i, a_{it})$.

Self-employment: When they are in Bangladesh, wage workers can choose to become self-employed, which requires an investment in the amount of C_e^I. We let this cost (as well as the profits specified below) vary across education groups to account for the heterogeneity of business types operated by individuals of different education levels. Based on the guidelines of the Microcredit Regulatory Authority (MRA) in Bangladesh, we assume that 50 percent of the investment cost can be covered by credit. Hence,

$$\tilde{V}_{it}^{B,W} = \begin{cases} \mathbb{E}\max\{V_{it}^{B,S}, V_{it}^{B,W}\} & , if\ A_{it} \geq 0.5C_e^I \\ V_{it}^{B,W} & , if\ A_{it} < 0.5C_e^I. \end{cases}$$

Self-employment generates profits $\pi_{it} = \pi(e_i, age_{it}, u_{it}^{S})$ per period, which vary with education level, age and unobserved factors $u_{it}^{S} \sim N(0, \sigma_S^2)$. Since the overwhelming majority of Bangladeshi migrants are contract workers when they are abroad, we assume that the self-employment option only is available in Bangladesh.

Budget constraint: Another decision variable for the individuals is the amount they will save. We have ρ^l denote the share of income generated in location l that is saved. The stock of assets accumulates according to the following equation:

$$\begin{aligned} A_{it+1} = (1+r)A_{it} + \rho^l(s_{it}\pi_{it} + (1-s_{it})w^l_{it}) \quad &- \quad \mathbb{1}[l_{it} = B \cap l_{it+1} = d]C^d(e_i, a_{it}) \\ &- \quad \mathbb{1}[s_{it} = W \cap s_{it+1} = S]C^I_e, \end{aligned}$$

where $r = r_L$ when assets are negative because an agent still repays a migrant loan, and $r = r_A < r_L$ otherwise. At the beginning of their working life, individuals own a stock $A_{e,0}$ of assets, depending on their education level e. A share p_S of individuals further inherits a business, and thus start their working life as self-employed without having to accumulate the upfront investment cost C^I_e. We take this fraction directly from the data.

Expectations about earnings abroad and migration duration: Our data suggest a strong overestimation of foreign wages among potential migrants prior to their emigration. In line with this observation, we let the emigration decision be based on expected wages $\tilde{w}^d_{it} = \mathrm{E}[\tilde{w}^d | e_i, age_{it}]$. However, once abroad, migrants realize their actual wage w^d_{it} and base all further decisions on this amount. When residing in a foreign country $d \in \{M, O, Q, SA, UAE\}$, the individual chooses whether to extend the stay for another period or return as a wage worker to Bangladesh. In addition and irrespective of this choice, migrant workers also face the exogenous risk that their contract is terminated, in which case they are forced to return. The probability $\delta^d_{it} = \delta^d(e_i, a_{it}, ysm_{it})$ for this event is destination specific and again depends on an individual's age, education level and the time since arrival in the country.

Value functions. The values attributed to wage- or self-employment in Bangladesh are now given by the following expressions, respectively:

$$V^{B,W}_{it} = (1-\rho^B)w^B_{it} + \beta\mathbb{E}[W^{B,W}_{it+1}] + \varepsilon^W_{it}$$

$$V^{B,S}_{it} = (1-\rho^B)\pi_{it} + \beta\mathbb{E}[V^{B,S}_{it+1}] + \varepsilon^S_{it},$$

We assume that self-employed individuals do not migrate, as they would have to leave their businesses behind. This is supported by our data, where only a small fraction of the respondents report to be self-employed at the time of their migration. For individuals who have not migrated yet, the expected value of destination d (if they were to migrate there),

is given by

$$\tilde{V}_{it}^d = (1-\rho^d)\tilde{w}_{it}^d + \eta_e^d + \beta\mathbb{E}[\tilde{W}_{it+1}^d] + \varepsilon_{it}^d$$

whereas the realized value, which enters the return migration decision, is given by

$$V_{it}^d = (1-\rho^d)w_{it}^d + \eta_e^d + \beta\mathbb{E}[W_{it+1}^d] + \varepsilon_{it}^d$$

The continuation values in the previous two expressions are respectively

$$W_{it}^d = (1-\delta_{it}^d)\max\{V_{it}^{B,W}, V_{it}^d\} + \delta_{it}^d V_{it}^{B,W}$$

and

$$\tilde{W}_{it}^d = (1-\delta_{it}^d)\max\{V_{it}^{B,W}, \tilde{V}_{it}^d\} + \delta_{it}^d V_{it}^{B,W}.$$

6 Estimation and Identification

Several components of our model are directly observed in our data. These include the cost C_{it}^d of migration, earnings w_{it}^l and profits π_{it} by individual characteristics and location, as well as saving rates ρ^l. In the data, we also observe earnings expected prior to emigration, $\tilde{w}_{it}^d$. Furthermore, the survey contains information on the reason for return migration, including whether a work contract has been terminated. We use this information to compute the corresponding probabilities δ_{it}^d within each group of migrants. In the World Bank Bangladesh Informal Firms Survey 2010, we observe the share of businesses inherited, whereas interest rates earned on savings or paid on migrant loans are obtained from Mallick (2012) and Berg, Emran, and Shilpi (2013).

Beyond these elements, we estimate the structural parameters of the model by method of simulated moments, minimizing the distance between informative moments computed for a population of agents simulated from the model and the counterpart of these moments observed in the data. In total, we jointly estimate 52 parameters pertaining to the demand in each destination country for workers of a given education level (parameter vector $\boldsymbol{\varphi}$), agents' destination-education specific disutility from migration η_e^d, their initial stock of assets $A_{e,0}$, the share p_e^L who can finance migration on credit, as well as the cost C_e^I of setting up a business. The latter three sets of parameters are education-specific, and identified by having the model match the observed asset level, the fraction of migrants who reports having financed their migration on credit, and the self-employment share in our sample. The remaining parameters are identified by observed migration patterns. Note that the intensity and distribution of emigration from Bangladesh to different destination countries are affected

both by labor demand (the share λ_{et}^d of would-be migrants that obtains a work visa) and by agents' preferences η_e^d. To disentangle the two effects, we target both emigration shares and migration durations conditional on having migrated to a given destination. The disutility η_e^d from staying abroad determines both the emigration and the migration duration decision. The share λ_{et}^d in contrast primarily affects emigration, whereas the termination or expiration of work permits is observed directly and accounted for through δ_{it}^d. Motivated by Figure 1, we let λ_{et}^d vary with destination countries' fuel revenues. Under the assumption that the former are exogenous and that labor supply by Bangladeshi migrants always exceeds labor demand in destination countries, the relation between fuel revenues and migrant demand can be identified as an estimate of ψ in an estimating equation

$$\ln migrants_{dt} = \phi^d + \psi \ln fuelRevenues_{dt} + u_{dt}.$$

We thus feed a regression estimate of ψ into the structural model, and estimate intercepts ϕ_e^d for each migrant group by letting the model match the respective observed emigration rate. Together, $\boldsymbol{\varphi} = (\psi, \phi_1^{Malaysia}, ..., \phi_4^{UAE})$ parameterize λ_{et}^d, the probability of locating a foreign job. The parameters estimated are shown in Table 5.

Estimating a life-cycle model requires an assumption on agents' expectation about the paths for fuel revenues in destination countries over time. We thus fit quadratic trends to fuel revenues in the main destination countries over the period 2000-2017, and assume that agents' expectations are based on these trends.

[Table 5 here]

Figures A2-A4 in the Appendix show the model's fit for all moments targeted in the structural estimation. While all moments contribute jointly to the estimation of the model's parameters, the last column in Table 5, which lists the estimated parameter vector, indicates for each parameter the moment related most directly to its identification. Agents total initial stock of assets strongly varies by education level, ranging from around 8,000 USD (adjusted for purchasing power parities) for individuals without any secondary education to 20,000-30,000 USD PPP for higher skilled individuals. Note that these numbers include all property. Either are considerably lower than the ca. 20,000-40,000 USD PPP that is accumulated over time and measured by the time of the survey after individuals return from abroad. The investment cost required to become self-employed that is compatible with the self-employment rate in our data also varies by education level, starting at about 29,000 USD PPP. Finally, the table lists the disutilities η_e^d from migration, as well as the parameters ϕ_e^d determining the percentage of visa applications that is granted, each for different destinations

and by migrants' level of education. Translated into probabilities, the latter indicate that across education groups and destination countries, about XY percent of individuals who would like to migrate are able to do so.

7 Results

Our model links the decisions on whether, where, when and for how long to migrate to self-employment in the home country. Note that the model is flexible enough to not impose the direction of several effects. For instance, lower cost of migration makes migration more attractive. However, a larger migrant population may either decrease the number of entrepreneurs in Bangladesh or raise it as migrants return with a higher stock of assets that can be used to finance self-employment. These two opposite effects have been documented for the specific case of Bangladeshi agricultural workers in Malaysia within a government mediated migration program by Shrestha, Mobarak, and Sharif (2019). Similarly, higher earnings in a destination country raise the opportunity cost of returning sooner, while the faster accumulation of assets may open up improved economic opportunities back in the country of origin, making return migration more attractive. We use the estimated model to evaluate several policy relevant relationships pertaining to the conditions under which migration and self-employment are chosen.

An immediate effect of a change in the cost of migration relates to chosen emigration and migration durations. In our setting, the main constraint on emigration is the availability of work visas, and to a lesser extent by financial constraints, which often can be overcome by borrowing from official or unofficial lenders. Figure 11 shows the effects of lower migration costs on emigration over the life cycle. As financial constraints are most binding for young individuals, the effect is concentrated at young ages. In our dynamic model, migration costs, however not only affect emigration, but also the time migrants choose to stay abroad. Migration duration will—conditional on having their job contracts extended—be longer the higher the cost of migration, and in particular the higher the amount of debt that needs to be repaid.

For a reduction in the cost of migration, Panel B of Figure 11 accordingly shows a marked leftward shift in the distribution of years spent abroad, which is more pronounced for lower skilled migrants. The dashed line shows the distribution at baseline, whereas the other two line indicate the distribution when migration costs are reduced by half. We further distinguish by the behavioral response of those who already migrate under the baseline (dotted line) and the full effect that includes compositional changes. The figure shows that the reduction in migration duration is almost entirely driven by a behavioral change of

migrants. Shorter migration durations imply an earlier availability of repatriated assets and their owners for entrepreneurial activity in Bangladesh. Panel C of Figure 11 accordingly shows that the same cut in migration costs considered before raises the business creation rate, in particularly for younger individuals. This accumulates to a sizeable negative elasticity of the *stock* of entrepreneurs with respect to the cost of migration. Jointly, these effects contribute to a rise in consumption expenditure in Bangladesh over individuals' life cycle shown in Panel D Figure 11, as well as to a gain in life-time welfare for migrants by more than 0.7 standard deviations.

As mentioned, a major hurdle for Bangladeshis seeking employment abroad is the opportunity to obtain a foreign work visa. Correspondingly, an increase in foreign labor demand—for instance due to a boom in fuel revenues in some of the major destination countries for Bangladeshi migrants—has a strong effect on the emigration rate. The effect on migration duration, on the other hand, is unclear a priori, and primarily determined by the change in the composition of emigrants. In particular, as the desire to emigrate is highest among younger individuals, additional vacancies tend to be filled with younger migrants, who in turn tend to stay slightly longer. The upper left panel of Figure 12 illustrates the strong increase in the emigration rate and its bias towards younger individuals, whereas the upper right panel shows that the effect on migration duration in response to an expansion of foreign labor demand is rather small. Similar to the effects of a cut in the cost of migration, a rise in foreign labor demand has a positive effect on business creation in Bangladesh (bottom left panel of Figure 12), primarily due to the larger volume of repatriated assets from the additional migrants.

Importantly, there also is an effect of the conditions for self-employment on migration decisions. A development of credit markets for entrepreneurs mitigates emigration pressure. Figure 13 for instance shows that cutting the lending rate on loans to finance a business has several effects: first, it makes entrepreneurial activity a more affordable alternative to earning money abroad. On the other hand, knowing that self-employment is a realistic option, individuals who lack the necessary savings, have an incentive to temporarily move abroad to achieve the required stock of assets. Finally, conditional on migration, the lower cost of becoming self-employed (or the cost of credit) means that fewer foreign savings are needed, and thus the optimal migration duration is reduced. Whereas the first two effects offset approximately offset each other, the last causes a shift of the duration distribution towards shorter stays abroad.

Finally, we use the model to evaluate the effect of an information policy that aligns individuals' expectations about their earnings potential abroad with the actual mean earnings of Bangladeshi migrants we observe in the sample. The implied reduction in expected earn-

ings leads to a reduction in the emigration by 19 percent, a milder reduction in migration duration by about 6 percent, and through the reduced repatriation of migrant savings to a decline in the rate at which new businesses are created of 5.6 percent. Thus, whereas, individual welfare unambiguously benefits from the better choices agents can make under accurate information about foreign earnings, business creation is enhanced by individuals' exaggerate expectations (see Figure 15 and Figure 16).

8 Conclusion

Most papers in the migration literature focus on the wage and labor market gains during the migration episode. In contrast, our paper highlights the interdependence between workers' decisions at each stage of the life cycle, and the dynamic effects of temporary migration on workers' entire life cycle. While prior work usually focuses on the role played by economic conditions at destination in return decisions, our paper models the central role played by self-employment aspirations back home. In this setting, temporary migration plays a crucial role in asset accumulation which allows to overcome credit constraints to entrepreneurship back home. Our estimated model using a recently collected dataset from Bangladesh closely mimics patterns observed in the data. We are also able to estimate the effects of changes in policy parameters on the dynamic paths of workers. Our results highlight that changes in one parameter have consequences on a range of migration-related decisions and on workers' trajectories after returning home. Given the similarities of outmigration from Bangladesh with other migrant-sending countries, the findings of this paper are of relevance beyond the context of Bangladesh.

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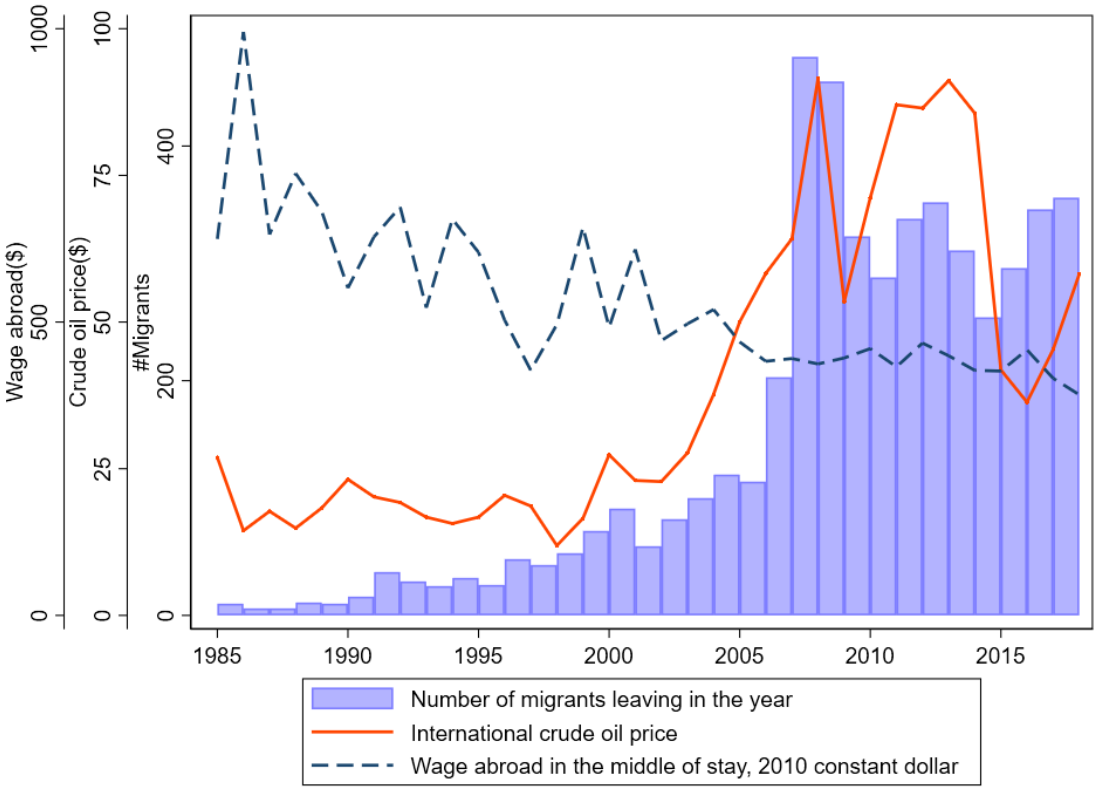
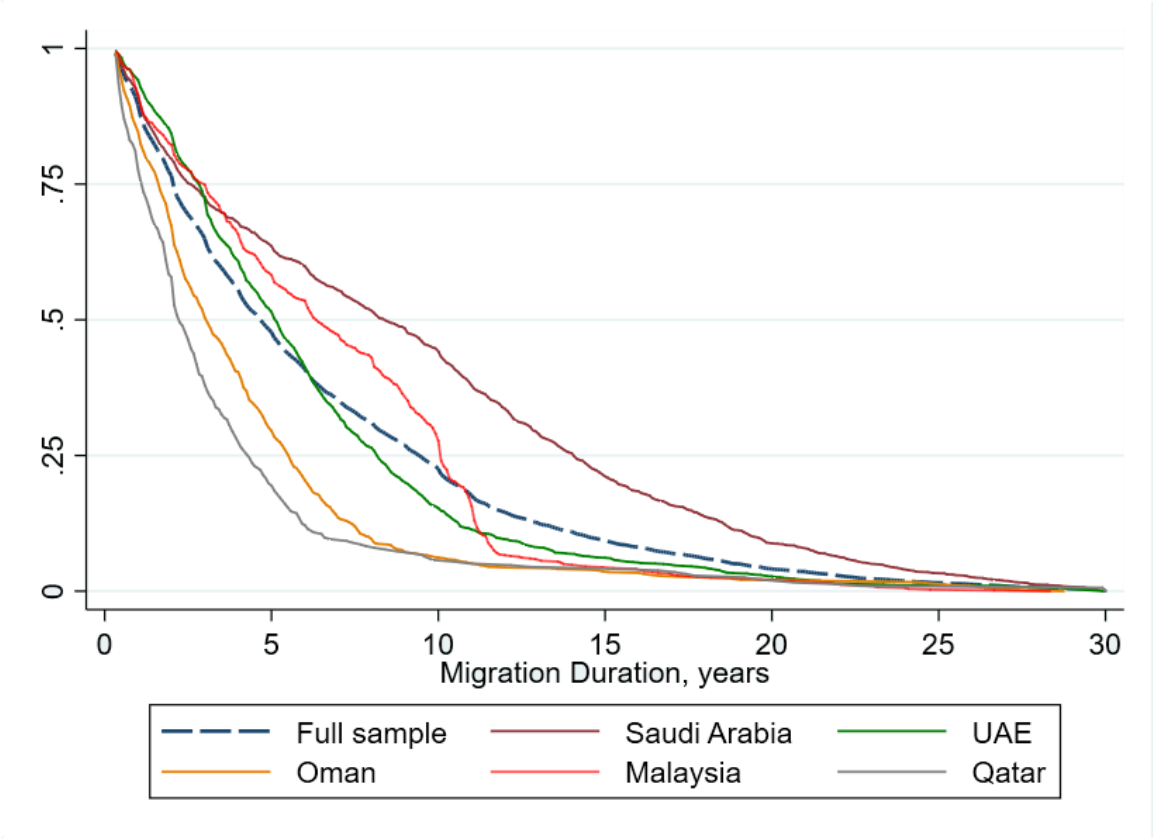
Figures

Figure 1: Migrants from Bangladesh and Oil Price



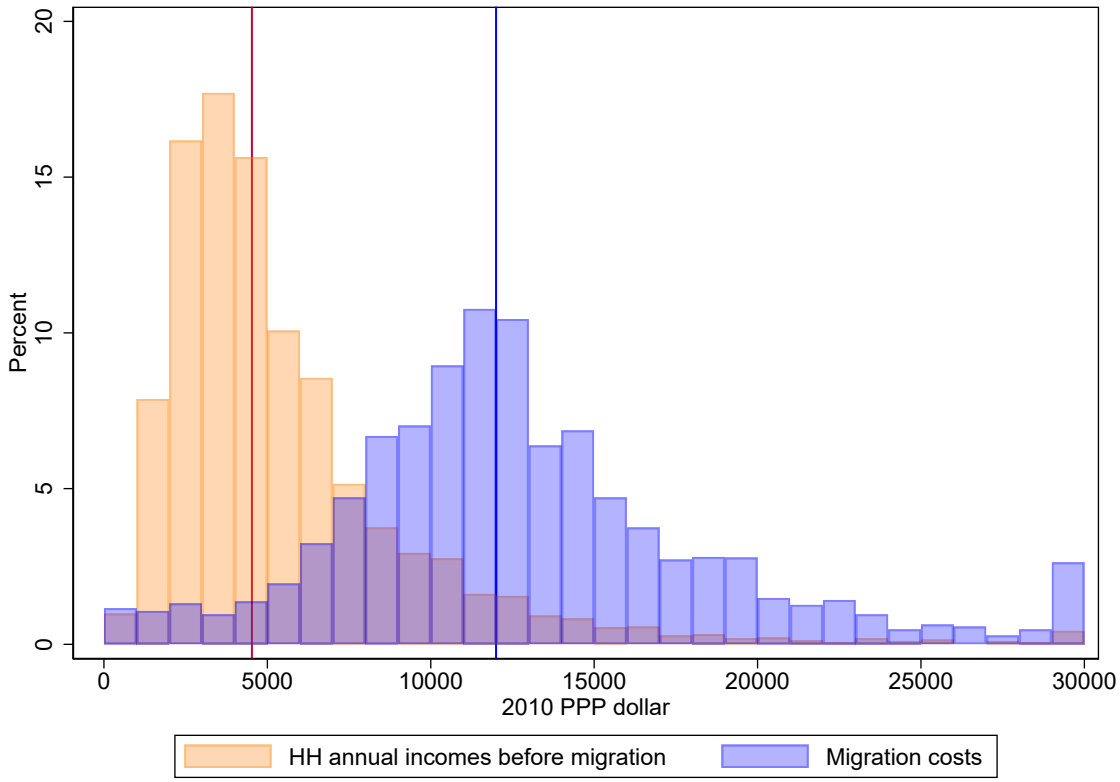
Source: Bangladesh Return Migrant Survey (BRMS)

Figure 2: Duration of stay of temporary migrants overseas



Source: Bangladesh Return Migrant Survey (BRMS)

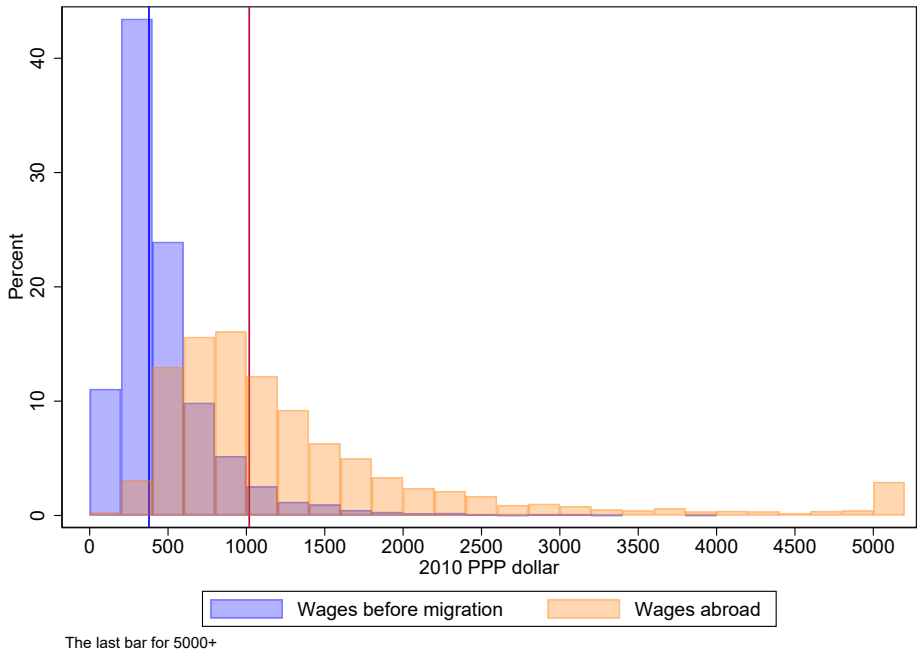
Figure 3: Temporary migration costs and annual household income before migration (in 2010 PPP adjusted USD)



Source: Bangladesh Return Migrant Survey (BRMS)

Figure 4: Labor earnings of temporary migrants (in 2010 PPP adjusted USD)

Panel A: in Bangladesh and abroad



Panel B: by destination

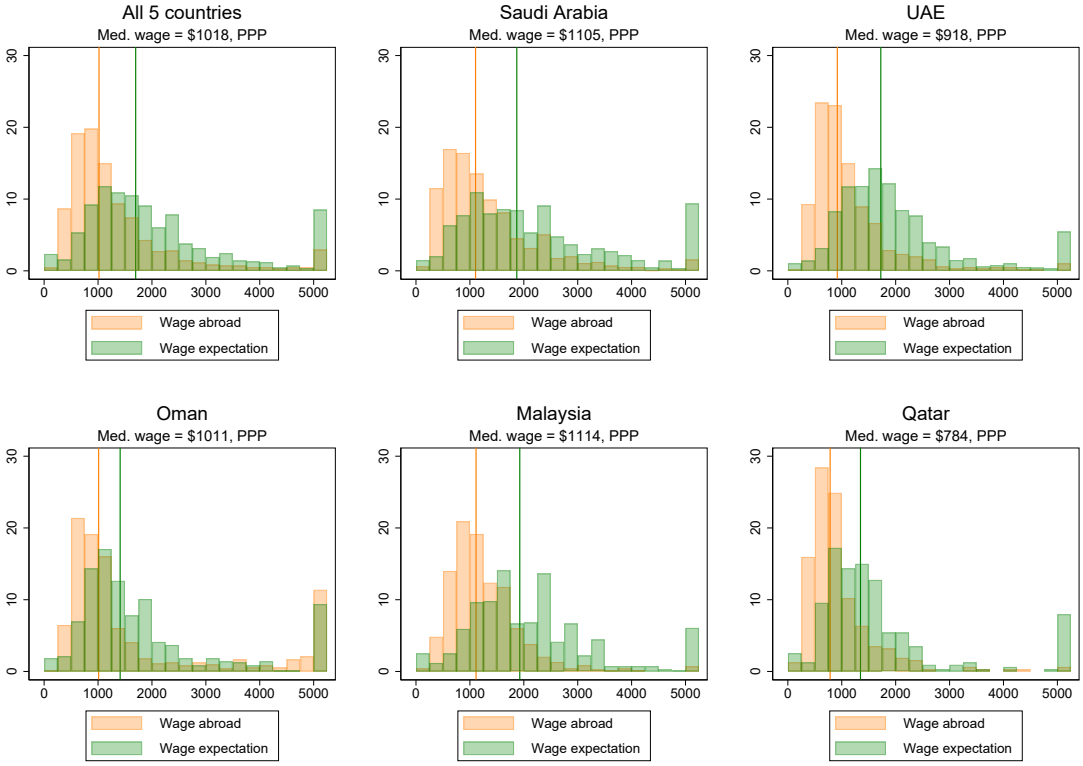
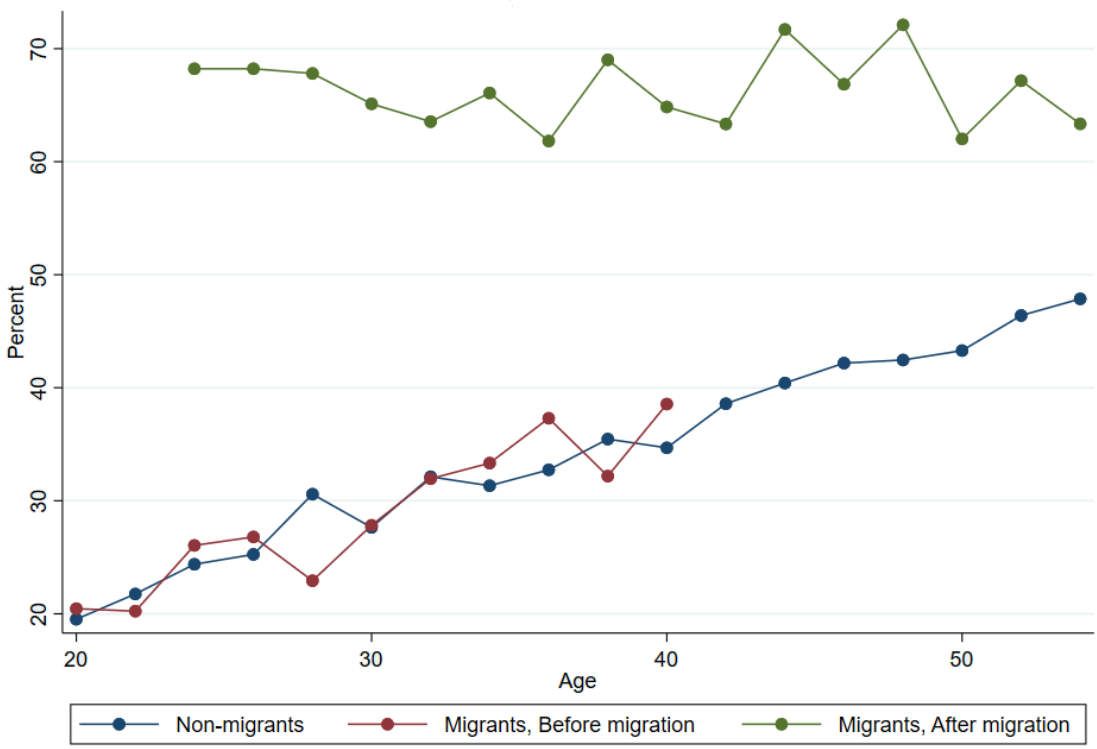
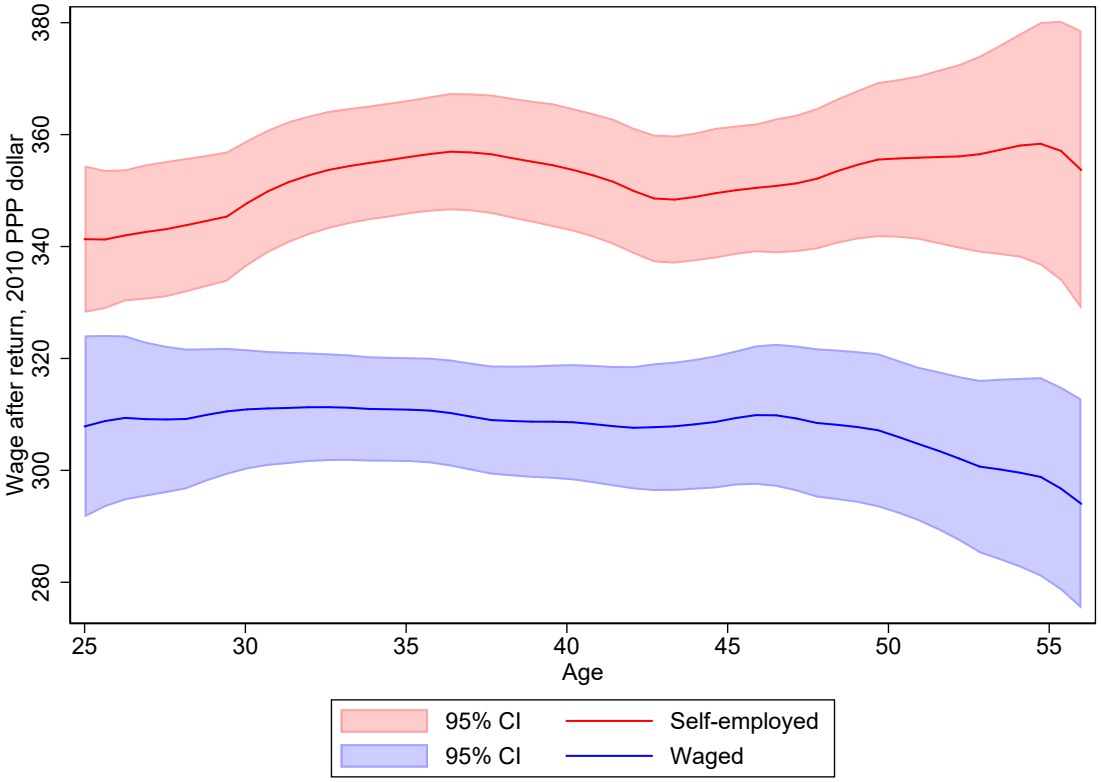


Figure 5: Share of self-employment (among employed) by age, by migration status



Sources: Bangladesh Return Migrant Survey (BRMS) for migrants; Household Income and Expenditure Survey (HIES) for non-migrants.

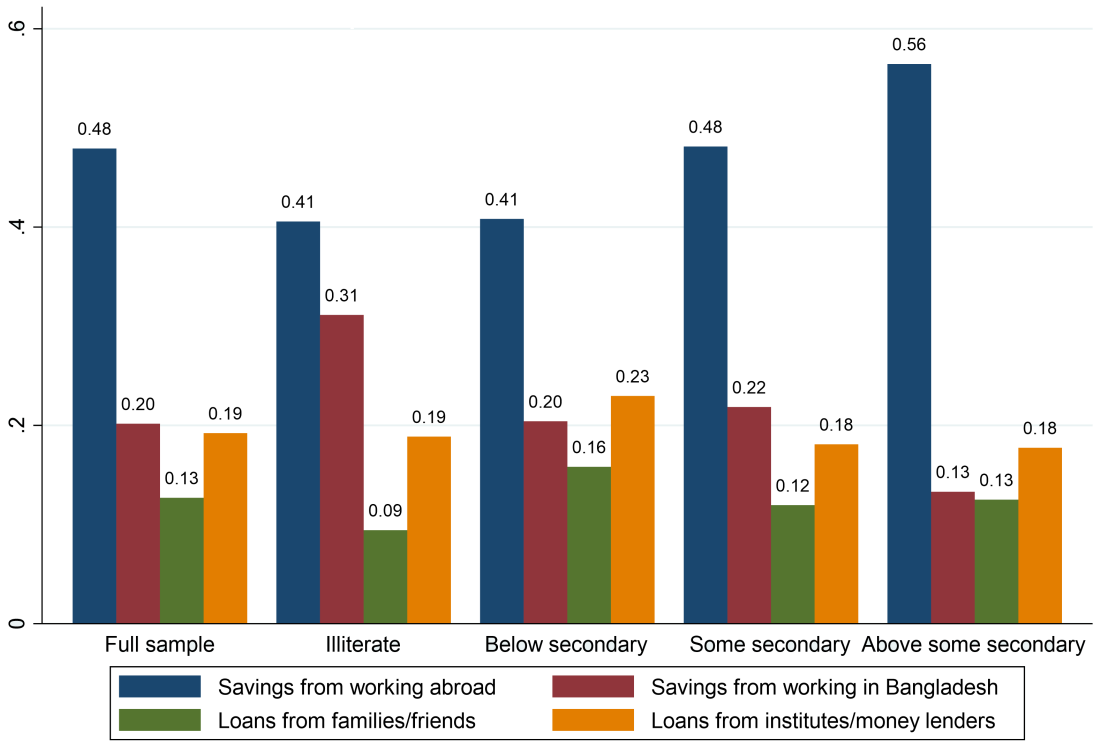
Figure 6: Earnings of workers after return, by type of employment



Source: Bangladesh Return Migrant Survey (BRMS).

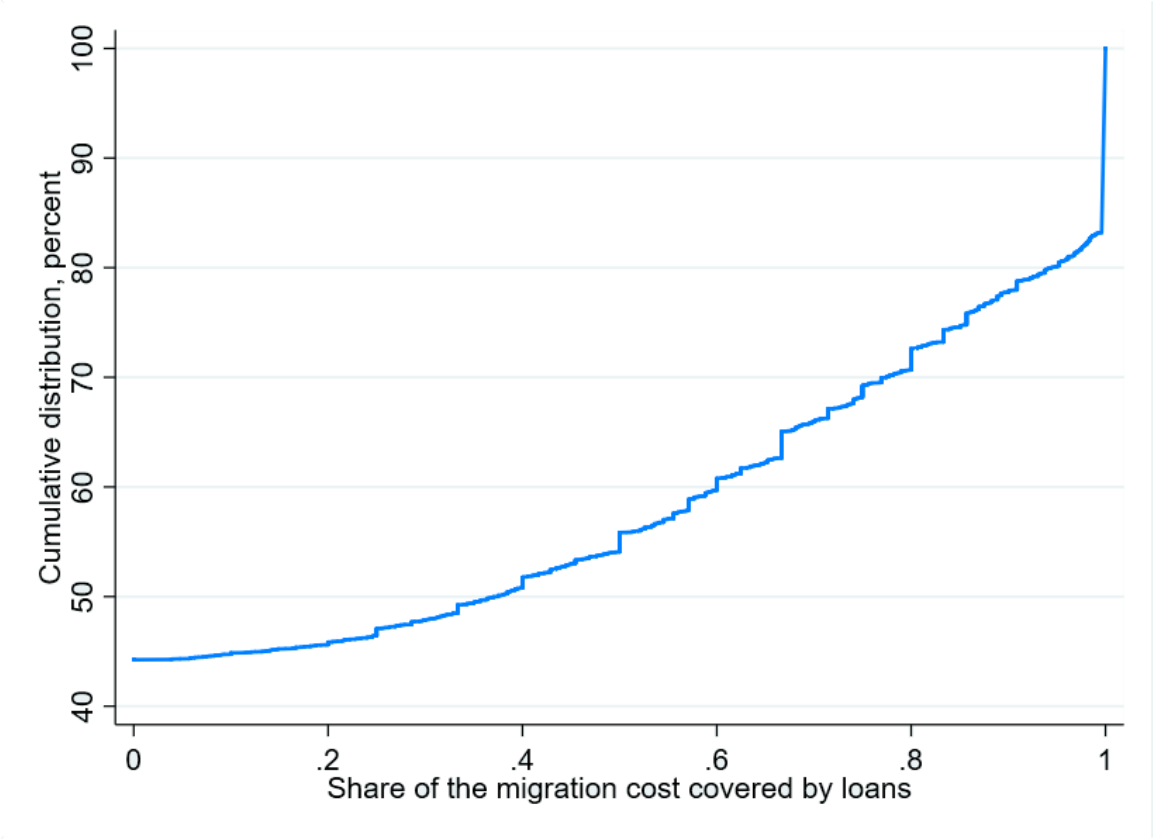
Note: The sample is restricted to males age 18-59.

Figure 7: Primary source of startup capital for self-employment



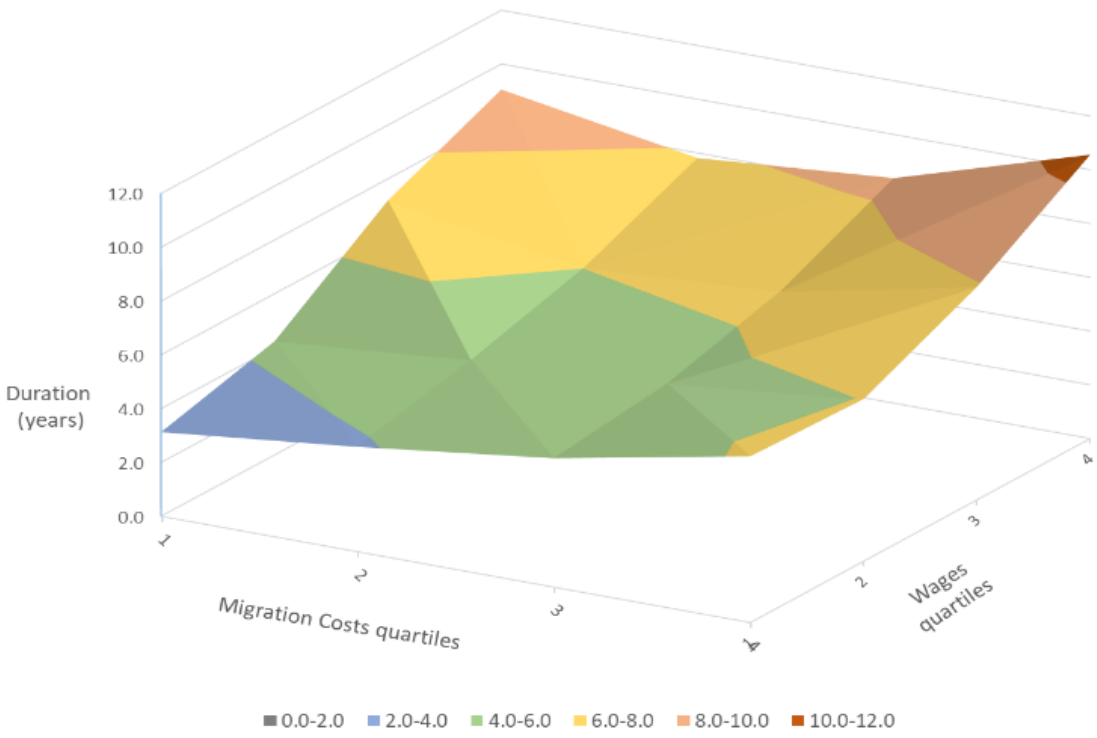
Source: Bangladesh Return Migrant Survey (BRMS)

Figure 8: Cumulative distribution of the share of total migration costs financed by a loan



Source: Bangladesh Return Migrant Survey (BRMS)

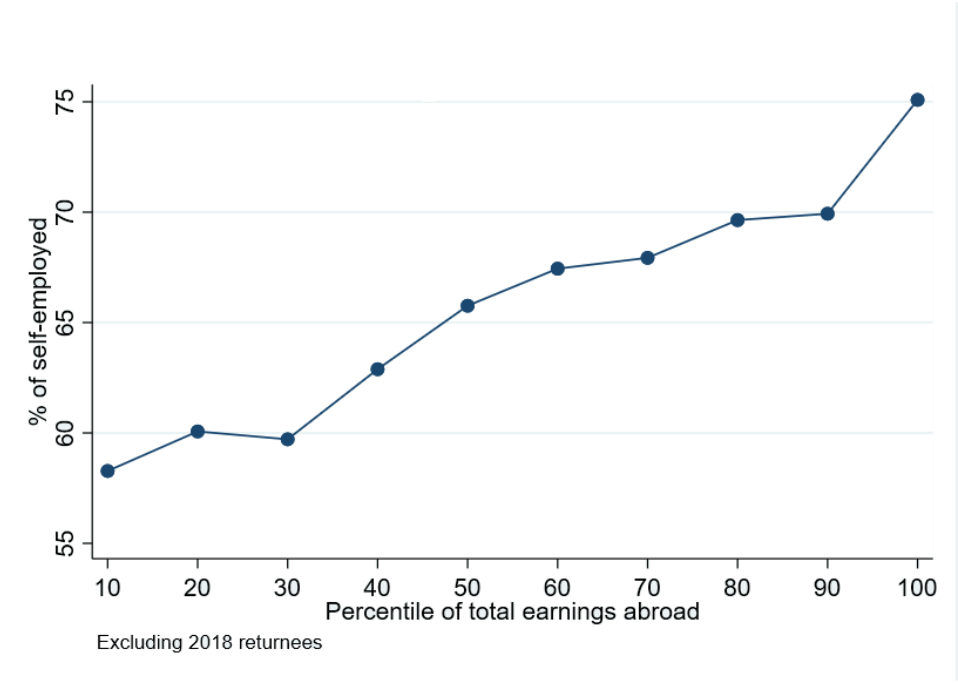
Figure 9: Duration of stay abroad by migration costs and wage abroad deciles



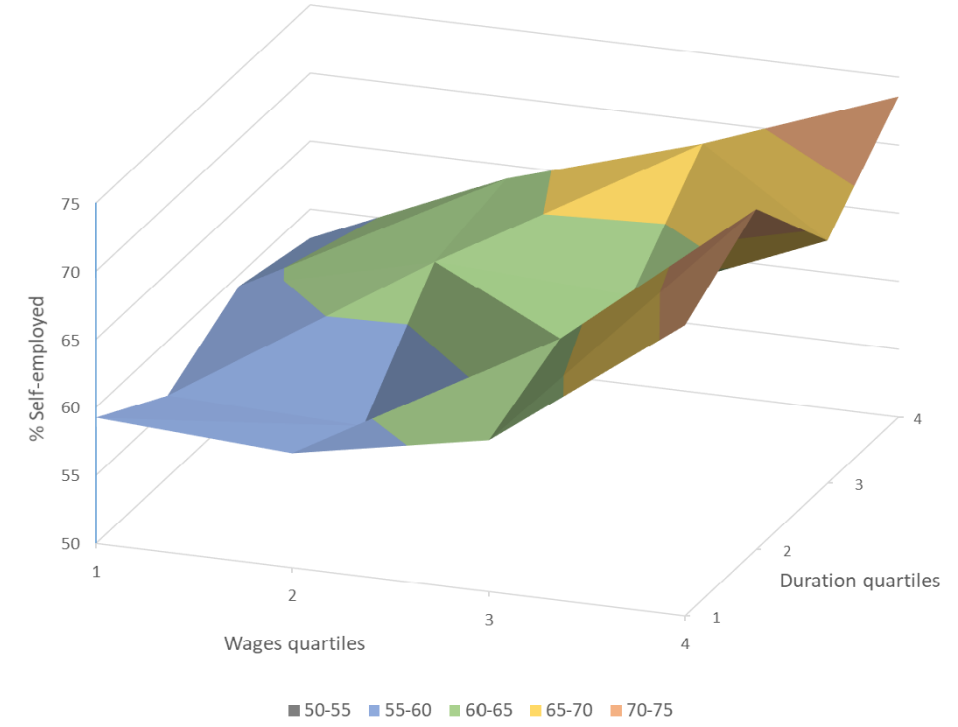
Source: Bangladesh Return Migrant Survey (BRMS)

Figure 10: Share of self-employment (among employed) of temporary migrants after return

Panel A. As a function of total earnings abroad (net of costs)



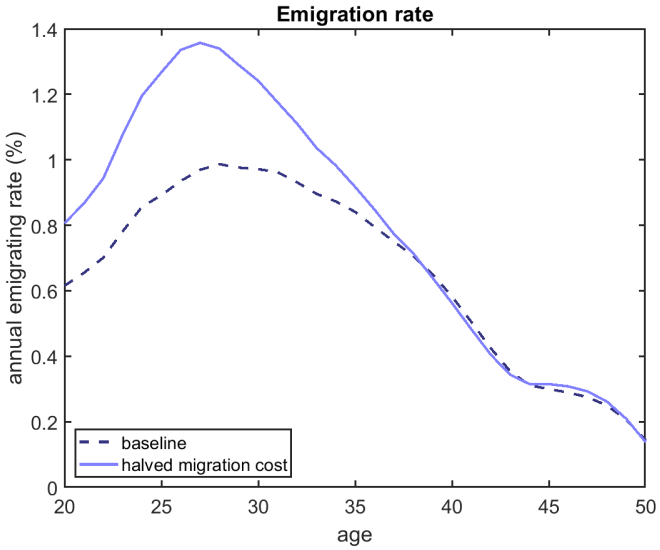
Panel B. As a function of monthly wage and duration of stay



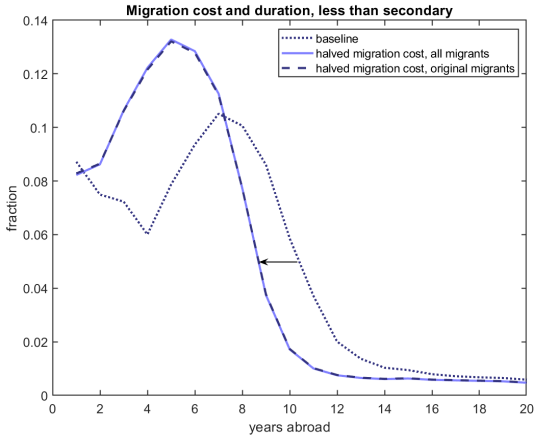
Source: Bangladesh Return Migrant Survey (BRMS)

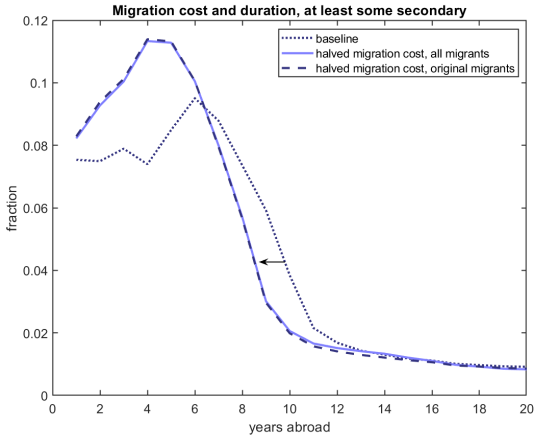
Figure 11: Simulated effects of a decrease in migration costs

Panel A

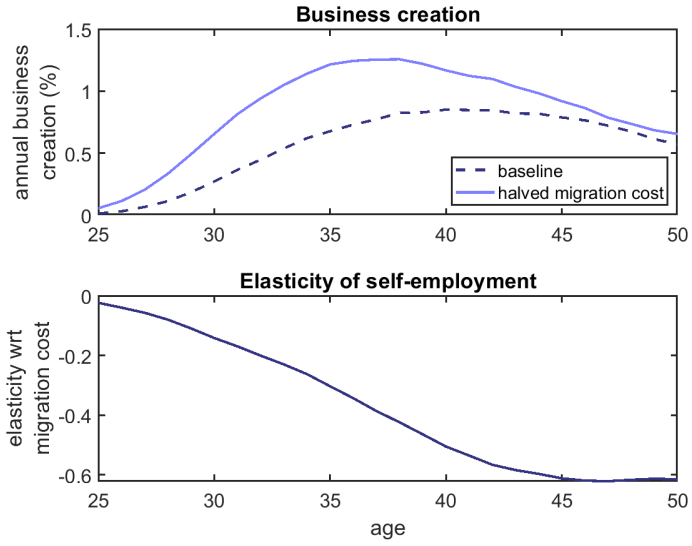


Panel B





Panel C



Panel D

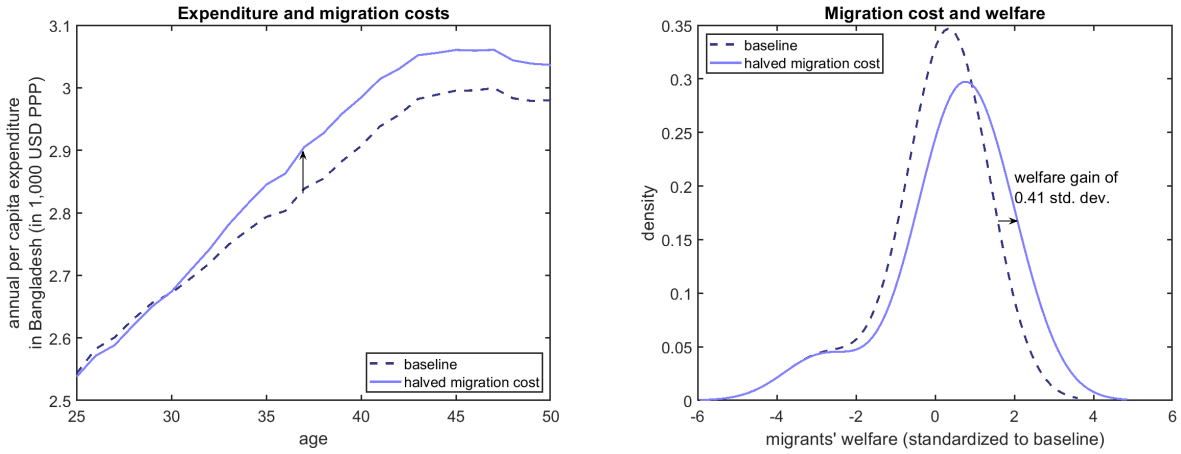


Figure 12: Simulated effects of an increase in labor demand in the main destinations

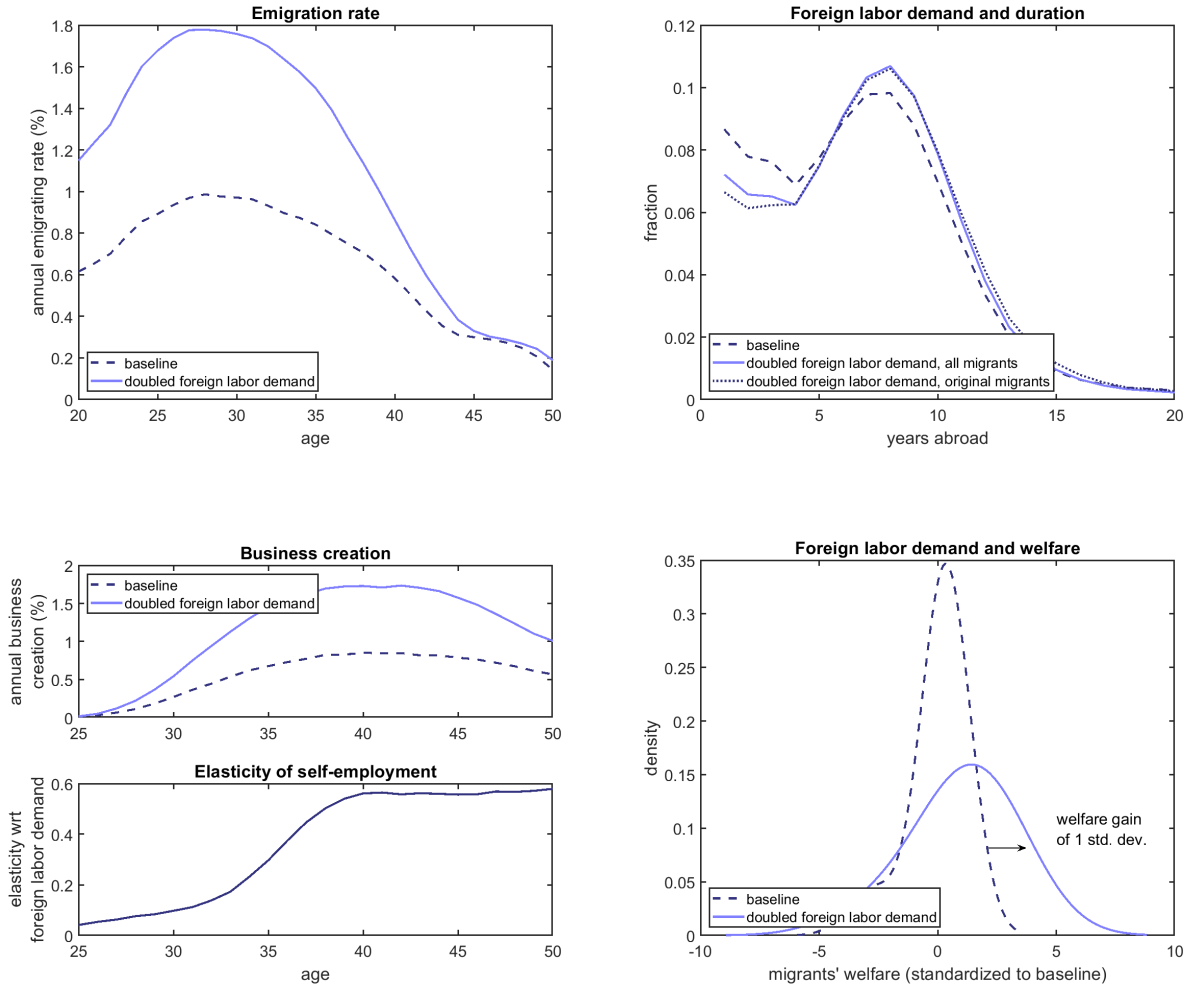


Figure 13: Simulated effects of a decrease in the lending rate for investments in Bangladesh

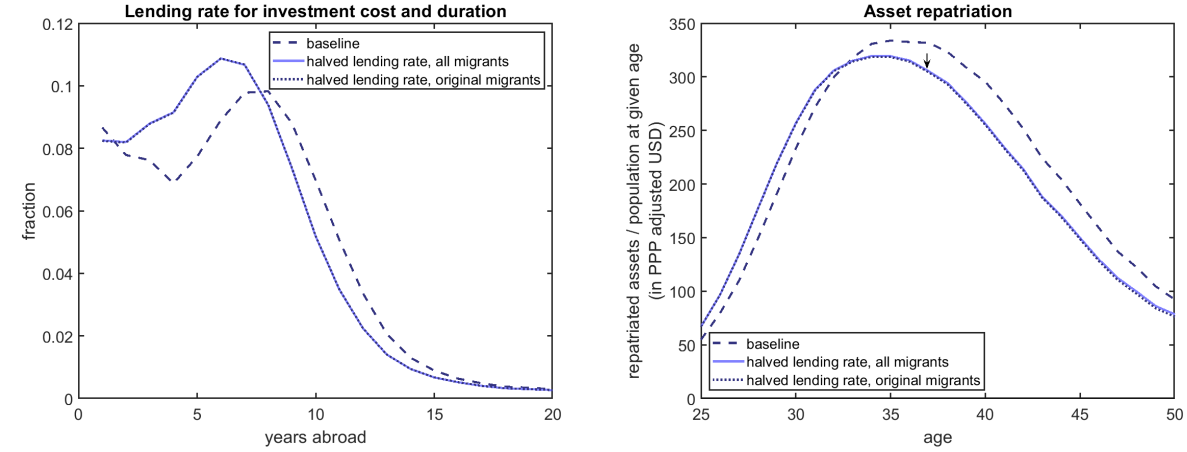


Figure 14: Simulated effects of a decrease in the lending rate for investments in Bangladesh

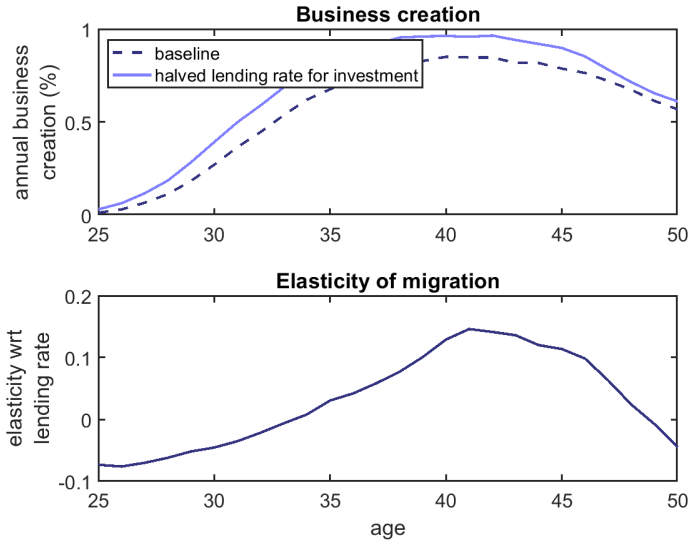


Figure 15: Simulated effects of correct expectations about earnings abroad

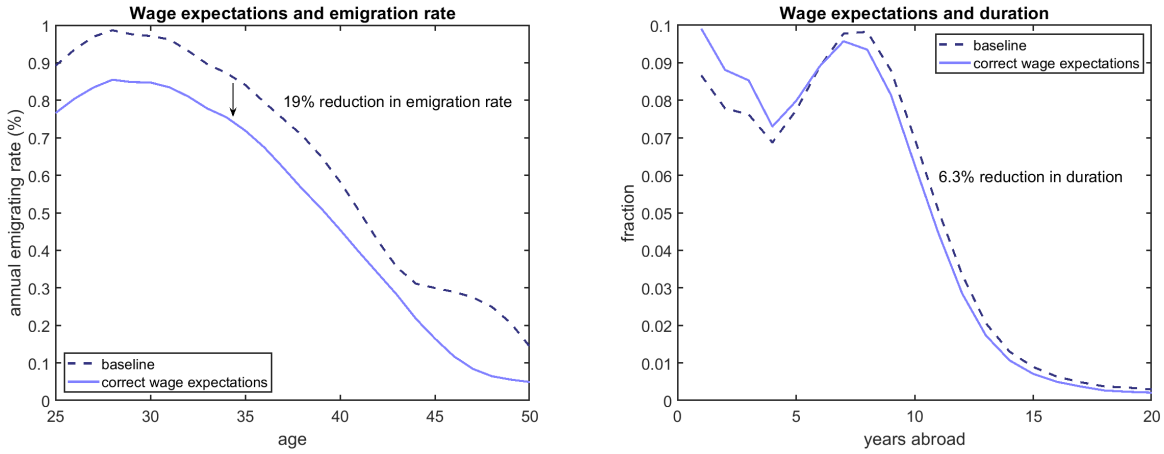


Figure 16: Simulated effects of correct expectations about earnings abroad

Table

Table 1: Summary statistics of returning migrants in the BRMS 2018/2019 sample

	Mean	Sd	p50	p25	p75
Socio-economic characteristics					
Male	0.96	0.20	1	1	1
Age	38.2	8.8	37.0	32.0	44.0
Age started working	27.7	6.2	27.0	23.0	32.0
Currently married	0.88	0.33	1	1	1
Illiterate	0.17	0.37	0	0	0
Below secondary (1-5)	0.24	0.43	0	0	0
Some secondary (6-9)	0.35	0.48	0	0	1
Above some secondary (10-15)	0.21	0.41	0	0	0
Tertiary (16+)	0.02	0.15	0	0	0
Years of schooling	6.45	4.01	7	4	9
Migration costs (2010 PPP dollar)					
Total costs	13,078	7,030	11,999	9,289	15,455
Intermediary fees	7,180	7,009	6,207	714.5	11,399
Visa & Passport	3,106	4,897	285.6	0	5,342
Government Fees	158.0	767.0	0	0	0
Other costs	2,340	4,486	845.5	0	2,368
Share of costs financed by borrowing	0.42	0.42	0.38	0	0.86
Stay abroad					
Share of migration to the Gulf	0.75	0.44	1	0	1
Share of migration to Southeast Asia	0.16	0.37	0	0	1
Share of migration to Other countries	0.09	0.29	0	0	0
Age at departure	28.8	7.4	27.0	23.0	33.0
Years of working experience at departure	1.8	5.3	0	0	0
Duration of stay at destination	6.54	5.93	4.71	2.08	9.50
Returned earlier than planned/contract term	0.46	0.50	0	0	1
After return					
Age at return	35.2	8.6	34.0	29.0	41.0
Number of years since return	2.68	2.64	2.00	0	5.00
Employment status and income (2010 PPP dollar)					
% employed, before departure	0.44	0.50	0	0	1
% self-employed among employed, before departure	0.29	0.46	0	0	1
% employed, after return*	0.82	0.38	1	1	1
% self-employed among employed, after return*	0.66	0.48	1	0	1
Income before departure, if employed	473.5	350.3	378.4	267.1	545.5
Income abroad	1,400.1	1,284.7	1,018.1	708.0	1,568.9
Income after return, if employed	339.1	132.0	320.9	267.4	401.1

Note: For full sample, observations 5,000. *At least one year since return.

Table 2: Self-employment and total earnings abroad, reduced-form specification

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample			Employed only		
	OLS	2SLS	First Stage	OLS	2SLS	First Stage
Dependent Var	Self-employed	Self-employed	ln(Earning)	Self-employed	Self-employed	ln(Earning)
ln(Cum. Earning abroad)	0.024***	0.117**		0.035***	0.133**	
	(0.009)	(0.052)		(0.010)	(0.056)	
Oil price growth × Oil rents/GDP			0.905***			0.884***
			(0.092)			(0.101)
Year of return FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin and destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
F value of the first stage		96.3			76.5	
Observations	2750	2750	2750	2288	2288	2288

Notes. Standard errors in parentheses. The sample is restricted to migrants who have returned from the top five destinations. Control variables include age and squared age at the time of survey, educational attainment, a dummy for self-employment prior to migration and education level dummies. Oil price growth is the ratio of oil price at the time of return over the one at the time of departure. * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Structural parameter estimates: Foreign labor demand parameters

Parameter	Point estimate	Standard error	Identifying moment
ϕ_1^M	-5.121	(1.523)	emigration to Malaysia, education level 1
ϕ_2^M	-4.204	(0.200)	emigration to Malaysia, education level 2
ϕ_3^M	-4.298	(0.108)	emigration to Malaysia, education level 3
ϕ_4^M	-4.581	(0.147)	emigration to Malaysia, education level 4
ϕ_1^O	-10.888	(0.125)	emigration to Oman, education level 1
ϕ_2^O	-9.669	(0.128)	emigration to Oman, education level 2
ϕ_3^O	-9.121	(0.008)	emigration to Oman, education level 3
ϕ_4^O	-9.952	(0.067)	emigration to Oman, education level 4
ϕ_1^Q	-5.128	(0.220)	emigration to Qatar, education level 1
ϕ_2^Q	-5.725	(0.041)	emigration to Qatar, education level 2
ϕ_3^Q	-4.616	(0.038)	emigration to Qatar, education level 3
ϕ_4^Q	-6.131	(0.097)	emigration to Qatar, education level 4
ϕ_1^{SA}	-3.808	(1.007)	emigration to Saudi-Arabia, educ. level 1
ϕ_2^{SA}	-4.761	(0.089)	emigration to Saudi-Arabia, educ. level 2
ϕ_3^{SA}	-5.179	(0.091)	emigration to Saudi-Arabia, educ. level 3
ϕ_4^{SA}	-5.244	(0.063)	emigration to Saudi-Arabia, educ. level 4
ϕ_1^{UAE}	-3.988	(0.124)	emigration to the UAE, education level 1
ϕ_2^{UAE}	-3.917	(0.093)	emigration to the UAE, education level 2
ϕ_3^{UAE}	-4.313	(0.018)	emigration to the UAE, education level 3
ϕ_4^{UAE}	-5.418	(0.264)	emigration to the UAE, education level 4

Asymptotic standard errors in parentheses; education levels 1-4 refer to illiterate, some primary, some secondary and high school degree, respectively.

Table 4: Structural parameter estimates: Preference parameters

Parameter	Point estimate	Standard error	Identifying moment
η_1^M	-8.873	(0.800)	mean years in Malaysia, education level 1
η_2^M	-7.829	(0.069)	mean years in Malaysia, education level 2
η_3^M	-7.191	(0.011)	mean years in Malaysia, education level 3
η_4^M	-7.755	(0.014)	mean years in Malaysia, education level 4
η_1^O	-9.174	(0.481)	mean years in Oman, education level 1
η_2^O	-7.020	(0.657)	mean years in Oman, education level 2
η_3^O	-3.318	(0.018)	mean years in Oman, education level 3
η_4^O	-7.080	(0.212)	mean years in Oman, education level 4
η_1^Q	-9.134	(0.095)	mean years in Qatar, education level 1
η_2^Q	-8.639	(0.235)	mean years in Qatar, education level 2
η_3^Q	-8.785	(0.022)	mean years in Qatar, education level 3
η_4^Q	-8.884	(0.095)	mean years in Qatar, education level 4
η_1^{SA}	-12.129	(0.025)	mean years in Saudi-Arabia, educ. level 1
η_2^{SA}	-11.210	(0.085)	mean years in Saudi-Arabia, educ. level 2
η_3^{SA}	-10.967	(0.020)	mean years in Saudi-Arabia, educ. level 3
η_4^{SA}	-11.417	(0.017)	mean years in Saudi-Arabia, educ. level 4
η_1^{UAE}	-11.795	(0.137)	mean years in the UAE, education level 1
η_2^{UAE}	-9.789	(0.032)	mean years in the UAE, education level 2
η_3^{UAE}	-9.462	(0.013)	mean years in the UAE, education level 3
η_4^{UAE}	-10.114	(0.043)	mean years in the UAE, education level 4

Asymptotic standard errors in parentheses; education levels 1-4 refer to illiterate, some primary, some secondary and high school degree, respectively.

Table 5: Structural parameter estimates: Initial stock of assets, investment costs and credit access parameters

Parameter	Point estimate	Standard error	Identifying moment
C_1^I	5.558	(0.148)	share self-employed, education level 1
C_2^I	6.790	(0.102)	share self-employed, education level 2
C_3^I	7.671	(0.041)	share self-employed, education level 3
C_4^I	10.069	(0.106)	share self-employed, education level 4
A_1^0	32.078	(0.177)	stock of assets, education level 1
A_2^0	31.963	(0.382)	stock of assets, education level 2
A_3^0	33.103	(0.013)	stock of assets, education level 3
A_4^0	31.813	(0.083)	stock of assets, education level 4
p_1^L	0.541	(0.176)	share borrowing, education level 1
p_2^L	0.568	(0.046)	share borrowing, education level 2
p_3^L	0.606	(0.015)	share borrowing, education level 3
p_4^L	0.982	(0.016)	share borrowing, education level 4

Asymptotic standard errors in parentheses; education levels 1-4 refer to illiterate, some primary, some secondary and high school degree, respectively.

Appendix

A Reduced form specification: self-employment and the cumulative earnings during migration

We use an instrument variable approach to estimate the reduced-form equation. The second-stage specification reads as:

$$SelfEmp_{idot} = \beta \ln(Cum.Earning_{idot}) + X'_{it}\theta + \gamma_o + \delta_d + \eta_t + u_{idot}$$

The dependent variable is whether individual i from division o becomes self-employed after returning from country d in year t. The main explanatory variable, cumulative earnings during stay abroad, is the wage rate in the destination country multiplied with the duration of stay abroad. The earnings is in the unit of PPP Bangladesh Takas. Thus,

$$Cum.Earning_{idot} = Wage_{idot} \times Duration_{idot} \times x_{dt}$$

where x_{dt} is the PPP rate of foreign currency over Bangladeshis Takas. X_{it} is a vector of control variables, including age and age squared at the time of survey, a dummy for self-employment before migration, education level dummies. γ_o, δ_d and η_t represent origin division fixed effects, destination countries fixed effects and year of return fixed effects, respectively.

The explanatory variable, cumulative earnings abroad, is instrumented by of the oil price growth at the time of return interacted with the oil GDP dependency of the destination country. The oil price growth is the ratio of oil price when an individual returns over the one when the individual migrates. Oil GDP dependency is measured by the mean of the annual oil rent over GDP in destination for all years from 1996 to 2017.

Thus the first stage is:

$$\ln(Cum.Earning_{idot}) = \alpha OilGrowth_t \times OilGDP_d + X'_{it}\phi + \gamma_o + \delta_d + \eta_t + v_{dot}$$

To be consistent with the structural estimation, we restrict the sample to migrants returning from the top 5 destination countries in the BRMS for all the reduced-form regressions. In addition, we exclude 2018 returnees, because it takes time for people to find a job or start up a business after return. Indeed, the employment rate for 2018 returnees is low, around 30%. In addition, we run regressions on the sample with unemployed individuals and on the sample of working individuals respectively.

B Other figures and tables

‘

Figure A1: Share of self-employed workers in Bangladesh and global oil prices

Source: Bangladesh Labor Force Surveys 1999-2017.

Note: The sample is restricted to non-migrant males age 18-59 who are employed in rural or semi-urban areas of Bangladesh.

Figure A2: Model fit for emigration rates by destination and education

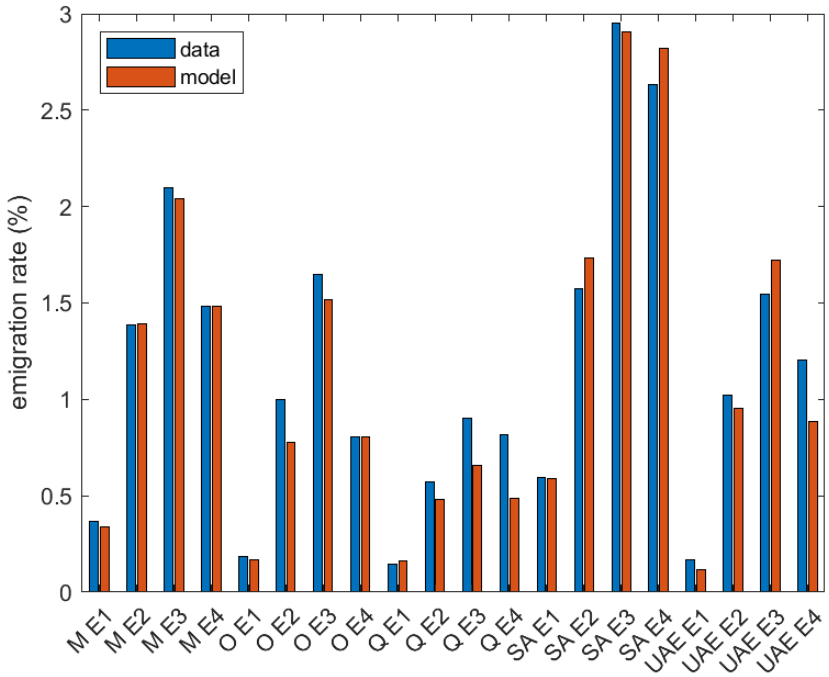


Figure A3: Model fit for migration duration by destination and education level

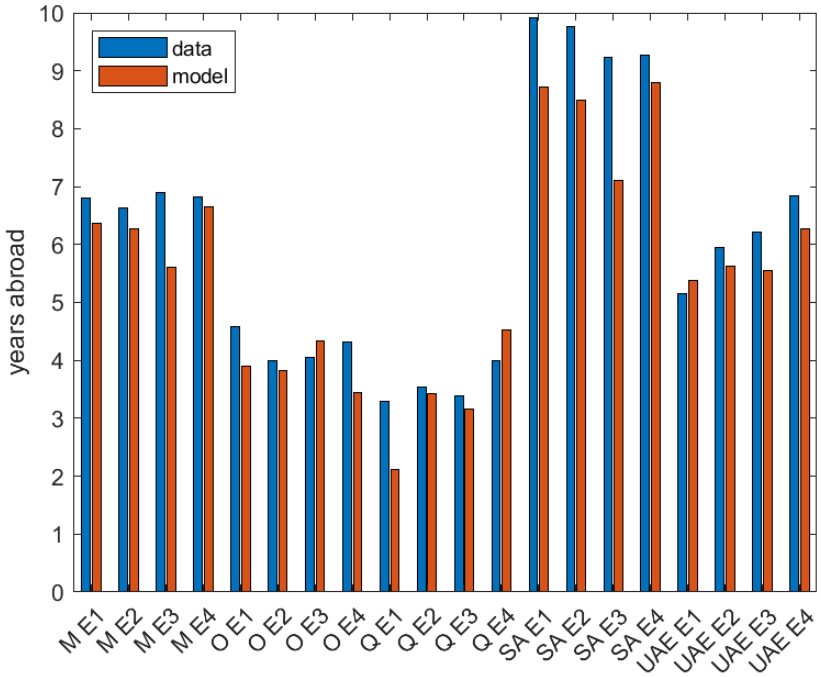


Figure A4: Model fit for self-employment, asset level and borrowing by education level

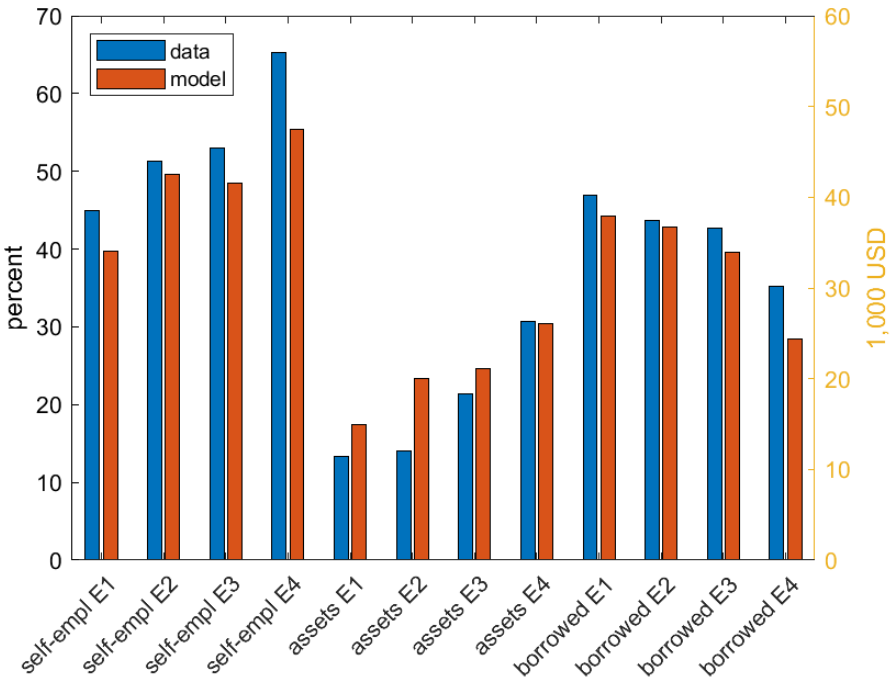


Table A1: Sample comparison of the HIES 2016/17 and the BRMS 2018/19, males age 18-59)

	HIES non-migrants		HIES current migrants		HIES return migrants		RMS retrun migrants	
	N	Mean	N	Mean	N	Mean	N	Mean
Male (among all age 18-59)	98,856	0.47	3,703	0.97	1,773	0.75	4,910	0.96
Rural/Semi-urban	46,937	0.92			1,328	0.93	4,709	0.99
Age category								
18-24	46,937	0.21	3,571	0.15	1,328	0.13	4,709	0.03
25-34	46,937	0.29	3,571	0.39	1,328	0.31	4,709	0.35
35-44	46,937	0.25	3,571	0.32	1,328	0.30	4,709	0.39
45-54	46,937	0.18	3,571	0.12	1,328	0.20	4,709	0.20
55-59	46,937	0.07	3,571	0.02	1,328	0.06	4,709	0.03
Age	46,937	35.2	3,571	33.9	1,328	36.4	4,709	37.9
Education								
Illiterate	46,786	0.30	3,563	0.07	1,322	0.19	4,709	0.16
Below secondary (1-5)	46,786	0.25	3,563	0.26	1,322	0.23	4,709	0.24
Some secondary (6-9)	46,786	0.21	3,563	0.39	1,322	0.32	4,709	0.36
Above some secondary (10-15)	46,786	0.18	3,563	0.25	1,322	0.21	4,709	0.22
Tertiary (16+)	46,786	0.06	3,563	0.02	1,322	0.05	4,709	0.02
Years of education	46,786	5.62	3,563	7.27	1,322	6.58	4,709	6.54
Employment status								
Self-employed	46,937	0.26			1,328	0.25	3,333	0.54
Waged worker	46,937	0.58			1,328	0.48	3,333	0.29
Not working	46,937	0.16			1,328	0.27	3,333	0.17
Income, current BDT	27,851	10,932			623	13,518	3,151	12,691
Income, 2010 PPP dollar	27,851	325.8			623	402.9	3,151	339.3

Table A2: Self-employment and total earnings abroad, excluding the transportation sector

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample			Employed only		
	OLS	2SLS	First Stage	OLS	2SLS	First Stage
Dependent Var	Self-employed	Self-employed	ln(Earning)	Self-employed	Self-employed	ln(Earning)
ln(Cum. Earning abroad)	0.024***	0.125**		0.032***	0.138**	
	(0.010)	(0.054)		(0.011)	(0.059)	
Oil price growth × Oil rents/GDP			0.917***			0.897***
			(0.096)			(0.106)
Year of return FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin and destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
F value of the first stage		90.9			71.3	
Observations	2465	2465	2465	2003	2003	2003

Notes. Standard errors in parentheses. The sample is restricted to migrants who have returned from the top five destinations. Control variables include age and squared age at the time of survey, educational attainment, a dummy for self-employment prior to migration and education level dummies. Oil price growth is the ratio of oil price at the time of return over the one at the time of departure. * p<0.10, ** p<0.05, *** p<0.01.

Table A3: Moments to fit in the model

Moments	Country	By education level			
		Illiterate	Below secondary	Some secondary	Above Secondary
%Self-employed after return		0.4500	0.5126	0.5294	0.6532
Assets at the time of survey (2018PPP$)		24,822	24,446	35,237	50,068
Duration in the destination	M	6.807	6.629	6.900	6.824
Duration in the destination	O	4.592	4.000	4.060	4.310
Duration in the destination	Q	3.293	3.531	3.383	3.992
Duration in the destination	SA	9.919	9.768	9.233	9.266
Duration in the destination	UAE	5.150	5.950	6.220	6.839
%Emigrants to the destination	M	0.0037	0.0139	0.0210	0.0148
%Emigrants to the destination	O	0.0019	0.0100	0.0165	0.0081
%Emigrants to the destination	Q	0.0015	0.0057	0.0090	0.0082
%Emigrants to the destination	SA	0.0060	0.0157	0.0295	0.0263
%Emigrants to the destination	UAE	0.0017	0.0102	0.0154	0.0120

Notes: The percentage of migrants to a given destination is from the HIES 2016-2017; Duration in the destination, the percentage of self-employed after return and assets at the time of survey is from the BRMS."Below secondary" is 1-5 years of schooling, "Some secondary" is 6-9 years of schooling and "Above secondary" is 10-15 years of schooling but excluding college and above. M stands for Malaysia, O for Oman, Q for Qatar, SA for Saudi Arabia, and UAE for United Arab Emirates.

Table A4: Auxiliary regressions for the model

Dependent variable	Country	Coefficient in the regression						SD of residuals
		Constant	Age	Below secondary	Some secondary	Above secondary	Duration	
ln(self-employment income)	B	8.395	0.0009	0.0130	0.0292	0.0269		0.335
ln(waged income)	B	8.215	0.0015	0.0378	0.0748	0.1080		0.312
ln(wage abroad)	M	9.635	-0.0056	-0.0508	-0.1130	-0.0683		0.491
ln(wage abroad)	O	9.385	0.0088	-0.0479	0.0433	-0.0370		0.805
ln(wage abroad)	Q	8.635	0.0146	0.2350	0.1320	0.2860		0.506
ln(wage abroad)	SA	9.085	0.0035	0.1660	0.1970	0.3230		0.603
ln(wage abroad)	UAE	9.085	0.0048	0.0580	0.1250	0.2920		0.509
ln(wage expectation)	M	9.635	0.0158	0.0250	-0.0946	0.0308		0.844
ln(wage expectation)	O	9.605	0.0088	-0.0209	0.0413	0.1780		0.847
ln(wage expectation)	Q	8.965	0.0204	0.0516	0.4410	0.3080		0.915
ln(wage expectation)	SA	9.235	0.0191	0.1780	0.3010	0.3720		0.783
ln(wage expectation)	UAE	9.435	0.0175	0.0560	0.1150	0.2460		0.706
ln(migration costs)	M	9.695	-0.0095	0.0048	0.0247	0.0248		
ln(migration costs)	O	9.545	-0.0043	0.0007	0.0035	-0.0099		
ln(migration costs)	Q	9.205	0.0026	0.1120	0.2640	0.2040		
ln(migration costs)	SA	9.955	-0.0096	0.0516	0.0008	0.0155		
ln(migration costs)	UAE	9.685	-0.0045	-0.0300	0.0281	-0.0213		
forced return	M	-2.464	0.0146	0.0788	0.1120	-0.0007	0.0022	
forced return	O	-1.900	0.0156	-0.0136	-0.0260	-0.0226	-0.0321	
forced return	Q	-1.674	0.0112	-0.0099	0.1010	-0.0209	-0.0365	
forced return	SA	-3.019	0.0268	0.1040	0.2870	0.2780	-0.0186	
forced return	UAE	-2.400	0.0191	0.0092	0.0137	0.0129	-0.0114	

Notes: Incomes are annual. All monetary variables are converted into 2018 PPP adjusted dollar. Age in the regressions of self-employment and waged incomes in Bangladesh is the age in 2018; age in the regressions of wages abroad, wage expectation and forced return is the age at the year of return; age in the regressions of migration costs is the age at departure. "Below secondary" is 1-5 years of schooling, "Some secondary" is 6-9 years of schooling and "Above secondary" is 10-15 years of schooling but excluding college and above. M stands for Malaysia, O for Oman, Q for Qatar, SA for Saudi Arabia, and UAE for United Arab Emirates.

Table A5: Other parameters in the model

Parameters	Country	Value
Price level relative to Bangladesh	M	1.62
Price level relative to Bangladesh	O	1.66
Price level relative to Bangladesh	Q	2.30
Price level relative to Bangladesh	SA	1.52
Price level relative to Bangladesh	UAE	2.31
Saving rate	M	0.347
Saving rate	O	0.289
Saving rate	Q	0.303
Saving rate	SA	0.354
Saving rate	UAE	0.384
Saving rate	B	0.114
interest rate of savings	B	0.05
interest rate of loans for migration	B	0.20

Notes: Relative price level is the ratio of nominal exchange rate and PPP rate between destination country and Bangladesh in 2012, from World Bank Development database. Saving rate in destination countries is the share of remittance and cash taken back to home over total earnings abroad, from RMS. Saving rate in Bangladesh is 1 less the share of household consumption expenditures over household incomes, from HIES. Interest rate of savings and loans is from literature. M for Malaysia, O for Oman, Q for Qatar, SA for Saudi Aribia, and UAE for United Arab Emirates.

Table A6: Joint distribution of education and age

Age	Illiterate	Below secondary	Some secondary	Above Secondary
18	0.0050	0.0116	0.0116	0.0184
19	0.0021	0.0061	0.0059	0.0122
20	0.0033	0.0083	0.0072	0.0129
21	0.0024	0.0047	0.0047	0.0085
22	0.0045	0.0108	0.0101	0.0120
23	0.0026	0.0058	0.0059	0.0072
24	0.0028	0.0072	0.0082	0.0057
25	0.0074	0.0116	0.0116	0.0071
26	0.0056	0.0102	0.0101	0.0054
27	0.0044	0.0074	0.0078	0.0046
28	0.0076	0.0134	0.0108	0.0078
29	0.0040	0.0062	0.0056	0.0038
30	0.0111	0.0130	0.0133	0.0074
31	0.0052	0.0063	0.0065	0.0028
32	0.0107	0.0119	0.0107	0.0060
33	0.0056	0.0060	0.0048	0.0041
34	0.0056	0.0051	0.0058	0.0028
35	0.0170	0.0147	0.0129	0.0087
36	0.0106	0.0085	0.0070	0.0050
37	0.0067	0.0046	0.0039	0.0025
38	0.0091	0.0070	0.0067	0.0047
39	0.0054	0.0038	0.0031	0.0022
40	0.0149	0.0093	0.0075	0.0041
41	0.0068	0.0050	0.0039	0.0019
42	0.0113	0.0073	0.0051	0.0046
43	0.0064	0.0028	0.0025	0.0018
44	0.0061	0.0031	0.0021	0.0012
45	0.0159	0.0093	0.0065	0.0045
46	0.0096	0.0052	0.0035	0.0021
47	0.0062	0.0029	0.0029	0.0016
48	0.0091	0.0040	0.0034	0.0024
49	0.0049	0.0025	0.0022	0.0011
50	0.0140	0.0060	0.0041	0.0029
51	0.0069	0.0024	0.0019	0.0013
52	0.0086	0.0046	0.0031	0.0027
53	0.0047	0.0018	0.0019	0.0010
54	0.0053	0.0020	0.0013	0.0013
55	0.0125	0.0059	0.0043	0.0024
56	0.0073	0.0035	0.0022	0.0015
57	0.0042	0.0019	0.0016	0.0009
58	0.0053	0.0025	0.0020	0.0014
59	0.0036	0.0016	0.0012	0.0008

Notes: Data source is the HIES 2016-2017. All cells add up to 1. "Below secondary", "Some secondary" and "Above secondary" are 1-5, 6-9, and 10-15 years of schooling respectively.