UNIVERSITÉ CLERMONT AUVERGNE

Ecole Doctorale des Sciences Economiques, Juridiques, Politiques et de gestion
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Sujet de la thèse:

Women Empowerment, Economic Welfare and Gender Differences in Education Attainment in Pakistan

Thèse présentée et soutenue publiquement le 28 June 2021
pour l'obtention du titre de Docteur en Sciences Economiques

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To My Beloved Pakistan.

To My Beloved Parents.

To My Beloved Brothers and Sisters.

ACKNOWLEDGMENT

I would like to express my appreciations to all the people who made this thesis possible. First of all, I am greatly indebted to my thesis supervisor, Professor Théophile T. AZOMAHOU. Not only his kindness, availability, and continuous support made it possible, but also his invaluable guidance and encouragement made it easy for me to achieve this research work. I extend my deepest gratitude to the esteemed members of the jury, Professor Pierre MOHNEN, Professor Kim PHAM, Professor Eleni YITBAREK, Professor Jean François BRUN, and Professor Pascale COMBES-MOTEL for their precious time they paid to my research and for agreeing to participate in its evaluation.

I would like to thank Pakistan Bureau of Statistics for providing data facilities used in this research. I would also like to thank the director of the lab, Gregoire ROTA-GRAZIOSI for his support, Professor Martine AUDIBERT and Professor Sonia SCHWARTZ for facilitating me in Doctoral Seminars of CERDI, and, Johan GUIOT for coordinating all my conference visits since the feedback I received in those conferences have enriched my thoughts and improved the quality of my research. My gratitude goes to the CERDI family, particularly, Marie, Chantal, Claudine, Franceline, Claudie and others who have participated in building my educational and teaching career. I would express my sincere thanks to Professor Simon BERTOLI, Professor Francesca MARCHETTA and Dr. Collin GREEN for their valuable suggestions on research and, Professor Anne VIALLEFONT for her guidance.

I am also heartily thankful to Université Paris-Est Créteil for giving me opportunity of ATER that further supported me financially particularly during the pandemic crisis. For this, I am deeply thankful to Professor Philippe FROUTE who has encouraged and motivated me. My sincere gratitude goes to Oulimata Ndiaye and Ababacar Sedikh Gueye, Almoustapha Seybou Gati, Saba, Aneeqa and Olamide to support me in my difficult times. Special thanks to my dearest friends, Yashmina Nebié, Nestor P. Sawadogo, Ali Compaore, Jocelyn Okara, Mohamed Boly and Alou A. Dama, who supported me a lot, and also, Yoro Diallo, Claire Ricard, and Muhammad Adil for their suggestions. I also thank all of my doctoral and Masters fellows at CERDI; Kady S. Keïta, Kodjo Adandohoin, Cornélie Ayémonna, Hugues Champeaux, Afrika Ndongozi-Nsabimana,

Constantin Compaore, Claire Gaubert, Axelle Kere, Alioune Ndiaye, Awa Diouf, Fatoumata Faye, Régina Séri, Camille Laville, Cezara Vinturis, Pierre Lesuisse, Épiphane Assouan, Issa Sanou, Fayçal Sawadogo, Hamid Silue, Moulaye Bamba, Jean-Marc Atsebi, Ibrahim Nana, Abdoul-Hakim Wandaogo, Mahamady Ouédraogo, Ismaël Ouédraogo, Maïmouna Barro, Macoura Doumbia, Aïcha Sanou, Arouna Diallo, Aimé Okoko, Naïmatou Ouédraogo, Harouna Kinda, Mouhamed Zerbo, Abdramane Camara, Achille K. Sanou, Elsa Gautrain Jules Gazeaud, Stephane, and other colleagues in university. I am thankful to my HEC fellows and friends, their support and assistance were invaluable throughout in all these years. They were with me throughout the journey and shared all happiness and misfortunes.

Most importantly, my thanks go particularly to my family. I would like to say special thanks to my parents Syed Mustafa Kamal Pasha and Maimoon-Un-Nisa Kamal Pasha, who have been extremely patient and supportive throughout my entire academic journey. I am thankful for their unconditional love and sacrifices through my long years away from home. To my brother, Sabir Kamal Pasha, that I always missed him the most. My heartiest thanks to my brother Saleem Kamal Pasha, whose trust, believe and hope in me remain remarkable. I owe a great part to him and I know his contribution in my success counts a lot. I like to thank my younger brother, Zohaib Kamal Pasha, who always supported me and guided me throughout this journey. I also thank for the support from my brothers Aslam Kamal Pasha and Jahangir Kamal Pasha. Also my sincere gratitude to my dearest sisters Shabnam Kamal Pasha, Neelam Kamal Pasha, Farhat Kamal Pasha, Saima Kamal Pasha, my brother-in-law Sultan Zulqarnain, my cutest nephews Haider, Ahmed, Abdul-Raphay, Hassan and niece, Maheen. I owe a great deal for their understanding, sacrifices, unwavering support and motivation to enable me to complete this thesis. I am also very indebted to my aunties, uncles, cousins and family friends who made me resilient to hard and troubled times.

Finally, I acknowledge and express my appreciations to the Higher Education Commission of Pakistan for providing me the financial assistance for three years of research that enabled me to accomplish this work.

SUMMARY

The impact of education and gender discrimination are the main objectives of this thesis in the perspective of Sustainable Development Goals including women empowerment, welfare and economic development (Envision 2030). It is important to examine that education investment and provision of basic human rights with equal distribution of the resources should consign without gender discrimination. This thesis provides empirical evidence to assess the impact of female human capital on economic welfare, empowerment and gender difference in determination of education achievement in Pakistan. The first chapter introduces the education and economic development in theoretical and factual practices towards females. It elaborates in detail about the educational system, reforms and commission from inception to date with the status of the females in the Pakistani society. It links the connection between gender discrimination, welfare and empowerment provided with theoretical evidences. The second chapter explores the relationship of the education attainment with the women empowerment in the household decision-making in monetary and non-monetary aspects relying on the survey data of the Pakistan Social and Living Standards Measurement. Evidence has shown that education has positive and significant impact to increase the empowerment in household decision-making and provides an optimal solution in restricted areas of the country. Meanwhile, the joint decision-making is appropriate than unitary one in the household expenditure, marriage and family planning, however, it is the opposite for son preference. Women in wealthier families are more likely to empower with education as compared to poor families, while, this impact varies by age and provinces. Furthermore, the study suggests public and community intervention from subsidizing schooling to provision of contraceptive at a lower cost. The third chapter focuses on the single females whether never married, widows and divorced, and their contribution with socio-economic background in improving economic welfare of the household. With the help of multilevel model regression, it is analyzed that education of the single females has a significant impact on the household's welfare. Eventually, widows and divorced ones contribute higher than never married females once they are acquainted with education. Evidences are provided of wider disparities between households as compared to within household. The fourth chapter determines the education attainment and current enrollment in the framework of gender difference with income per capita and socioeconomic characteristics of the household, as well as, it attempts to capture the potential

endogeneity between income and education. It also explores the effects of gender differences within the household by gender and educational inequalities. The findings provide strong evidence of gender differences in education attainment and current enrollment with income and socioeconomic characteristics. In addition, educational inequalities and gender gap highly likely to decrease girls' education and income of the household respectively. Meanwhile, Oaxaca type decomposition provides higher percentage of unexplained variations. I find evidence of transitional gap from lower to higher education attainment, while, personal and household attribute play differently with gender in current enrollment. It emphasizes on reforming educational and public policies according to the demand of education, economic condition, and treatment towards children particularly with girls in the household.

Key words: Education attainment, Women empowerment, Economic welfare and development, Gender differences, Non-linear models, Reverse Causality.

RESUME

L'impact de l'éducation et la discrimination de genre sont les principaux objectifs de cette thèse dans la perspective des Objectifs de Développement Durable (ODD) incluant l'autonomisation des femmes, le bien-être et le développement économique (Envision 2030). Il est important d'examiner que l'investissement dans l'éducation et la fourniture des droits fondamentaux de l'homme avec une distribution égale des ressources devraient être consignés sans discrimination de genre. Cette thèse fournit des preuves empiriques de l'impact du capital humain féminin sur le bien-être économique, l'autonomisation et la différence de genre dans la détermination de la réussite scolaire au Pakistan. Le premier chapitre introduit l'éducation et le développement économique dans les pratiques théoriques, empiriques et factuelles envers les femmes. Il décrit en détail le système éducatif, les réformes et les commissions depuis le début jusqu'à aujourd'hui, ainsi que le statut des femmes dans la société pakistanaise. Il établit un lien entre la discrimination fondée sur le sexe, le bien-être et l'autonomisation à l'aide de preuves théoriques. Le deuxième chapitre explore la relation entre le niveau d'éducation et l'autonomisation des femmes dans la prise de décision au sein du foyer, dans ses aspects monétaires et non monétaires, en s'appuyant sur les données de l'enquête Pakistan Social and Living Standards Measurement. Les données ont montré que l'éducation a un impact positif et significatif sur l'autonomisation dans la prise de décision au sein du foyer et fournissent une solution optimale dans les zones restreintes du pays. Parallèlement, la prise de décision conjointe est plus appropriée que la prise de décision unilatérale en ce qui concerne les dépenses du ménage, le mariage et le planning familial, mais c'est l'inverse pour la préférence pour les fils. Les femmes des familles riches sont plus susceptibles de s'autonomiser par l'éducation que celles des familles pauvres, mais cet impact varie selon l'âge et les provinces. En outre, l'étude suggère une intervention publique et communautaire allant de la subvention de la scolarité à la fourniture de contraceptifs à moindre coût. Le troisième chapitre se concentre sur les femmes célibataires, qu'elles n'aient jamais été mariées, qu'elles soient veuves ou divorcées, et sur leur contribution, avec le contexte socio-économique, à l'amélioration du bien-être économique du ménage. A l'aide d'un modèle de régression multiniveau, il est analysé que l'éducation des femmes célibataires a un impact significatif sur le bien-être du ménage. En fin de compte, les veuves et les divorcées contribuent davantage que les femmes jamais mariées une fois qu'elles ont acquis une éducation. Des preuves ont fourni des disparités plus importantes entre les ménages qu'au sein d'un même

ménage. Le quatrième chapitre détermine le niveau d'éducation et l'inscription actuel dans le cadre de la différence de genre avec le revenu par habitant et les caractéristiques socio-économiques du ménage, et tente de capturer l'endogénéité potentielle entre le revenu et l'éducation. Elle explore également les effets des différences de genre au sein du ménage en fonction des inégalités de genre et d'éducation. Les résultats fournissent des preuves solides de différences entre les sexes en matière de niveau d'éducation et d'inscription actuel en fonction du revenu et des caractéristiques socio-économiques. En outre, les inégalités éducatives et l'écart entre les sexes sont fortement susceptibles de diminuer l'éducation des filles et le revenu du ménage respectivement. Parallèlement, la décomposition de type Oaxaca fournit un pourcentage plus élevé de variations inexpliquées. La thèse trouve des preuves de l'écart transitoire entre le niveau d'éducation le plus bas et le plus élevé, tandis que les attributs personnels et du ménage jouent différemment avec le genre dans l'inscription actuelle. L'étude met l'accent sur la réforme des politiques publiques et éducatives en fonction de la demande d'éducation, de la situation économique et du traitement des enfants, en particulier des filles dans le ménage.

Mots Clés: Niveau d'éducation, autonomisation des femmes, bien-être et développement économiques, différences entre les sexes, modèles non linéaires, causalité inverse.

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LIST OF ACRONYMES

AIC	Akaike Information Criterion
AME	Average Marginal Effect
ASF	Acid Survivors Foundation Pakistan
ATC	Anti-Terrorism Courts
BIC	Bayesian Information Criterion
BMI	Body Mass Index
ECE	Early Child Education
EFA	Education For All
GDI	Gender Development Index
GDI	Gender Development Index
GDP	Pakistan Demographic and Health Survey
GER	Gross Enrollment Rate
GGGI	Global Gender Gap Index
GPI	Gender Parity Index
HDI	Human Development Index
HDR	Human Development Report
HRCP	Human Rights Commission of Pakistan
ILO	International Labor Organization
KPK	Khyber Pakhtun Khwa
LFS	Labor Force Survey in Pakistan
MDG	Millennium Development Goals
NER	Net Enrollment Rate
NFE	Non-Formal Education
OECD	Organization for Economic Co-operation and Development

PBS	Pakistan Bureau of Statistics
PDHS	Pakistan Demographic and Health Survey
PSES	Pakistan Socio-economic Survey
PSLM	Pakistan Social and Living Standards Measurement
PSU	Primary Sampling Units
PWA	Pakistan Women's Association
SDG	Sustainable Development Goals
STEM	Science, Technology, Engineering and Mathematics
UFGE	Umbrella Facility for Gender Equality
UNDP	United Nation Development Program
UNESCO	The United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nation Sustainable Development Framework for Pakistan
UNICEF	United Nations International Children's Emergency Fund
UPE	Universal Primary Enrollment
WHO	World Health Organization
WPS	Women, Peace and Security

CHAPTER 1: General Introduction

1. Background and Motivation

1.1 Human Capital Investment and Education

Human capital investment in education is the most dynamic channel to establish long-run economic growth in developing countries that strive for fundamental rights in dimensions of gender equality, economic welfare, and empowerment (Teles et al., 2008). On the other side, it uplifts poor economies to break the vicious cycle of poverty, unemployment, inflation, and social injustice (Zamaz 2008). It has the potential to maximize returns that directly increase per capita income, improves consumption expenditure patterns, and most importantly builds confidence and self-esteem (Thomas et al., 2001). The report of EFA (Education for All) by the World Bank defines education as the catalyst for the developing economies in order to mobilize human capital stock without regional and sectoral discrimination (Lanzi 2007). It establishes economic stability through unveiling the barriers of customs, caste, creed, language, color and, gender discrepancies. While recognizing such value, critical insights in gender differences for education investment and allocation of the resources argue economic conditions, unitary and joint decision-making, fundamental preferences, and socio-economic differentials within and between households (Akram et al., 2011).

The role of the females in the process of economic growth is an integral part of the development of the country. Conversely, prevailing concepts regarding the existence of females hinder their capabilities to work. The majority of the people in the traditional society of developing countries consider females for procreation, child-rearing, and domestic chores (Stephenson et al., 2004). Whether it is the matter of income generation or participation in the market, male autonomy is obvious that intrigues two major concerns: first, the obsession of son preference and secondly, strong patriarchy system. Meanwhile, the share of work and income of females remain uncounted or most of the time attribute as disguised employment in developing countries that extremely depend on agriculture. Besides education, high fertility rate, limited mobility and old customs dissuade females' participation in the market. Additionally, returns of parental education investment are associated with sons being long-run assets that eventually widens gender bias within the household. Developed countries incline towards unfolding gender differences by investigating about the vulnerability of male dominance and equal availability of resources that are opposite in developing countries, particularly, observing in Pakistan (Schultz et al., 2012).

Broadly, empowerment is a multidimensional term, which enables a female to maintain her position in individual, household, and community life through decision-making in continuation of education, employment, and family planning, choice of spouse, household resource management, and societal status. Meanwhile, economic welfare is intertwined with intellectual skills, physical and mental health, active participation in income generation, access to infrastructure, and freedom of mobility and speech in order to pursue a gender-egalitarian society (Sullivan 1994). As far as concern about Pakistan which has central and geopolitical importance in South Asia with the highest ratio of young population (UNDP 2018), faces extreme gender disparity that consequently influences negatively on economic development of the country (Duflo 2003, 2012).

1.2 Women in Pakistan: General Portfolio of Gender Discriminatory Practices

In Pakistan, women belong to any age or region are likely to face deprivation of education, health, employment, and fundamental human rights. These deprivations correspond to socio-economic mindsets that need to be changed. Recent situation of women in the country indicates injustice and societal atrocity on one side and on the other side raises questions on human resource planning management. The ratios in child labor, early marriage, and mortality are higher for girls, which highlights the education imminence and human rights violations. I briefly narrate some of these important factors.

The lack of education and extreme poverty are the main causes behind child labor. It is one of the hazardous forms of deprivation, which, not only affects a child mentally but also physically and socially. According to the Human Rights Commission of Pakistan (HRCP 2018), 12 million children are associated with any form of labor in the country. While International Labor Organization (2020) reports 168 million children linked with child labor globally. Besides poverty, the behavior of the people for these children strongly advocates education investment. For example, Zohra an 8-years old girl who was working as a house cleaner. She has killed by the employers in Rawalpindi for opening the gate of the parrot's cage to feed them and they flew away[1]. Approximately 8.5 million women and children of every age work domestically for cooking, cleaning, baby-sitting, and other household works but do not consider as the workers for an economic point of view. Majority of these workers belong to extremely poor families and congested urban areas. Nevertheless, the country's law prohibits child labor and takes strict

[1] For details see; Killing of Zohra Shah (Wikipedia 2020)

actions against the brutality of minor domestic servants. Currently, three years sentence and fine to the couple who burnt and kept in confinement their 10-years old female child worker demonstrate the implementation of the laws has been started (HRCP 2020).

Similar cases of physical and sexual abuse, domestic violence, and honor killing report 1000 women killed per year because of the honor killing (Human Rights Watch 2020) and 49.4 percent suffer from marital physical abuse (Agha Khan Academics 2005). One of the cases that drew global attention is Zainab Alert Bill, in which Zainab, 6-years old girl from Kasur who had abducted, strangled, and physically molested to death. Government took initiative by passing a bill to sentence the child abuser to life imprisonment (Zainab Alert, Response and Recovery Act 2019)[2]. In addition, bride burning and stove burning cases are also extremely high. According to Pakistan Women's Association (PWA), 3000 women die from bride-burning and stove burning cases because they are easy ways for the in-laws' families to escape from punishment (UN Press Release 1999). Most of the burning cases are relatively associated with low dowry and the birth of the female child. Bushra is among the acid survivor for not paying enough dowry. Meanwhile, the Acid Control and Acid Crimes Prevention Act, 2011 punish the acid attackers with 1 million fine and 14 years of prison as well as Anti-Terrorism Courts (ATC) implement heavy fine and exemplary punishments (BBC's 100 Women).

In contrast, it does not mean that there is no community's support and participation, The Edhi Foundation (non-profit social welfare organization)[3] facilitates shelter, food, and work for women and men mostly elderly who are disowned by their families. Meanwhile, it also provides legal protection to newborn and disowned children. One of its works is the dispensing of the baby curdles in many cities to curb infanticide and the killing of unwanted children. The foundation reports that the number of girls is increasing every year in baby curdles indicating son preference in the society and appalling situation towards family planning and social responsibility. Within one year (2017-2018), both of these welfare institutions Chippa and Edhi had found 345 newborns in the garbage in which 99 percent were girls. All the above examples explain

[2] National Assembly of Pakistan. National Assembly of Pakistan. Retrieved 7 October 2019.
[3] It is non-profit welfare organization founded by Abdul Sattar Edhi in 1951, is working to protect every deprived child in the world and focusing precisely in South Asia, Africa and Middle East. It provides 24-hours emergency help and its major headquarters are located in USA, UK, Canada, Japan and five other countries. For details see: https://edhi.org/

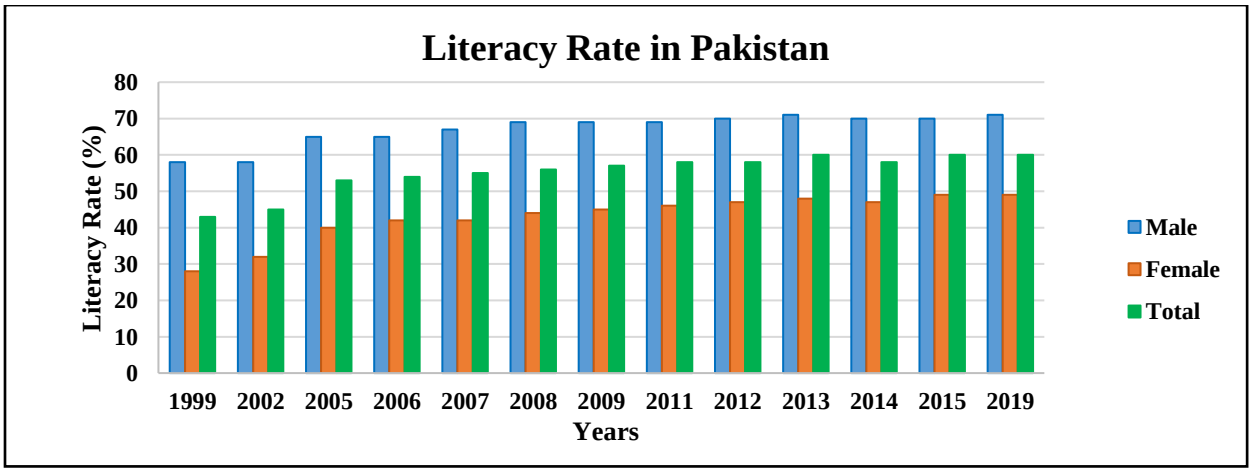
deteriorating financial and social conditions of females that require deep understanding at the household level and public considerations at state the level.

According to Asian Development Bank, out of 49 percent of the female population, only 7 percent have financial accessibility that is quite meager. Pakistan ranked 151 out of 153 countries for the Global Gender Gap Index (World Economic Forum 2020). Additionally, it has a 34 percent gender wage gap as compared to 73 countries across the globe (International Labor Organization 2018). The platform indicates four major aspects in which education attainment is an essential yardstick to examine the gender inequality in wages. Nationwide 21.9 percent female participation in labor report against 68 percent ratio of male participants making 5.1 percent of female unemployment in the country (World Bank 2019).

1.3 Education in Pakistan: System, Reforms and Literacy Improvement

Education helps woman to identify self-existence, financial support, empowerment, and all of them interconnected to the improvement in the welfare of the household and economic growth of the country. It is evidently to say that woman with proper facilities and financial support can attain higher studies as compared to those who have limited resources and minimum sustenance. Furthermore, particularly single females who are widowed, divorced, or never married consider being economic burden on families. Therefore, education is the only phenomenon that has the potential to uplift these females from poverty by improving their skills and confidence in crucial circumstances. However, the literacy rate in Pakistan is quite lower. A boy has 15 percent more chances to start primary education.

Figure 1.1 Literacy rate in Pakistan (1999-2019)



Source: Author construction based on PSLM Bureau of Statistics, Pakistan.

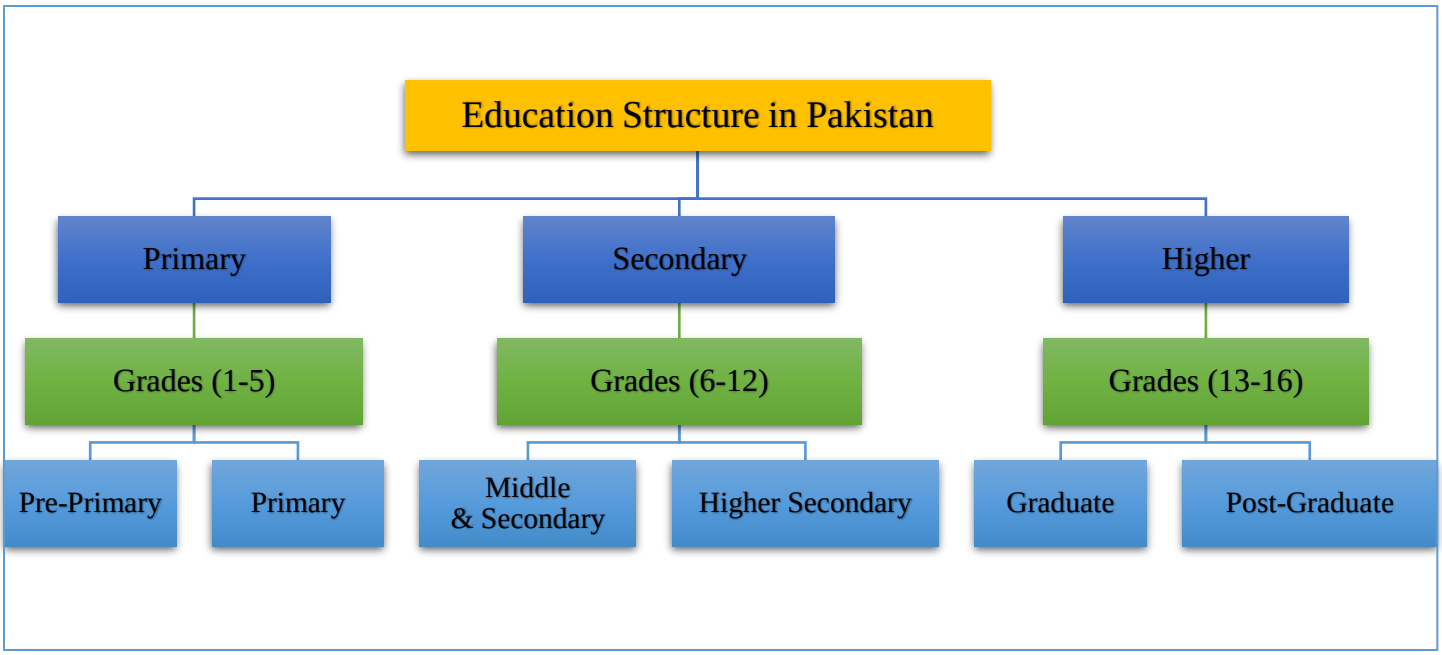
Figure1.1 demonstrates the literacy rate in Pakistan over the twenty years of the period. The statistics show that the literacy rate in females started to increase after 1999; however, in 2006-07 it does not improve at a higher ratio. The literacy rate in males remains quite higher than is observable in 2008 and 2013.

In Pakistan, privatization of schools and educational institutions has introduced in 1979 for quality of education and learning environment but parents who belong to the middle or lower-middle-income groups are unable to send their children, especially, daughters due to high cost. Literacy rate among males and females as 70 to 43 percentage demonstrates gender disparity across the country. Additionally, the situation of females in Pakistan is quite disappointing from the inception. Sons have privileged over daughters in terms of education, health, income generation, legislation, leadership, and decision-making, freedom of communication, and employment, even exemptions from certain customs.

1.3.1 Structure of Education System in Pakistan

The structure of education is divided generally into three levels (Figure 1.2). First, the primary level that includes pre-primary (Kachi in local language) and primary (Grades 1-5) levels. In 1999, the gross enrollment accompanied 80 percent males as compared to 61 percent females at this level, and the percentage in rural areas was quite discouraging than urban ones. Second level is secondary education that consists of three sublevels of middle (Grades 6-8), secondary (Grades 8-10), and higher secondary (Grades 11-12). This is an intermediate and strategic level to enable children in choosing relevant fields of interest such as arts, computers, mathematics and, sciences. During 2000, female participation rate was only 33 percent. Finally, the higher level of education constitutes graduation (13-14) and post-graduation (15-16) levels composing university level. Meanwhile, further grades (above 16) also attribute based on diplomas, research programs, and professional training.

Figure 1.2 Education by levels in Pakistan



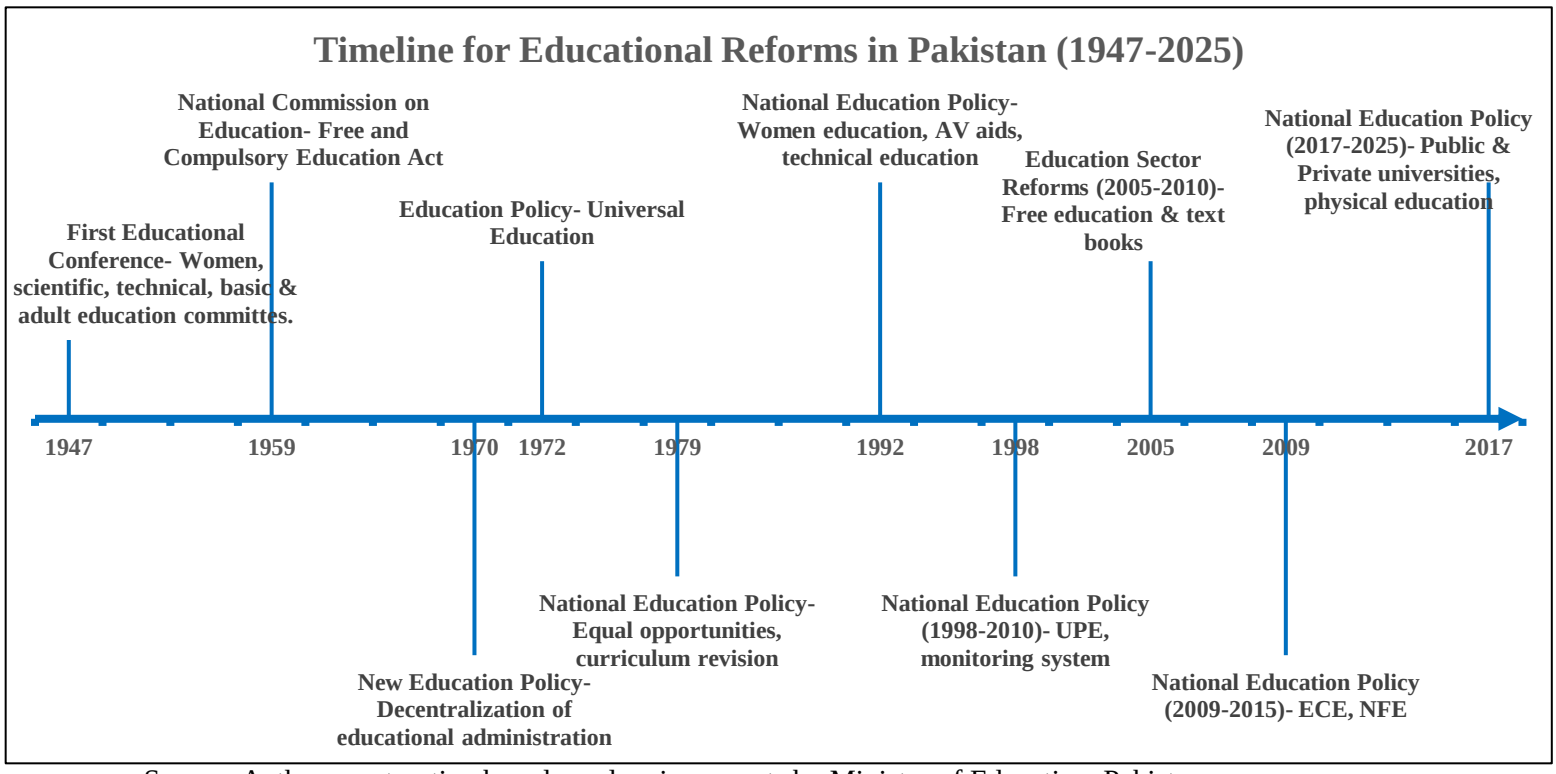
Source: Author construction based on information by Education Ministry of Pakistan

1.3.2 Educational Reforms in Pakistan

From the inception in 1947, Pakistan is facing educational challenges as education remains a pivotal subject and the situation is quite serious in the shortage of female teachers and the gender gap. The education sector has been struggling to introduce and implement policies but teaching techniques and curriculum are still undermined. The first Educational Conference in 1947 had focused on women education, scientific and technical education. In 1959, National Commission on Education proposed the free and Compulsory Education Act. However, a major step was held in 1970 in which decentralization of the educational administration took place.

Universal Education has promoted in Education Policy 1972, whereas, measures to provide equal educational opportunities formed in 1979. Women education remained an integral part of the National Education Policy 1992 and ten years plan started in 1998 for attaining Universal Primary Enrollment (UPE). Furthermore, Early Child Education (ECE) and Non-Formal Education (NFE) had discussed after 2008 to implement educational strategies for the minors and remote areas (Figure 1.3).

Figure 1.3 Education Policies and Commissions in Pakistan



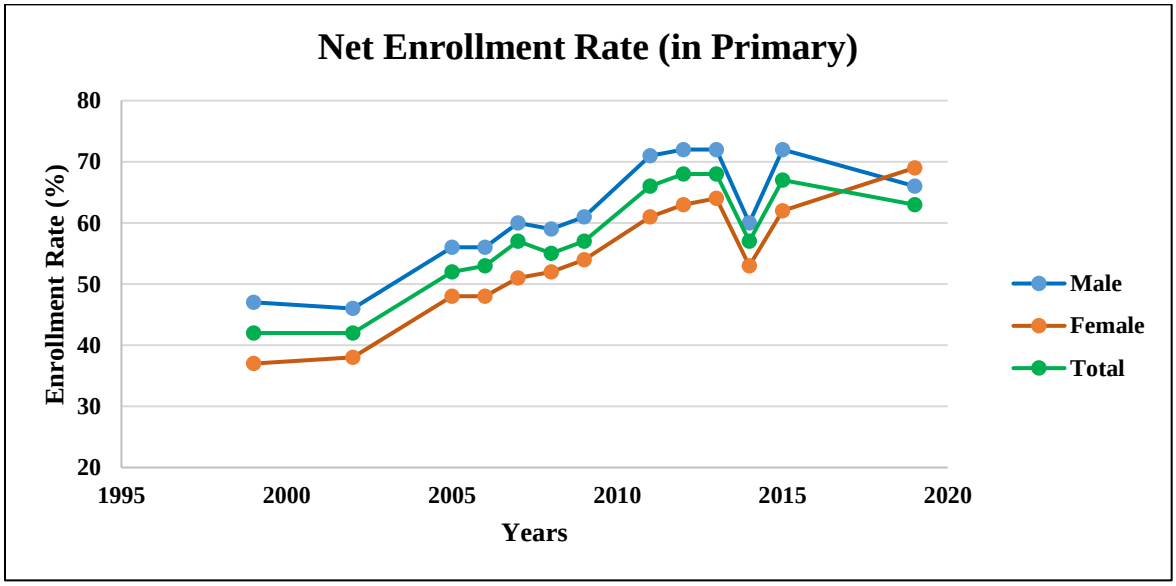
Source: Author construction based on planning reports by Ministry of Education, Pakistan

1.3.3 Enrollment Rates

The gender differences are highly accounted in each level of education in South Asia e.g. Pakistan, Bangladesh, and India. These regions also reveal the highest mortality rate for mothers and infants (Amartya Sen 2003). Similar statistics observe occupational and gender segregation in the labor market that fails to achieve sustainable development goals. One of these goals emphasizes to reduce the gender gap in education that triggers women's employment opportunities and directly influences fertility and mortality rates. Secondly, it is evident that gender discrimination is directly proportional to the reduction of the economic growth, therefore; any political or economic policy cannot implement by ignoring the women participation in achieving socio-economic development goals. There are many prominent reasons for the gender inequalities in Pakistan. Firstly, distant located schools are unfavorable choices for parents to allow their daughters to go for education due to security, transportation, and related cost concerns, especially in rural and remote areas. In addition, if these schools provide co-education, the chance to be enrolled for girls becomes minimum. Approximately, 39 percent of the girls are

not enrolled in schools as compared to the 30 percent of the boys. Secondly, a teaching staff that is likely to be untrained, insufficient, and underqualified also discourage parents to send their girls. Thirdly, female mobility is restricted and depends on cultural norms and limitations based on different regions. A boy has 15 percent more chances to attend school as compared to a girl. Figure 1.4 shows primary net enrollment rate over the years by gender. The statistics reveal the enrollment rate increases from 2000 but tends to decline drastically in 2015; however, males have comparative advantage in each year.

Figure 1.4 Percentage of net enrollment rate in Pakistan



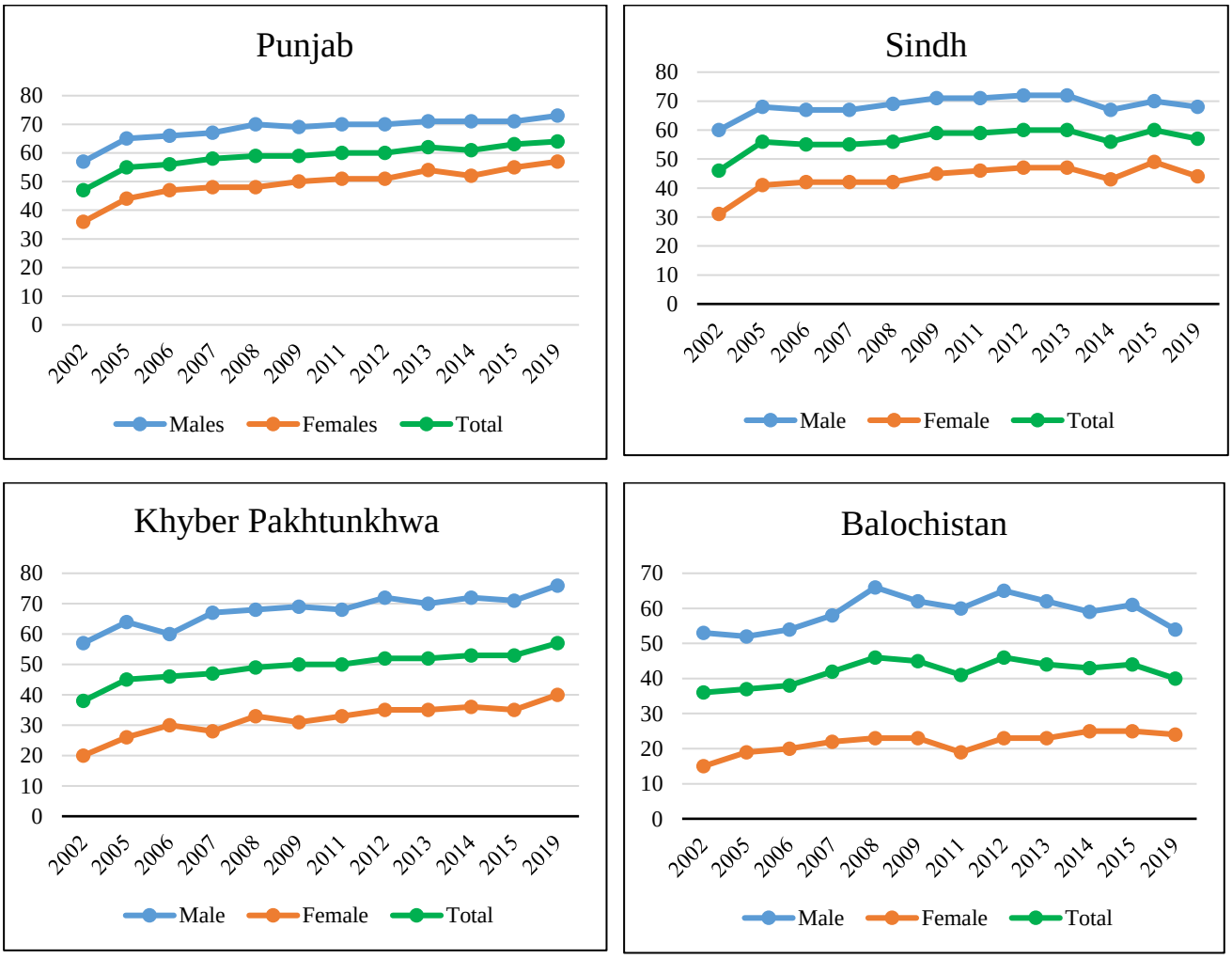
Source: Author construction based on data from Annual Reports of Bureau of Statistics, Pakistan.

After the 18th Constitutional Amendment legislated by the Parliament in 2010, education has become a provincial subject in Pakistan. In a population of 22 million school-going children, there are only 17 million enrolled while gender differences are widening each year that recently boys' enrollment is 57 percent as compared to 43 percent of the girls at primary education. While, with 6 million enrollment children at secondary education, only 44 percent are girls as compared to 56 percent boys. These statistics also account, as 146,185 primary, 42,147 lower secondary and 29,874 secondary schools are currently functioning (UNESCO Report 2015).

The ratio of girls marginally decreases with the increase of education level, meanwhile, at higher secondary level the female-to-male ratio becomes 42 to 58 percent (Gender Parity Index 2015). Another measure of the quality of life and welfare measure with education attainment and

knowledge for long-term assessment is Human Development Index (HDI) reports 0.53 index is ranking Pakistan 147 out of 188 countries with only 2.9 percent increase in average years of schooling in last twenty years. However, an index based on gender by HDR known as Gender Development Index put the country at the lowest rank with 0.91 points (GDI 2014). The important factor contributes to the allocation and investment of the national income in the education sector that liable to provide learning opportunities to the children. While Education Development Index ranks Pakistan at 11 out of 120 countries for education investment.

Figure 1.5 Literacy Rate by Province and Gender in Pakistan



Source: Author construction based on data of PSLM Bureau of Statistics, Pakistan.

Figure 1.5 shows the percentage of the literacy rate over the census of the years in different provinces. The statistics reveal the highest rate of literacy rate overall in Punjab, the contrary,

KPK and Balochistan have a minimum rate of female literacy rate especially in 2009 to 2011 which might be due to regional conflicts and the War on Terror. Furthermore, as a whole, the ratio has inclined in all provinces in 2008.

According to the Global Gender Gap Index 2020, Pakistan ranks 151 out of 153 countries. The report published by the World Economic Forum also provides statistics for ranking Pakistan 150 for economic participation and 143 for education attainment that drastically declined from the past five years. The reports also provide a performing rank as 93 for political empowerment and 149 for survival rate. The Gender Parity Index for 2018 is 0.84 for the gross enrollment ratio in primary education (UNESCO 2019). Other factors associated with low enrollment rates are domestic and community restriction, distant schools as well as law and order deteriorating conditions in a country.

The female schools for primary (Grade 1-5) are 40,548, for middle (Grade 6-8) 7,927 and for high (Grade 9-10) are 5,175 as compared to 78,601 primary, 8,501 middle and 7,401 high male schools (Pakistan Education Statistics 2017). Whereas, hard-to-reach areas of the country are unable to provide any physical or virtual institution for girls that require public-private partnership as the number of private schools is growing to 68,000 across the country.

2. Bridging Education, Female Human Capital and Economic Development

***The Power of Household Decision-Making and Education Attainment*:** Women face extreme gender discrimination in developing countries particularly in South Asia. Patriarchal norms and cultural barriers are widening the gender gap due to scarcity and unavailability of education, social security, working opportunities, health, limited mobility, and freedom of speech. The male autonomy over socio-economic sectors in developing societies has failed to achieve MDGs of gender equality and women empowerment to gain welfare and financial stability (Sullivan 1994). Majority of the researchers are advocating women empowerment through self-awareness, mobility, household decision-making, and bargaining power that are highly interlinked with the economic development of the country (Blumberg 2005).

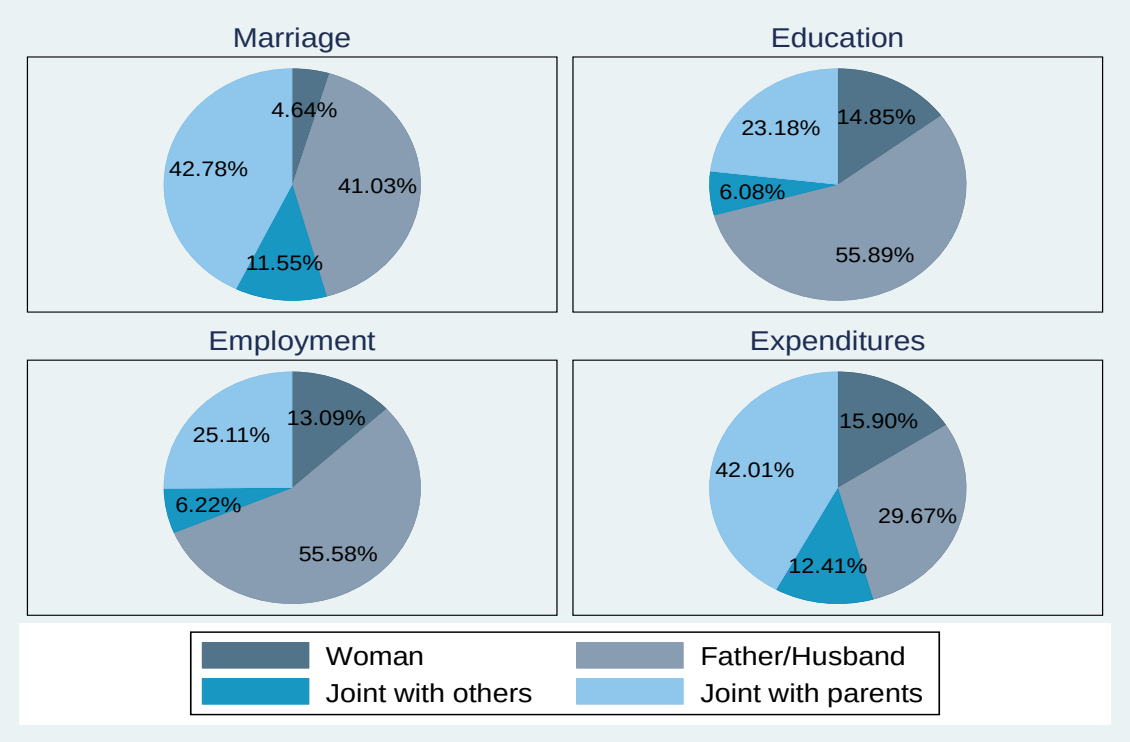
Comparatively, it is negotiable that whether these factors enhance the empowerment or one needs to transform household structure by considering equal and joint participation of women in decision-making. Prior research argues health measures and child welfare are associated with

maternal autonomy (Gupta et al., 2006; Basu et al., 2005; Bloom et al., 2001). While bargaining power also considers as the power of shift from men towards women particularly in a household (Quisumbing 2000), however, the distribution of labor in a household contribute proportionally to gain control over resources (Craig et al., 2016; Killewald 2011; Bianchi et al., 2000). Similarly, researchers empirically have examined the impact of physical possession whether inheriting or purchase in terms of land rights and the influence of political stability for determining women's position in society (Burton 1993; Lechene et al., 1992). On the other side, women's participation in effective household resource allocation and economic decisions of the household are pieces of evidence for power gain (Blumberg 1984).

Researchers support the income share of the women for different measures related to human capital theory. For example, food intake in calories (Aromolaran 2004), child health with height and weight scale (Thomas, 1990, 1992, 1993), household budgeting (Hoddinott et al.,1995) and broadly emphasizing economic stability for the country that unfortunately have not taken seriously in the past (Heath et al., 2012; Jensen 2012; Munshi et al., 2006). Simultaneously, women education remains ignored for achieving basic rights regarding the choice of spouses (Metthananda 1990), early marriages (Kirdar et al., 2018), and educational expenditures (Duflo et al., 2012).

Recent studies attribute equal distribution of educational resources with economic welfare and gender equality to assess the sustainable development goals in the least developed countries (Miller et al., 2016; Schultz et al., 2012). Consequently, the sustainable development goals that are framed with women empowerment and gender equality rigorously demonstrate the intervention of women education in household decision-making. Empowerment is a dynamic process to bring change based on making choices (Kabeer 1999) with confidence and potential to conceptualized different frameworks such as ability-defining goals and gaining control over resources (Kabeer 1999), participation in social activities (Kishore et al., 2004), and improving cognitive skills (Malhotra 1997; Mason 1986). Nevertheless, women empowerment experiences different impacts according to the regions and communities. It is commonly referred to as autonomy or freedom, which is making it a latent behavior, but on the other hand, it follows rigorous responsibilities that can be crucial for economic welfare and development.

Figure 1.6 Participants in Household Decision-Making



Source: Author construction based on data of PSLM Bureau of Statistics, Pakistan.

Figure 1.6 shows briefly the statistics in household decision-making in which the unitary power of a woman to take decisions for marriage is quite smaller. The proportion of decision-making in education and employment of females is highly dependent on males of the household. As compared to the unitary decision, joint decisions are preferable for household resources.

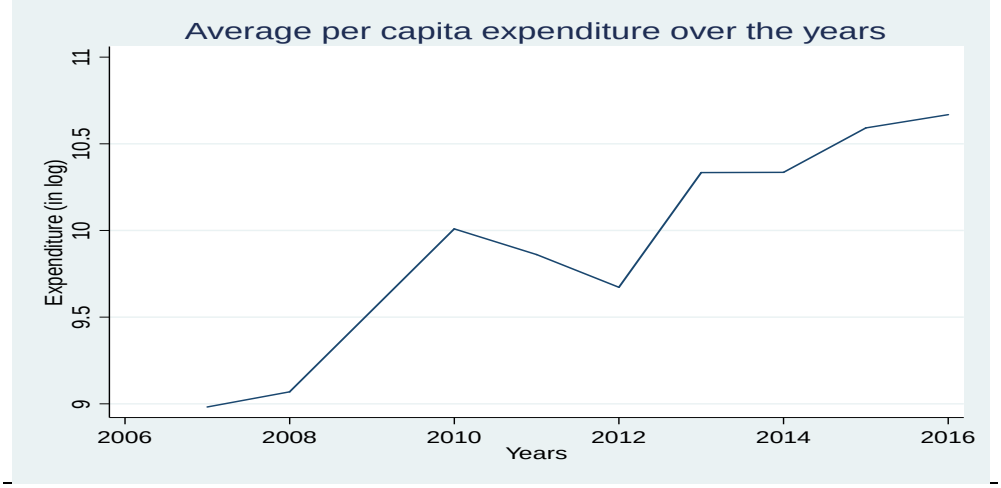
The women's share of the population is half in the world and but their intellectual skills have been acknowledged are subsided whether it is socio-economic perspective or demographic parameters (Agarwal 1994; Sen 1990). By examining the definition of empowerment in Pakistan, it demonstrates the following facts. Firstly, there is a huge gap between rights and responsibilities, and latter has more expected from women that perpetuate discrimination for legal rights (Constitution of Pakistan, Article 25(2), 1965). Secondly unavailability of public health services (mortality rate among adult females reported 138 percent (per 1,000 female adults) by 2018 World Bank Statistics), and lack of education (9 percent enrollment rate above secondary

education PSLM database 2016). It captures vague scenario of empowerment fails to deliver for future generations unless traditional norms, social setups, and basic rights do not establish to meet the demands of 49 percent of the women population (6th Population and Housing Census 2017). According to Women, Peace and Security (WPS 2019-2020), Pakistan ranked fourth amongst the worst performing countries in terms of the secure place for women with a 0.46 score in the index. Additionally, 73 percent of males do not allow women to work outside households and every year 27 percent of females face domestic violence. This also highlights women weak participation in parliament (17 percent in 2013 election) and escalating gender disparity (143 out of 144 countries in the gender gap according to World Economic Forum 2017) in a patriarchal society by violating basic and constitutional laws (Klein et al., 1992; Mehdi 2004).

The prominent strategic choices find comprehensive to understand the reasons behind weak empowerment and status of women within and outside the households including education, employment, household resources, marriage, family planning, and son preference. On one side, these connect with freedom of rights and mobility and on the other side, they represent the individual and collective role of women in the economic growth of the country. Therefore, the following points must be considered according to these strategic life choices. The system of education remained complexed and undermined since the inception of the country. The higher dropout rate of girls in Pakistan among South Asian countries indicates poverty and parental preference in education investment for maximizing long-run returns (Saeed 2007). The need for higher participation of women in education deliberately focuses on collaborative efforts for public-private ventures and initiatives towards free education in the country. Generally, cultural barriers and security concerns are highly dependent on the working environment for a woman. On one side, getting education is not an easy task with the average household size of 8.33 and on the other side, freedom of mobility is hard to attain. There are opposite parameters in the labor market designed by gender. Eventually, the jobs are also gendered biased and many employment sectors especially industrial and technology generate male-oriented opportunities. With no education, 88 percent of women are associated with the agriculture under disguised unemployment and only 29 percent of women get paid employment (Pakistan Employment Trend 2018).

***Improvement in Welfare and Education Attainment*:** Past studies empirically find a strong relationship between educated women and economic welfare (King 2001) and examining the marital status of woman to capture her individual role within the household can provide significant findings in reducing poverty and improving human capital (Strauss 2008). Among others, the benefits of education investment on women bring gender equality that is directly associated with socio-economic egalitarianism and financial stability of the country (Schultz 1961; Aslam 2008). The prerequisite solution of gender inequality and poverty for the welfare of the people is education. The choice of the mating and value of the time alter female preferences with the effect of education attainment and earning (Schultz et al., 1982). The educational support becomes an effective tool for economic stability when parents emphasize equal domestic resource distribution among their children. In empirical literature, the welfare is measured with two different methodologies namely calories intake (Aromolaran 2004) and consumption expenditure patterns (Hoddinott 1995). The women education plays important role in achieving the prosperity of families, as they are true nation builders (Bernhardt et al., 2002). The female education and the welfare of the households although have strong positive effects yet they are negligible in practice in developing countries. Several studies focus on female education for long-term relationship and human capital growth. This pattern remains feeble in the developing countries where educating to females is not usual practicing due to many social and economic reasons. Family welfare and economic development are enveloped by female education and improved human capital (World Bank 2012b).

Figure 1.7 Consumption Expenditure in Pakistan over the Years



Source: Author construction based on data of PSLM Bureau of Statistics, Pakistan.

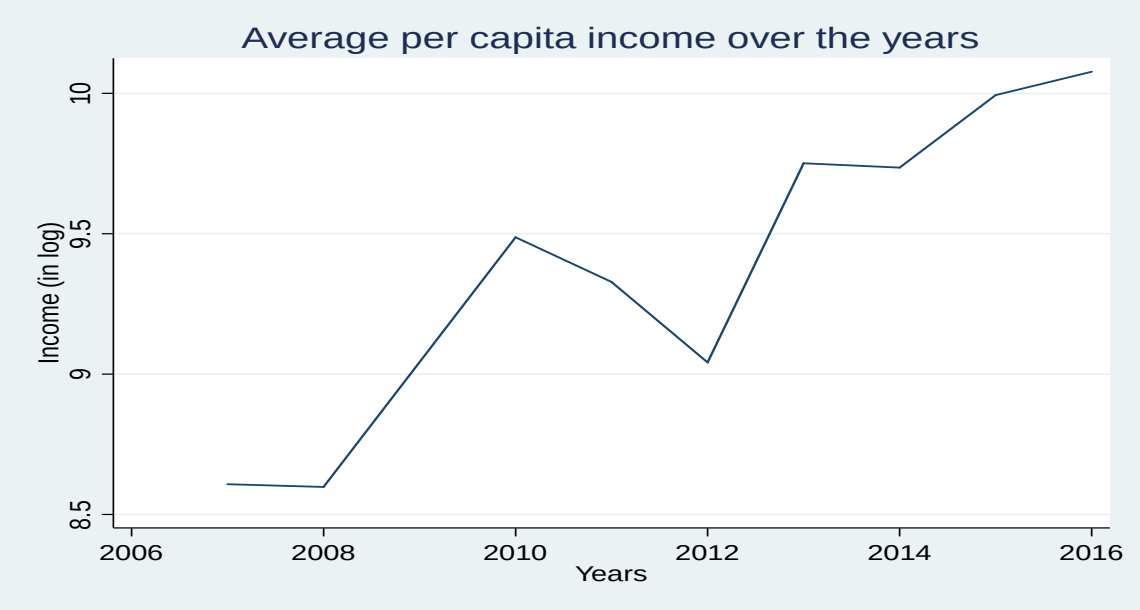
Figure 1.7 shows the increasing pattern of household per capita expenditure in Pakistan over the years. The sharp decline between 2009 and 2013 might be due to calamities that happens in this duration however, the situation tends to improve drastically after 2014.

Particularly in developing countries, educated women; being single mothers, unmarried, or living with larger family sizes can improve household welfare with their share of income, unitary or joint decision-making and low fertility rate, and regulating expenditure resources (Thomas 1995; Behrman 1997, 2010). Pakistan is facing countless obstacles since its inception that effecting directly the wellbeing of its citizens. The recession that started in 1990 has strong effects, which are observed in the declined growth rate of 5.7 percent, 18 percent increase of population below the poverty line, and 40 percent foreign debts from mid 2000s (Pakistan Financial Ministry 2018). The United Nation Development Program (UNDP 2016) reports 4 out of 10 people in Pakistan are living under multidimensional poverty. Currently, there is a 39 percent multidimensional poverty and only a 60 percent literacy rate that has escalated unemployment, population, inflation and gender disparity across the country (World Bank 2017). The allocation and equal distribution of the national income is a panacea for institutional conflicts, corruption, terrorism, gender discrimination, and economic disability (Chaudhary 1982). Female education and their labor force participation appear significant mediums in policy implication for maximizing economic returns (Kimenyi 2006; Nguyen et al., 2007).

***Education and Gender Differences*:** According to the 'Education for All' (EFA), reports 'education enhances the stock of the human capital in an economy not only with its provision but also with equality of distribution for education regardless of gender, regions and sectors' (World Bank 2017). It deliberately demonstrates the impact of women education to enhance economic growth specifically in developing countries (Lanzi, 2007). The assessment on the advantages of educating women was quite opposite just a decade before believing that "often treats all aspects of education as disadvantaging women" (Jacob 1996; p.156).

Now the scenario has changed in which women are excelling from men that is not limited to education attainment but the others socio-economic perspectives of life. Statistics show that on average a girl potentially performs better in education achievement than a boy does. However, girls have very low enrollment rates relative to boys making these countries lagging behind in economic progress (Mickelson 1989).

Figure 1.8 Household's Income in Pakistan



Source: Author construction based on data of PSLM Bureau of Statistics, Pakistan.

Figure 1.8 demonstrates the trend of per capita income from 2007-2016. The statistics provide a sharp decline after 2012; however, it gradually improves from 2014. The share of the income is positively associated with an increase in education as per capita income is one of the determinants of educational outcomes. Considering developing countries, such as Pakistan, it is highly likely that lower-income households prefer sons to daughters for education investment, but it is interesting to investigate that if there are some findings for middle-income groups who are interested to support their daughters in acquiring education. Similarly, it is quite definite that higher income groups have affordability and unbiased attitude toward education investment. On the other side, it is relative to the region, existing culture, and societal behavior that contribute largely to female education.

3. Education and Female Human Capital: What do the literature tell us?

The empowerment theory explores the relationship of individuals within households and communities that are likely to affect socio-economic institutions in a productive way; however, it entirely focuses on the outcome to achieve specific goals such as improved literacy rate, reduction in gender gap, and egalitarianism in a society (Jackson et al., 2001). Often, empowerment attributes as a process but one always looks for the outcome that makes this term quite complex (Swift et al., 1987). Within individual a sense of control and ownership of the

decisions by oneself, increase confidence and motivation for others as well (Conger et al., 1988), comparatively weakness to incorporate economic or social activities within the community results low empowerment or lack of power (Seifert 2004). According to Robbins et al. (1998), "Empowerment is a process by which individuals and groups gain power, access to resources and control over their own lives. In doing so, they gain the ability to achieve their highest personal and collective aspirations and goals".

The capability approach introduced by A. Sen and M. Nussbaum (1980) prefers substantive freedom to utility or access to the resources. It is opposite to the traditional approach of welfare economics. It observes the capability of the individual that what and how they can do. Therefore, the capability approach gives a challenging definition of empowerment that focuses on human abilities and it seems quite difficult to choose the appropriate one in the context of Pakistan. Some argue that women empowerment can only observe indirectly such as level of freedom, autonomy, and mobility. However, this sort of empowerment has exposure to violence and unequal distribution of responsibilities among household members (Basu 2005). In this situation, focusing only on primary education by ignoring tertiary education is not sufficient to measure for empowering women. Education is the prerequisite indicator to liberate women from financial dependency and mental captivity for unitary decision-making. It alternatively stimulates inner abilities to perform better in traditional societies with the increase of education levels. The educated women are well informed to channelize different mediums in order to resolve their rights exploitations.

Kabeer (1994, 1999) has largely focused on the three inter-related dimensions in the process to achieve women empowerment in which agency sets one's goals and act accordingly by utilizing human or social resources for the well-being of the society. She defines empowerment as a procedure with three elements consists of resources, agency, and outcome. While, Kishore (2000) and Mishra et al. (2011) elaborate these resources as the main characteristics in women's lives in which they might be assets or objects in terms of better schooling, secure environment, healthy lifestyles, and freedom of mobility. They examine age, education, household wealth, and income that is positively correlated with the empowerment but do not provide sufficient information about endogeneity in measuring women empowerment.

However, promoting economic stability and power on household resources, the empirical studies define empowerment with the acquaintance of education and learning skills for marginalized groups mainly women (Lambert et al., 2005). It is one of the prominent ways for the definition of empowerment to acquire desirable attributes. Nevertheless, it captures other resources of freedom including age at marriage, contraceptive use, social security, and balanced diet. In contrast, the supporters of the capability approach refer to the choices and ability to transform one's own life (Sen 1999) and others advocate household decision-making for attaining power (Holvoet 2005; Agarwal 1994). However, no studies have investigated the contribution of education attainment to define women empowerment with the ability to take the decision for different strategic choices within the household for community and economic welfare. Oppositely, studies remain to focus on the impact of decision-making to enhance the education level that limits the role of empowerment particularly women who belong to patriarchal society.

Allendrof (2007) investigate women empowerment by land rights with a logit model using the dataset of Nepal Demographic and Health Survey of 2001. It observes women's land rights promote child health outcomes. Education of father supports not only land rights but also the child's health outcome. Land rights attribute with own land residency, mother's land and landless household. On contrary, women empowerment is also examined by using loan-use data and borrower testimonies that conclude the lack of co-ownership due to patriarchal hold on the assets (Garikipati 2008). It used multinomial logit and Tobit models with multiple variables such as male child, rural household, women education for loan consumption on land, farmland, or business. By using Indonesia Family Life Survey wave (2007), Samarakoon (2015) investigates women empowerment with the aid of education. It finds that taking dependent variable as levels of education and empowering women as explanatory one, reduces the number of live births, increases on the contraceptive use and reproductive facilities. Nevertheless, it could not establish the significant relationship between education and asset ownership, decision-making authority within home and participation at the community level. Empowering women defined as using educational outcome, health, household expenditure decision making (on food, clothes, monthly savings, employment status of the respondent), and asset ownership on land, livestock and home appliances.

Mahmud (2012) establish the dynamic process of women empowerment with the covariates for 3500 rural females in 128 villages of Bangladesh by using the linear regression method. The results show a strongly significant relationship with freedom of mobility and two self-esteem indicators of women empowerment. It also covered by the odds ratios from logistic regression while taking empowerment indicators ranged 1 to maximum 10 with their mean values, such as decision making, resource control, beating not justified, right to say and freedom of mobility as response variables. Covariates included wealth quintile, media exposure, women education and age. Female labor force participation increases their options in many aspects; the working environment polishes the inner abilities of a woman, provides freedom of mobility, and access to resources. Women are risk aversive and financial institutions at micro and macro levels respectively. They sort information with planning and manage investment choices better than males whether it is a household or a firm (Browning et al., 2014). Meanwhile, Dhaliwal et al. (2011) show a larger proportion of the per child expenditure as compared to the returns to education for the parents that are higher for girls. Studies explain the reduced women empowerment is linked with the higher gender inequality in education. Reducing the fertility rate is directly associated with the female participation in the labor market. Women with nuclear households are better in accessibility and children brought up and control different decisions relating with child schooling, health, marriages, and mobility (Kirk 1965).

The inevitable contribution of women education remained undermined in the past studies from decision-making to economic development of the country (Lynn et al., 2006; Mulatu et al., 1999; Weber 2014). Women education not only has a positive correlation with human resource development (Oyelere 2011; Sackey 2008; Patrinus 2004; Schultz 2004; Aromolaran 2004; Bennel 1996; Becker 1993) as well as it improves technological progress and efficiency for long-run economic welfare (McDaniel 2006; Hanushek et al., 2000). Using survey data of Botswana for two rounds in 2003 and 2010, (Khaufelo et al., 2016) determine the welfare, which is negatively associated with the poverty in which the education of the head of the household and employment status of the household members play important roles. The male head of the household with the marital status like divorced, widow and never married have significant but negative impact on the household such as 0.22 percent which is second after the separated ones by the use of logit estimations. The dependency ratio shows 0.7 percent decrease in the household per capita consumption expenditure. In contrast, Richard et al. (1993) have been interesting

findings on the female headship and the economic welfare of the households, which are mostly compared with the married families in terms of earnings and poverty evaluation. In a similar study of Jordan for population disparities between 2008 and 2009,

Mansour (2012) examines economic growth with the welfare gain; however, the situation becomes serious when the household depends only on female earnings. The lack of education, limited mobility, and outdated traditional norms are obstacles for female labor force participation if they get a divorce, never married or become widowed (Krysik et al., 1997; Roach 1997). These single females become financially unstable and compelled to acquire small jobs like being household maids, packaging or stitching garments in small factories where welfare no longer remains even at a low level (Cancian et al., 2001). Women having enough education or at least higher or post-secondary education tends to become financially better than those who are illiterate (Mauldin et al., 1990; Bae et al., 2000; Smock 1993, 1994).

It is evident that the relationship between maternal education and child's welfare advocates healthier and educated households in developing countries (Behraman 1997, 2010; Thomas 1995; Orazem et al., 2008). The positive effect of maternal education and child health increases with her education that raises her share of income in the household (Caldwell 1979). Additionally, maternal education plays a multidimensional role and one of among them is the reduction in the mortality rate that indicates improvement in health measures for living standards and wellbeing of the community (Schultz 1982).

Many countries have put their interest in designing education policy to improve the quality of education with public expenditure and efficient allocation of resources for economic development. However, the efficiency of resources attributes with proper planning and monitoring teams to avoid irrelevant use of the revenue. Main empirical studies highlight the equal proportion of the input and output assumption, for instance investing 10 percent in the input can yield the 10 percent output but this assumption cannot be true always (Raymond 1968). There are fewer empirical studies on female education in Pakistan for investigating gender differences.

Using the dataset of Pakistan Socio-economic Survey (PSES) 1999 conducted by Pakistan Institute of Development Economics, Arif et al. (1999) determined primary school enrollment for the children aged (5-12). They examine by logistic regression that girls need more financial

resources to attend school and poverty equality and likely impact on the primary enrollment rate regardless of gender. In a similar study of Chaudhary (2007), by using data from 1970-2005 from Pakistan Economic Survey, the findings suggest that women have a better impact on socio-economic conditions in Pakistan once the gender gap reduces with the increase in enrollment rates. The findings explore that the ratio of female-male participation has a positive impact on economic growth. Whereas, some studies (Mahmood 2004) prefer to examine the transition ratio from primary to secondary schooling. They argue that rural females are linked with low attendance and high discontinuous rates based on the census dataset of 1998 on education attainment. The results suggest that the deficit in education enrollment comes from female population belong to rural areas and higher rate of drop out can be minimized with the increase in demand of education, particularly for Universal Primary Enrollment (UPE).

4. Research Questions, Aims and Objectives

The purpose of the study is to explore the participation of the human capital in the economic development of the country in gender perspective and to identify socio-economic factors to enhance the education attainment in the traditional society of Pakistan. Based on these situations, my study raises three major research questions to address the central pint of this thesis:

Do women education and socio-economic background contribute to gain empowerment in household decision-making for strategic life choices?

Do single females contribute in the economic welfare and how much variability it determines within and between households?

Do income and socio-economic characteristics contribute in the education attainment and current enrollment in order to understand gender differences among children?

5. Overview of the Chapters

Chapter 2 examines the impact of education attainment on women empowerment in household decision-making in order to contribute in the welfare and economic development of Pakistan. The link between education and empowerment deserve attention, as female human resources and household decision-making are the prominent indicators of the wellbeing within household and in society. Any discrimination on the control over power regrading consumption resources or basic human rights affects drastically at household level, which consequently create unrest in the

society. The gender discrimination within the household decision-making lowers women empowerment and directly affects the economic growth of the country by decreasing literacy rate, female labor force participation, and production of resources, equal opportunities and social liberalization.

Capability approach introduced by A. Sen and M. Nussbaum in 1980 preferred substantive freedom to utility or access to the resources. On the other hand, Kabeer (1999) explains empowerment as three inter-related dimensional process to gain welfare. The question arises that these or prior definitions of empower represent the socio-demographic and socio-economic position of women in least developed countries when it is claimed as latent phenomenon. The lowest female participation rate in South Asia, reported acid and burning attacks in thousand and increasing maternal mortality aggravate the importance of equal distribution of the resources and power of decision making with the dynamic channel of education in Pakistan. It is critically negotiable that daughters are economic burden if they do not get married at suitable age or productive human resource to participate in the development of the country.

The aim of my study is to clarify and define the concept of women empowerment in decision-making in the context of Pakistani society. Furthermore, this study examines social and economic approaches to measure women empowerment with the help of individual and household characteristics by using Pakistan Social and Living Standard (PSLM) survey microdata from 2005-2014 with Probit and Multinomial Probit Models regression. The socio-economic indicators for these two approaches include; firstly, choice of marriage, family planning, son preferences, and secondly, intra-household resource expenditures, education continuation and, employment. Moreover, another objective of this study is to deal with the reverse causality between education attainment and empowerment with the help of instrumental variable technique for economic perspectives.

The findings of my study suggest that education is determined the strongest strategy to achieve women's social and economic rights in traditional culture of the country. As compared to the unitary decision by woman mainly, her joint decision with husband/father and other members of the households or joint decision of her parents are more likely to empower in the household's decision-making. It is also imply that husband/father/head are unlike to empower women if they decide unanimously in certain areas. By examining each model of the study thoroughly, average

years of schooling of woman is likely to attain power on household decision-making but relative income groups and location contribute equally. Rural and tribal areas escalate strongly in son preference and autonomy on household resources. However, fertility rate decreases with the increase of women empowerment in employment. Highly educated husband are likely to empower women in their working decision as compared to low-level educated husband. Moreover, working-woman is independent for education continuation and does not influenced by the son preference.

It is entirely feasible to suggest that female education is multidimensional tool to excrete woman from the chain of social injustice, income inequality, human rights deprivation and pro-male biasedness in productive domains of the country. However, policy reforms for education and gender equality at community and country level must be introduced in order to rehabilitate female victims and initiate economic streamline for development goals.

Chapter 3 evaluates the impact of educated single females (never married, widows and divorced) in the society and their contribution in the economic welfare of the household. Specifically, this chapter designed to focus on two main perspectives. Firstly, it highlights the importance of single females who remained ignored and face extreme discrimination that their marital status becomes stigma throughout their lives. Secondly, it analyze whether it is feasible to provide economic opportunities to single females and they might influence positively in the wellbeing of the household by securing the equitable position in the society.

The society segregates females on socio-economic and marital status, therefore, uneducated single females are prone to gender discrimination, extreme hunger, financial burden and low empowerment rate. The education is the prerequisite for rebuilding the conflicted areas, positive outlook, and improved life, accessibility to the outer world, advance technology, confidence and employment opportunities. On the other hand, female education and socioeconomic characteristics of the individuals and households are predictable dynamic channels for gender equality and economic growth in developing countries such as Pakistan. However, major areas of the country deprived from education and freedom of mobility that restrict the female to work and explore her cognitive areas. Moreover, War on Terrorism, regional and political instability have triggered immensely to halt ongoing educational projects since recent decades. Educational

reforms by integrating peace and equality seems difficult to implement, particularly, in rural, tribal and conflicted areas to gain economic welfare.

The aim of my study is to determine economic welfare of Pakistan with the contribution of single females, their education and, socio-economic characteristics at micro and macro levels. Furthermore, this study examines economic welfare by using Pakistan Social and Living Standards Measurement (PSLM) survey microdata from 2005-2016 with Multilevel Model regression. In addition, another objective of this study is to deal with the potential endogeneity between gender and consumption expenditure, which is proxy of economic welfare with the help of instrumental variable technique. The data structure of my study supports the use of multilevel regression model. The two stage consists of Primary Sampling Unit (PSU) at higher level and, lower level contains households and individuals while using multilevel model enables to acquire different slopes that cannot be possible with simple fixed effects. Using this methodology puts identifying variations in the outcome on two or three levels depending on the stages of the hypothesis.

The findings of my study suggest that education improves living standards of single females and form productive behavior of the society towards vulnerable ones. Primary and secondary education levels of the single female are equivalent to the possession of physical asset to gain welfare. Results reveal that educated parents can capture the persistent gender gap and contribute in the human capital investment for the long run economic growth by providing education to their children in which mother contributes potentially higher. Findings explain strong influence of male head of the household as the society has deep roots of patriarchal system. The cultural norms refrain male members to allow their females to work outside the households. Meanwhile, household characteristics play important role to improve living standard, yet they are quite associated with the people who have sufficient resources and living in the urban areas. The borderline indicates that fostering education opportunities can address the poverty issue at micro as well as macro levels by reducing the unequal distribution of the household resources. It appears that PSU examine to be different and effective for different kind of the households and variations are stronger between PSUs as compared to between households.

Chapter 4 determines education attainment and current enrollment in framework of gender differences in Pakistan with the contribution of household income and socio-economic

characteristics by using Pakistan Social and Living Standards Measurement (PSLM) survey microdata from 2005-2016 with ordered logit and logit models regressions depending on the outcome variables. In addition, it deals with the potential endogeneity between income and education by advance instrumental variable technique of Two Stage Residual Inclusion Method. Another objective of this study is to examine the educational and gender inequalities on education and income of the household. The findings of my study suggest that per capita income increases the probability of education attainment and current enrollment, however, as far as concern about the educational transition effect among children then boys are more likely to complete their education and entry into schools than girls are. Additionally, transition effect is higher from primary to secondary education as compared to secondary to tertiary education (Freedom et al., 1990). Interestingly, the findings contradicts previous studies (Chowdary et al., 2011) and highlights the lower and middle income groups associated with manual or low skills occupation who are thriving to educate their daughters more than sons. Findings provides significant and higher impact of educational inequalities as well as gender gap in education is unlike to increase income per capita particularly among girls. In addition, Oaxaca type decomposition reveals higher unexplained variation; however, there is 61 to 41 percent explained variation in education attainment and current enrollment respectively. Findings suggest personal attributes and household infrastructure might be favorable for girls, and, members and income of the household support boys' education, yet, these results are highly dependent on the household's treatment towards children. The borderline indicates that fostering education opportunities can address the issues of poverty, fertility rate and low female labor force participation. The results from IV techniques emphasize to exploit exogenous variations in income and indicate robust results for education attainment and current enrollment.

5.1 Data Structure

The data used in the research is attained from Pakistan Social and Living Standards Measurement (PSLM) survey. Since all chapters are interconnected and their motivations are interlinked with each other that is why the same data is used for the consistent analysis across the research. A pooled data is constructed from six cross-section household datasets including 2005-06, 2007-08, 2010-11, 2011-12, 2013-14 and 2015-16. The total number of observations in the pooled data 749,503. The sample of the second chapter includes information on the women aged 15-49 years for their decision-making in the household for their strategic life choices to contribute in society

and economy by marriage, education, health, employment, and household resources. The total number of observations in this chapter is 562,829 and composition of the questionnaire provide information mainly for women, mainly for the joint decision with father or husband and mainly for joint decision of woman with other members of the household. The sample of the third chapter is based on the single females aged 15-65 years who are never married, widowed and divorced. The sample of the fourth chapter is confined to the children aged 9-24 and 5-24 years for education attainment and current enrollment respectively.

The Pakistan Bureau of Statistics (PBS, Government of Pakistan) conducts the PSLM survey to provide socio-economic indicators at district and provincial levels in alternative years since 2004. Generally, the data conducted by this survey is a helpful tool to assist the government in designing economic and strategic policies and plans to reduce poverty and illiteracy as well as transforming society on egalitarianism. Additionally, the Sustainable Development Goals (SDGs) focus on living standards of the individuals by statistical computation for education, health, employment, and consumption expenditure of the household resources. Therefore, PBS is responsible for monitoring the task of SDGs with the help of PSLM all over Pakistan since 2015 in order to provide consistent estimates for United Nations Development Programs. The sample size of the survey is huge that is 80,000 households at the district level and 26,000 at the provincial level. Besides UN, the IMF and World Bank also rely on the Poverty Reduction Strategy Paper Secretariat that is designed by the estimates of PSLM survey datasets. As far as concern about the data structure then urban and rural areas of four provinces (Punjab, Sindh, Khyber Pakhtun Khwa (KPK) and Balochistan) makes the universe of the survey excluding military restricted areas. The sampling frame includes urban and rural areas and each city or town further divides into enumeration blocks in which there are 200 to 250 households are included. The two stage stratified sampling design has been adopted whereas the response rate of the survey is quite satisfactory almost more than 90 percent. However, the reliability of the data concerns, there are several authentic measures by PBS in which first response gathers by qualified team of four including males and females with supervisor committee members and further data monitor at the headquarters. The preliminary editing happens at regional offices and

after ensuring data quality it carried out to the Islamabad headquarter for consistency check based on variation and confidence intervals[4].

Meanwhile, the benefit of using PSLM is manifold such as, it is unique data, which provide information using an integrated questionnaire at individual and households levels on a variety of topics covering from education to the income per capita. Secondly, it has another purpose to monitor indicators of Millennium Development Goals (MDGs) that actually build the foundation to tackle socio-economic issues with consistency and modern techniques. Lastly, it provides detailed information of individuals of every age regarding education, health, employment, consumption and there are specific modules on gender equality and women empowerment. Lastly, PSLM pooled data from six rounds have never been investigated in prior research related to gender discrimination, economic growth and empowerment earlier. Therefore, this research is the pioneer in analyzing and providing significance of this dataset for individuals and households of Pakistan. It has three main advantages; firstly, number of observations is higher than number of the households that provide significant comparison at provincial levels. Secondly; it is suitable to conduct empirical analysis when the categories for specific domains are further divided to sub-domains such as working head into different occupational categories, thirdly; because of the high response rate, quality and reliability of the data, it is highly appropriate to investigate socioeconomic characteristics of individuals for human capital perspective.

General Overview of the Variables: In general, most of the variables described at individuals, households, community and provincial levels. In specific, by considering the chapter 2, the outcome variables are binary and categorical. For example, for marriage, family planning and household expenditure decision-making, the outcome variables takes value 1 if woman alone decides and 0 if other decides. For son preference, binary outcome variables defines 1, if the first child is son and 0 for daughter. The categorical outcome variables for education and employment have value 1 for woman alone decision, 2 for husband/father alone decision, 3 for joint decision with parents/husband and 0 for the joint decision of the other members of the household. The other explanatory variables include women, husband and head characteristics (age, marital and working status etc.), household and community characteristics, location and wealth quintiles.

[4] The details on the methodology is available on the website (http://www.pbs.gov.pk/content/methodology-1).

Chapter 3 focuses on the economic welfare of the household and the main outcome variable designed by the per capita income expenditures that constructed by the total expenditure divided by the household size. Other variables include, dummy variables of woman in marital status, their education and age, parents' education and other variables for household characteristics, location and languages. Finally, chapter 4 explains the gender difference in education achievement and I adopted two measurements of the education (Sawada 2009; Maitra 2003). First one is education attainment for four categories including 1 for primary, 2 for secondary and 3 for tertiary and 0 for no education. While, second one is current enrollment that takes 1 values if the child is enrolled and 0 otherwise. Other variables include income per capita that is total annual income of the household (in Pakistani Rupees) divided by the household size, child and individuals characteristics, head and parents education, household background and provincial characteristics.

5.2 Contribution to the Literature

The female human capital is a prerequisite element in household wellbeing and economic development. Generally, empirical studies have examined the significant contribution of women in economic development but some remain limited to cross-sectional data, others focus on married women or totally ignored gender-specific role, while, some consider the only linear relationship that lacking dynamic and econometric contribution in longitudinal studies (For details see Table 1.1). Similarly, it fails to receive adequate attention among researchers and prior studies in Pakistan in the context of 'human capital accumulation in developing countries'.

Most of the studies do not provide in-depth analysis for the women participation in socio-demographic and socio-economic perspectives that mainly neglected the role of household decision-making in various strategic choices, household welfare, and education attainment. Therefore, to fill the gap, this research provides dynamic analysis for women empowerment in household decision-making while focusing on primary to higher education attainment. More precisely, it determines almost possible socio-demographic and economic factors to highlight the importance of women's position in Pakistani society and their role regardless of their marital status. Prior researchers focus education determinants with the contributions of the women's rights towards employment, income share, and freedom of mobility, however, in my study, I try to capture alternative specifications in order to draw robust estimates for female human resources.

Table 1.1 Empirical Studies on Female Human Capital and Gender Gap: Brief Glance

Table 1.1 Empirical Studies on Gender Gap and Female Human Capital

Research article	Research question	Main methodology	Main results	Rationale
Empowerment				
Klasen et al. (2015)	The contribution of defining empowerment and representation of the ability to change aspects of one's life at communal and individual level.	**Models:** Generalized ordered logit model regressions and Probit model regression analysis for the year 2008 in Gambia. **Sample:** 2,184 observations on individuals. **Variables:** **Socio-demographic:** Age, gender, household size, marital status **Socio-economic**: Education, literacy and economic activity, expenditure, wealth index **Region:** Rural or urban **Instruments:** Averages of the endogenous variables and village fixed effects	The definition of empowerment related to agency, literacy and wealth find consistent variables to increase empower. However, male population and polygamous status play major role in empowerment.	The study is quite general in terms of power with two aspects. Empowerment in community and as change within one's self with self-reported capabilities happen according to the individual desire and wish without focusing on particular group.
Allendrof (2012)	The contribution of women's agency and the quality of life through kinship patterns household structure and domestic violence.	**Model:** Multivariate model regression for the year 2002 in India. **Sample:** 2,444 currently married women aged (15-39) **Variables:** **Socio-demographic:** Age, household size, freedom of mobility, kinship quality **Socio-economic**: Education, employment, expenditure, household wealth	Women empowerment by mobility and decision-making in expenditure can influence household. Kinship quality can increase women's agency. However, limited to married women and joint families by ignoring importance of mainly joint decision-making power within the household.	The authors argue that empowerment is associated with the family structure and quality of relationship.

		Region: Residence area **Instruments:** No correction of endogeneity		
Corroon et al. (2013)	The contribution of women empowerment in urban health care outcomes associated by region of residence.	**Model:** Multiple logistic regression for the year 2010 in Nigeria. **Sample:** 8,834 married women aged (15-39) **Variables:** **Socio-demographic:** Age, household size, freedom of mobility, violence, decision-making. **Socio-economic**: Education, women employment, economic freedom, household wealth quintiles. **Region:** Cities **Instruments:** No correction of endogeneity	Modern health measures likely to increase empowerment with partner. However, study limited to the structure of data, gender and cultural barriers in decision-making.	Urgent reproductive health strategies are requires to facilitate maternal and child health in terms of African countries.
Economic Welfare				
Ogundari et al. (2013)	The contribution of education attainment on the on household per capita expenditure for expected economic benefits.	**Model:** Quantile regression for the year 2003-04 in Nigeria. **Sample:** 18,883 households **Variables:** **Socio-demographic:** Age, household size **Socio-economic**: Education levels of head, occupation, household per capita expenditures. **Region:** Rural **Instruments:** No correction of endogeneity	The improvement in the welfare is highly likely with the additional year in the tertiary education whereas, primary and secondary levels of education do not account much impact. However, the causal inference has not drawn for per capita expenditure and education attainment.	The wellbeing within the household associated with the advance level of education and gender of the head along with the occupation choices play wider role.
Himaz et al. (2011)	The contribution of education attainment and household welfare for	**Model:** Quantile regression for the year 1985-2006 in Sri Lanka. **Sample:** Approx. 18,000 households	Higher quintile yields higher returns and better quality of education that indicate education completion (grades 8-13) and	Not only basic level of education, but tertiary education is equally important to develop

	higher returns in labor market.	**Variables:** **Socio-demographic:** Age, household size, 0-14 year's population in household **Socio-economic**: Education levels of head, occupation, household per capita expenditures, remittances and house rent. **Region:** Rural **Instruments:** No correction of endogeneity **Model:** OLS and Tobit models regressions for the year 1993-97 in Ethiopia. **Sample:** 15,000 households.	more earning opportunities in labor market. However, possible endogeneity remained ignored.	household welfare. The returns gap are likely to happen due to gender differences in completion of education.
Fafchamps et al. (2011)	The contribution of bargaining power in order to acquire intrahousehold welfare.	**Variables:** **Socio-demographic:** Age, height, BMI, siblings, leisure, decision-making. **Socio-economic**: Education, employment, asset, bargaining measures, assets at marriage. **Region:** Rural **Instruments:** No correction of endogeneity	More skilled and intelligent people appear to have significant impact on intrahousehold welfare contrary by leisure. However, the possibility of female returns and household purchases might subject to endogeneity bias.	BMI and mobility index of couple provide long-term welfare measures. BMI improves welfare with unit increase that is not appearing for mobility index.
Gender Differences				
Rammohan et al. (2018)	The contribution of women education and gender differentials with the quantitative evidence of economic and social factors.	**Model:** Ordinary Least Square regression for the year 2007-08 and 2011-12 in India. **Sample:** 33,074 married women **Variables:** **Socio-demographic:** Age, caste, exogamy, religion.	Negative educational outcomes while residing with husband's kin for women and gender differential associated with the patrilocal exogamy. However, causal inference has not drawn for the gender gap.	The higher GDP per capita is associated with lower gender gap in education attainment that indicates heterogeneity among income groups.

Sawada et al. (2009)	The contribution of dynamic gender differences in education attainment by full-information maximum likelihood estimation.	**Socio-economic**: Husband and wife education, women employment, per capita income of household. **Region:** Geographical location **Instruments:** No correction of endogeneity **Model:** FIML regression for the year 1997-98 survey on 367 households in Pakistan. **Sample:** 2365 children **Variables:** **Socio-demographic:** Age, siblings. **Socio-economic**: Income and health shocks, employment, land, worth of land, parent's education. **Region:** Provinces **Instruments:** No correction of endogeneity instead using shocks	Father' education influences at primary education while maternal one at secondary levels. However, reverse causality between economic factors and education completion remained ignored that is somehow captured with the relationship between shock and education.	Gender effect for investing for on male child, credit constraints' role in education investment on siblings and pick-the-winner vs education-friendly households based on the parental perspectives towards child.
Maitra et al. (2003)	The contribution of education attainment and schooling with socio-economic characteristics.	**Model:** Ordered probit model regression for the year 1996 in Bangladesh. **Sample:** 4538 households **Variables:** **Socio-demographic:** Age, gender, head, siblings, household size, religion. **Socio-economic**: Household per capita expenditure, parental education. **Instruments:** Correction of endogeneity only for education attainment.	The estimates show higher-grade attainment in girls rather in boys and no gender differential in current enrolment among children. However, exogeneity of consumption expenditure depends inversely on schooling and education attainment.	The gender differentials depend on the gender of the parents and preferences while human resource accumulation and education are inevitable for economic growth but differ with socio-economic structures.

Past studies argue women participation in households and society with the limited information while neglecting the structure and cultural preferences of Pakistan, meanwhile, I try to examine the importance of unitary and joint decision-making for the household economic and social welfare in which alone decision get less attention and mostly rejected due to cultural barriers. Pertaining to methodology, past studies have examined socio-economic and demographic characteristics separately for the probabilities of women empowerment in decision-making while focusing on the particular dimension with only binary models. Therefore, this study addresses this gap with six major dimensions of women's socio-economic lives with multinomial logit and logit models and significantly contributes in order to capture the reverse causality between education attainment and empowerment in which mainly woman, mainly husband or father, jointly with parents and jointly with husband provide appropriate estimations to discuss the importance of women education. It is noted that most of the prior studies focus on married women and analyze their contribution to the economic growth of the country.

Meanwhile, it is the foremost and pioneer study in the context of single females in Pakistan to present dynamic analysis for two levels: households and PSUs (Primary Sampling Units). Pakistan suffered more than 70,000 causalities in the "War on Terror" in which the majority of the victims are children and women. Besides this, regional and domestic conflicts, uncertain economic and political conditions, calamities (drought, floods, and earthquakes) between 2000 and 2010 become another factor behind increasing single females in the country. This study very first time has highlighted those single females who claimed as an economic burden or social stigma of the society have the potential to transform the country into a welfare state through education attainment. It describes within and between household variations with multilevel model regression and finds treatment differences subjective to languages, poverty, location, and literacy aspects. This study itself unique to use the pooled date of repeated cross-section household survey to examine the impact of single females' education on welfare and draw causal interference between gender and consumption expenditures.

Understanding the socio-economic factors affecting education attainment and current enrollment, this study explains the gender differences at the individual level. It provides a dynamic analysis of transforming rate of success from one level of the education to the higher level with the help of ordered logit model that has never been considered in the previous research by using PSLM

dataset. A better understanding of this mechanism can lead to boost up economic growth of the country. Analyzing determinants of education in developing countries ultimately demonstrate the MDGs for uplifting the living standards of the people. This study addresses the literature gap by providing consistent estimates that link with education attainment by complete years of schooling and current enrollment to explore the gender differences within the household and explaining the role of per capita income for education improvement. Most of the past studies focused on the impact of educational and gender inequalities across country at the macro level, or demonstrate between countries effect. With existing gender differences and discrimination in human resources capital in the households, this thesis contributes towards the understanding of the educational returns at the micro level with multiple predictors. Apart from standard explanatory variables such as age, household size etc., this study include wide range of individual, household and community characteristics along with occupation, regional variation, and individual choices that have never been examined in Pakistan before.

It explores at one side, the determinants of education with income and Gini coefficients, and on the other side, it determines the income of the household with gender inequalities in education attainment and current enrollment that have never be addressed at one platform. Lastly, I determine the gender effect again with multiple approaches available in the existing literature to highlight another variation aspect in Pakistani education. Furthermore, my study uses the advanced econometric technique to tackle the issue of endogeneity with Two Stage Residual Inclusion for non-linear models. To my knowledge, no previous study has tackled the potential endogeneity issue in non-linear models for female human resources, and household income in Pakistan. In addition, I applied control function, IV Probit and 2SLS approaches to demonstrate the consistent results with and without considering the nature of the dependent variables.

In nutshell, this study attempts to determine the gender differences, women empowerment and economic welfare to fill the discussed gap in the literature by using pooled data of PSLM from 2005 to 2016. A random sample survey of data covering six cross-sections of approximately 80,000 households across Pakistan provides unique sample size and true representation of Pakistan in the analysis of women's contribution in the economy and society. While, most of the past studies were confined to the few districts, provinces or particular year and collected from different surveys, which are potentially not a random sample for consistent analysis. Given the

evidence of gender discrimination in Pakistan for education, it is worthy to evaluate and determine the status of women, the extent of the gender gap and the potential to rebuild the country with modern and advanced skills with non-linear decomposition and multilevel techniques.

5.3 Structure of the Thesis

Furthermore, the thesis is divided into three interconnected chapters where the findings of each chapter emphasize on the motivation of the next chapter. The chapter 2 explains the relationship between women education and empowerment in the household along with clarifying the concept of empowerment in Pakistani society. The chapter 3 identifies the role of single females in the welfare gain across different ethnic groups. The chapter 4 determines education attainment and current enrollment with income and socio-economic characteristics of the household in the framework of gender differences. The same dataset is used in all empirical estimations consistently in all chapters as their aims are interrelated, however, survey rounds might vary. Each chapter is designed into the following subsections: Introduction, Stylized Facts, Literature Review, Data and Methodology, Results and last chapter with Discussion, Conclusions and Policy Implication and at the end provided with References and Appendices. After that, I present general conclusion of the thesis. Lastly, I present the extended summary of the thesis in French language.

CHAPTER 2: Power of Education Empowers Women: Women Strategic Life Choices and Economic Development

A slightly different version of this chapter is currently "Under Review" in Journal of International Development.

Abstract

The objective of this study is to analyze the impact of education attainment on women empowerment who are struggling to contribute in the welfare and economic development of Pakistan. It uses the microdata of Pakistan Social and Living Standards Measurement survey from 2005 to 2014 for 80,000 households. This study attempts to clarify and define the concept of empowerment in the context of Pakistani society where young women constrain in strong patriarchal structure, cultural barriers, baradari system and, human rights violation. The study uses economic strategy of probit and multinomial probit regression models depending on outcome variables. In socio-demographic context, women empowerment observe by decision-making in marriage, family planning and son preference. Meanwhile, economic perspective examines women decision-making power for household resource expenditures, education attainment and continuation, and employment. In addition, this study contributes in the economic literature by dealing with the potential endogeneity while exploiting exogenous variability in women education attainment that has been remained ignored in women empowerment for economic perspectives. The estimates show a strong and the significant impact of education attainment on women empowerment in intrahousehold decision-making. The results indicate that age has the diminishing marginal effect on women empowerment. Younger women are vulnerable for marriage decisions; however, education attainment reduces their age of marriage and increases the probability to contribute in labor market. Contrary, strong patriarchal system supports women empowerment subject to son preference. Additionally, substantial healthcare services accompany to the mothers with birth of male child. Joint decisions in family planning is favorable for women empowerment, on the other side, woman individual decision-making is directly proportional to the use of birth control methods that effective for reduced fertility rate. Estimates provide sufficient evidence that education can lower the male autonomy in the household resource expenditures but it is less likely to affect in rural areas. The female labor force participation increases in higher-income groups that are unlike to increase gender equality in education. On the other hand, working-women are highly likely to gain control if they are married with a qualified husband and when the head of the household is associated with paid employment. The findings of this study transfer valuable and specific information for policy makers at individual and household levels for women in education reforms, media exposure for self-awareness, marriage age, equal health and employment opportunities in the country.

Key words: Human development, education, gender inequality, women empowerment, probit and multinomial models, Instrumental Variable.

JEL Codes: O15, I24, C36, B54

1. Introduction

Women education is prerequisite to Millennium Development Goals for achieving social and economic empowerment (United Nations Charter 2015). High mortality rate and gender discrimination, after and before birth, subsequently have increased number of missing women in millions (Sen 2003). On the other side, women education is inevitable to implement public policies for poverty reduction and unemployment (UNESCO 2015). It has claimed that empowerment remains a latent phenomenon that can observe indirectly. In agreement, researchers and policy developers in recent decades are interested to observe the effect of women empowerment through social and economic contexts, particularly, education attainment, female labor force participation, power of decision-making, status and access to freedom (Klasen et al., 2003). However, most of the research highlight the correlates of women empowerment but do not address their respective causal effects (Samman et al., 2009; Allendrof 2012). In addition, the definition of empowerment remains complex and unclear in different social set-ups and population demographics.

In Pakistan, women are experiencing economic injustice, social discrimination, strong patriarchal system, cultural boundaries and, outdated norms since inception (Malik 2011). The capability approach emphasizes on the role of agency in empowerment that enforces woman to take decision according to her capacity and ability (Holvoet 2005; Alkire 2009) [5]. This approach contradicts prevailing social behaviors in predicament of forced marriage, physical abuse by husband and marital family, dowry and, obsession of male heir. In extreme crisis, women face honor killing in consequences for practicing their individual rights for marriages. Despite of legal reforms, Pakistan reports highest number of estimated cases of honor killing around 900 to 1000 per capita in the world[6].

Kabeer (1999) explains empowerment as three inter-related dimensional process. Woman uses social, human and economic resources and make choices for her strategic goals to achieve welfare. These resources focuses on education, employment, power and control over the

[5] Capability approach introduced by A. Sen and M. Nussbaum in 1980. This theory prefer substantive freedom to utility or access to the resources. It is opposite to the traditional approach of welfare economics. This theory observe capability of the individual that what and how they can do.

[6] International digital resource networking is known as "Honour Based Violence Awareness Network" and working since 2006 for forced marriages and women abuse through documentation and information. This network provides suggestions according to the victims need.

resources. Similar thoughts of Scanlan (2010) define empowerment with desired human attributes that include education completion, good health and, social security. In contrast, women have been suffering from lack of education and occupational segregation in economic stream of Pakistan. One of the prominent name of the youngest Nobel Prize laureate, Malala Yousafzai[7], who was banned along with other girls to continue their education in the province of KPK[8]. The working environment for women is hazardous with low pay scale, no medical benefits or job assurance, no legal protection for sexual harassment at workplace in male-oriented labor unions[9]. It is more likely that marginalized women after gaining empowerment face frequent exposure to violence and unequal distribution of household resources (Basu 2006). However, recognizing the importance of reduce fertility rate or basic education do not determine embodiment of strategic goals[10].

The study contributes in the literature in following aspects: First, the study examines Pakistan, one of the developing countries in the South Asia with larger proportion of young women, bound in patriarchal structure, cultural barriers, baradari system, social taboos and, human rights violation. It is important to observe these differences and this is one of the main objectives of my study to clarify and define the concept of women empowerment in decision-making in the context of Pakistani society. Secondly, it develops understanding of human resource investment in education, focusing only on the power of women decision-making within and outside of the households, for social and economic perspectives simultaneously. It highlights the complexity of women empowerment that is inter-linked with the family and community repercussion and difficult to emancipate. The socio-economic indicators for these two approaches include; firstly, choice of marriage, family planning, son preferences, and secondly, intra-household resource expenditures, education continuation and, employment. Thirdly, this study attempts to provide conclusive analysis for women unitary and joint decision-making by dealing potential endogeneity in education attainment that has remained ignored in previous literature and,

[7] See Malala Fund
[8] Recent report of Pakistan Bureau of Statistics (2018) claims that female-to-male disparity has declined or narrow down in the 2018, whereas, the literacy rate has slightly improved by 49 to 51 percent all over the country. See Labor Force Survey Pakistan Report 2017-2018.
[9] See for details: Ministry of Human Rights, Pakistani women struggle for equality at work by S. Jamil (2009), and women work by Sathar et al. (1990).
[10] See N Kabeer; Resources, Agency, Achievement (1999) as empowerment describes as the process to take control on lives by expanding choices for the alternatives.

provides useful recommendations for policy makers[11]. In addition, taking advantage of this correlation, I try to examine whether or not women empowerment can also effect on education achievement. These estimates can observe for the robustness of the results as well. The scheme of the paper includes five sections. First section is Introduction, second deals with stylized facts of the country, third part covers background of the study and in fourth section, I present methodology and data. The fifth part consists of analysis and last section deals with discussion, conclusion and policy implications.

2. Stylized facts in Pakistan

It is important to provide synopses of education system in Pakistan before describing empowerment indicators. Education system of Pakistan has deep roots with pre-partitioned British subcontinent that inclined to produce necessary subordinates and clerks for administrative work. Several reforms and policies have introduced in the observance of ideology, socio-economic needs and modern technologies since partition, however, education system is still widely underdeveloped (Malik 2011). It is centrally governed by Ministry of Education and follows three levels: Primary, Secondary and Tertiary. Formal education starts at the age of 5 years and remains compulsory until the age of 16 but it is important to note that basic education is not completely free in all provinces (Saeed 2007)[12].

I focus three major areas for socio-economic activities including education, employment and household consumption expenditure. The literacy rate of the country is 62.3 percent that constitutes 51.8 percent females and 72.5 percent males (Pakistan Bureau Statistics 2017). Female literacy rate is highest in Punjab with 57.4 percentage, afterwards, in Sindh 49.9 and, lowest reports in KPK and Balochistan 38.5 and 33.5 respectively where tribal and Jirga systems are highly dominating. It is true that low female literacy rate links to poor status, least power, mobility restraints and income inequality with respect to each province. In South Asia, dropout rate is higher in Pakistan that includes approximately more than 30 percent female students[13].

[11] See Gupta et al. (2006), Allendrof (2007), Allendrof (2012) and Lokshin et al. (2005).
[12] Each province has liberty to organize its curriculum and education system is independent at university level. However, reforms and public initiatives for the content of the subjects introduced in 2005 for public and private education institutions to make curriculum more adaptable.
[13] The number of the out-of-school children is more than twenty two million by the end of the decade (Pakistan Economic Survey and Labor Force Survey 2017-2018).

There has been low rate of degree completion by females that is 5.1 percent and only 5.2 percent get the opportunity to reach at tertiary level of education.

Additionally, low statistics are linked to the low share of the GDP (Gross Domestic Product) on education and it was 2.4 percent in last the year (Ministry of Finance, 2018-2019). Public and non-profit organizations collaborate to make initiatives to reduce the literacy gap[14]. However, rural areas are becoming vulnerable for basic infrastructure and education facilities (Shami et al., 2005). Secondly, in Pakistan, economic growth suffer from gender segregation where working-women label as social status quo. Female labor force participation in Pakistan recorded lowest in South Asia that means male biasedness towards traditional gender roles and subsistence wages that triggers extreme poverty (Ejaz 2007). Pakistan is an agricultural country and this sector contributes in GDP by two third ratio that covers 50 percent of the working population in which women ratio is 67 percent. Jirga system and Pardah restriction are stemmed for reducing female labor force participation from 12.1 to 7.9 percent (Pakistan Labor Force Survey 2017-2018). In addition, majority of the husbands prefer home-based work for their wives that is inclined to caring services or teaching. Almost 85000 female doctors are not working after completing their medical education and it constitutes 50 percent of the total enrolled female students (Pakistan Cardiac Society 2019). Pakistan Vision 2025[15] urges to raise the current level of female labor force rate up to 45 percent. It initiates with the improvement in female gross enrolment rates to alleviate poverty that is already prevailing 39 percent in the country (World Bank 2019). Thirdly, women's bargaining power deliberately considers as economic endowment that is directly proportional to the age, education, land ownership and status within the household. Educated women can distribute household resources judiciously on education and health of children regardless of gender (Ashraf 2010). In developing countries, majority of the households fail to provide strategic decisions on consumption expenditures (Duflo 2012). Women autonomy and headship on household resources increases their bargaining power and efficiency that could facilitate them in small investment ventures and spouse preferences (Udry 1996). While, female

[14] Programs especially in rural areas, such as, Non-Formal Basic Education for the adults and poor families. It somehow proves better for girls with the ratio of 4 to 1.

[15] This 12-year plan has been started in 2014 for the 90 percent literacy rate, female labor force participation rate by 21 percentage point, reducing generation costs in electricity, hydropower and mediums of energy that are economical elements of sustainable growth. It urges to increase the export 150 billion US dollar on annual basis by opening small business ventures and promoting gender equality in labor market to maximize the female human resource.

headship of the households reported only 10.29 percent in the country (Pakistan Statistics Bureau 2013).

In focus of socio-demographic perspective of the study, interested areas are decision-making in marriage, family planning and son preference in Pakistan. Marriage considers as a social change and moral obligation in Pakistan. Economic progress and social movements for gender equality have brought changes in marriage structure in Pakistan (Critelli 2012). However, regional disparities, class, culture and caste practices also remain highly active (Sathar et al., 2015). Extremism of men power demonstrates patriarchal customs in the tribal or rural areas where women become victims and may be sold, bought and, paid as ransom amount for murder, inheritance and physical abuse (Amnesty International 2002). Human Rights Commission of Pakistan allow women to enter and liberate themselves in a marriage according to the law. However, Karo-Kari custom, kinship forced marriages and child marriages specifically in rural areas are denial of women access to education, law and individual liberty (Philipps 2004). According to Pakistan Demographic and Health Survey (PDHS), more than half of the women aged 15-49 married with their cousins and this percentage becomes up to 70 percent in rural areas[16]. On the other side, scientific research brings the causes of birth defects and congenital malformation in newborns are due to interfamily marriages (Mahmood 2002).

Population estimates show 21 percent girls get married before reaching the age of 18 years (UNICEF Pakistan 2017). Every girl achieving secondary education reduces the chances of getting married before 15 years of age by 3.4 percent. Recent government suggests amendments in Child Marriage Restrain Act 1929. By this act, the child marriage would be ban and parents cannot get married their girls until the age of 18. In contrast, it is critically negotiable that unmarried women pass certain age might be considered disgrace and become a dilemma for parents being unproductive economic burden in Pakistan. As far as concern about government reform for women rights protection against violence, according to Human right commission of Pakistan, the total acid and burning attack cases reported 3791 in last ten years that drive to pass 'Acid and Crime Bill 2018'. Meanwhile, Acid Survivors Foundation Pakistan (ASF) reports 150

[16] This survey has standard sample size of 50 thousand households to monitor health indicators and mortality rates after five years. The main areas covered by women violence, domestic abuse, childcare and education. The kinship marriages claim as providing support, protection and security to women against husband injustice and, domestic violence.

cases per year[17]. Non-profits organizations are contributing to rehabilitate acid and burnt victims by educating them and enabling them financially independent to survive in the society[18].

Gender inequality in health care is directly associated with the socio-economic background of married woman (Country Program 2018-2022 UNFPA)[19]. Education attainment is associated with late marriage by reducing childbearing age, increase in female labor force and income generation. Currently in Pakistan, fertility rate is increasing with five children per woman and maternal mortality rate is 500 per 10 thousand live births. Mothers and children face poor health with limited access to hospital, public dispensaries and costly health services (Islam et al., 2002). The share of GDP on public expenditure on health is only 2.6 in Pakistan (WHO 2014). The positive consequence of education attainment extricate women from financial dependence on sole male earner or community support and public funds to pay their health care bills and counter ailment or epidemics with physical and mental maturity. (Kabeer 1999; World Bank 2002). It has no doubt that misconception about birth control treatment, superstitious interpretation for medical technology and, traditional beliefs pertaining for procreation are catastrophes for the health sector of the country (Stephenson et al., 2004). The situation in Pakistan for maternal health and population control has become challenging and requires supplementary health financing and, educating health awareness programs with the cooperation of non-governmental organizations (WHO 2016).

Lastly, women in Pakistan suffer from clinically relevant mental symptoms due to severe gender inequality and discrimination within the households and in society (Niaz 2004). Depression and relevant symptoms of anxiety are coherent to mental disorder with ratio of 1.5 to 2.0 between women and men. Sons are virtually necessary for frail older parents. 'Missing women' is another example of gender discrimination and with the birth (Gillard et al., 2008). They face deficient behavior in terms of family care, resources, food nutrients and affection[20]. Secondary approach

[17] Towards women empowerment, this organization has mandate to eliminate acid violence through peaceful and democratic process and provide comprehensive rehabilitation. The highest rate of acid attacks observe in 2004. Acid and Crime Bill 2018 has passed by the help of right activists in which perpetrators would punish for seven year with fine.
[18] See details for Center for Peace and Development Initiative and Smile Again
[19] United Nation Sustainable Development Framework for Pakistan.
[20] Childcare and protection also depends on the gender of the child. Parents' attention and proper diet is available when son is born in the family. This accelerates sex-relative abortions and ratios with decrease in fertility rate on the selection sex of a child (Sathar et al., 2015).

towards women originates inferiority complex and exert impression of being subordinate of the men (Zaidi et al., 2016). Its perspective defines a complex family structure with psychological pressure and risky behavior might be susceptible to prevailing cultural norms. Sons believe to be productive asset and financial support in long run for the family. They take advantage for getting education in quality institutes and acquiring high salaried job as compared to daughters (Ashraf 2010). While, investing household resources on daughters is disadvantage as they assume to benefit their marital families. Pakistan has ranked second in son preference out of 61 countries[21] and Pakistan Demographic and Health Surveys validates these estimates.

That is why, it is important to focus these particular areas for women's empowerment in decision-making with empirical approach elaborated as below:

a. Women decision-making power (marriage); does she has right to choose her spouse freely and confidently or others influence on her future life.
b. Women decision-making power (family planning); does she has right to decide individually about family planning, have more children and does she take decisions by looking into the health status of herself and her children?
c. Women decision-making power (son preference); does woman feel empowered and has control on household and its resources by having first child, a son?
d. Women decision-making power (household expenditure); does she has control on the household expenditure and spend freely on cloths, travel, food and other household items.
e. Women decision-making power (education continuation); does she participates in education attainment decisions and if she has right to take individual decision on the continuation of their education?
f. Women decision-making power (employment); does woman has right to participate in labor market and if she has right to take individual decision to go out for the job search and continuation of profession?

3. Literature Review

In contest with definition, the women empowerment describes by five categories or types: social, economic, political, psychological and most important educational. The prominent approaches

[21] See Bongaarts (2013) for details.

towards empowerment state, firstly, the ability to do work with own capacity and freedom (Sen 2003; Alkir 2009), Secondly, the extended explanation of ability with resources that can produce significant outcome (Kabeer 2011). In recent studies, education attainment consistently proves to be the utmost medium for women empowerment and contribution in the development process. The studies of Bayissa (2018), Strauss et al. (2017) and Hunt (2016) explain that the women make half of the population have equal rights for education attainment and participation in the economic development. Highly educated women have more exposure to the world opportunities as compared to the illiterate ones. These women foster capacities to enhance their cognitive skills and self-awareness. Another study in Pakistan and India (Jejeebhoy et al., 2001) found positive effect of education on empowerment. Empowerment is multidimensional term that does not build only on theoretical basis but also need empirical investigation. Applying econometric tools, Hindin (2000) worked on Zimbabwe dataset, found positively, and significantly influence of education completion rate for women empowerment. While, researchers focus on the combined impact of individual and household characteristics for female authority. These characteristics involve age, education level and household wealth index (Mishra et al., 2011). Meanwhile, Gupta et al. (2006) investigate on the dataset of married women in India with other explanatory variables like literacy rate, education completion, age and, media exposure but do not capture its causal relationship.

The emphasis of literacy programs are inevitable in the achievement of power and control but micro financing is another predictor that increases income level of women and power simultaneously. Females with low level of income and entirely dependent on the household members face limitation for small business enterprises. Micro credits schemes increases the probability of women autonomy in the household and studies of Gurman et al. (2016) and Cheston (2002) show similar results. Nevertheless, different geographies and social set ups establish opposite results, such as, study of Ganle et al. (2015) found inverse relationship between micro financing and women authorship. While some researchers argue for the cash flow mechanism that is consistent with the female headship and ownership within the household. They focus on the cash flow towards women is likely to increase their decision-making power and control on resources (McLean et al., 2010; Gitter et al., 2008). It is interesting to study that not only cash flow but also other mediums of monetary assets contributes equally to increase women empowerment. The study of Presser et al. (2000) examines the autonomy of women in

which holding assets or ownership including valuable goods in terms of gold and jewelry are likely to reflect more control by the females.

In addition, the importance of physical assets holding have significant role in the provision of security and protection against domestic violence by Panda (2005). Whereas, discrepancies prevail in the physical possession of money in which most important is loans. Sen (1996) describes that women have partial or no control for the use of loans and their husband spend these loans without informing them. In spite of these shortcomings, some studies do not emphasize on the micro financing and land ownership. According to Samman et al. (2009) and Haddad et al. (1997), most of the studies are concerned for specific economic characteristics related to land ownership, influence of assets, control on the household resources or microcredit financing that ignore the socio-economic and demographic determinants that are main elements of empowering women. They claim that with the economic activity perspective asset holding might be defined as empowerment, yet social indicators play role identically.

This argument supports the empowerment definition given by Kabeer (1999). The author defines empowerment a procedure with three elements consists of resources, agency and outcome. These resources are the main characteristics in women's lives in which they might be assets or objects in terms of better schooling, secure environment, healthy lifestyles and freedom of mobility. In similar human resources domain, Allendorf (2012) worked on married women by using OLS and determined empowerment by age, education and family relationship by ignoring potential endogeneity. In his previous work for Nepal (Allendrof 2007), land ownership remains ignored with possible causality for investigating empowerment and gender role. The role of mother and the elder members of the households influence on the upbringing of the female child. While, domestically, child survival rate and his nutrition level, health care facilities and calorie intake also describe women's income in the households. Women empowerment in Pakistan has taken particularly for social awareness. However, women strategic life choices with decision-making are remained ignored empirically in recent studies. Most of the studies have focused only on social set-ups for women or theoretical aspects of the empowerment with limited determinants. Maslak et al. (2008) explains girls are brought up with the self-denial and subservient in the South Asian countries. Another study by Beaman et al. (2009) present cultural boundaries as political restrictions for females to perform at macro levels. Its study examine power of control

with different methods in which people response for the male and female leaders differently. It found that men are preferable leaders as compared to women.

It is evident that investigating empowerment is not complete without recognizing child's health and family planning by the individual and joint decision of wife and husband. By examining the data of Taiwan, Chou et al. (2010) found positive effect of parents' education on the child health and inverse relationship with child mortality. On the other hand, similar strategy used by Duflo (2004) do not find evidence of reduce mortality rate. However, their results explain the place and year of birth of women are important determinants for empower achievement. They suggest that women belong to cluster of regions has strong impact on the household size and education completion rate.

It is undoubted to analyze the gender disparity within household with the help of education and empowerment for female children. Another study explains the low women empowerment is linked with the higher gender inequality in education. For example, in India the ratio of sending boys for the graduate school as compared to the girls are 32 to 18 percent (Beaman et al., 2012). Few studies have dealt with the potential reverse causality such as; Trommlerova et al. (2015) used generalized ordered logit model and find age, marital status, nationality and health important determinants of empowerment. They use village averages as instruments and village fixed effects to control the unobserved heterogeneity. Nevertheless, their work is focused on communal level rather intra-household decision-making.

Examining particularly the working-women in Pakistan, Malik (2011) explains women exposure to the higher education offers economic independence. Labor force participation has potential to increase per capita income of the household and its expected monetary returns reduce gender discrimination among children. He argues that joint decision-making equivalently stimulates family support system and marginal income level. The positive externalities of support system increases the likelihood of education continuation up to tertiary level. The study of Clementia (2017) instrument women work in private and public environment and deal causal behavior with the woman decision-making for employment alone. Noreen (2012) also found significant impact of family background characteristics on income equality and education attainment. In South

Asia, particularly in Pakistan[22], the income and wage rate define status and the power of the family member within the households and respective society. Female labor force participation increases their options in many aspects; the working environment polishes the inner abilities of a woman, provides freedom of mobility, and access to resources. Women are risk aversive and financial institutions at micro and macro levels respectively. They sort information with planning and manage investment choices better than males whether it is household or a firm (Browning et al., 2014). The caste or social group that influence extremely in India discourage women time allocation in labor market (Eswaran et al., 2013). It is hard to manage household and employment responsibilities for married women when gender based work dominates in the society. Gupta et al. (2006) studies the married women empowerment in India by logit model regression. It covers mobility and household decision making as indicators of empowerment with explanatory variables such as age, education and media exposure but do not provide the causal effect of education and empowerment. The existing empirical literature observe insufficient information about endogeneity such as potential reverse causality in measuring women empowerment.

The studies of Vlassof (1994) and Malhotra et al. (1997) suggest that married women earnings are likely to support husbands in their household's budget constraints. However, women do not secure empowerment after contributing financially in the household. Man has control and access on the household's economic resources whether he is the only earner, joint worker or if the wife is the only earner of the households. In China (Smyth et al., 2008), missing women are proportionally lower in the tea producing regions as compared to the other part of the country. Female's income increases household's income by US $7 that is likely to increase 1 percent point the survival of the missing young girls. In the classical study of the power within the household decisions, they argue that the joint decision is likely to effect on empowerment with their higher level of education and wages. On the other side, Duflo (2012) and Lundberg et al. (1993) explain that education and empowerment along with household and community

[22] In context of Pakistan, see Zubair et al. (2006) for gender preferences, Chaudhary et al. (2012) different perception of empowerment and Sohail (2014) for women and economic development. Whereas, Khan (2012), Rehman (2015) and Weber (2014) for microfinancing to gain women empowerment; Naqvi (2002) for female labor force participation and autonomy and Niaz (2004), Durrant (2000) and Mumtaz (2009) for child care an women health empowerment. Furthermore, other studies such as Bushra (2015), Faridi (2009) for socio-economic characteristics influencing on gender role and empowerment, Weiss (2003) for religious rights and women empowerment and Jayaweera (1997) and Heward (1999) for education attainment.

characteristics might be unobserved. They focus on the economic development that is achievable with the women empowerment by facing stereotypes of the society. In a result, welfare and nutrition of child and household might increase but on the other hand, it increases the expenditure on health instead of education. Osili et al. (2008) suggest that the reduced number of children increase the women empowerment in case of Nigeria whereas Mocan et al. (2012) explains the use of contraceptives and likelihood of being tested HIV might increase among women with the power gain.

Previous research on late marriages by Goldin et al. (2002) examine that fertility rate can be controlled and likely to improve income level for unmarried women. Meanwhile, availability of the contraceptives methods increases women's marriage age and years of schooling. In developing countries, people are afraid of these methods and cultural beliefs are resilient against its use. However, others (Heath et al., 2016; Mumtaz et al., 2009) also favor this concept that education among young women effect their health care services and improve labor force participation that further accelerates household welfare. Most of the studies found correlation between women empowerment and its determinants but not the causal relationship. The study of Corroon (2014) on reproductive health in Sub-Saharan Africa examined by the women empowerment. They found positive relationship for the family planning use with the women empowerment but unable to focus on the potential endogeneity.

Aaronson et al. (2017) suggest that the labor market opportunities acquire by the women if they control on the choice of having more children and potentially increase their wages. When family planning is taking by the joint decision of the wife and husband, and they are both in working environment, can achieve optimal fertility targets. Women alone are able to reduce fertility rate if they have resources available for the modern technology and contraceptives. Receiving free vouchers in Zambia for the contraceptives by the women who took them alone as compared to those who received in the presence of their husband. This huge difference of 23 percent are more tends towards improved family planning and reduced unwanted childbirths (Ashraf et al., 2014; 2010). Some studies (Jayachandran et al., 2009) also focus on family planning and maternal healthcare services that are strongly correlated with the women decision-making and fertility control[23]. Another study by Zaidi et al. (2016) focuses sex-selective abortions in Pakistan that

[23] Also, see Sathar et al. (1997) and Fikree et al. (2001) for maternal health,

mainly reduces fertility rate but strongly correlate with son preference. Their study supports additional children in the household for the pursuit of more sons or at least one son. Their research provides gender based challenge in population growth of Pakistan. Some studies attempts to deal with potential endogeneity to focus on human capital resources with the help of women empowerment. It includes the study of Godoy et al. (2006) that instrument women empowerment in nutritional status among native Amazonian. Whereas, some studies emphasize only one aspect of women empowerment by ignoring socio-demographics concerns.

Using probit and multinomial logit model (Naqvi et al., 2002) figured out that in Pakistan the female labor participation are quite low with higher level of education with other household factors. Researchers have calculated likelihood models on the decisions made for the primary education level using cross sectional data by controlling family and individual factors. These decisions have made on the time of survey or at the time of school entrance (Alderman et al., 1995; Sawada et., al 2001), the distance to the nearest schools (Jejeebhoy et al., 2001; and Hazarika 2001). Studies of Jejeebhoy et al. (2001) find access to be strongly significant in school enrollment. These results become important when observed at the basis of gender. Further study by Sathar et al. (2000) suggested that parents' preference was strong for separate schools for the girls. The nested multinomial logit model is used for estimation of mutually exclusive choices not to enroll, to enroll in public or private school. Other variables used are father's education, mother's schooling, public and private schools' availability and teachers residing in the same village. Parents' enrollment varies significantly for the girls and boys such as, girls are less likely to enroll if her mother is not educated and father job is in agriculture sector. Other interesting studies have offered estimations based on multinomial models based on human capital approach (Becker 1964, 1965; Mincer 1974; Breen et al., 2000; Kessler et al., 2006).

4. Data and Methodology

4.1 Data Description and Variables

The study uses Pakistan Social and Living Standards Measurement (PSLM) survey micro dataset from 2005 to 2014 of four rounds (2005-06, 2007-08, 2011-12 and 2013-2014) for empirical investigation. The Pakistan Bureau of Statistics (PBS), Government of Pakistan conducts this survey and the objective of PSLM is to establish the distributional impact of the development programs for the welfare of people. The data calculated from these surveys helpful for

monitoring and assessing the Millennium Development Goals (MDGs) indicators and assisting the government to formulate and design policies. The sample size of PSLM surveys is 80,000 households. The number of observations after pooling data is 562,829.

Table 4.1 Overview of Explanatory Variables and Definitions

Variable	Description
Dependent Variable	
Marriage decision	=1 if woman alone decides about her marriage =0 if husband and other HH members decide about her marriage
Family planning decision	=1 if woman alone decides about having more children =0 if husband and other HH members decide about having more children
Son preference	=1 if woman has first child Son =0 if woman has first child girl
HH expenditure	=1 if woman alone decides about consumption expenditures such as of food, clothes and travel =0 if husband and other HH members decide about consumption expenditures such as of food, clothes and travel
Education decision	=1 if woman alone decides to get or continue of education =2 if father/husband decides to get or continue of education =3 if woman with father/ husband jointly decide to get or continue of education =0 if other members of the HH decide joint to get or continue of education
Employment decision	=1 if woman alone decides to find or continue employment =2 if father/husband decides to find or continue employment =3 if woman with father/ husband jointly decide to find or continue employment =0 if other members of the HH decide joint to find or continue employment
Dependent Variable in IV Approach	
Education decision D	=1 if woman alone decides to get or continue of education =0 if other members of the HH decide to get and continue of education
Employment decision D	=1 if woman alone decides to find or continue employment =0 if other members of the HH decide to find or continue employment
Other Explanatory Variables	
Woman	Dummy variable for woman aged (15-49)
Woman Education	Woman complete years of schooling in average
Woman age (15-24)	Woman age dummy if 15-24 years
Woman age (25-34)	Woman age dummy if 25-34 years
Woman age (35-above)	Woman age dummy if 35 and above years
Woman unmarried	Dummy variable if woman is unmarried
W married	Dummy variable if woman is married
Woman divorced	Dummy variable if woman is divorced
Woman property	Dummy variable if woman holds any physical asset
Woman working	Dummy variable if woman is working
Head	Dummy variable for the male head of the HH
Head self-employer	=1 if HH head is self-employer =0 otherwise

Head paid-employer	=1 if HH head is paid employer =0 otherwise
Head agriculture	=1 if HH head is agricultural employer =0 otherwise
HH size	Size of the household (HH)
HH joint	Dummy variable if living jointly
Husband Edu	=0 if husband has no education =1 if husband has primary (P) education (grade 1-5) =2 if husband has secondary (S) education (grade 6-12) =3 if husband has higher (H) education (grade 13-16)
Husband work	Dummy variable if husband works
HH telephone	Dummy variable if HH has telephone connection
HH TV	Dummy variable if HH has TV
HH water system	Dummy variable if HH has water/pump and sewerage system
Child 5	Dummy variable if HH has child under 5 years of age
Marriage age <25	Dummy variable if woman's age at marriage is less than 25
Live Births	Total live births in a household
Family Plan services	Dummy variable if woman is satisfied with family planning services
Family plan cost	Dummy variable if woman is not using family planning services because they are costly
Birth control pills	Dummy variable if the woman used any birth control pills
Boys HH	Dummy variable if the boy is living with the mother in the HH
Private School	Dummy variable if the private school is near
Iodize Salt	Dummy variable if HH uses iodized salt
Health visit	Dummy variable if health worker visits the household
Urban	=1 for Urban =0 for rural
Wealth Quintiles	= 1 if HH wealth is between PKR 0- 54400 = 2 if HH wealth is between PKR 54450 - 96000 = 3 if HH wealth is between PKR 96090 - 153000 = 4 if HH wealth is between PKR 153050 - 264000 =5 if HH wealth is between PKR 264004 - 5.09e+07
Provinces	=1 Province Punjab =2 Province Sindh =3 Province KPK =4 Province Balochistan
Instruments	
Grandchild Girl	Dummy variable for the female grandchild of the HH studies
Grandchild Boy	Dummy variable for the male grandchild of the HH studies
School 5km	Dummy variable for school distance is less than 5 km
W School G	Dummy variable if woman has completed education from government school
Left school domestic	Dummy variable if child left school because had to help at home
Left school work	Dummy variable if child left school because had to help at work

Dependent Variables: This study estimates six models for empirical investigation. The dependent variables for each model formulated according to the respective model. Women empowerment determined by marriage, family planning, son preference and resources estimate with probit model. Having of a son as a first child is also a reflection of the women empowerment because typically daughters are not considered as the main source of income or future investment rather economic burden in the household. The binary dependent variable consists of value equals 1 if the women alone takes the decision and 0 if father or husband, and other family members are making decision. In comparison of the binary choice model, discrete choice models with more than two categories allow more variations. The education and employment models examine by the multinomial probit regressions, in which, the categories are as follow; decision-making by, woman alone takes value 1, father or husband alone takes value 2, parents jointly takes value 3 and, woman with father or husband takes value 0.

Explanatory Variables: Explanatory variables consist of individuals, household, community characteristics, region and provinces of the country. The individual characteristics include woman (in which, woman's age, marital status, education attainment, physical possession and working status, family planning measures, age at marriage, are presented), head (profession) and husband (education, work) variables. Moreover, household characteristics introduce size, availability of television and telephone connection, water system, number of children less than 5 year and wealth index. Community characteristics measure by availability of school and distance from school and location. Finally, dummy variables for provinces are also included[24].

4.2 The Econometric Model

Current study is using two econometrics strategies, which are depending on the outcome variables. I have adopted probit model regression when the dependent variable is binary. However, for more than two categories, I use multinomial probit regression. Probit model is a statistical probability model with two possibilities in the outcome variable. It has been remained popular in human resource management, labor economics and agricultural economics. It has

[24] The reasons to use PSLM data conducted by PBS are following; Firstly, PBS takes special measures for the quality and reliability of the data by monitored team with supervisors for the field wok. Entire data is taken from all the regions of Pakistan to the Islamabad Headquarters for further processing. Secondly, the survey covers wide range of topics such as; education, health, occupation, services etc. Thirdly, the survey is the main mechanism for monitoring Millennium Development Goals (MDGs) indicators in Pakistan.

based on the cumulative normal distribution that gives it an edge to use in applied economics. The binary variable y takes the value 1n if the decision is made by woman alone and 0 for husband, guardian and household members. The probability P_i of choosing any alternative can represent by,

$$P_i = prob\,[Y_i = 1\,|X] = F\,(x'\beta) = \int_{-\infty}^{x_i'\beta} \left(2\pi^{-\frac{1}{2}}\right) \exp\left(-\frac{t^2}{2}\right) dt \qquad (1)$$

In multinomial probit model regression, different relevant effects of explanatory variables explain with different outcomes variables. Errors might correlated across the chosen categories in multinomial probit model that is a significant advantage over other non-linear models although estimations of parameters are computationally complexed (Wooldridge 2002). It eliminates the assumptions of independence of irrelevant alternatives. This assumption is key feature in multinomial logit model (Imbens et al., 2009; Greene 2012). However, this method becomes very computationally complex with multiple integrals when more than 5 alternatives or choices are involved (Butler et al., 1982; McFadden et al., 1984). In my study, there are four categories for making choices in the decision making process: first; by the woman/wife[25] alone, second; by the father/husband[26] alone, third; by joint decision of parents[27] and lastly by joint decision of woman with the father /husband and family members.

The multinomial probit model presents as:

$$W_j = x_j'\,\beta_j + \varepsilon_j \; and \; j = 1,2,3\ldots J, \left[\varepsilon_1, \varepsilon_2\,, \ldots, \varepsilon_J\right] \sim [0, \Sigma] \qquad (2)$$

The log-likelihood relating to the d choice can express as,

$$\Pr[Choiced] = Prob\,[U_d > U_j, j = 1, \ldots, J, j \neq d] \qquad (3)$$

Above equations represent x as explanatory variables, β as vector of coefficients and ε is error term assumed to have normal distribution. We assume that ε_J has the density function $f(\varepsilon_J)$ and

[25] In case when woman is married.
[26] I take head or the guardian of the household if woman has no father and if she is married than her husband. (already specified in questionnaire of survey)
[27] This category might take with head and guardian with their spouse when parents are not alive (already specified in questionnaire of survey), for simplicity, I name it with parents only.

$f(\varepsilon_J) = f(\varepsilon_{j1}, \varepsilon_{j2}, \varepsilon_{j3})$ and has mean vector equal to 0 while the variance covariance matrix corresponds as:

$$Cov(\varepsilon_J) = \begin{pmatrix} \sigma^2{}_{j,1} & \sigma_{j,12} & \sigma_{j13} \\ \sigma_{j,12} & \sigma^2{}_{j,2} & \sigma_{j23} \\ \sigma_{j,13} & \sigma_{j,23} & \sigma^2{}_{j,3} \end{pmatrix} \quad (4)$$

Above equation demonstrates the choice probability is a cumulative distribution. It is likely to have comprehensive interpretation with calculating marginal effect while computing estimates under non-linear models. This study examine the measures of empowerment with the use Average Marginal Effects (AMEs) that have estimated as the average of the individual marginal effects.

4.3 Empirical Strategy

In order to examine the women empowerment I adapt the following empirical strategy:

- I adopt two models to see the effect of education attainment on women empowerment, Probit and Multinomial Probit model.
- I apply Instrumental Variable technique by instrumenting women education attainment to control the reverse causality.
- I analyze the strength of various dimensions of women empowerment on the education achievement by linear model regression as an alternative specification.

Firstly, some points are negotiable, I include category of father and head (when father is not alive) with spouse, for simplicity call it parents, because this study uses data for both married and unmarried women. In the absences of father, head of the household performs as guardian of the woman described in questionnaire of the survey. The baseline category in all estimations of the multinomial probit regressions adopt the default category is father/husband, who mainly make decisions of the households. Another reason to adopt this category is that in Pakistani society; father, head and, husband, controls most of the household's decisions. This category is mainly compared with the (a) woman/wife, (b) parents and (c) joint decision of woman with father/husband and other members of the households.

The reason to adopt the multinomial probit over the commonly used multinomial logit is that it relaxes the assumption of the independence of irrelevant alternatives (IIA)[28]. According to the Alvarez et al. (1998) multinomial probit estimates provides accurate results as compared to multinomial logit regression. Although for empirical analysis, I compare estimates for both models. Marginal Effects give better interpretation for non-linear models (Long et al., 2006; Solon et al., 2015); therefore, similar methodology applies in this study. The models test with the multicollinearity by using the variance inflation factor (VIF) indicator and the value for all independent variables lie in 3.9 to 2.05 range. It means being all values under 10, models do not have problem of multicollinearity. The estimated effect of education attainment in women empowerment models might suffer with the unobserved heterogeneity as woman can find more interest in education investment to get better spouse in financial and educational terms and later on, it might contribute in her empowerment. Some studies suggest (Blundell et al., 1997) to incorporate wide range of family background characteristics.

Link test conducted for each model to test its specification by probit regression (Pregibon 1980). Although it is formally a test of specification of dependent variable but mostly interpreted as a conditional test on the specification. In each model of women empowerment, the test fails to reject the null hypothesis where it indicates no misspecification errors exist and there is no need to include or omit any other explanatory variable. Apart from link test, Wald test[29], likelihood ratio chi-square with p-value report for each model describes that model as a whole, statistically significant at 1 percent, and more appropriate than model having no predictors.

Secondly, I only focus to deal with the reverse causality for economic perspective particularly in employment, education and household resource expenditure[30]. It is implying that with the increase of women empowerment lead to higher education attainment. To address the issue of

[28] In this assumption, while person answers the question, the probability to choose an option is independent of alternative options either they are explicitly available in the questionnaire or not. In our case, I test for the assumption validation for education and employment models and low values of Hausman test for IIA (Independence of Irrelevant Alternatives) explain violation for two categories (Hausman and McFadden 1984).

[29] A Wald test conducted in order to test whether the coefficients for the variables are simultaneously equal to zero. I estimate the full model that consists of all predictor variables. Based on the p-value at 1 percent, I reject the null hypothesis, again indicating that the coefficients of variables are not simultaneously equal to zero, meaning that including these variables create a statistically significant improvement in the fit of the model.

[30] To my knowledge, reverse causality has not find evidence for marriage and son preference. Family planning also refer to proxy for fertility rate that I have not deal it here. Similarly, I focus instrumenting only on education attainment. However, I also suspect the behavior of other explanatory variables such as working women and women physical possession.

potential endogeneity[31], I apply Instrumental Variable Approach (IV here after) by instrumenting women education (Sargan 1958)[32]. The results of estimation might be inconsistent when correlation between regressor and error term is not zero. The key point works with two stage regression equations in which reduced form equation is obtained when endogenous variable is regressed on the instruments ($say\ z_i$) and other explanatory variables. Its predicted values are used in second stage that is also called structural equation (Murray 2007). Similarly, Two Stage Residual Inclusion method (Terza et al., 2008a) based on the suspected attempt of traditional linear instrumental variable estimator for correction of endogeneity problem. The main idea behind this approach states that estimated coefficients associated with the residuals from first stage regression significantly express the presence of endogeneity in the model (Huasman 1978). Precisely, the first stage consist of the ordinary least square regression in which the endogenous variable is instrumented on the number of exogenous variables and relative explanatory variables. While, the second stage estimates with the multinomial probit model with the inclusion of the first stage residuals. At the end, whole program sets to be bootstrapped (McDowell et al., 2015; Toth et al., 2017; Polat et al., 2017). Furthermore, in alternative specification to deal with endogeneity in most of the binomial response model, researchers sometimes use linear 2SLS model that is equivalent to linear probability model with the IV technique ignoring binary outcome. In the Instrumental Variable framework, this study switch the estimation method from multinomial probit model to probit model where dependent variable is treated cardinally (Trommlerova et al., 2015). It is feasible to interpret the results but I use 2SLS estimator to find the strength of the instruments and over-identification.

The use of family background variables as instruments for education as compared with the other instruments have advantage such as, they are available in the questionnaire most frequently and avoid the issue of weak instruments (Bound, Jaeger & Baker 1995, Parker and Van Praag 2006, Hoogerheide, Block, and Thurik 2012). Similarly, in empirical studies, presence of siblings (Butcher and case 1994), school laws and background with variations (Harmon and Walker 1995) and questionnaire for school performance and teacher-students ratios remain valid

[31] See Angrist and Krueger (1991); Angrist, Imbens, & Rubin (1996) and Card (2001).
[32] Family background and household related question are found to be good instrument to deal potential endogeneity of education (Blackburn and Neumark, 1993, 1995; Parker and Van Praag, 2006). In this study the education of mother, type of institution by the women aged (15-49) and question based on the enrolment in the schools are estimated. See Chevalier (2007).

instruments (Chevalier 2007). I use three sets of variables based on family education background or school information as identifying instruments, which in first part of the analysis do not effect on women empowerment but might affect education attainment. In first model of decision-making in education (1) specification based on grandchildren education. The second specification for the model decision-making in the employment uses (2) distance of school and type of school. While, third model's specification uses (3) questions relating leaving schools.

(a) Endogenous variable: In order to test the endogeneity of education attainment I performed weak exogeneity test by the Smith and Blundell's (1986) and conclude that the models for decision-making in household expenditure, employment and education suffer from endogeneity.
(b) Exclusion restriction: An instrument should not have direct effect on dependent variable but via endogenous explanatory variable. The classical approach performs Sargan test on the validity of the instrument (Kennedy 2008). I test Sargan-Hansen test of over identifying restriction estimated with instrumental variable techniques and find valid instruments.
(c) Strength of the instrument: An instrument should have a strong effect on the endogenous explanatory variable. If not, it may consider as weak instrument and not reliable to generate results (Hoogerheide, Kaashoek, Van Dijk, 2007). I report first stage regression for goodness of fit statistics. According to informal rule of thumb (Stock and Yogo 2004) F-Statistics > 10 and results exceed the threshold and satisfy the relevance condition.

Finally, review of numerous studies found that various dimensions of women empowerment have been associated with the employment, health, family planning and particularly with the education (Corroon et al., 2013; Ahmed et al., 2010). To identify the role and impact of decision making on education, I examine linear relationship between women education and various dimensions of women empowerment in the household. I use dummy variables for the women empowerment as explanatory variables and regress them on women average years of schooling. Furthermore, the results find robust for women empowerment by region and years distribution.

4.4 Descriptive Analysis

Descriptive Statistics: The descriptive analysis for empowerment in household decision-making in Table 4.2 explain that only 14 percent of women have freedom to take decision for their education continuation that is quite low as father or husband have advantage with 54 percent.

Similarly, the other five outcome variables explain the proportion of decision-making mainly by women such as, 9 percent for employment, 4 percent for household expenditure, 10 percent for marriages and 26 percent for the family planning. Meanwhile the average value for women empowerment with the male child is 10.6 percent. The average education of women in the household implies only 8 percent; in addition, 10 percent women are in the age group of 15 to 24 years. It is worthy to note that only 16 percent females are working in the household that might be the reason that 60 percent females get married before reaching the age of 25. Average household size is 20.28 that draws attention towards increasing population in the country. While, 48 percent population living in the urban areas and comparatively that is higher than women employment that is only 16 percent. The summary statistics by categories are presented in appendices.

Table 4.2 Summary Statistics

Variables	Observations	Mean	Std. Dev.
Education decision 0 (Ref. Cat.)	421,761	0 .0874439	0 .2824848
Education decision 1	421,761	0.1442618	0.3513554
Education decision 2	421,761	0.5430327	0.4981453
Education decision 3	421,761	0.2252626	0.4177557
Education decision Dummy	333,804	0.1822746	0.3860713
Employment decision 0 (Ref. Cat.)	562,834	0.3056808	0.4606956
Employment decision 1	562,834	0.0969451	0.2958833
Employment decision 2	562,834	0.4114606	0.4920988
Employment decision 3	562,834	0.1859163	0.3890394
Employment decision Dummy	331,250	0.1647215	0.3709296
HH expenditure	562829	0.0464884	0.2105404
Marriage decision	57283	0.1017056	0.3022634
Family planning decision	44107	0.2656041	0.4416594
Son preference	562829	0.1059292	0.3077472
Woman	562829	0.316375	0.4650615
Woman education	347837	8.486548	3.316006
Woman age (15-24)	562829	0.1018338	0.3024299
Woman age (25-34)	562829	0.0712277	0.257205
Woman age (35-above)	562829	0.1329107	0.3394785
W married	562829	0.1576251	0.3643895
W property	562829	0.0373328	0.1895763
Woman working	562829	0.1656542	0.3717703
Head	562829	0.0629801	0.2429273
Head self-employer	562829	0.0073042	0.0851518
Head paid-employer	562829	0.0139563	0.1173095
Head agriculture	562829	0.0035979	0.0598745
HH size	562829	20.2858	9.78609
HH joint	562829	0.1460106	0.3531172
Husband No Education	562,829	0.9388056	0.2396868
Husband Education Primary (Ref. Cat.)	562,829	0.0168986	0.1288915

Husband Education Secondary	562,829	0.0342946	0.181985
Husband Education Higher	562,829	0.0100013	0.099505
HH telephone	562829	0.0822772	0.2747868
HH TV	562829	0.615297	0.4865255
HH water system	562829	0.1529239	0.3599144
Marriage age <25	562829	0.6014331	0.4896037
Husband work	562829	0.0679034	0.2515803
Live Births	562829	42.32503	38.78494
Private School	562829	0.0137289	0.1163632
Iodize Salt	562829	0.1894021	0.3918281
Health visit	562829	0.4079747	0.4914588
Woman unmarried	562829	0.08009	0.2714328
Woman divorce	562829	0.006032	0.0774316
Family Plan services	562829	0.1939079	0.395358
Family plan cost	562829	0.1720114	0.3773907
Birth control pills	437355	1.924805	0.2637064
Boys HH	562829	0.0326103	0.2445998
Urban	562829	0.4864977	0.4998181
Wealth Q1	530,866	0.2000128	0.40001
Wealth Q2 (Ref. Cat.)	530,866	0.211592	0.4084374
Wealth Q3	530,866	0.1886728	0.3912489
Wealth Q4	530,866	0.2029118	0.4021678
Wealth Q5	530,866	0.1968105	0.3975883
Punjab (Ref. Cat.)	562,834	0.4276325	0.4947357
Sindh	562,834	0.2457154	0.430511
KPK	562,834	0.2087436	0.4064111
Balochistan	562,834	0.1179122	0.3225044
Grandchild Girl	562829	0.0319991	0.1759977
Grandchild Boy	562829	0.0342786	0.1819441
School 5km	562829	0.0401454	0.1963003
W School G	562829	0.1426952	0.3497621
Left school domestic	562829	0.0040812	0.0637536
Left school work	562829	0.0051774	0.0717678

5. Empirical Results

5.1 Women empowerment in Marriage, Family Planning and Son Preference: Probit Model

Table 5.1 presents average marginal effects for decision-making in marriage, family planning and, son preference for socio-demographic perspectives. The estimates show education increases the probability of decision-making in choice of spouse, family planning and son preference with 0.18, 0.24 and 0.20 percentage points respectively at 1 percent level of significance when woman takes decision instead of other family members. It explains that the ratio to increase empowerment is quite lower in marriage decision-making even after achieving certain level of education and comparatively education might give advantage to mother having first child as son.

Table 5.1 Average Marginal Effects by Probit Regression for Women Empowerment

	Marriage	Family Plan	Son Preference
Variables	**(1)**	**(2)**	**(3)**
Woman	0.0119	-0.04141	-0.00510
	(0.0141)	(0.02771)	(0.00690)
Woman education	0.0018***	0.00243***	0.00203***
	(0.0004)	(0.00085)	(0.00021)
Woman age (15-24)	-0.0643***	0.01757	0.01844***
	(0.0137)	(0.02650)	(0.00677)
Woman age (25-34)	-0.0026	0.02179	0.01916***
	(0.0136)	(0.02604)	(0.00670)
Woman age (35-above)	-0.0277**	0.03723	0.00562
	(0.0130)	(0.02655)	(0.00668)
Woman married	-0.0081	0.01942	0.02623***
	(0.0075)	(0.01273)	(0.00265)
Woman property	0.0056	0.03192**	-0.00258
	(0.0067)	(0.01628)	(0.00359)
Woman working	0.0121***	-0.03150***	-0.01898***
	(0.0038)	(0.00819)	(0.00194)
Head	-0.0067	0.01335	-0.01005***
	(0.0079)	(0.01512)	(0.00374)
Head self-employer	-0.0424*	-0.12578***	0.01441
	(0.0225)	(0.04142)	(0.00905)
Head paid-employ	-0.0173	-0.06478**	0.01643**
	(0.0166)	(0.03305)	(0.00705)
Head agriculture	0.0326	-0.03764	0.02354*
	(0.0307)	(0.06880)	(0.01420)
HH size	-0.0011***	-0.00043	-0.00062***
	(0.0002)	(0.00033)	(0.00007)
HH joint	0.0030	-0.06409***	-0.00408**
	(0.0045)	(0.00880)	(0.00201)
Husband Edu P	-0.0107	-0.03388*	0.03080***
	(0.0109)	(0.01922)	(0.00530)
Husband Edu S	-0.0146*	0.03073*	0.04798***
	(0.0077)	(0.01594)	(0.00387)
Husband Edu H	-0.0036	0.02428	0.04197***
	(0.0169)	(0.03351)	(0.00667)
HH telephone	0.0217***	0.07541***	0.01276***
	(0.0032)	(0.00650)	(0.00159)
HH TV	-0.0053	0.02756***	-0.00210
	(0.0047)	(0.00966)	(0.00229)
HH water system	0.0188***	0.01718***	0.00169
	(0.0035)	(0.00656)	(0.00162)
Child 5	0.0188***	0.01058	0.03510***
	(0.0052)	(0.00727)	(0.00190)
Urban	0.0092***	0.02348***	-0.00042
	(0.0029)	(0.00624)	(0.00142)
Wealth Q2 (ref =poor)	-0.0383***	-0.01728**	0.00083
	(0.0049)	(0.00837)	(0.00222)
Wealth Q3	-0.0613***	-0.02957***	-0.00755***

	(0.0048)	(0.00907)	(0.00227)
Wealth Q4	-0.0679***	-0.00989	-0.00379*
	(0.0048)	(0.00959)	(0.00230)
Wealth Q5	-0.0530***	-0.00225	-0.00251
	(0.0052)	(0.01047)	(0.00237)
Sindh (Ref =Punjab)	0.0249***	0.16359***	0.00051
	(0.0041)	(0.00913)	(0.00169)
KPK	-0.0140***	0.09304***	0.00849***
	(0.0034)	(0.01076)	(0.00180)
Balochistan	-0.0143***	-0.20533***	0.01548***
	(0.0044)	(0.00705)	(0.00253)
Woman unmarried	-0.0061		
	(0.0096)		
Woman divorced	0.1940***		
	(0.0080)		
Planning services		0.10108***	
		(0.00757)	
Planning costly		0.01388**	
		(0.00671)	
Birth control pills			0.02555***
			(0.00264)
Boys HH			0.04741***
			(0.00249)
Observations	37,890	23,263	260,532
Link test: P-value	0.540	0.950	0.375
Log-likelihood	-9867.103	-12066.920	-100457.213
Chi2: Deviance	19734.207	24133.841	200914.425
Prob > chi2	0.000	0.000	0.000
LR chi2	2004.62	3552.23	1558.48
AIC	19798.207	24197.841	200978.425
BIC	20071.565	24455.588	201313.481
VIF	3.99	2.52	2.84

*Dependent variable for Model 1 is dummy variable for decision-making in marriage, Models 2 is dummy variable for decision-making in family planning, Model 3 if the woman has first child son equals to 1 or 0 for daughter. Robust standard errors are in parentheses. The significance levels are reported as *** p<0.01, ** p<0.05, * p<0.1*

It is unlikely to increase the probability to make decision for marriage when woman is between the age group of 15 to 24, and, 35 years and above. It is interesting that women gradually increases empowerment by age if having first child as son. However, the impact of age for 25-34 years is only significant if the woman has son that is similar to the marital status of the woman. As compared to non-working women, working-women are more likely to empower by decision-making in marriage and unlikely to increase empowerment with having son or birth control measurements. Besides, the probability to empower women decreases to 0.1 percentage points in marriage if there is unit increase in the household size.

One of the interesting results reveal that similar increase in household is going to decreases empowerment with 0.06 percentage points in son preference. The results indicate two phenomenon of the society, firstly, empowering women can be beneficial to control the household size mainly by late marriages and lower expected rate. Secondly, most of the household size increases in the obsession of male heir that is conditional with the first-born child as son. Meanwhile, the results only show women' possession of asset in positive and significant in decision-making for family planning.

As far as concerned about the male head of the household and related profession the results explain heterogeneity among them. For example, head is insignificant for marriage and family planning decision-making whereas, it has opposite influence if the mother has first child as son. It clearly indicates the tug of war to gain control over the household in which head seems not to lose the authority even if the mother's first child is son. This is obvious in the Pakistani society, mostly, in jirga and tribal areas where male autonomy is quite strong to transfer the power to the opposite gender. However, the head who is self-employed reducing the women empower by 4.2 and 1.2 percent point for decision-making in marriage and family planning. Conversely, the estimates are quite encouraging for women control if head belongs to paid and agriculture employment. The unit increase in paid and agriculture employment raises the probability of empowerment by son preference with 1.6 and 2.3 percentage points respectively that indicate professional heterogeneity strongly impact on the society based on location. For example, most of the paid employment are associated with urban location and in contrast, agricultural occupations belong to rural areas. Broadly, considering both location, there is highly likely to gain empowerment that indirectly manifest strong root of patriarchal society across the country. Additionally, even acquiring education, whether primary, secondary or tertiary, husband likely to support their wives to gain empower if they have first child as son with 3.0, 4.8 and 4.2 percentage points. However, the results find positive relationship between husband education and women empowerment in family planning if he achieved secondary education; alternatively, with low level of education, woman is less likely to gain control. It might reflect that the corresponding husbands might participate in raising empowerment for family planning decision-making once acquainted with higher education. Interestingly, divorced women are more likely to increase the probability of decision-making by 19 percent points for marriage as compared to unmarried women. Marital status of the women is another factor affecting the decision-making in

the household with 2.6 percent point. On the contrary, working-women are less likely to give son preference with 2 percent points. Observing health measurement whether availability of family planning services and birth control methods are concerned, the results are mixed. Such as, women get power on decision-making in family planning from health services by 10.10 and if services are costly then, 1.38 percent while, birth control methods likely to gain power on resources with 2.5 percent that can further increase maternal status living with sons in same household by 4 percent points indicating fragility of daughters' status in natal family. In opposition, joint family as compared to nuclear family is less likely to increase women decision-making control by 6.4 and 0.4 percentage points in family planning and son preference models. It is very important to mention that estimates for telecommunication mediums are more likely to encourage family planning decisions by women. Whereas, wealthier families are less likely to increase the women empowerment for marriage decision as compared to middle class families. While, women belong to low-income families might be resilient. The estimates present that situation of women empowerment in marriage is better in Sindh province as compared to Punjab. Generally, as compared to Punjab, Sindh and KPK provinces more likely to empower woman when she decides alone in contrast of Balochistan province. Women empowerment with having first child a son holds positive and significant estimates for all provinces even in KPK and Balochistan provinces.

5.2 Women Empowerment in Household's Expenditures: Probit Model

The study analyze the three major economic perspectives for improving women empowerment in Pakistan including household expenditure, education continuation and employment. These aspects directly reflect the misallocation of the resources and household behavior in decision-making process. Table 5.2 illustrate results for women empowerment in decision-making for household expenditures. It provides marginal effects before and after dealing with endogeneity. The results in first model explains that woman significantly increases the probability of empowerment with 0.93 percentage points. The positive relationship demonstrates the possible implication of improved bargaining power, increase per capita share of household resources and last but not the least freedom of mobility within and outside the household to manage consumption behavior. While, unit increase in women education raises the probability to increase empowerment by 0.06 percentage point that becomes higher after dealing with endogeneity approximately 1.8 percentage points.

Table 5.2 Average Marginal Effects by Probit Model Regression for Women Empowerment

	Before Endogeneity	After Endogeneity
Variables	**(1)**	**(2)**
Woman	0.00928***	0.00169
	(0.00355)	(0.00171)
Woman education	0.00061***	0.01671***
	(0.00012)	(0.00268)
Woman age (15-24)	-0.04080***	-0.03479***
	(0.00359)	(0.00195)
Woman age (25-34)	-0.01460***	-0.01767***
	(0.00349)	(0.00319)
Woman age (35-above)	-0.01254***	-0.01034***
	(0.00344)	(0.00230)
Woman married	0.01082***	0.01472***
	(0.00147)	(0.00197)
Woman property	0.00641***	0.00485**
	(0.00200)	(0.00230)
Woman working	-0.00276**	-0.00199*
	(0.00109)	(0.00115)
Head	-0.00702***	-0.00730***
	(0.00229)	(0.00125)
Head self-employer	-0.02501***	-0.02002**
	(0.00667)	(0.00797)
Head paid-employer	-0.00632	-0.00509
	(0.00467)	(0.00352)
Head agriculture	-0.00902	-0.00042
	(0.00971)	(0.00680)
HH size	0.00234***	0.00188***
	(0.00005)	(0.00007)
HH joint	-0.00089	0.00141
	(0.00119)	(0.00098)
Husband Edu P	-0.00407	0.00390*
	(0.00260)	(0.00212)
Husband Edu S	-0.00010	-0.00744***
	(0.00186)	(0.00161)
Husband Edu H	0.00860**	-0.01883***
	(0.00352)	(0.00459)
HH telephone	-0.00123	-0.00621***
	(0.00087)	(0.00106)
HH TV	0.00156	0.00054
	(0.00126)	(0.00111)
HH water system	0.02429***	0.01099***
	(0.00106)	(0.00197)
Child 5	0.00309***	0.00144

	(0.00114)	(0.00176)
Urban	0.00201**	-0.01048***
	(0.00083)	(0.00245)
Wealth Q2 (ref =poor)	-0.02023***	-0.02223***
	(0.00139)	(0.00204)
Wealth Q3	-0.02507***	-0.02932***
	(0.00142)	(0.00123)
Wealth Q4	-0.03338***	-0.04176***
	(0.00140)	(0.00061)
Wealth Q5	-0.04417***	-0.06259***
	(0.00137)	(0.00216)
Sindh (Ref =Punjab)	-0.07692***	-0.08728***
	(0.00090)	(0.00184)
KPK	-0.07190***	-0.08045***
	(0.00091)	(0.00162)
Balochistan	-0.08022***	-0.09068***
	(0.00096)	(0.00146)
Private School	0.00986***	-0.00200
	(0.00247)	(0.00278)
Iodize Salt	0.01520***	0.00294
	(0.00098)	(0.00242)
Health Visit	-0.00972***	-0.00483***
	(0.00082)	(0.00137)
Observations	330,086	562,829
Link test: P-value	0.068	
Log-likelihood	-59105.416	
VIF	2.95	
AIC	118276.832	
BIC	118630.166	
LR Chi2	17327.216	
Prob > Chi2	0.0000	
Instruments criteria		
Wald exogeneity test	9.03 *(p=0.002)*	
Overidentification	0.02398 *(p=0.877)*	
Hausman Test	5.65564 *(p=0.000)*	
Joint Significance	91.0036 *(p=0.000)*	

*Dependent variable is dummy variable for women decision-making in household expenditure, if she takes decision then 1 and 0 for other members of the household. The instrumental variables are the questions in the survey regarding child leaves school for (a) to help in domestic chores (b) to help in work. Wald test of exogeneity reports Chi-Square is estimated with ivprobit model. For Hausman endogeneity test, the F-statistics is provided. The test of overidentifying restrictions reports based on Sargan score for Chi-Square. Whereas, joint test describes test of significance for Prob > F score with the help of 2SLS estimators. Robust standard errors are in parentheses. The significance levels are reported as: *** p<0.01, ** p<0.05, * p<0.1*

According to Udry (2008), the developing countries mainly face the inefficient allocation of the resources that differ them from developed countries and our results support the evidence such as age cohorts describe negative relationship with women empowerment. However, with the increase of age, the ratio gradually decreases that reflects younger woman is quite vulnerable to take any decision for the household expenditure specifically between 15 to 24 years old. In contrary, marital status of the woman drastically changes the household consumption behavior. The results show 1.5 percentage points increase in the empowerment if the woman is married and similar results are obtained with possession of any physical asset.

The results are quite interesting for working women that is less likely to gain control over the resources. These results contradicts the previous studies (Duflo 2003; Ashraf et al., 2014) for gaining power with financial access, however, the structure of the Pakistani society elaborate these results very well. It predicts strong male autonomy in the intrahousehold decision-making that with other important factors for example, joint family structure, unemployed head and weak bargaining power.

As estimates are evident that gender of the head and if he is self-employed appear to control household resources with 0.7 and 2.5 percent points than the woman does. Similar marginal effects define male monopoly in the intrahousehold expenditure decision-making with the husband's education. Educated husband significantly reduces the women empowerment if he secures secondary and higher education but it opposite to the primary level. It explains a link between women empowerment and husband low skilled and high skilled labor as education directly correspond to the level of education. Other household facilities except telephone, enhances empowerment while urbanization becomes negative after controlling endogeneity that explains population density in urban areas with single male earner in a larger household as well as deficiency of education among married women. Besides, children of 5 years and under are likely to increase women gain on household resources that is opposite to the health improvement measurements. It is important that as compared to Punjab province, Balochistan with high probability reduce women decision-making in household expenditure. Meanwhile, I observe strong effect of women empowerment with the increase in the income level of the household.

5.3 Women Empowerment in Education: Multinomial Probit Model

Table 5.3 presents average marginal effects for women empowerment in decision-making for education attainment and continuation (for simplicity I call education continuation) with the help of multinomial probit model.

Table 5.3 Average Marginal Effects by Multinomial Probit Model for Education

Decision by:	**Woman Joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**
Woman	-0.00217	0.03808***	-0.01373
	(0.00671)	(0.00714)	(0.00843)
Woman education	0.00351***	0.00807***	0.00079***
	(0.00018)	(0.00022)	(0.00026)
Woman age (15-24)	0.03562***	-0.04074***	-0.01476*
	(0.00668)	(0.00712)	(0.00835)
Woman age (25-34)	0.02245***	0.01107	-0.02576***
	(0.00672)	(0.00707)	(0.00832)
Woman age (35-above)	0.02952***	-0.00226	-0.02101**
	(0.00660)	(0.00699)	(0.00822)
Woman married	-0.02970***	-0.03181***	0.04499***
	(0.00217)	(0.00262)	(0.00320)
Woman property	0.00499*	0.01267***	0.00063
	(0.00288)	(0.00349)	(0.00434)
Woman working	-0.00194	0.00876***	0.01185***
	(0.00165)	(0.00195)	(0.00234)
Head	-0.00548*	-0.00506	-0.00010
	(0.00323)	(0.00384)	(0.00449)
Head self-employer	0.00803	-0.02336**	-0.01615
	(0.00815)	(0.01022)	(0.01170)
Head paid-employer	0.00633	0.01139	0.01897**
	(0.00617)	(0.00735)	(0.00857)
Head agriculture	0.01963	-0.03520**	-0.02490
	(0.01312)	(0.01770)	(0.01874)
HH size	-0.00091***	0.00046***	-0.00066***
	(0.00006)	(0.00008)	(0.00009)
HH joint	0.00805***	-0.00033	0.00710***
	(0.00183)	(0.00219)	(0.00251)
Husband Edu P	-0.00450	-0.01221**	0.01165*
	(0.00443)	(0.00503)	(0.00616)
Husband Edu S	0.01191***	0.02251***	0.01517***
	(0.00310)	(0.00356)	(0.00423)
Husband Edu H	0.01451***	0.10275***	0.04050***
	(0.00517)	(0.00687)	(0.00763)
HH telephone	0.03052***	0.02733***	-0.01222***
	(0.00145)	(0.00168)	(0.00196)
HH TV	0.00289	0.00691***	0.01409***
	(0.00198)	(0.00230)	(0.00276)
HH water system	0.00697***	0.09024***	0.00215
	(0.00150)	(0.00195)	(0.00204)

Child 5	-0.01334***	0.00021	0.01018***
	(0.00198)	(0.00221)	(0.00251)
Marriage age < 25	-0.07450***	0.00069	0.05429***
	(0.00121)	(0.00144)	(0.00173)
Urban	0.00508***	0.01661***	0.01642***
	(0.00123)	(0.00147)	(0.00175)
Wealth Q2(ref =poor)	-0.00959***	-0.03125***	0.01029***
	(0.00195)	(0.00238)	(0.00267)
Wealth Q3	-0.00866***	-0.03137***	0.00737***
	(0.00198)	(0.00243)	(0.00275)
Wealth Q4	0.00130	-0.02993***	0.02019***
	(0.00199)	(0.00242)	(0.00279)
Wealth Q5	0.01936***	-0.00631**	0.01960***
	(0.00211)	(0.00252)	(0.00289)
Sindh (Ref =Punjab)	-0.01957***	-0.14161***	0.08599***
	(0.00154)	(0.00180)	(0.00238)
KPK	-0.01717***	-0.14093***	-0.08687***
	(0.00155)	(0.00178)	(0.00196)
Balochistan	-0.02948***	-0.20461***	0.00781***
	(0.00202)	(0.00177)	(0.00299)
Observations	257,539	257,539	257,539
Log-Likelihood	-286359.045		
Chi2: Deviance	572718.090		
Wald chi2	42527.20		
Prob > chi2	0.000		
Link test	0.105		
VIF	3.05		
AIC	572904.09		
BIC	573876.77		

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides (reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for education. Coefficients are estimated with the base outcome (2). Robust standard errors are in parentheses. The significance levels are reported as *** p<0.01, ** p<0.05, * p<0.1.*

This indicator of women empowerment composed of four categories that is compared with husband or father in pursue of decision-making in education continuation mainly by woman, mainly joint decision of parents and, mainly woman joint decision with husband and father. The variable woman is significant and positively that increases the probability of empowerment by 3.8 percent points when woman takes decision alone. Whereas, educated woman is highly likely to raise empowerment for education continuation by 0.81, 0.35 and 0.08 percentage points by woman's unitary, woman jointly with father or husband and parents joint decision-making respectively as compared to mainly decision of father and husband. It observes that joint decision-making is more preferable than unitary one.

Interestingly, woman's age has strong linked with the unitary and joint decision-making, for example, between 15 to 24 years, woman is less likely to gain empowerment in education if decides alone or her parents decide. However, she is more likely to effect on household decision-making if she decides jointly with husband or father with the probability of 3.6 percentage points that is similar to the past studies (Ngenzebuke et al., 2018). It explores the gender discrimination in education investment by parents while observing women age cohorts; none of them is positively associated with the decision-making mainly by parents. Even, married woman has no say in decision-making for education with almost 3 percentage point mainly by alone and jointly with father or husband. Oppositely, parental decision-making is more likely to empower woman in education once she gets married. It explains the shift of the economic burden from natal to the marital family. The physical possession enhances the women empowerment with 1.27 percentage points for unitary decision-making in education while it reported opposite for married ones. On the other side, working woman has more say for education continuation if she takes decision alone or her parents as compared to mainly father or husband. Broadly, the estimates show economic opportunity to access power with the acquisition of education and employment by women that ultimately improve balance of resources and gender inequality in the household. Nevertheless, gender of the head of the household is inversely related to the joint decision of woman with father or husband to increase empowerment for education that is common practice in the patriarchal society. However, this approach alters with the professions as paid-employed head likely to support woman empowerment as compared to those who belong to agricultural sector. That is why women enrollment rate in the rural areas is quite low and adult literacy rate unable to increase in past decades.

There are some noteworthy results to reduce the gender and economic gaps of the intra-household system. Such as, results describe consistent increase in empowerment in education with the increase in husband's education. The primary educated husband is less likely to raise empowerment in education when woman decides alone. On the opposite side, 2.2 and 10.3 percentage points increments have observed with secondary and higher education of the husband by woman's unitary decision-making. In addition, joint family supports women education that is conditional to joint decision-making that is opposite to the larger family size. In other words, woman's unitary decision-making has strong say in large families that might have elder child as daughter or being single economic support and lastly, parents find convenient to share the

financial responsibility with daughters. Meanwhile, woman who gets married at younger age of 25 years is less likely to continue education if she decide jointly with her father or husband, however, it might get support of her parents that support our prior results for marital status. The early marriages indicate more likely to lose empowerment in household decision-making exploring male dependence and autonomy. Similar results are found for the children under 5 years in the household.

The results explain media exposure increases the power on education when woman decides alone and urbanization is highly affecting women autonomy in education in each outcome that provides significant evidence for gender gap in literacy according to the location and prevailing social mindsets of the people in different regions. By segregating households in wealth groups, the results find effect of joint decision-making of parents and father or husband is inclined to empower woman in education continuation, conversely, her empowerment is less likely to gain control on education continuation from high-income group to low-income groups. As far as concern about provinces, then only Sindh province is more likely to increase women empowerment in education as compared with Punjab if joint decision of parents is taken into account.

5.4 Women Empowerment in Employment: Multinomial Probit Model

Table 5.4 shows results for women empowerment in decision-making for employment by multinomial probit model. The indicator of women empowerment for employment consist of four categories while comparing with husband or father in decision-making for employment mainly by woman, mainly joint decision of parents and, mainly woman joint decision with husband and father. However, average marginal effects of each outcome have presented here and coefficient estimates can be provided on demand. Woman variable is highly significant when she decides alone or jointly with other household members as compared to the father or husband alone that is likely to increase the probability of empowerment by 2.8 and 1.9 percent points respectively. However, parental decision contradicts it but when woman is educated they are likely to improve empowerment with 0.16 percentage points. Similarly, educated women are significantly increasing the probability of individual and joint decision-making with father or husband by 0.12 to 0.45 percent points in employment. With increase of age, woman get rights

of employment when she takes joint decision otherwise her own and parents choices do not support her.

Table 5.4 Average Marginal Effects by Multinomial Probit Model for Employment

Decision by:	**Woman Joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**
Woman	0.01959**	0.02835***	-0.01878***
	(0.00860)	(0.00526)	(0.00704)
Woman education	0.00119***	0.00447***	0.00160***
	(0.00025)	(0.00017)	(0.00022)
Woman age (15-24)	-0.01102	-0.03400***	-0.01174*
	(0.00856)	(0.00526)	(0.00698)
Woman age (25-34)	-0.00122	-0.00093	-0.01466**
	(0.00856)	(0.00520)	(0.00694)
Woman age (35-above)	0.04041***	-0.01140**	-0.02714***
	(0.00844)	(0.00515)	(0.00687)
Woman married	-0.06799***	-0.01623***	0.06041***
	(0.00302)	(0.00195)	(0.00266)
Woman property	-0.00811*	0.00784***	-0.00018
	(0.00429)	(0.00267)	(0.00368)
Woman working	-0.00043	0.01899***	0.00772***
	(0.00227)	(0.00144)	(0.00194)
Head	-0.01416***	-0.00410	0.00214
	(0.00447)	(0.00297)	(0.00380)
Head self-employer	0.01114	-0.01097	-0.01914*
	(0.01144)	(0.00775)	(0.00986)
Head paid-employer	0.00375	0.01704***	0.00968
	(0.00909)	(0.00586)	(0.00765)
Head agriculture	0.02393	-0.02224*	-0.00882
	(0.01742)	(0.01262)	(0.01491)
HH size	0.00240***	-0.00061***	-0.00247***
	(0.00010)	(0.00007)	(0.00009)
HH joint	0.00190	-0.00182	0.00593***
	(0.00243)	(0.00162)	(0.00206)
Husband Edu P	-0.01610***	-0.00601	0.01035**
	(0.00574)	(0.00374)	(0.00511)
Husband Edu S	-0.00458	0.00590**	0.01305***
	(0.00415)	(0.00274)	(0.00369)
Husband Edu H	0.02170***	0.04422***	0.02930***
	(0.00717)	(0.00517)	(0.00645)
HH telephone	0.00629***	0.02072***	-0.00502***
	(0.00189)	(0.00125)	(0.00163)
HH TV	-0.00437	0.00105	0.01172***
	(0.00272)	(0.00175)	(0.00230)
HH water system	0.01455***	0.04843***	-0.00052
	(0.00196)	(0.00142)	(0.00169)
Child 5	-0.03614***	-0.00028	0.02614***
	(0.00248)	(0.00163)	(0.00206)

Husband work	0.01054***	0.00399	0.01068***
	(0.00387)	(0.00257)	(0.00334)
Live births	-0.00104***	0.00039***	0.00059***
	(0.00003)	(0.00002)	(0.00002)
Urban	-0.00521***	0.00867***	0.01469***
	(0.00170)	(0.00111)	(0.00147)
Wealth Q2(ref =poor)	-0.02325***	-0.03161***	0.01224***
	(0.00257)	(0.00180)	(0.00218)
Wealth Q3	-0.03459***	-0.03335***	0.01558***
	(0.00266)	(0.00184)	(0.00228)
Wealth Q4	-0.03261***	-0.03321***	0.01213***
	(0.00269)	(0.00185)	(0.00230)
Wealth Q5	0.00280	-0.02904***	0.00509**
	(0.00282)	(0.00189)	(0.00236)
Sindh (Ref =Punjab)	0.06943***	-0.10965***	0.03005***
	(0.00215)	(0.00128)	(0.00190)
KPK	-0.05886***	-0.11029***	-0.07035***
	(0.00203)	(0.00131)	(0.00172)
Balochistan	0.07401***	-0.13915***	-0.06368***
	(0.00299)	(0.00133)	(0.00224)
Observations	330,086	330,086	330,086
Wald chi2	34218.51		
Chi2: Deviance	806264.661		
Log-likelihood	-403132.330		
Prob> chi2	0.000		
LR Chi2	6939.63		
VIF	3.06		
Link Test	0.509		
AIC	806456.661		
BIC	807484.543		

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides (reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for employment. Coefficients are estimated with the base outcome (2). Robust standard errors are in parentheses. The significance levels are reported as *** p<0.01, ** p<0.05, * p<0.1.*

The marital status of the women is likely to increase empowerment by 6 and 2.3 percentage points with parents and husband support respectively, however, she is less likely to gain control on employment when she decides alone. The physical possession by the women is also likely to increase empowerment by 0.78 percent points in employment that is almost equal for the education attainment variable that we are experiencing in this model. Human resources are equally important in the economy as physical resource. The estimates provide strong and positive relationship between working-women and her unitary decision that is similar to the decision of her parents. She increases the probability to gain empowerment in employment with 1.9 percentage points with her alone decision and 0.77 percentage points when her parents decide.

This is most appealing results in determination of women empowerment that contradicts the traditional concepts and theories related to maximizing returns in long run only having male child.

Woman with strong employment background not only increases her education rather changes the socio-economic perception about the son preference. Working women, whether married or unmarried or being single mother have potential to maximize returns for fragile parents and families. The gender of the head opposes the women empowerment in employment, however, its strong impact can be observed in reduced family size by her unitary decision-making that indicate lower expected fertility rate and population growth rate according to the available resources. The results highly supportive to the past studies for time allocation of working women between domestic chores and labor market that consequently raises the economic welfare within the household. The joint decision-making of women with father or husband is less likely to access employment opportunity if the husband has only primary education but it is opposite, if, he is highly educated. While, there is gradual increase in empowerment with the increase in the husband's education if she takes decision alone with 0.6 and 4.4 percentage points by secondary and higher education level. The results are frequently providing disparity among head's occupations. The results significantly improve the empowerment in employment if head belongs to paid-employment as compared to agricultural ones when woman decides alone by 1.7 percentage points. Household with TV, telephone connection and water supply are positively influence on empowerment. Similar results are found for the wealth quintiles. Apart from this, KPK province is highly significant for mainly father or husband decision-making as compared to Punjab.

5.5 Instrumental Variable Estimation: Education and Employment by Multinomial Probit Regression/2SRI Approach

Table 5.5 reports average marginal effects for women empowerment in education and employment decision-making by 2SRI (Two Stage Residual Inclusion) approach after capturing reverse causality. The variable woman is highly significant in each outcome and more likely to influence on empowerment with unitary and woman's joint decision-making in education and employment as compared to parents. The woman education attainment significantly increases the probability of the women decision-making in both models.

Table 5.5 Average Marginal Effects by Multinomial Probit Regression/2SRI for Women Empowerment

	Education			Employment		
Decision by:	**Woman Joint**	**Woman alone**	**Parents**	**Woman Joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.03176***	0.02404**	-0.08810***	0.03323***	0.01737***	-0.03163***
	(0.00466)	(0.01056)	(0.02537)	(0.00523)	(0.00634)	(0.00482)
Woman education	-0.07051***	0.03856***	0.16301***	-0.02712***	0.02721***	0.02835***
	(0.01082)	(0.01013)	(0.01845)	(0.00188)	(0.00242)	(0.00424)
Woman age (15-24)	0.00718*	-0.02900***	0.04741*	-0.02336***	-0.02408***	-0.00003
	(0.00379)	(0.00970)	(0.02715)	(0.00606)	(0.00751)	(0.00443)
Woman age (25-34)	0.03895***	0.00427	-0.06191***	0.00375	-0.00494	-0.01930***
	(0.01016)	(0.00713)	(0.01864)	(0.00551)	(0.00446)	(0.00578)
Woman age (35-above)	0.02035***	0.00151	-0.00096	0.03619***	-0.00801	-0.02310***
	(0.00581)	(0.00677)	(0.02096)	(0.00376)	(0.00509)	(0.00405)
Woman married	-0.04482***	-0.02557***	0.07813***	-0.07416***	-0.01127***	0.06617***
	(0.00467)	(0.00450)	(0.00853)	(0.00265)	(0.00296)	(0.00180)
Woman property	0.01297***	0.00938***	-0.01681***	-0.00484	0.00521*	-0.00326
	(0.00438)	(0.00313)	(0.00620)	(0.00433)	(0.00305)	(0.00560)
Woman working	-0.00505*	0.01006***	0.01878***	-0.00162	0.01994***	0.00882***
	(0.00294)	(0.00135)	(0.00451)	(0.00342)	(0.00151)	(0.00244)
Head	-0.00459	-0.00546*	-0.00207	-0.01348***	-0.00466*	0.00151
	(0.00490)	(0.00288)	(0.00730)	(0.00270)	(0.00273)	(0.00248)
Head self-employer	-0.01725***	-0.01293	0.03924***	0.00037	-0.00230	-0.00899
	(0.00574)	(0.00992)	(0.01451)	(0.00740)	(0.00622)	(0.01166)
Head paid-employer	0.00074	0.01370*	0.03128***	0.00059	0.01962***	0.01265***
	(0.00618)	(0.00706)	(0.01020)	(0.00873)	(0.00610)	(0.00414)
Head agriculture	-0.02030	-0.01874	0.06270***	0.00765	-0.00910	0.00653
	(0.01636)	(0.01411)	(0.01565)	(0.00922)	(0.02350)	(0.00888)
HH size	0.00103***	-0.00034	-0.00490***	0.00348***	-0.00148***	-0.00349***
	(0.00030)	(0.00024)	(0.00049)	(0.00011)	(0.00011)	(0.00022)
HH joint	-0.00401	0.00461***	0.03333***	-0.00249	0.00168**	0.01010***
	(0.00333)	(0.00167)	(0.00360)	(0.00308)	(0.00073)	(0.00097)
Husband Edu P	-0.03498***	-0.00257	0.09737***	-0.03093***	0.00607	0.02547***
	(0.00662)	(0.00964)	(0.02057)	(0.00752)	(0.00489)	(0.00522)
Husband Edu S	0.05926***	0.00224	-0.06817***	0.00917**	-0.00494	-0.00004
	(0.00409)	(0.00405)	(0.00426)	(0.00401)	(0.00427)	(0.00456)
Husband Edu H	0.23475***	-0.01405	-0.19164***	0.08628***	-0.00582	-0.02274*
	(0.03804)	(0.02469)	(0.01361)	(0.01248)	(0.00752)	(0.01311)
HH telephone	0.05525***	0.01718***	-0.06647***	0.01539***	0.01336***	-0.01356***
	(0.00508)	(0.00441)	(0.00896)	(0.00200)	(0.00163)	(0.00232)
HH TV	0.00742*	0.00503***	0.00428*	-0.00266	-0.00031	0.01009***
	(0.00405)	(0.00175)	(0.00252)	(0.00380)	(0.00226)	(0.00106)
HH water system	0.07163***	0.06362***	-0.13957***	0.03895***	0.02885***	-0.02355***
	(0.00909)	(0.00985)	(0.01573)	(0.00203)	(0.00232)	(0.00417)
Child 5	-0.00452**	-0.00332	-0.01026***	-0.03273***	-0.00304***	0.02297***
	(0.00216)	(0.00220)	(0.00356)	(0.00208)	(0.00095)	(0.00205)
Marriage age < 25	-0.08746***	0.00605***	0.08260***	0.01160***	0.00314	0.00969**
	(0.00231)	(0.00108)	(0.00146)	(0.00441)	(0.00336)	(0.00413)
Husband work				0.01160***	0.00314	0.00969**
				(0.00441)	(0.00336)	(0.00413)
Live births				-0.00121***	0.00053***	0.00075***
				(0.00002)	(0.00003)	(0.00004)
Urban	0.06360***	-0.00750	-0.11191***	0.01625***	-0.00857***	-0.00557*
	(0.00952)	(0.00826)	(0.01341)	(0.00420)	(0.00234)	(0.00338)
Wealth Q2(ref =poor)	-0.00652***	-0.03283***	0.01015*	-0.02135***	-0.03429***	0.01280***
	(0.00222)	(0.00216)	(0.00573)	(0.00304)	(0.00192)	(0.00200)

Wealth Q3	0.00065	-0.03469***	-0.01231	-0.02915***	-0.03885***	0.01293***
	(0.00269)	(0.00465)	(0.00773)	(0.00334)	(0.00269)	(0.00276)
Wealth Q4	0.02600***	-0.03906***	-0.04162***	-0.02025***	-0.04432***	0.00249
	(0.00497)	(0.00538)	(0.00967)	(0.00177)	(0.00227)	(0.00354)
Wealth Q5	0.13998***	-0.05600***	-0.18432***	0.04486***	-0.06214***	-0.03178***
	(0.02018)	(0.01371)	(0.02180)	(0.00209)	(0.00273)	(0.00680)
Sindh (Ref =Punjab)	0.02728***	-0.15684***	-0.02150*	0.08909***	-0.12456***	0.01157***
	(0.00758)	(0.00745)	(0.01229)	(0.00316)	(0.00175)	(0.00345)
KPK	0.01569***	-0.15510***	-0.15649***	-0.04584***	-0.12294***	-0.08174***
	(0.00597)	(0.00528)	(0.00914)	(0.00361)	(0.00118)	(0.00249)
Balochistan	0.02257***	-0.21881***	-0.11702***	0.09447***	-0.15325***	-0.08369***
	(0.00827)	(0.00560)	(0.01523)	(0.00409)	(0.00124)	(0.00446)
Observations	562,829	562,829	562,829	562,829	562,829	562,829
Wald *Chi2*	16815.07			16749.57		
Instruments Criteria						
Wald test of exogeneity	25.07			48.40		
	(p=0.000)			*(p=0.000)*		
Hausman Test	22.6728			40.8303		
	(p=0.000)			*(p=0.000)*		
Overidentification Test	0.282321			0.138557		
	(p=0.596)			*(p=0.709)*		
Joint Significance Test	51.3932			372.7		
	(p=0.000)			*(p=0.000)*		

*The dependent variable for education and employment models are categorical with value 1 mainly by woman decides, 2 mainly by father or husband decides (reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband respectively. The instruments in education models are; dummy variables for the female and male grandchild of the HH if study. While for employment, the instruments are; dummy variable for school distance is less than 5 km and dummy variable if the woman has completed education from government school. The specification criteria is estimated as follows: Wald test of exogeneity is estimated with ivprobit model. The other criteria of speciation is estimated with 2SLS estimator. For Hausman endogeneity test, the F-statistics is provided. The Hausman test for endogeneity is based on the coefficient of H0. The test of overidentifying restrictions reports based on Sargan score for Chi-Square. Whereas, joint test of significance reports Prob > F score. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Most of the results of age cohort are consistent with previous ones however; marital status of the woman significantly reduces the probabilities to gain power in education and employment with slightly higher ratios. Similarly, head's occupation, household size and husband's education provide consistent results after tackling endogeneity. The low-income groups are less likely to empower women decision-making as compare to higher income groups. In addition, women who belong to Balochistan and KPK suffer more with weak empowerment rate as compared to Sindh and Balochistan[33]. Prior research highlighted the importance of education achievement with the impact of women empowerment.

5.6 Alternative Specification: Impact of Women Empowerment on Education Attainment

[33] Additionally, Table A.1.3 provides alternative specifications for dealing causality between women education and empowerment. The categorical dependent variable is transformed into binary outcome variable to apply appropriately in 2SLS and IV Probit.

Table 5.6 Coefficient Estimations by OLS for Education Attainment: Alternative Specification

	Marriage	Family plan	Son Preference	Expenditures	Employment	Education
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	-0.10593	0.22471	0.44189***	0.47048***	0.46651***	0.43353***
	(0.18620)	(0.21592)	(0.06379)	(0.05820)	(0.05840)	(0.05844)
W age (15-24)	-0.05011	-0.16861	-0.39141***	-0.37001***	-0.42129***	-0.36456***
	(0.18153)	(0.20694)	(0.06290)	(0.05788)	(0.05807)	(0.05806)
W age (25-34)	0.49853***	-0.00130	0.15246**	0.19388***	0.17419***	0.21619***
	(0.18325)	(0.20312)	(0.06224)	(0.05779)	(0.05796)	(0.05798)
W age (35-above)	0.45051**	0.12042	-0.12842**	-0.13517**	-0.14476**	-0.11759**
	(0.17499)	(0.20717)	(0.06176)	(0.05711)	(0.05728)	(0.05729)
W married	-0.25820***	0.00799	-0.11927***	-0.24452***	-0.20979***	-0.18517***
	(0.08313)	(0.10058)	(0.02475)	(0.02093)	(0.02102)	(0.02133)
W property	0.18791**	0.04466	0.08681***	0.09549***	0.11145***	0.09786***
	(0.07401)	(0.13134)	(0.03359)	(0.02946)	(0.02954)	(0.02956)
W working	-0.09519**	-0.12812**	-0.04797***	-0.04821***	-0.05058***	-0.04702***
	(0.04381)	(0.06534)	(0.01759)	(0.01564)	(0.01569)	(0.01569)
Marriage decision	0.25193***					
	(0.05814)					
Family plan decision		0.17938***				
		(0.05166)				
Son preference			0.17488***			
			(0.01809)			
Expenditure decision				0.11922***		
				(0.02493)		
Employment decision D					0.46006***	
					(0.01822)	
Education decision D						0.64503***
						(0.01692)
Wealth Q 2(ref =poor)	-0.01903	-0.11274*	0.00650	0.01009	0.03398*	0.02558
	(0.04799)	(0.06568)	(0.02007)	(0.01753)	(0.01758)	(0.01758)
Wealth Q 3	0.10937**	-0.13098*	0.11915***	0.11141***	0.15412***	0.13801***
	(0.04923)	(0.07071)	(0.02085)	(0.01829)	(0.01831)	(0.01830)
Wealth Q 4	0.28891***	0.09691	0.40804***	0.34329***	0.40848***	0.39104***
	(0.05115)	(0.07436)	(0.02112)	(0.01857)	(0.01856)	(0.01855)
Wealth Q 5	1.24792***	0.78511***	1.43757***	1.29067***	1.45393***	1.44041***
	(0.05455)	(0.08242)	(0.02164)	(0.01922)	(0.01897)	(0.01896)
Sindh (Ref =Punjab)	0.76284***	0.66564***	0.56509***	0.68150***	0.68129***	0.66774***
	(0.04291)	(0.06349)	(0.01577)	(0.01462)	(0.01444)	(0.01438)
KPK	0.68372***	0.54808***	0.38577***	0.34526***	0.51450***	0.51995***
	(0.04130)	(0.07487)	(0.01650)	(0.01510)	(0.01498)	(0.01494)
Balochistan	0.87045***	1.32836***	0.72028***	0.81348***	0.85715***	0.85739***
	(0.05140)	(0.06111)	(0.02254)	(0.01970)	(0.01981)	(0.01979)
Individual Characteristics	yes	yes	yes	yes	yes	yes
Household Characteristics	yes	yes	yes	yes	yes	yes
Constant	5.59500***	5.73153***	6.18219***	5.85473***	5.79179***	5.88745***
	(0.06509)	(0.09636)	(0.05270)	(0.02356)	(0.02364)	(0.02424)

Observations	37,890	23,263	260,532	330,086	330,086	330,086
R-squared	0.11475	0.11061	0.11432	0.12615	0.12097	0.12048
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
F-Statistics	158.30	93.20	1084.71	1488.91	1465.19	1507.09

*Individual characteristics include head, professions of head, husband education, child under 5 years. Household characteristics include household size, structure, appliances, location and model specific variables. Standards errors are in parentheses. Significance level reports as: *** p<0.01, ** p<0.05, * p<0.1*

In Table 5.6, the dependent variable is the women average years of schooling and explanatory variables include decision-making for marriage, family planning, son preference, household expenditure, education and, employment that are estimated in separate models. Woman is highly significant except in marriage and family planning models. Whereas, women between 25 to 34 years increase education achievement 15 to 49 percent in overall models. It is unexpected but by examining to each model, variables of marital status of woman and work have negative effect. In contrast, women physical possession increases with the increase of education level in all models. As far as concerned about the decision-making variables, in first model, women empowerment in marriage increases education 25 percent, and second model of family planning increases 17 percent of women education if she decides alone. In third model, being mother of son, increase the level of education by 17.5 percent, whereas, 12 percent level of education increase with unit increase in the probability of decision-making by women in household expenditure. In addition, for last two models, unit increase in empowerment in employment will increase 46 percent increase in the women education.

Lastly, to empower woman in her education continuation decision can increase her level of schooling by 64 percent that is comparatively highest in all models. It is consistent with the hypothesis that education is the most effecting and important factor for women to achieve their basic rights and that it is the most comprehensive way to reduce the gender gap. I observe positive effect of income on education achievement in all wealth groups. By examining individually, as compared to poor income group, second quintile of wealth decreases the women schooling by 11 percent in model 2. The middle-income groups are performing better to increase women education in model 3 and 5. The effect of the income is highly effective in the fifth quintile, in which, wealth is positively increasing women schooling for economic perspective in model 4, 5 and 6. One important thing that demonstrates in this result analysis that Balochistan

and KPK that gives lowest estimates in previous models are explained quite effectively. My results are robust with this alternative specification.

5.7 Robustness Check

Sub-samples: The main goal of this section is to investigate women empowerment consisting of subsamples by years. The results presented in Appendix A.2.1 and A.2.2 describes two panels from 2006-2008 and 2011-2014 for education continuation by multinomial probit model regressions. Each panels explores that education attainment has increased the women decision-making. Although in both subsamples, gender of the household head and his related agricultural occupation remain inversely proportional to women empowerment in education continuation, yet, findings reveal decline in marital status, household size and shift of joint decision-making to unitary decision making. The results find increase in the male human capital that is likely to transform intrahousehold infrastructure with joint decision-making. Moreover, the second subsample indicates wealth influence on the women-decision-making that eventually increases the welfare of the household.

As far as concerned about the other four indicators of empowerment, women remain highly significant in each model in Table A.2.3. Women education deliberately improves the freedom of choice for marriage and subsequently increases the probability of family planning; however, the ratio of son preference also increased indicating strong roots of patriarchal society over the years. Most of the results are consistent with our baseline model. Nevertheless, different wealth groups find more inclined for son preference and highly unlikely for decision-making in marriage.

Heterogeneity by Location: I find drastic change in the women empowerment with the distribution of the sample by location that highly support our results. Table A.2.4 and Table A.2.5 describes estimates for women empowerment in education and employment. Amazingly, education attainment has improved the women rights to seek employment in urban areas more than rural ones, however, it has enables women to continue education equally and significantly in the rural areas. Most of the findings confirm our results, such as, the physical possession significantly effective in rural areas and working-are highly increasing the women empowerment in urban areas for employment. The joint decision-making is strongly influencing women decision-making in education whether at younger age or older, on the other side, household infrastructure is consistently increasing women say in urban location. I examine decreasing

empowerment rate in Balochistan and KPK provinces regardless of region that comprehensively support our policy implications for these provinces.

Furthermore, women education is more likely to enhance women empowerment in marriage and household expenditures in urban areas (Table A.2.6). In contrast, the findings reveal that women education is highly likely to support family planning in rural region indicating need of health services and advance treatments of birth control with the help of opening of new schools and training programs that provide awareness to the community. Most of the results are expected and robust out previous results in which, pro male biasedness in the household resource allocation, centered infrastructure in urban areas and slightly improvement in women say associated with higher income level, husband's education and conditional with the male heir.

Alternative Model: In order to further test my baseline results, I conduct series of tests and alternative model specifications, in which, the most consistent is the multinomial logit model regression that presented in Table A.2.7 for education and employment. The results show alternative criteria has also positive effect of education in both models that eventually increases the women decision-making power in the household to reduce gender differences by improving individual wellbeing. These both models contribute conclusively in the economic development of the country while targeting the female human capital at the micro level.

6. Discussion, Conclusion & Policy Implications

In context of Pakistan, the women empowerment is entirely different term as the previous approaches defined it. Whether it is decision-making, or abilities to incorporate with herself, household and community attributes, it is pre-requisite to equip woman with self-awareness and self-consciousness. That I describe with the "awareness gap" in this study. It is very important to understand to clarify the concept of being woman is not being slave but a human being with equal rights. Until and unless woman would feel to liberate herself from abuse, would not be able to break the chains of oppression. It is conclusive to suggest that education is the strongest source to support and facilitate woman for achieving her basic rights. It might be closer to the definition of Kabeer (1999) in which, empowerment is tri-link phenomenon to reach. However, I prefer ability before resources to achieve productive outcomes for women empowerment development. In addition, my study also have the conceptual glimpses by other approaches in which ability to do work (Sen 1980), control over the resources (Haddad et al., 1997), bargaining

power (Udry 1996), and freedom of choice (Scanlan 2010) are determined. The effect of education attainment on the individual decision-making contribute to empower women regardless of monetary and non-monetary aspects. However, slight differences are observed in household decision-making in economic and non-economic activities. It is important to discuss the results to comprehend the differences with social and economic contexts of the households simultaneously and then highlight the provincial and income groups influence on empowerment. In socio-demographic perspective or non-monetary empowerment context, the related indicators are marriage, family planning and son preference.

The aspect of woman decision-making conclusively analyze her valuation and status in the household at individual level. More educated woman has highly improved chances to marry with educated man that explains principal role of education for women well-being and social equality (Schuler et al., 2006). I observe that younger and unmarried woman is entirely dependent on decision of elder members of the household for marriage as compared to divorced one. Extensive literature links women autonomy related to childbearing and procreation are customary indices that develop with the education attainment for their freedom of expression and decision-making for their modernized status in the economy. Although some suggest that use of contraceptives and health care measures are more likely to use by the educated women and their direct link with the power and autonomy does not exist (Goldin et al., 2002) but my results contradict this hypothesis. The results demonstrate that the use of contraceptive services, although costly for poor families, strongly empower women and directly link to their health but opposite association between higher mortality rate and low share of GDP on health expenditure cannot be avoidable in the country (Mumtaz et al., 2009). That is why women having physical possession amplify adequate resources and significantly decide for family planning methods that are suggested by estimates. Joint family structure also has persistent negative effect on women empowerment in family planning and son preference models. I observe a borderline significant relationship with the women education and power of decision-making in marriage and family planning by diminishing transition age for procreation that are consistent with the other studies (Gangadharan and Maitra 2001; Choe et al., 2005). Consequently, control of women on household decision-making, family planning and use of contraceptive methods perpetuates by giving birth to the male children and residing with them (Phillips et al., 2004).

Many claim improved economic circumstances in family planning and son preferences with the woman employment but my results contradict this hypothesis. It might be due to female labor force participation in the in the traditional sector of the economy, that is agriculture, in which their contribution always remain uncounted as productive labor force. The other reasons might be lack of opportunities for female jobs and pardah resistance, larger family set up that occupies women working hours in domestic chores and, and most importantly zero accessibility to the labor market (Dyson et al., 1983). Although not significantly, but male head of the household has inverse effect on decision-making in the marriage and son preference. My quantitative data includes head professions that affect negatively on women empowerment for marriage and family planning. The findings of association with the educated male or husband with the women empowerment in marriage and family planning are quite similar with the coefficients of head professions. However, the level of education suggest comparative women empowerment from primary level to tertiary level. Media has significant and positive impact on the freedom of expression towards suitors, fertility rate and psychological impact of a male child (McLean et al., 2011). In three models, this medium is highly effective for the health and nutrition campaigns through internet then television. Beside this, the availability of improved water supply in the household also proxy for the better living standards that increase the probability to gain power with the income stability. The findings suggest significant association of women empowerment in marriage and family planning decision-making with improved living standards (Chou et al., 2010).

With the context of economic activity, the respective indicators for women empowerment include household resources, education and employment. The aim to work on these three economic indicators is to analyze the impact on women empowerment in intrahousehold and inter-household environment that focuses on the economic resources. In the model for household resources expenditure, woman mainly decides alone instead of joint decision by her parents, husband or family members (Cranage 2005). Moreover, my findings are consistent with Udry (1996) and Chant (2016) that educated women and mothers organize and manage consumption expenditures on clothes, food and travel more economically. The economic factor with the increase of age of the women is quite useful to examine in the household budget line and distribution of labor. With the increase of the age, it is likely to increase the probability of power on the household resources and one of the major reason behind that the in current culture, joint

family system is quite strong and transition of power from mothers to their daughter-in-law prevails. Estimates show that the education attainment increases the probability of women decision-making on consumption expenditure of the household.

Working-women are less likely to increase the probability of decision-making in household expenditures and it is quite interesting as there are many factors behind it. Firstly, head of the household whether male or female, controls over the household expenditure that is consistent with my findings. Similarly, when it comes with the head profession in the self-employment, he seems to control household resources better than the woman do in the respective household. The estimates provide sufficient evidence that at low level of education of males or husbands is persistent with the low empowerment but this narrative becomes positive with the increase of education. Secondly, mostly women are household wives who do not work and participate in formal sector of employment and if they do, the ratio is minor (Duflo 2003). The findings suggest similar hypothesis with respect to urban location, in which women are less empowered in expenditure control.

The monetary effect can be discussed with two important economic indicators in decision-making, education continuation and employment, in which women decision-making alone is compared with mainly by husband or guardian, mainly her joint decision, and lastly joint decision by parents. However, woman after the age of 34 years are more likely to increase the probability of power when she takes joint decision instead of the mainly husband alone. Contrary to the decisions, in which parents decide for the education continuation of their daughters. It is evident that with increase of woman's age, parents are less likely to invest on the daughters' education and decisive towards their marriage (Jejeebhoy et al., 2001).

The estimates are consistent with the marital status of the women in which most of the married women are less likely to continue their education whether she decides alone or jointly with the family members instead of mainly husband. In both of the cases, social structure and family set up are built to motivate married women more in the house management rather than in the education or employment. That is why most of the women after getting married while completing their postgraduate, professional degrees and technical diplomas prefer to quit their careers. This situation is not only serious while looking at the intrahousehold resources but also wastage of the state wealth to invest on women. Approximately, Government of Pakistan spend $

32 000 to make one female doctor per year and if she quits her profession after the marriage then it creates income gap and misplacement of the state resources[34]. However, on the other hand we see that joint decision of the mother with the father has more weightage to empower girls after they get married. If the woman gets married before 25 years, it is less likely to increase probability for decision-making in the education, although, the joint decision of parents support her. At younger age, women is less likely to empower herself for employment as compared to the older age 35 and above but this situation is only possible with her joint decision with the head or the husband (Lundberg 1993). Here, it is important to discuss that younger age does not mean that women can remain unemployed. Young working woman are mostly unaware of their basic rights and do not perceive the meaning of empowerment in joint family structure.

It is consistent with the prior studies that education attainment by the woman remains highly significant to increase the probability of the empowerment when she take decisions in continuation of the education mainly alone and jointly with the husband or father instead mainly husband or father alone. Education attainment also remains highly positive and significant in all the outcomes whether she takes decisions alone or with other family members (Malik 2011). Nevertheless, her individual decision is strongly significant among other family members' decisions. These facts are consistent with our estimates in which male head of the household is less likely to increase women empowerment as compared to the female head. Estimates suggest that the women in working profession is highly likely to continue her education while taking decision individually or with the joint decision of the parents. It also supports the evidence with the marital status of the woman that if husband alone take decisions then it is less likely to increase the probability of women empowerment. Although working environment fosters the confidence to make decision independently but it also have negative externalities. It includes, early divorce cases, violence, domestic conflicts and women abuse. Most of the divorced cases from the educated and working women observe which highlight the conflict of power and control on the basic rights of the women financial and intellectual resources.

The inheritance rights and physical possession are supposedly to attain when women are more likely to continue their education. The estimates of property possession are strongly favor in the

[34] See Yusufzai Ashfaq. Pakistan attracts 700 female doctors back into practice through online service BMJ 2019; 367 :l6752

women empowerment in education continuation as compared to the other human capital variable. It draws our attention that acquiring education and inheritance right or building physical asset are highly likely to increase women power over decision-making (Mishra et al., 2011). It is clear that physical possession can increase empowerment when women alone takes the decision instead of mainly by husband. Male head of the household is less likely to increase the women empower but when he is paid employed, it might also support women in continuation of education so she might also take part in the household resources and labor distribution. Education attainment reduces the fertility rate and it is evident that the family size reduces with the women empowerment in education. That also can be observed with the presence of the child under 5 years, which is less likely to increase in the household. As compared to agriculture, paid employed heads support working-women. That is quite similar to the estimates of the education by the husband. Highly educated husband are likely to empower women in their working decision as compared to low-level educated husband. It also consistent with the working husband as they prefer working wife (Maslak 2008).

On the other hand, family size is likely to increase when women takes control on the household expenditure but it is also noticeable that education of the husband is significantly and positively increases the women empowerment in decision of household expenditure. Results show that the educated husband are more likely to increase the women decision-making in education that is opposite to the male head of the household. Husband who have higher level of education as compared to primary have more influence on the education of their wives. It also explains that low education level of husband is less interest with the education of their wives. That is why educated women prefer highly qualified husband to the illiterate or low education profile holders. The media exposure plays very strong and effective role in the women empowerment and consistent results are examined except for decision-making in household resources expenditure. This medium is prime for reducing the awareness gap not only at individual but community level. Fertility rate also decreases with the increase of women empowerment in employment that has describes by the estimates of having children under 5 years. That eventually decreases the household size when women alone takes the decision. As far as concerned about the live birth, it mainly improve by the working environment of the women, as working husband and wife can increase the household resources and effect the family nutrition that increase the live birth of the family.

Lastly, discussing the wealth and provincial effects on women empowerment thoroughly, findings suggest that wealth quintiles are less likely to increase the probability of women decision-making in marriage, family planning and son preference. By analyzing each model, as compared to poor people, average income families are more unlikely to empower women in marriage decisions. Although insignificant, higher income families are less likely to empower women for family planning decisions. Whereas, those mediocre families are significantly reduces the power of woman who has son as first child. Similar estimates are presented in the household resources and consumption expenditure. It is rather opposite but consistent with the findings that as the level of income increases, there is reduction of women empowerment in decision-making for the household expenditure. Most of the household who are self-employed with small business and enterprises are more influential on the household decision-making and save the household time for women in child bearing and nutrition (Das 2000). That is somehow, opposite in lower middle class families and poor ones where women control the household consumption expenditure that might be due to the joint family structure.

Broadly, high-income families are positively and significantly contribute to increase the probability of women empowerment in education decision-making as compared to poor families. There are two main findings; firstly, higher income families have exposure to the advance technologies and urban housing, which give them benefits to acquire tertiary education. Secondly, there is not only income inequality but also cultural and social distance that I might say, ‘awareness gap’. It is unquestionable that scare resources are limiting women education but also one cannot neglect the lack of awareness regarding increasing poverty, inflation, unemployment, female-to-male ratio and above all the importance of education that is only medium to rescue middle class or poor families from these macro and micro economic issues. By observing women empowerment in employment, consistent findings suggest the unitary decision by women is less likely to gain power in high-income groups. There has been negative effect for each outcome category but the probability slightly decreases from lower to upper class families.

The findings reveals gender disparity in women empowerment in all provinces. There is still a debate on the maintenance of infrastructure, implementation of public policies and urbanization. Provinces that are highly equipped with the educational institutions are inclined for power transition as compared to those that have low rate of literacy. My findings are highly consistent

with these stylized facts. Sindh province is positively and significantly increases the probability to empower women in marriage decisions. As compared to Punjab, Balochistan and KPK have similar behavior to reduce the empowerment for marriage when women take decision alone instead of their family members. The situation is quite improving with the recent development in health sectors and media exposure in the Sindh and KPK that they are more likely to increase the women empowerment in family planning as compared to Punjab. On the other side, male dominance factor is highly observed in KPK and Balochistan as compared to Punjab and Sindh. The estimates show that KPK and Balochistan are more likely to empower women with son preference among other provinces. As far as concern about the household expenditure, the control by women is highly reduced in Balochistan as compared to Punjab. The categorization of provinces presents that Sindh is highly unlike to give power over household resources than KPK against Punjab province. The estimates for education and employment are not different to the previous models. Each province is highly unlike to increase the empowerment in education while mainly woman is taking decision. This behavior slightly modified and less when joint decision with woman and joint decision of parents are considering in all provinces. Besides this, Balochistan province is severely affecting in reducing women empowerment for education as compared to Sindh. This situation is also not comprehensive in case of employment. In Sindh, the ratio to reduce women empowerment for employment is less as compared to KPK and Balochistan against the reference category that is Punjab. This displays about the shrinking the 'awareness gap' in Sindh for employment and motivating women to participate in labor force.

This study is first attempt to analyze gender discrimination in households' decision-making in Pakistan. It covers social and economic aspects of women empowerment in marriage, family planning, son preferences, household resources, education continuation and employment by using data PSLM from 2005 to 2014. The findings direct towards three major conclusions regarding the impact of education in determining women empowerment in household decision-making in Pakistan. Firstly, to define the women empowerment qualitative and quantitatively in multidimensional gender role in Pakistan. It is relevant to the process of Kabeer's approach (1999), however, in the Pakistani society; ability plays multidisciplinary impact at individual level that encourages women to promote empowerment with the help of available resources at community level. Secondly, to observe the measurement of education attainment to consider the vast range of individual, community and household characteristics socially and economically

relevant to reduce the gender inequality and focusing on human capital investment. Education is determined the strongest strategy to achieve women's social and economic rights in traditional culture of the country. Although, women empowerment in employment proved to be the second appropriate economic tool for the economic growth of the household. By region, women suffer from extreme severity in decision-making while joint decision-making can have impact socially in family planning and economically in education and employment. Rural and tribal areas escalate strongly in son preference and autonomy on household resources. However, educated males of the household can reduce the gender inequality in the household and labor market. Thus, physical and human resource capital are important but later performs significantly to achieve income equality. Thirdly, attempt to deal with the causal effect of education and women empowerment to access the impact of household decision-making for economic and social welfare. The estimates remain significant after controlling possible endogeneity and findings are robust for significant role of women education.

Lastly, my findings transfer valuable and specific information for policy makers at individual and household levels.

- Revised education policies for higher education to finance women education who belong to the lowest wealth quintile.
- Establishment of marriage age and protection rights according to religion and civil laws.
- Self-awareness programs for rehabilitation who suffer from son preference, joint family planning decision and active participation in labor market.
- Public policies for the use of advance health techniques.
- Public and non-profit organizations support to least developed provinces.

There are several limitations and these might direct some future research. The study prime focus deal with the endogeneity by instrumenting women education, however, explanatory variables such as women physical possession and working status and empowerment indicator of family planning might suffer as well. The study focused on intra-household decision-making and political aspects of women contribution remained unobserved due to limited data. Finally, more research and quantitative mechanisms urge to determine the women empowerment apart from I identified in this study.

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Appendices

Appendix A. Tables

A.1: Coefficient Estimation: Multinomial Probit

Table A.1.1 Coefficient Estimations by Probit Model Regression for Women Empowerment

	Marriage	Family Plan	Son Preference	Expenditure
Variables	**(1)**	**(3)**	**(3)**	**(4)**
Woman	0.0853	-0.14141	-0.02414	0.09791***
	(0.1015)	(0.09465)	(0.03267)	(0.03741)
W education	0.0131***	0.00831***	0.00962***	0.00641***
	(0.0032)	(0.00289)	(0.00100)	(0.00131)
W age (15-24)	-0.4615***	0.05999	0.08728***	-0.43040***
	(0.0980)	(0.09050)	(0.03206)	(0.03783)
W age (25-34)	-0.0185	0.07440	0.09069***	-0.15399***
	(0.0975)	(0.08894)	(0.03174)	(0.03682)
W age (35-above)	-0.1988**	0.12712	0.02662	-0.13232***
	(0.0931)	(0.09069)	(0.03164)	(0.03627)
W married	-0.0579	0.06632	0.12416***	0.11419***
	(0.0539)	(0.04349)	(0.01253)	(0.01548)
W property	0.0405	0.10902*	-0.01222	0.06767***
	(0.0483)	(0.05562)	(0.01697)	(0.02115)
W working	0.0872***	-0.10758***	-0.08988***	-0.02913**
	(0.0274)	(0.02798)	(0.00918)	(0.01154)
Head	-0.0479	0.04558	-0.04757***	-0.07407***
	(0.0570)	(0.05165)	(0.01770)	(0.02415)
H self-employ	-0.3045*	-0.42953***	0.06822	-0.26385***
	(0.1613)	(0.14153)	(0.04286)	(0.07032)
H paid-employ	-0.1246	-0.22121*	0.07777**	-0.06667
	(0.1190)	(0.11289)	(0.03338)	(0.04927)
H agriculture	0.2341	-0.12852	0.11142*	-0.09520
	(0.2203)	(0.23493)	(0.06723)	(0.10248)
HH size	-0.0082***	-0.00147	-0.00295***	0.02468***
	(0.0011)	(0.00112)	(0.00035)	(0.00049)
HH joint	0.0218	-0.21886***	-0.01931**	-0.00942
	(0.0327)	(0.03017)	(0.00950)	(0.01255)
Husband Edu P	-0.0805	-0.11925*	0.13740***	-0.04438
	(0.0864)	(0.06979)	(0.02210)	(0.02922)
Husband Edu S	-0.1120*	0.10256**	0.20650***	-0.00103
	(0.0635)	(0.05212)	(0.01519)	(0.01961)
Husband Edu H	-0.0262	0.08141	0.18286***	0.08544***
	(0.1251)	(0.11036)	(0.02660)	(0.03307)
HH telephone	0.1558***	0.25751***	0.06041***	-0.01297
	(0.0229)	(0.02237)	(0.00754)	(0.00914)
HH TV	-0.0382	0.09411***	-0.00995	0.01643
	(0.0340)	(0.03301)	(0.01085)	(0.01331)
HH water system	0.1349***	0.05866***	0.00799	0.25628***
	(0.0248)	(0.02240)	(0.00767)	(0.01115)
Child 5	0.1349***	0.03613	0.16619***	0.03258***
	(0.0371)	(0.02483)	(0.00900)	(0.01200)
Urban	0.0662***	0.08020***	-0.00198	0.02118**
	(0.0211)	(0.02134)	(0.00671)	(0.00877)
Wealth Q 2 (ref =poor)	-0.2241***	-0.05860**	0.00387	-0.17405***
	(0.0286)	(0.02835)	(0.01033)	(0.01191)
Wealth Q 3	-0.3971***	-0.10131***	-0.03598***	-0.22242***

	(0.0310)	(0.03107)	(0.01080)	(0.01258)
Wealth Q 4	-0.4556***	-0.03334	-0.01788*	-0.31438***
	(0.0322)	(0.03236)	(0.01085)	(0.01308)
Wealth Q 5	-0.3303***	-0.00753	-0.01179	-0.45634***
	(0.0328)	(0.03509)	(0.01114)	(0.01382)
Sindh (Ref =Punjab)	0.1608***	0.44352***	0.00248	-0.89257***
	(0.0256)	(0.02493)	(0.00813)	(0.01461)
KPK	-0.1078***	0.25866***	0.04000***	-0.76711***
	(0.0271)	(0.02956)	(0.00843)	(0.01241)
Balochistan	-0.1104***	-0.78981***	0.07166***	-0.99750***
	(0.0355)	(0.02771)	(0.01144)	(0.02146)
W unmarried	-0.0437			
	(0.0690)			
W divorced	1.3932***			
	(0.0576)			
Planning services		0.34518***		
		(0.02613)		
Planning costly		0.04738**		
		(0.02293)		
Birth control pills			0.12095***	
			(0.01251)	
Boys HH			0.22445***	
			(0.01178)	
Private School	0.10397***			0.10397***
	(0.02610)			(0.02610)
Iodize Salt	0.16032***			0.16032***
	(0.01031)			(0.01031)
Health Visit	-0.10253***			-0.10253***
	(0.00866)			(0.00866)
Constant	-1.2693***	-0.71942***	-1.48313***	-1.92100***
	(0.0434)	(0.04419)	(0.02877)	(0.01899)
Observations	37,890	23,263	260,532	330,086
Link test: P-value	0.540	0.950	0.375	0.068
Log-likelihood	-9867.103	-12066.920	-100457.213	-59105.416
Chi2: Deviance	19734.207	24133.841	200914.425	118210.832
Prob > chi2	0.000	0.000	0.000	0.000
LR chi2	2004.62	3552.23	1558.48	17327.216
AIC	19798.207	24197.841	200978.425	118276.832
BIC	20071.565	24455.588	201313.481	118630.166
VIF	3.99	2.52	2.84	2.95

*Dependent variables for Model 1 is dummy variable for decision-making in marriage, Models 2 is dummy variable for decision-making in family planning and Model 4 is dummy variable for decision-making in household expenditures, Model 3 if the woman has first child son equals to 1 or 0 for daughter. Robust standard errors are in parentheses. The significance levels are reported as *** p<0.01, ** p<0.05, * p<0.1*

Table A.1.2 Coefficient Estimations by Multinomial Probit Model for Women Empowerment

	Education			Employment		
Decisions by:	**Woman joint**	**Woman alone**	**Parents**	**Woman Joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.0022	0.3096***	-0.0166	0.13968***	0.36391***	-0.02744
	(0.0852)	(0.0621)	(0.0519)	(0.04806)	(0.06343)	(0.05062)
W education	0.0683***	0.0846***	0.0300***	0.02351***	0.06412***	0.02790***
	(0.0022)	(0.0020)	(0.0016)	(0.00137)	(0.00203)	(0.00157)
W age (15-24)	0.3250***	-0.3186***	-0.1134**	-0.18800***	-0.50780***	-0.21630***
	(0.0849)	(0.0621)	(0.0513)	(0.04787)	(0.06346)	(0.05007)
W age (25-34)	0.2809***	0.1022*	-0.0872*	-0.04584	-0.05827	-0.11888**
	(0.0856)	(0.0614)	(0.0511)	(0.04798)	(0.06254)	(0.04977)
W age (35-above)	0.3504***	0.0102	-0.0732	0.14495***	-0.12226**	-0.14284***
	(0.0840)	(0.0608)	(0.0506)	(0.04727)	(0.06201)	(0.04937)
W married	-0.3531***	-0.2618***	0.1606***	-0.29434***	-0.21320***	0.26474***
	(0.0265)	(0.0229)	(0.0202)	(0.01658)	(0.02377)	(0.01945)
W property	0.0965***	0.1224***	0.0417	-0.02904	0.07309**	0.00012
	(0.0343)	(0.0307)	(0.0276)	(0.02359)	(0.03225)	(0.02673)
W working	0.0203	0.1060***	0.0927***	0.06822***	0.26342***	0.11145***
	(0.0200)	(0.0171)	(0.0146)	(0.01247)	(0.01740)	(0.01417)
Head	-0.0789**	-0.0575*	-0.0258	-0.09040***	-0.08013**	-0.03232
	(0.0391)	(0.0337)	(0.0280)	(0.02429)	(0.03623)	(0.02743)
H self-employ	-0.0041	-0.2410***	-0.1402*	-0.01323	-0.18039*	-0.15373**
	(0.0977)	(0.0903)	(0.0728)	(0.06207)	(0.09543)	(0.07122)
H paid-employ	0.1479**	0.1601**	0.1618***	0.09333*	0.24658***	0.12950**
	(0.0751)	(0.0651)	(0.0534)	(0.05075)	(0.07195)	(0.05589)
H agriculture	0.1023	-0.3323**	-0.2003*	0.06092	-0.26276*	-0.06825
	(0.1554)	(0.1584)	(0.1146)	(0.09406)	(0.15810)	(0.10694)
HH size	-0.0117***	0.0000	-0.0048***	0.00627***	-0.00960***	-0.01506***
	(0.0008)	(0.0007)	(0.0006)	(0.00055)	(0.00083)	(0.00065)
HH joint	0.1053***	0.0271	0.0670***	0.02416*	-0.00501	0.04676***
	(0.0222)	(0.0192)	(0.0154)	(0.01329)	(0.01981)	(0.01479)
Husband Edu P	-0.0816	-0.1110**	0.0395	-0.08924***	-0.09961**	0.02240
	(0.0572)	(0.0470)	(0.0366)	(0.03214)	(0.04822)	(0.03575)
Husband Edu S	0.2354***	0.2683***	0.1831***	0.02195	0.10755***	0.10810***
	(0.0352)	(0.0290)	(0.0261)	(0.02320)	(0.03224)	(0.02615)
Husband Edu H	0.5990***	0.9960***	0.6102***	0.37215***	0.66898***	0.45484***
	(0.0595)	(0.0486)	(0.0489)	(0.04129)	(0.05169)	(0.04635)
HH telephone	0.4457***	0.3154***	0.0398***	0.07991***	0.26841***	0.02684**
	(0.0178)	(0.0147)	(0.0121)	(0.01026)	(0.01525)	(0.01176)
HH TV	0.0890***	0.0977***	0.1195***	0.00785	0.03403	0.08562***
	(0.0241)	(0.0203)	(0.0172)	(0.01499)	(0.02138)	(0.01670)
HH water system	0.3320***	0.9145***	0.2421***	0.21498***	0.69552***	0.16972***
	(0.0182)	(0.0181)	(0.0124)	(0.01050)	(0.01788)	(0.01205)
Child 5	-0.1701***	-0.0052	0.0390**	-0.15011***	-0.02309	0.11280***
	(0.0249)	(0.0193)	(0.0153)	(0.01353)	(0.01982)	(0.01472)
Urban	0.1439***	0.1988***	0.1581***	0.03271***	0.13549***	0.12879***
	(0.0149)	(0.0129)	(0.0109)	(0.00929)	(0.01347)	(0.01062)
Wealth Q 2(ref =poor)	-0.1836***	-0.2859***	-0.0230	-0.19379***	-0.42316***	-0.05669***
	(0.0250)	(0.0205)	(0.0166)	(0.01383)	(0.02042)	(0.01592)
Wealth Q 3	-0.1753***	-0.2936***	-0.0415**	-0.26001***	-0.46580***	-0.06625***
	(0.0252)	(0.0208)	(0.0173)	(0.01447)	(0.02103)	(0.01657)
Wealth Q 4	-0.0173	-0.2187***	0.0637***	-0.25665***	-0.47231***	-0.08776***
	(0.0243)	(0.0205)	(0.0175)	(0.01466)	(0.02098)	(0.01694)
Wealth Q 5	0.2469***	0.0431**	0.1609***	-0.05296***	-0.35086***	-0.04186**
	(0.0243)	(0.0205)	(0.0183)	(0.01506)	(0.02110)	(0.01770)

Sindh (Ref =Punjab)	-0.4349***	-1.0895***	0.1397***	0.17631***	-1.13893***	0.09397***
	(0.0189)	(0.0174)	(0.0128)	(0.01127)	(0.01905)	(0.01244)
KPK	-0.6999***	-1.4243***	-0.9728***	-0.77412***	-1.67708***	-0.96846***
	(0.0185)	(0.0169)	(0.0149)	(0.01189)	(0.01969)	(0.01423)
Balochistan	-0.8363***	-2.4594***	-0.4320***	-0.09585***	-2.26383***	-0.70815***
	(0.0274)	(0.0376)	(0.0174)	(0.01457)	(0.03967)	(0.01880)
Marriage age < 25	-0.8306***	-0.0574***	0.2074***			
	(0.0150)	(0.0127)	(0.0111)			
Husband work				0.10325***	0.11106***	0.12677***
				(0.02138)	(0.03149)	(0.02435)
Live births				-0.00380***	0.00414***	0.00304***
				(0.00014)	(0.00020)	(0.00015)
Constant	-1.8691***	-2.1757***	-1.2071***	-0.42565***	-1.73673***	-0.73966***
	(0.0348)	(0.0312)	(0.0252)	(0.02009)	(0.03023)	(0.02323)
Observations	257,539	257,539	257,539	330,086	330,086	330,086
Log-Likelihood	-286359.045			-403132.330		
Chi2: Deviance	572718.090			806264.661		
Wald chi2	42527.20			34218.51		
Prob > chi2	0.000			0.000		
Link test	0.105			0.509		
VIF	3.05			3.06		
AIC	572904.09			806456.661		
BIC	573876.77			807484.543		

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides (Reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision father or husband for education and employment. Estimates of Z scores under Link Test are by Probit Model. Coefficients are with the base outcome (2) represents decision-making by mainly father or husband. Other criteria of specification estimates are from Multinomial Probit Regression. Robust standard errors are in parentheses. The significance levels are reported as: *** p<0.01, ** p<0.05, * p<0.1*

Table A.1.3 Alternative Specification: Endogeneity Bias in Education, Employment and Expenditure

	Education		Employment		Expenditure	
	2SLS	IV probit	2SLS	IV probit	2SLS	IV probit
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.01552*	0.05518	0.01748***	0.08653***	0.00665	0.01561
	(0.00838)	(0.03787)	(0.00598)	(0.03199)	(0.00481)	(0.04346)
W education	0.05489***	0.22956***	0.02650***	0.15131***	0.01289**	0.15611***
	(0.01116)	(0.02591)	(0.00359)	(0.01568)	(0.00526)	(0.04196)
W age (15-24)	-0.00821	-0.02882	-0.02491***	-0.12704***	-0.03632***	-0.32421***
	(0.00785)	(0.03377)	(0.00590)	(0.03201)	(0.00455)	(0.05742)
W age (25-34)	-0.00208	-0.02227	-0.00333	-0.02675	-0.02069***	-0.16482***
	(0.00703)	(0.02772)	(0.00571)	(0.02973)	(0.00422)	(0.03378)
W age (35-above)	-0.00244	-0.01316	-0.00894	-0.04399	-0.01485***	-0.09636***
	(0.00664)	(0.02708)	(0.00564)	(0.02954)	(0.00411)	(0.03642)
W married	-0.01893***	-0.07051***	-0.01005***	-0.05679***	0.01590***	0.13731***
	(0.00333)	(0.01898)	(0.00220)	(0.01239)	(0.00196)	(0.01422)
W property	0.00906**	0.03474**	0.00557*	0.03005*	0.00335	0.04515**
	(0.00356)	(0.01561)	(0.00292)	(0.01548)	(0.00215)	(0.02114)
W working	0.00824***	0.03521***	0.02026***	0.11012***	-0.00248**	-0.01852*
	(0.00184)	(0.00736)	(0.00155)	(0.00836)	(0.00114)	(0.01122)
Head	-0.00153	-0.00803	-0.00396	-0.02610	-0.00542**	-0.06802***
	(0.00346)	(0.01426)	(0.00302)	(0.01686)	(0.00216)	(0.02227)
H self-employ	-0.00644	-0.03368	-0.00351	-0.01068	-0.01405**	-0.18655***
	(0.00939)	(0.04195)	(0.00792)	(0.04463)	(0.00559)	(0.07061)
H paid-employ	0.00695	0.03526	0.01828***	0.10552***	-0.00448	-0.04744
	(0.00672)	(0.02723)	(0.00623)	(0.03334)	(0.00417)	(0.04511)
H agriculture	-0.00095	-0.03454	-0.00734	-0.04672	0.00172	-0.00369
	(0.01480)	(0.06965)	(0.01210)	(0.07255)	(0.00887)	(0.09680)
HH size	-0.00090***	-0.00452***	-0.00140***	-0.00832***	0.00180***	0.01749***
	(0.00030)	(0.00087)	(0.00015)	(0.00066)	(0.00016)	(0.00298)
HH joint	0.01219***	0.03319***	0.00411**	0.00934	0.00260*	0.01318
	(0.00263)	(0.00924)	(0.00174)	(0.00961)	(0.00141)	(0.01321)
Husband Edu P	0.00641	0.03544	0.00420	0.03593	0.00169	0.03523
	(0.00705)	(0.02752)	(0.00444)	(0.02426)	(0.00387)	(0.03579)
Husband Edu S	-0.00588	-0.03638	-0.00423	-0.02784	-0.00621*	-0.07302***
	(0.00688)	(0.02559)	(0.00334)	(0.01731)	(0.00320)	(0.02699)
Husband Edu H	-0.00352	-0.14605*	0.00307	-0.04221	-0.01273	-0.20600**
	(0.02339)	(0.08496)	(0.00856)	(0.04356)	(0.01042)	(0.09045)
HH telephone	0.00645	0.02775	0.01340***	0.07382***	-0.00137	-0.05804***
	(0.00401)	(0.01936)	(0.00172)	(0.01067)	(0.00186)	(0.01477)
HH TV	0.00253	0.01701*	-0.00098	-0.00187	0.00050	0.00501
	(0.00225)	(0.00969)	(0.00186)	(0.01002)	(0.00138)	(0.01269)
HH water system	0.01830*	0.15945***	0.01941***	0.15960***	0.00957**	0.10216*
	(0.00986)	(0.05656)	(0.00336)	(0.02188)	(0.00444)	(0.05388)
Child 5	-0.00782***	-0.03583***	-0.00261	-0.01998**	0.00251*	0.01336
	(0.00236)	(0.00846)	(0.00171)	(0.00943)	(0.00130)	(0.01275)
Urban	-0.02459***	-0.09810***	-0.00892***	-0.04730***	-0.00458	-0.09797***
	(0.00893)	(0.02879)	(0.00295)	(0.01487)	(0.00416)	(0.03526)
Wealth Q 2(ref =poor)	-0.01600***	-0.08227***	-0.02898***	-0.16756***	-0.01794***	-0.15506***
	(0.00200)	(0.01097)	(0.00172)	(0.01019)	(0.00124)	(0.01604)
Wealth Q 3	-0.02131***	-0.09838***	-0.03408***	-0.19225***	-0.02499***	-0.21291***
	(0.00252)	(0.00925)	(0.00186)	(0.01003)	(0.00142)	(0.01583)
Wealth Q 4	-0.02617***	-0.12341***	-0.04011***	-0.22321***	-0.03512***	-0.32900***
	(0.00481)	(0.01112)	(0.00231)	(0.01010)	(0.00222)	(0.01409)
Wealth Q 5	-0.05955***	-0.28186***	-0.05981***	-0.33475***	-0.05874***	-0.59680***
	(0.01636)	(0.04342)	(0.00551)	(0.02219)	(0.00689)	(0.02588)
Sindh (Ref =Punjab)	-0.13605***	-0.55418***	-0.12384***	-0.66723***	-0.08186***	-0.89004***

	(0.00690)	(0.02421)	(0.00267)	(0.00907)	(0.00368)	(0.03628)
KPK	-0.12126***	-0.45764***	-0.12265***	-0.65458***	-0.08120***	-0.72843***
	(0.00538)	(0.02212)	(0.00221)	(0.01093)	(0.00206)	(0.04094)
Balochistan	-0.18247***	-0.94617***	-0.15180***	-1.02496***	-0.09117***	-1.00242***
	(0.00884)	(0.05349)	(0.00345)	(0.01778)	(0.00445)	(0.04047)
Marriage <25	0.02683***	0.10539***			0.00246	-0.01892
	(0.00234)	(0.00561)			(0.00484)	(0.04531)
Husband work			0.00297	0.01674	0.00649	0.02711
			(0.00267)	(0.01462)	(0.00413)	(0.04448)
Live births			0.00050***	0.00289***	-0.00592***	-0.04490**
			(0.00003)	(0.00010)	(0.00179)	(0.02153)
Private School					0.00246	-0.01892
					(0.00484)	(0.04531)
Iodize Salt					0.00649	0.02711
					(0.00413)	(0.04448)
Health Visit					-0.00592***	-0.04490**
					(0.00179)	(0.02153)
Constant	-0.24341***	-2.55074***	-0.02895	-2.05673***	-0.02480	-2.57885***
	(0.06636)	(0.04497)	(0.02113)	(0.06505)	(0.03085)	(0.11537)
Observations	330,086	330,086	330,086	330,086	330,086	330,086
Wald *Chi2*	16815.07		16749.57		16017.21	
Instrument Criteria						
Wald exogeneity test	25.07		48.40		9.03	
Hausman test	22.6728		40.8303		5.65564	
Overidentification Test	0.282321		0.138557		0.02398	
Joint Significance test	51.3932		372.7		91.0036	
Wald *Chi2*	16815.07		16749.57		16017.21	

*The dependent variable for education and employment models are dummy variables in which 1 takes value if woman alone makes decision and 0 takes for the other family members. The instruments in education models are; dummy variables for the female and male grandchild of the HH if study. While for employment, the instruments are; dummy variable for school distance is less than 5 km and dummy variable if the woman has completed education from government school. Dependent variable for household decision-making is dummy variable variables in which 1 takes value if woman alone makes decision and 0 takes for the other family members. The instrumental variables are the questions in the survey regarding child leaves school for (a) to help in domestic chores (b) to help in work. The specification criteria is estimated as follows: Wald test of exogeneity is estimated with ivprobit model. The other criteria of speciation is estimated with 2SLS estimator. For Hausman endogeneity test, the F-statistics is provided. The Hausman test for endogeneity is based on the coefficient of H0. The test of overidentifying restrictions reports based on Sargan score for Chi-Square. Whereas, joint test of significance reports Prob > F score. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A.1.4 Coefficient Estimations by 2SRI Approach for Women Empowerment

	Multinomial Probit						Probit
	Education			Employment			Expenditure
Decision by:	**Woman joint**	**Woman alone**	**Parents**	**Woman Joint**	**Woman alone**	**Parents**	
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Woman	0.15596	0.05887	-0.34361***	0.12799***	0.15348***	-0.07546*	0.01785
	(0.10154)	(0.08325)	(0.05761)	(0.03348)	(0.04755)	(0.04000)	(0.04424)
W education	-0.20923**	0.42720***	0.77598***	-0.00866	0.24201***	0.16914***	0.17631***
	(0.10630)	(0.15353)	(0.13614)	(0.01998)	(0.01927)	(0.03891)	(0.02951)
W age (15-24)	0.08825	-0.08787	0.19942***	-0.16334***	-0.26146***	-0.10387**	-0.36707***
	(0.08561)	(0.07843)	(0.06133)	(0.03707)	(0.04123)	(0.04768)	(0.04211)
W age (25-34)	0.22410***	-0.00806	-0.23469***	-0.03414	-0.07824	-0.11606***	-0.18647***
	(0.05571)	(0.05430)	(0.06017)	(0.02432)	(0.04917)	(0.04189)	(0.05116)
W age (35-above)	0.17492**	0.05229	0.03654	0.10472***	-0.04266	-0.07610**	-0.10911***
	(0.06951)	(0.03831)	(0.04355)	(0.02640)	(0.03759)	(0.03492)	(0.03584)
W married	-0.28939***	-0.11688***	0.26495***	-0.23500***	-0.11217***	0.20413***	0.15531***
	(0.02731)	(0.03824)	(0.01067)	(0.01186)	(0.01983)	(0.01580)	(0.02184)
W property	0.09902***	0.05856	-0.04313	-0.01847*	0.02761	-0.01771	0.05114
	(0.02298)	(0.04175)	(0.02819)	(0.01046)	(0.03214)	(0.02155)	(0.03148)
W working	0.01425	0.09386***	0.10621***	0.05467***	0.19043***	0.09283***	-0.02098
	(0.01071)	(0.01533)	(0.02715)	(0.01051)	(0.01711)	(0.01636)	(0.02428)
Head	-0.05481***	-0.05089**	-0.02996	-0.07084***	-0.06681***	-0.03030	-0.07698***
	(0.01565)	(0.02306)	(0.02962)	(0.00468)	(0.02426)	(0.02210)	(0.02238)
H self-employ	-0.10068	-0.04797	0.14285	-0.02239	-0.03938	-0.05696	-0.21124***
	(0.09294)	(0.07603)	(0.12316)	(0.05239)	(0.04982)	(0.07960)	(0.04918)
H paid-employ	0.09513	0.15544**	0.18826*	0.07261***	0.20105***	0.11927**	-0.05371
	(0.06863)	(0.07229)	(0.10132)	(0.01569)	(0.02492)	(0.05462)	(0.07862)
H agriculture	-0.09487	-0.04796	0.24575***	0.03027	-0.04815	0.03411	-0.00438
	(0.11469)	(0.09200)	(0.07666)	(0.09869)	(0.11690)	(0.13666)	(0.09332)
HH size	-0.00122	-0.00966**	-0.02379***	0.00581***	-0.01317***	-0.01635***	0.01980***
	(0.00323)	(0.00431)	(0.00346)	(0.00095)	(0.00079)	(0.00189)	(0.00090)
HH joint	0.03890***	0.08770**	0.17199***	0.01339	0.03184**	0.05758***	0.01487
	(0.00814)	(0.03441)	(0.02546)	(0.01232)	(0.01396)	(0.01041)	(0.01283)
Husband Edu P	-0.16772**	0.10334	0.38840***	-0.08272***	0.04151**	0.09214**	0.03968
	(0.07257)	(0.08984)	(0.09226)	(0.01178)	(0.01814)	(0.04374)	(0.03726)
Husband Edu S	0.31795***	0.00639	-0.26347***	0.03231*	-0.02385	0.00819	-0.08246***
	(0.05392)	(0.08041)	(0.05213)	(0.01927)	(0.02801)	(0.03325)	(0.01778)
Husband Edu H	0.97406***	0.01086	-1.06454***	0.33289***	0.09190**	0.03948	-0.23244***
	(0.19347)	(0.29962)	(0.23755)	(0.07005)	(0.04619)	(0.04368)	(0.03729)
HH telephone	0.38226***	0.10552**	-0.20194***	0.07325***	0.12001***	-0.01663	-0.06557***
	(0.03527)	(0.04322)	(0.04014)	(0.00425)	(0.01097)	(0.01226)	(0.01793)
HH TV	0.08226***	0.05844***	0.04579	0.00821	0.01407*	0.05267***	0.00569
	(0.01544)	(0.01861)	(0.03068)	(0.00694)	(0.00758)	(0.01168)	(0.01239)
HH water system	0.48389***	0.31198**	-0.45413***	0.19738***	0.28437***	0.00975	0.11594***
	(0.09317)	(0.12766)	(0.11704)	(0.01056)	(0.02812)	(0.03309)	(0.01646)
Child 5	-0.06509**	-0.05224**	-0.06753***	-0.11278***	-0.04659***	0.05794***	0.01516*
	(0.03010)	(0.02485)	(0.02107)	(0.01769)	(0.01414)	(0.01271)	(0.00921)
Marriage <25	-0.57618***	0.01348	0.26891***				
	(0.00231)	(0.00108)	(0.00146)				
Husband work				0.08242***	0.07451***	0.08843***	
				(0.00831)	(0.02191)	(0.02552)	

Live births				-0.00299***	0.00363***	0.00300***	
				(0.00017)	(0.00018)	(0.00027)	
Private School	-0.02113						-0.02113
	(0.03194)						(0.03194)
Iodize Salt	0.03097						0.03097
	(0.02441)						(0.02441)
Health Visit	-0.05093***						-0.05093***
	(0.01269)						(0.01269)
Urban	0.31414***	-0.13216	-0.46687***	0.04640*	-0.05185**	-0.01718	-0.11058***
	(0.08891)	(0.11867)	(0.10647)	(0.02395)	(0.02247)	(0.03110)	(0.02520)
Wealth Q 2(ref =poor)	-0.12773***	-0.21356***	-0.03660*	-0.15348***	-0.29081***	-0.05321**	-0.17549***
	(0.01547)	(0.02210)	(0.02173)	(0.01133)	(0.02082)	(0.02139)	(0.01724)
Wealth Q 3	-0.09445***	-0.25918***	-0.13504***	-0.20108***	-0.34666***	-0.07912***	-0.24092***
	(0.01418)	(0.00668)	(0.03117)	(0.00939)	(0.02158)	(0.01733)	(0.00678)
Wealth Q 4	0.08676**	-0.29792***	-0.24301***	-0.19136***	-0.39919***	-0.13195***	-0.37223***
	(0.04180)	(0.03990)	(0.05034)	(0.01238)	(0.03168)	(0.02117)	(0.01509)
Wealth Q 5	0.55813***	-0.48814**	-0.96324***	-0.00169	-0.50722***	-0.24349***	-0.67496***
	(0.15766)	(0.21541)	(0.20580)	(0.02659)	(0.04055)	(0.05342)	(0.03516)
Sindh (Ref =Punjab)	-0.14423**	-0.99918***	-0.36304***	0.16073***	-0.84192***	-0.02325	-1.00707***
	(0.06416)	(0.09081)	(0.08269)	(0.01487)	(0.01128)	(0.02254)	(0.02129)
KPK	-0.44998***	-1.23637***	-1.11195***	-0.61813***	-1.26267***	-0.81726***	-0.82429***
	(0.04079)	(0.06152)	(0.05716)	(0.01245)	(0.01340)	(0.01752)	(0.00997)
Balochistan	-0.44983***	-1.93625***	-0.96170***	-0.06589***	-1.55275***	-0.64791***	-1.13421***
	(0.07197)	(0.10384)	(0.10962)	(0.02204)	(0.02822)	(0.01518)	(0.05131)
Constant	0.15514	-3.74384***	-5.41438***	-0.18505	-2.36429***	-1.43524***	-2.91645***
	(0.61872)	(0.92792)	(0.82420)	(0.12814)	(0.09831)	(0.22219)	(0.18126)
Observations	562,829	562,829	562,829	562,829	562,829	562,829	562,829
Instruments Criteria							
Wald exogeneity test	25.07			48.40			9.03
Hausman Test	22.6728			40.8303			5.65564
Overidentification Test	0.282321			0.138557			0.02398
Joint Significance Test	51.3932			372.7			91.0036

*The dependent variable for education and employment models are categorical with value 1 mainly by woman decides, 2 mainly by father or husband decides (reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for employment. The dependent variable for expenditure is dummy variables in which 1 takes value if woman alone makes decision and 0 takes for the other family members. The instruments in education models are; dummy variables for the female and male grandchild of the HH if study. While for employment, the instruments are; dummy variable for school distance is less than 5 km and dummy variable if the woman has completed education from government school. The instrumental variables for expenditure are the questions in the survey regarding child leaves school for (a) to help in domestic chores (b) to help in work. The specification criteria is estimated as follows: Wald test of exogeneity is estimated with ivprobit model. The other criteria of speciation is estimated with 2SLS estimator. For Hausman endogeneity test, the F-statistics is provided. The Hausman test for endogeneity is based on the coefficient of H0. The test of overidentifying restrictions reports based on Sargan score for Chi-Square. Whereas, joint test of significance reports Prob > F score. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

A.2 Robustness Check

Table A.2.1 Multinomial Probit Estimations For Women Empowerment in Education by Years

	2006-2008			2011-2014		
Decisions by:	**Woman joint**	**Woman alone**	**Parents**	**Woman joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.102	0.229***	0.00179	-0.0125	0.243***	0.0206
	(0.0745)	(0.0607)	(0.0548)	(0.0804)	(0.0697)	(0.0617)
W education	0.0326***	0.0516***	0.0141***	0.0591***	0.0696***	0.0331***
	(0.00224)	(0.00197)	(0.00178)	(0.00211)	(0.00203)	(0.00185)
W age (15-24)	0.115	-0.224***	-0.0457	0.240***	-0.249***	-0.153**
	(0.0745)	(0.0605)	(0.0544)	(0.0799)	(0.0694)	(0.0610)
W age (25-34)	0.167**	0.0853	-0.0445	0.155*	0.0434	-0.121**
	(0.0746)	(0.0597)	(0.0544)	(0.0804)	(0.0690)	(0.0610)
W age (35-above)	0.153**	-0.0163	-0.0183	0.254***	0.00928	-0.117*
	(0.0733)	(0.0590)	(0.0536)	(0.0793)	(0.0684)	(0.0604)
W married	-0.256***	-0.209***	0.0799***	-0.220***	-0.176***	0.148***
	(0.0268)	(0.0238)	(0.0214)	(0.0250)	(0.0240)	(0.0221)
W property	0.0837**	0.110***	0.0340	0.0671**	0.0827**	0.0432
	(0.0347)	(0.0316)	(0.0292)	(0.0337)	(0.0330)	(0.0308)
W working	0.0223	0.0987***	0.0505***	0.0332*	0.0610***	0.108***
	(0.0197)	(0.0174)	(0.0158)	(0.0189)	(0.0180)	(0.0165)
Head	-0.0809*	-0.00996	0.00505	-0.0499	-0.0548*	-0.0191
	(0.0435)	(0.0372)	(0.0329)	(0.0337)	(0.0328)	(0.0293)
H self-employ	0.000126	-0.353***	-0.210**	-0.00743	-0.0596	-0.0435
	(0.111)	(0.108)	(0.0896)	(0.0851)	(0.0831)	(0.0730)
H paid-employ	0.214**	0.208***	0.221***	0.0612	0.0692	0.0814
	(0.0883)	(0.0764)	(0.0678)	(0.0631)	(0.0612)	(0.0539)
H agriculture	0.152	-0.0739	-0.0312	0.0600	-0.262*	-0.147
	(0.189)	(0.175)	(0.145)	(0.131)	(0.142)	(0.115)
HH size	0.00194**	-0.00593***	-0.00723***	-0.0148***	-0.00291***	-0.00821***
	(0.00098)	(0.00093)	(0.00082)	(0.00068)	(0.00065)	(0.00059)
HH joint	0.152***	0.0613***	0.0156	-0.0256	-0.0247	0.0491***
	(0.0212)	(0.0192)	(0.0166)	(0.0212)	(0.0201)	(0.0178)
Husband Edu P	0.0208	0.00897	0.0929**	-0.0983*	-0.149***	-0.0120
	(0.0549)	(0.0474)	(0.0407)	(0.0520)	(0.0487)	(0.0421)
Husband Edu S	0.133***	0.124***	0.0789***	0.209***	0.258***	0.197***
	(0.0359)	(0.0313)	(0.0286)	(0.0327)	(0.0302)	(0.0288)
Husband Edu H	0.346***	0.599***	0.350***	0.537***	0.868***	0.520***
	(0.0616)	(0.0522)	(0.0525)	(0.0553)	(0.0514)	(0.0510)
HH telephone	0.342***	0.302***	0.137***	0.413***	0.234***	0.240***
	(0.0163)	(0.0142)	(0.0134)	(0.0365)	(0.0332)	(0.0276)
HH TV	0.0385*	0.0515***	0.0610***	0.0769***	0.0961***	0.0854***
	(0.0221)	(0.0196)	(0.0172)	(0.0247)	(0.0234)	(0.0219)
HH water system	0.0998***	0.410***	0.0584***	0.344***	0.803***	0.266***
	(0.0182)	(0.0169)	(0.0140)	(0.0171)	(0.0184)	(0.0144)
Child 5	-0.0891***	-0.0231	0.00812	-0.107***	0.0128	0.0530***
	(0.0225)	(0.0189)	(0.0163)	(0.0227)	(0.0204)	(0.0180)
Marriage age < 25	-0.540***	-0.0403***	0.195***	-0.528***	-0.0558***	0.0913***
	(0.0144)	(0.0129)	(0.0117)	(0.0139)	(0.0136)	(0.0125)
Urban	0.284***	0.346***	0.255***	0.0143	0.0161	0.0146
	(0.0165)	(0.0144)	(0.0129)	(0.0134)	(0.0129)	(0.0117)
Wealth Q 2(ref =poor)	-0.0737***	-0.170***	0.0345**	-0.248***	-0.303***	-0.179***
	(0.0194)	(0.0173)	(0.0150)	(0.0316)	(0.0290)	(0.0269)
Wealth Q 3	-0.100***	-0.153***	0.0260	-0.202***	-0.338***	-0.163***
	(0.0208)	(0.0185)	(0.0164)	(0.0296)	(0.0277)	(0.0256)
Wealth Q 4	0.0810***	0.00213	0.147***	-0.148***	-0.345***	-0.0996***

	(0.0224)	(0.0198)	(0.0182)	(0.0273)	(0.0255)	(0.0238)
Wealth Q 5	0.105***	0.211***	0.263***	0.0802***	-0.145***	-0.0575**
	(0.0264)	(0.0227)	(0.0216)	(0.0268)	(0.0249)	(0.0237)
Sindh (Ref =Punjab)	-0.0342*	-0.636***	0.257***	-0.581***	-0.966***	-0.142***
	(0.0181)	(0.0164)	(0.0138)	(0.0181)	(0.0174)	(0.0153)
KPK	-0.481***	-0.868***	-0.967***	-0.670***	-1.291***	-0.564***
	(0.0181)	(0.0161)	(0.0157)	(0.0177)	(0.0178)	(0.0155)
Balochistan	-1.063***	-1.876***	-0.864***	-0.179***	-1.307***	0.239***
	(0.0283)	(0.0305)	(0.0192)	(0.0250)	(0.0319)	(0.0208)
Constant	-1.549***	-1.373***	-0.784***	-1.335***	-1.497***	-1.035***
	(0.0364)	(0.0331)	(0.0291)	(0.0478)	(0.0449)	(0.0394)
Observations	138,448	138,448	138,448	119,091	119,091	119,091

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides, 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for education. Base outcome category is 2 that describes mainly father or husband decides in the household for education continuation. Robust standard errors in parentheses. Significance level reports as: *** p<0.01, ** p<0.05, * p<0.10*

Table A.2.2 Multinomial Probit Estimations for Women Empowerment in Employment by Years

	2006-2008			2011-2014		
Decisions by:	**Woman joint**	**Woman alone**	**Parents**	**Woman joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.0976**	0.206***	0.0203	0.133**	0.299***	-0.0270
	(0.0490)	(0.0586)	(0.0500)	(0.0564)	(0.0658)	(0.0579)
W education	0.00174	0.0338***	0.00603***	0.0325***	0.0552***	0.0350***
	(0.00148)	(0.00191)	(0.00160)	(0.00160)	(0.00198)	(0.00172)
W age (15-24)	-0.175***	-0.309***	-0.160***	-0.132**	-0.392***	-0.185***
	(0.0490)	(0.0584)	(0.0497)	(0.0561)	(0.0656)	(0.0573)
W age (25-34)	-0.0178	0.00895	-0.0600	-0.0719	-0.105	-0.139**
	(0.0489)	(0.0573)	(0.0496)	(0.0562)	(0.0648)	(0.0572)
W age (35-above)	0.161***	-0.0371	-0.0728	0.0453	-0.121*	-0.139**
	(0.0481)	(0.0570)	(0.0490)	(0.0555)	(0.0644)	(0.0568)
W married	-0.242***	-0.152***	0.140***	-0.211***	-0.154***	0.216***
	(0.0181)	(0.0230)	(0.0195)	(0.0188)	(0.0235)	(0.0204)
W property	-0.0108	0.0411	-0.0113	-0.0320	0.0564*	0.0113
	(0.0253)	(0.0310)	(0.0271)	(0.0269)	(0.0323)	(0.0288)
W working	0.0510***	0.220***	0.0525***	0.0655***	0.140***	0.130***
	(0.0134)	(0.0164)	(0.0145)	(0.0143)	(0.0174)	(0.0153)
Head	-0.0691**	-0.0365	0.00321	-0.0767***	-0.0819**	-0.0436
	(0.0282)	(0.0366)	(0.0303)	(0.0259)	(0.0325)	(0.0277)
H self-employ	-0.0450	-0.246**	-0.218***	0.0654	0.0153	-0.0242
	(0.0733)	(0.0997)	(0.0805)	(0.0667)	(0.0844)	(0.0701)
H paid-employ	0.105*	0.236***	0.140**	0.106**	0.160**	0.0929*
	(0.0612)	(0.0758)	(0.0648)	(0.0530)	(0.0650)	(0.0550)
H agriculture	0.230**	-0.218	0.0923	0.0318	-0.0342	-0.0706
	(0.116)	(0.171)	(0.127)	(0.0996)	(0.131)	(0.104)
HH size	0.00545***	-0.00823***	-0.0124***	0.00207***	-0.00740***	-0.0145***
	(0.000733)	(0.00102)	(0.000809)	(0.000635)	(0.000830)	(0.000711)
HH joint	0.0737***	-0.0161	0.00123	-0.0529***	0.00880	0.0463***
	(0.0140)	(0.0185)	(0.0150)	(0.0158)	(0.0192)	(0.0164)
Husband Edu P	-0.0206	-0.00593	0.0236	-0.0995***	-0.113**	0.0320
	(0.0342)	(0.0440)	(0.0371)	(0.0375)	(0.0474)	(0.0392)
Husband Edu S	-0.0360	0.00962	0.0144	0.0776***	0.133***	0.139***

	(0.0249)	(0.0309)	(0.0270)	(0.0267)	(0.0317)	(0.0282)
Husband Edu H	0.122***	0.294***	0.173***	0.410***	0.655***	0.445***
	(0.0445)	(0.0524)	(0.0481)	(0.0447)	(0.0515)	(0.0476)
HH telephone	0.145***	0.185***	0.0933***	0.0899***	0.225***	0.175***
	(0.0113)	(0.0140)	(0.0123)	(0.0232)	(0.0320)	(0.0251)
HH TV	-0.0219	-0.00674	0.0407***	0.0317*	0.0635***	0.0592***
	(0.0149)	(0.0189)	(0.0158)	(0.0191)	(0.0228)	(0.0203)
HH water system	0.0815***	0.278***	0.0557***	0.206***	0.617***	0.165***
	(0.0116)	(0.0156)	(0.0126)	(0.0124)	(0.0175)	(0.0133)
Child 5	-0.114***	-0.0409**	0.0863***	-0.115***	0.000670	0.0669***
	(0.0140)	(0.0181)	(0.0147)	(0.0160)	(0.0196)	(0.0165)
Husband work	0.153***	0.127***	0.109***	-0.0236	0.0121	0.0671**
	(0.0217)	(0.0279)	(0.0234)	(0.0269)	(0.0331)	(0.0281)
Live births	-0.00250***	0.00242***	0.00203***	-0.00319***	0.00276***	0.00255***
	(0.000136)	(0.000165)	(0.000138)	(0.000190)	(0.000219)	(0.000188)
Urban	0.158***	0.223***	0.177***	-0.0657***	0.0241*	0.0256**
	(0.0110)	(0.0138)	(0.0119)	(0.0102)	(0.0126)	(0.0109)
Wealth Q 2(ref =poor)	-0.148***	-0.239***	-0.0139	-0.166***	-0.401***	-0.151***
	(0.0124)	(0.0160)	(0.0135)	(0.0229)	(0.0271)	(0.0244)
Wealth Q 3	-0.181***	-0.253***	-0.0141	-0.241***	-0.460***	-0.147***
	(0.0137)	(0.0176)	(0.0149)	(0.0219)	(0.0256)	(0.0232)
Wealth Q 4	-0.150***	-0.192***	0.0171	-0.249***	-0.508***	-0.191***
	(0.0154)	(0.0195)	(0.0167)	(0.0205)	(0.0239)	(0.0218)
Wealth Q 5	-0.0342*	-0.0723***	0.0682***	-0.0815***	-0.423***	-0.160***
	(0.0182)	(0.0224)	(0.0199)	(0.0202)	(0.0233)	(0.0216)
Sindh (Ref =Punjab)	0.208***	-0.714***	0.178***	0.0596***	-0.733***	-0.0773***
	(0.0121)	(0.0165)	(0.0127)	(0.0130)	(0.0170)	(0.0140)
KPK	-0.591***	-1.028***	-0.919***	-0.680***	-1.352***	-0.567***
	(0.0126)	(0.0160)	(0.0145)	(0.0138)	(0.0192)	(0.0146)
Balochistan	-0.110***	-1.720***	-0.792***	-0.0384**	-1.030***	-0.166***
	(0.0152)	(0.0326)	(0.0183)	(0.0190)	(0.0298)	(0.0208)
Constant	-0.281***	-1.042***	-0.391***	-0.362***	-1.254***	-0.704***
	(0.0230)	(0.0313)	(0.0252)	(0.0325)	(0.0416)	(0.0348)
Observations	181,178	181,178	181,178	148,908	148,908	148,908

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides, 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for employment. Base outcome category is 2 that describes mainly father or husband decides in the household for employment. Robust standard errors in parentheses. Significance level reports as: *** p<0.01, ** p<0.05, * p<0.10*

Table A.2.3 Probit Model Regression for Women Empowerment by Years

	Expenditure		Marriage		Family Planning		Son Preference	
	2005-2008	2012-2014	2005-2008	2011-2014	2005-2008	2011-2014	2005-2008	2011-2014
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Woman	0.161***	-0.0731	-0.314**	0.664***	-0.150	0.0389	-0.0846*	0.0582
	(0.0457)	(0.103)	(0.152)	(0.164)	(0.124)	(0.157)	(0.0449)	(0.0485)
W education	0.0121***	-0.00316	0.00956**	0.0189***	0.00823**	0.0258***	0.00704***	0.0124***
	(0.00162)	(0.00337)	(0.00467)	(0.00496)	(0.00388)	(0.00505)	(0.00137)	(0.00144)
W age (15-24)	-0.451***	-0.358***	-0.162	-0.864***	0.0133	0.0454	0.168***	-0.0145
	(0.0463)	(0.104)	(0.166)	(0.162)	(0.118)	(0.149)	(0.0445)	(0.0478)
W age (25-34)	-0.212***	0.0199	0.123	-0.276*	-0.0821	0.145	0.141***	0.0222
	(0.0445)	(0.0988)	(0.156)	(0.157)	(0.116)	(0.147)	(0.0435)	(0.0469)
W age (35-above)	-0.201***	0.0272	0.0977	-0.640***	0.0749	0.131	0.0648	-0.0297
	(0.0440)	(0.0991)	(0.141)	(0.154)	(0.117)	(0.152)	(0.0431)	(0.0466)
W married	0.113***	0.120***	0.0369	-0.188**	0.131**	-0.0793	0.100***	0.150***
	(0.0200)	(0.0385)	(0.0717)	(0.0734)	(0.0595)	(0.0710)	(0.0181)	(0.0185)
W property	0.0417	0.0503	0.129**	-0.0561	0.115	0.111	-0.0239	-0.00183
	(0.0273)	(0.0551)	(0.0622)	(0.0722)	(0.0734)	(0.0934)	(0.0236)	(0.0244)
W working	-0.00981	-0.0633**	0.0685*	0.0865**	-0.0366	-0.245***	-0.0858***	-0.0971***
	(0.0145)	(0.0293)	(0.0373)	(0.0413)	(0.0368)	(0.0459)	(0.0126)	(0.0130)
Head	-0.0379	-0.0799	0.0663	-0.134	0.0149	0.0905	-0.0283	-0.0528**
	(0.0305)	(0.0568)	(0.0800)	(0.0827)	(0.0705)	(0.0765)	(0.0267)	(0.0239)
H self-employ	-0.248***	-0.319*	-0.546**	-0.162	-0.455**	-0.368*	0.0481	0.0843
	(0.0873)	(0.177)	(0.270)	(0.209)	(0.195)	(0.201)	(0.0678)	(0.0558)
H paid-employ	-0.0705	-0.157	-0.213	-0.112	-0.0885	-0.341**	0.0962*	0.0618
	(0.0651)	(0.125)	(0.181)	(0.164)	(0.181)	(0.150)	(0.0543)	(0.0426)
H agriculture	-0.0785	-0.119	0.384	-0.0261	0.0939	-0.394	0.0589	0.141*
	(0.127)	(0.210)	(0.275)	(0.375)	(0.310)	(0.363)	(0.114)	(0.0840)
HH size	0.000385	0.0529***	-0.0086***	-0.0068***	-0.022***	0.0180***	-0.0034***	-0.0031***
	(0.000726)	(0.000903)	(0.00203)	(0.00151)	(0.00202)	(0.00165)	(0.000637)	(0.000472)
HH joint	-0.046***	0.0257	0.0815*	-0.0830*	-0.147***	-0.433***	0.00268	-0.0514***
	(0.0159)	(0.0286)	(0.0428)	(0.0496)	(0.0374)	(0.0570)	(0.0129)	(0.0142)
Husband Edu P	-0.0915**	0.0457	-0.190	0.0733	-0.176*	-0.0532	0.210***	0.0569*
	(0.0372)	(0.0667)	(0.117)	(0.136)	(0.0921)	(0.108)	(0.0302)	(0.0325)
Husband Edu S	0.0172	-0.113**	-0.304***	0.117	0.128*	0.0952	0.172***	0.239***
	(0.0245)	(0.0488)	(0.0907)	(0.0922)	(0.0697)	(0.0816)	(0.0217)	(0.0215)
Husband Edu H	0.143***	-0.0587	-0.281	0.288	0.00854	0.358**	0.143***	0.217***
	(0.0401)	(0.0850)	(0.179)	(0.185)	(0.150)	(0.170)	(0.0389)	(0.0364)
HH telephone	0.0807***	-0.0217	0.106***	0.0580	0.0507	0.0266	0.0636***	0.0521**
	(0.0115)	(0.0514)	(0.0319)	(0.0743)	(0.0327)	(0.0577)	(0.0105)	(0.0220)
HH TV	0.0218	-0.0221	-0.0722*	0.0104	0.148***	0.0647	-0.0108	-0.00460
	(0.0158)	(0.0363)	(0.0436)	(0.0548)	(0.0415)	(0.0628)	(0.0139)	(0.0174)
HH water system	0.259***	0.171***	0.0886***	0.146***	0.112***	0.125***	-0.00624	0.0279**
	(0.0134)	(0.0284)	(0.0330)	(0.0392)	(0.0309)	(0.0380)	(0.0110)	(0.0113)
Child 5	0.0262*	0.0889***	-0.00224	0.328***	-0.00203	0.0395	0.116***	0.227***
	(0.0148)	(0.0285)	(0.0496)	(0.0570)	(0.0325)	(0.0426)	(0.0122)	(0.0133)
Private School	0.128***	0.168***						
	(0.0356)	(0.0518)						
Iodize Salt	0.124***	0.232***						
	(0.0144)	(0.0213)						
Health Visit	-0.047***	-0.110***						
	(0.0111)	(0.0205)						
W unmarried			0.0164	-0.154				
			(0.117)	(0.122)				
W divorced			1.483***	1.276***				
			(0.0785)	(0.0885)				
Planning services					0.327***	0.442***		

					(0.0341)	(0.0454)		
Planning costly					0.0312	-0.0409		
					(0.0315)	(0.0363)		
Birth control pills							0.0994***	0.141***
							(0.0165)	(0.0193)
Boys HH							0.218***	0.237***
							(0.0157)	(0.0176)
Urban	0.00629	0.0898***	0.184***	-0.0437	0.198***	0.122***	-0.0127	0.0176*
	(0.0114)	(0.0192)	(0.0310)	(0.0303)	(0.0308)	(0.0331)	(0.0103)	(0.00923)
Wealth Q 2(ref =poor)	-0.168***	-0.142***	-0.223***	-0.244***	-0.0753**	0.0260	-0.0253**	0.0922***
	(0.0133)	(0.0397)	(0.0337)	(0.0560)	(0.0318)	(0.0810)	(0.0119)	(0.0214)
Wealth Q 3	-0.223***	-0.156***	-0.396***	-0.422***	-0.0315	-0.163**	-0.0482***	0.000244
	(0.0149)	(0.0367)	(0.0379)	(0.0558)	(0.0370)	(0.0782)	(0.0132)	(0.0204)
Wealth Q 4	-0.252***	-0.238***	-0.419***	-0.537***	-0.0657	-0.00549	0.0247*	-0.0243
	(0.0165)	(0.0343)	(0.0458)	(0.0506)	(0.0428)	(0.0767)	(0.0144)	(0.0193)
Wealth Q 5	-0.225***	-0.544***	-0.252***	-0.449***	-0.0485	-0.227***	0.0309*	-0.00900
	(0.0188)	(0.0342)	(0.0533)	(0.0495)	(0.0566)	(0.0762)	(0.0171)	(0.0190)
Sindh (Ref =Punjab)	-0.913***	-1.252***	0.182***	0.111***	0.377***	0.500***	0.0169	-0.0139
	(0.0173)	(0.0635)	(0.0338)	(0.0392)	(0.0336)	(0.0398)	(0.0112)	(0.0119)
KPK	-0.689***	-0.764***	-0.130***	-0.0836**	0.427***	0.166***	0.0559***	0.0251**
	(0.0151)	(0.0318)	(0.0357)	(0.0415)	(0.0368)	(0.0544)	(0.0117)	(0.0123)
Balochistan	-0.915***	-1.510***	-0.312***	0.299***	-1.128***	0.275***	0.131***	-0.00469
	(0.0243)	(0.0809)	(0.0456)	(0.0593)	(0.0363)	(0.0527)	(0.0149)	(0.0183)
Constant	-1.382***	-2.614***	-1.212***	-1.188***	-0.216***	-1.026***	-1.396***	-1.577***
	(0.0253)	(0.0656)	(0.0705)	(0.0935)	(0.0636)	(0.104)	(0.0385)	(0.0492)
Observations	181,178	105,596	22,977	14,913	16,442	6,821	142,239	118,293

*Table describes coefficient for women empowerment. Dependent variables is dummy variable for women decision-making in for model 1 and 2 expenses, for models 3 and 4 marriage, and 5 and 6 family planning. While, dummy variable for model 7 and 8 is if the woman has first child son. Robust standard errors are in parentheses. The significance levels are reported as: *** p<0.01, ** p<0.05, * p<0.1*

Table A.2.4 Multinomial Probit Estimations for Women Empowerment in Education by Region

	Urban			Rural		
	Woman joint	Woman alone	Parents	Woman joint	Woman alone	Parents
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.130*	0.298***	-0.00680	-0.0712	0.137**	0.00150
	(0.0738)	(0.0615)	(0.0574)	(0.0818)	(0.0693)	(0.0576)
W education	0.0462***	0.0578***	0.0163***	0.0442***	0.0644***	0.0318***
	(0.00201)	(0.00187)	(0.00174)	(0.00230)	(0.00213)	(0.00186)
W age (15-24)	0.123*	-0.293***	-0.0474	0.262***	-0.139**	-0.124**
	(0.0737)	(0.0613)	(0.0570)	(0.0815)	(0.0692)	(0.0570)
W age (25-34)	0.140*	0.0129	-0.0483	0.180**	0.153**	-0.0875
	(0.0735)	(0.0605)	(0.0568)	(0.0826)	(0.0687)	(0.0572)
W age (35-above)	0.142**	-0.0433	-0.0336	0.279***	0.0701	-0.0776
	(0.0725)	(0.0599)	(0.0561)	(0.0809)	(0.0681)	(0.0565)
W married	-0.274***	-0.189***	0.100***	-0.187***	-0.202***	0.128***
	(0.0250)	(0.0225)	(0.0211)	(0.0267)	(0.0255)	(0.0224)
W property	0.0687**	0.0987***	0.0292	0.0800**	0.0960***	0.0454
	(0.0329)	(0.0307)	(0.0294)	(0.0354)	(0.0341)	(0.0304)
W working	0.00157	0.0705***	0.0843***	0.0536***	0.0897***	0.0626***
	(0.0188)	(0.0171)	(0.0160)	(0.0197)	(0.0183)	(0.0161)
Head	-0.0428	-0.0106	-0.00958	-0.0739*	-0.0853**	-0.0270
	(0.0360)	(0.0329)	(0.0301)	(0.0384)	(0.0366)	(0.0316)
H self-employ	-0.0556	-0.151*	-0.0506	0.0323	-0.188**	-0.166**
	(0.0955)	(0.0911)	(0.0807)	(0.0943)	(0.0927)	(0.0789)
H paid-employ	0.0583	0.0672	0.0792	0.173**	0.201***	0.194***
	(0.0692)	(0.0633)	(0.0570)	(0.0749)	(0.0710)	(0.0615)
H agriculture	0.131	-0.646***	-0.124	-0.0174	0.0675	-0.124
	(0.145)	(0.187)	(0.131)	(0.160)	(0.139)	(0.124)
HH size	0.000749	0.00690***	0.00423***	-0.0176***	-0.00914***	-0.0155***
	(0.000714)	(0.000656)	(0.000625)	(0.000817)	(0.000815)	(0.000696)
HH joint	0.0363*	-0.0138	0.00746	0.119***	0.0923***	0.0934***
	(0.0215)	(0.0197)	(0.0182)	(0.0210)	(0.0198)	(0.0164)
Husband Edu P	-0.0632	-0.137***	0.0115	-0.0260	0.00258	0.0364
	(0.0528)	(0.0471)	(0.0410)	(0.0538)	(0.0493)	(0.0410)
Husband Edu S	0.130***	0.148***	0.119***	0.232***	0.280***	0.170***
	(0.0313)	(0.0280)	(0.0264)	(0.0373)	(0.0337)	(0.0312)
Husband Edu H	0.404***	0.745***	0.399***	0.498***	0.714***	0.558***
	(0.0502)	(0.0436)	(0.0443)	(0.0701)	(0.0662)	(0.0631)
HH telephone	0.287***	0.231***	0.0577***	0.294***	0.236***	0.0465***
	(0.0161)	(0.0145)	(0.0131)	(0.0169)	(0.0159)	(0.0135)
HH TV	-0.00492	0.0317	0.0549***	0.153***	0.144***	0.132***
	(0.0216)	(0.0195)	(0.0178)	(0.0249)	(0.0233)	(0.0203)
HH water system	0.138***	0.625***	0.229***	0.251***	0.541***	0.0909***
	(0.0193)	(0.0205)	(0.0162)	(0.0169)	(0.0158)	(0.0132)
Child 5	-0.0862***	-0.0150	0.0408**	-0.0976***	0.00686	0.0197
	(0.0222)	(0.0191)	(0.0171)	(0.0230)	(0.0203)	(0.0169)
Marriage age < 25	-0.554***	-0.0545***	0.147***	-0.495***	-0.0358**	0.135***
	(0.0136)	(0.0124)	(0.0116)	(0.0147)	(0.0141)	(0.0124)
Wealth Q 2(ref =poor)	-0.124***	-0.205***	-0.0615***	-0.143***	-0.208***	0.00699
	(0.0243)	(0.0218)	(0.0198)	(0.0225)	(0.0204)	(0.0171)
Wealth Q 3	-0.142***	-0.176***	-0.0743***	-0.115***	-0.253***	0.00464
	(0.0238)	(0.0214)	(0.0198)	(0.0238)	(0.0220)	(0.0185)
Wealth Q 4	-0.0284	-0.141***	0.0101	-0.0120	-0.171***	0.0907***
	(0.0229)	(0.0208)	(0.0195)	(0.0239)	(0.0221)	(0.0191)
Wealth Q 5	0.104***	0.0434**	0.120***	0.254***	0.0261	0.102***
	(0.0232)	(0.0210)	(0.0201)	(0.0240)	(0.0222)	(0.0202)
Sindh (Ref =Punjab)	-0.310***	-0.664***	0.137***	-0.269***	-0.994***	0.0186

	(0.0164)	(0.0150)	(0.0135)	(0.0207)	(0.0208)	(0.0157)
KPK	-0.672***	-1.031***	-0.780***	-0.455***	-1.105***	-0.744***
	(0.0180)	(0.0163)	(0.0159)	(0.0177)	(0.0172)	(0.0153)
Balochistan	-0.731***	-1.636***	-0.325***	-0.553***	-1.696***	-0.482***
	(0.0240)	(0.0277)	(0.0187)	(0.0270)	(0.0358)	(0.0207)
Constant	-1.260***	-1.572***	-0.965***	-1.212***	-1.312***	-0.689***
	(0.0338)	(0.0328)	(0.0292)	(0.0360)	(0.0343)	(0.0292)
Observations	132,050	132,050	132,050	125,489	125,489	125,489

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides, 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for education. Base outcome category is 2 that describes mainly father or husband decides in the household for education continuation. Robust standard errors in parentheses. Significance level reports as: *** p<0.01, ** p<0.05, * p<0.10*

Table A.2.5 Multinomial Probit Estimations for Women Empowerment in Employment by Region

	Urban			Rural		
	Woman joint	**Woman alone**	**Parents**	**Woman joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.186***	0.336***	0.0284	0.0336	0.154**	-0.0428
	(0.0526)	(0.0602)	(0.0535)	(0.0519)	(0.0641)	(0.0533)
W education	0.0177***	0.0409***	0.0160***	0.0164***	0.0475***	0.0232***
	(0.00149)	(0.00184)	(0.00161)	(0.00158)	(0.00205)	(0.00170)
W age (15-24)	-0.194***	-0.418***	-0.175***	-0.101*	-0.269***	-0.153***
	(0.0525)	(0.0602)	(0.0532)	(0.0517)	(0.0638)	(0.0528)
W age (25-34)	-0.0421	-0.0796	-0.0913*	-0.0342	-0.00441	-0.0876*
	(0.0523)	(0.0591)	(0.0530)	(0.0519)	(0.0629)	(0.0528)
W age (35-above)	0.0736	-0.122**	-0.113**	0.154***	-0.0192	-0.0800
	(0.0516)	(0.0588)	(0.0524)	(0.0511)	(0.0626)	(0.0523)
W married	-0.286***	-0.184***	0.165***	-0.165***	-0.124***	0.184***
	(0.0183)	(0.0222)	(0.0194)	(0.0187)	(0.0244)	(0.0204)
W property	-0.0375	0.0401	0.000127	-0.00876	0.0550*	-0.00623
	(0.0260)	(0.0305)	(0.0275)	(0.0262)	(0.0328)	(0.0283)
W working	0.0289**	0.173***	0.106***	0.0793***	0.192***	0.0646***
	(0.0140)	(0.0166)	(0.0149)	(0.0135)	(0.0171)	(0.0147)
Head	-0.0767***	-0.0245	-0.00346	-0.0631**	-0.106***	-0.0463
	(0.0265)	(0.0328)	(0.0283)	(0.0273)	(0.0358)	(0.0294)
H self-employ	-0.0339	-0.107	-0.0951	0.00192	-0.115	-0.128*
	(0.0716)	(0.0892)	(0.0756)	(0.0673)	(0.0919)	(0.0731)
H paid-employ	0.0712	0.104	0.0595	0.0799	0.277***	0.156**
	(0.0542)	(0.0658)	(0.0568)	(0.0577)	(0.0725)	(0.0605)
H agriculture	-0.0624	-0.365**	-0.0613	0.156	0.0246	0.0133
	(0.113)	(0.159)	(0.118)	(0.100)	(0.136)	(0.109)
HH size	0.0101***	-0.00131*	-0.00256***	-0.00200***	-0.0110***	-0.0221***
	(0.000608)	(0.000743)	(0.000663)	(0.000666)	(0.000950)	(0.000754)
HH joint	0.00541	-0.0137	0.00671	0.00382	0.0346*	0.0621***
	(0.0158)	(0.0192)	(0.0167)	(0.0140)	(0.0187)	(0.0149)
Husband Edu P	-0.0453	-0.116**	-0.0329	-0.0938***	-0.00678	0.0561
	(0.0357)	(0.0453)	(0.0382)	(0.0358)	(0.0459)	(0.0375)
Husband Edu S	0.0331	0.0495*	0.0870***	-0.00754	0.1000***	0.0661**
	(0.0239)	(0.0285)	(0.0254)	(0.0279)	(0.0344)	(0.0299)
Husband Edu H	0.237***	0.403***	0.272***	0.364***	0.630***	0.433***
	(0.0381)	(0.0438)	(0.0409)	(0.0557)	(0.0655)	(0.0594)

HH telephone	0.0524***	0.182***	0.0322***	0.0766***	0.197***	0.0350***
	(0.0114)	(0.0142)	(0.0122)	(0.0114)	(0.0149)	(0.0124)
HH TV	-0.0198	-0.000347	0.0398**	0.0322*	0.0584***	0.0838***
	(0.0157)	(0.0192)	(0.0166)	(0.0176)	(0.0222)	(0.0187)
HH water system	0.153***	0.465***	0.132***	0.152***	0.401***	0.0604***
	(0.0138)	(0.0193)	(0.0148)	(0.0111)	(0.0147)	(0.0121)
Child 5	-0.120***	-0.0452**	0.100***	-0.109***	0.00543	0.0562***
	(0.0151)	(0.0185)	(0.0157)	(0.0146)	(0.0190)	(0.0154)
Husband work	0.0628**	0.106***	0.108***	0.102***	0.0554*	0.0773***
	(0.0244)	(0.0295)	(0.0257)	(0.0234)	(0.0309)	(0.0249)
Live births	-0.00363***	0.00200***	0.00183***	-0.00204***	0.00304***	0.00271***
	(0.000166)	(0.000189)	(0.000164)	(0.000149)	(0.000184)	(0.000152)
Wealth Q 2(ref =poor)	-0.164***	-0.324***	-0.0979***	-0.154***	-0.251***	-0.00895
	(0.0169)	(0.0205)	(0.0181)	(0.0143)	(0.0186)	(0.0154)
Wealth Q 3	-0.223***	-0.320***	-0.0918***	-0.193***	-0.319***	-0.0195
	(0.0169)	(0.0203)	(0.0182)	(0.0155)	(0.0202)	(0.0167)
Wealth Q 4	-0.229***	-0.312***	-0.0846***	-0.185***	-0.333***	-0.0672***
	(0.0167)	(0.0200)	(0.0180)	(0.0161)	(0.0211)	(0.0175)
Wealth Q 5	-0.0828***	-0.213***	-0.0279	-0.0116	-0.249***	-0.0693***
	(0.0170)	(0.0202)	(0.0185)	(0.0169)	(0.0216)	(0.0186)
Sindh (Ref =Punjab)	0.0928***	-0.601***	0.141***	0.211***	-0.915***	-0.0153
	(0.0119)	(0.0150)	(0.0126)	(0.0133)	(0.0203)	(0.0143)
KPK	-0.621***	-1.076***	-0.683***	-0.622***	-1.261***	-0.792***
	(0.0135)	(0.0169)	(0.0147)	(0.0129)	(0.0177)	(0.0142)
Balochistan	-0.0526***	-1.332***	-0.410***	-0.125***	-1.470***	-0.686***
	(0.0163)	(0.0281)	(0.0184)	(0.0173)	(0.0332)	(0.0205)
Constant	-0.343***	-1.206***	-0.635***	-0.230***	-1.075***	-0.279***
	(0.0238)	(0.0304)	(0.0258)	(0.0233)	(0.0320)	(0.0255)
Observations	167,676	167,676	167,676	162,410	162,410	162,410

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides, 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for employment. Base outcome category is 2 that describes mainly father or husband decides in the household for employment. Robust standard errors in parentheses. Significance level reports as: *** p<0.01, ** p<0.05, * p<0.10*

Table A.2.6 Probit Regression for Women Empowerment by Region

	Expenditure		Marriage		Family Planning		Son Preference	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Woman	0.0191	0.188***	0.303**	-0.0976	-0.103	-0.174	0.00542	-0.0531
	(0.0535)	(0.0540)	(0.146)	(0.163)	(0.133)	(0.127)	(0.0455)	(0.0475)
W education	0.0163***	-0.0080***	0.0165***	0.00284	0.00480	0.00683*	0.0130***	0.00473***
	(0.00173)	(0.00206)	(0.00455)	(0.00513)	(0.00456)	(0.00386)	(0.00136)	(0.00144)
W age (15-24)	-0.343***	-0.528***	-0.419***	-0.550***	-0.0493	0.157	0.0372	0.139***
	(0.0543)	(0.0547)	(0.151)	(0.174)	(0.127)	(0.121)	(0.0451)	(0.0469)
W age (25-34)	-0.0697	-0.243***	-0.138	0.0976	-0.0109	0.137	0.0678	0.115**
	(0.0519)	(0.0527)	(0.143)	(0.165)	(0.124)	(0.120)	(0.0439)	(0.0462)
W age (35-above)	-0.0700	-0.203***	-0.484***	0.0482	0.116	0.134	-0.0184	0.0724
	(0.0515)	(0.0521)	(0.134)	(0.154)	(0.127)	(0.122)	(0.0435)	(0.0458)
W married	0.113***	0.117***	-0.111	-0.0170	0.0859	0.0549	0.113***	0.133***
	(0.0217)	(0.0236)	(0.0738)	(0.0713)	(0.0645)	(0.0584)	(0.0185)	(0.0182)
W property	0.0281	0.104***	0.0792	-0.00838	0.278***	-0.00617	-0.0151	-0.0112
	(0.0304)	(0.0311)	(0.0608)	(0.0750)	(0.0859)	(0.0745)	(0.0241)	(0.0238)
W working	-0.0276*	-0.0323*	0.165***	0.00321	-0.107**	-0.113***	-0.104***	-0.0769***
	(0.0162)	(0.0169)	(0.0369)	(0.0416)	(0.0434)	(0.0373)	(0.0130)	(0.0125)
Head	-0.0287	-0.128***	0.0188	-0.112	-0.0215	0.107	-0.0357	-0.0589**
	(0.0317)	(0.0366)	(0.0773)	(0.0853)	(0.0726)	(0.0701)	(0.0247)	(0.0257)
H self-employ	-0.259***	-0.263***	-0.373	-0.257	-0.191	-0.672***	-0.0514	0.167***
	(0.0971)	(0.0984)	(0.244)	(0.224)	(0.212)	(0.194)	(0.0646)	(0.0579)
H paid-employ	-0.0585	-0.0993	-0.142	-0.128	-0.218	-0.213	0.101**	0.0488
	(0.0636)	(0.0805)	(0.160)	(0.182)	(0.161)	(0.159)	(0.0453)	(0.0496)
H agriculture	-0.373*	0.0430	0.455	0.0894	-0.395	0.00993	0.126	0.111
	(0.206)	(0.119)	(0.320)	(0.308)	(0.366)	(0.296)	(0.0969)	(0.0945)
HH size	0.0213***	0.0255***	0.000392	-0.018***	-0.00128	-0.0041**	-0.0021***	-0.0052***
	(0.000559)	(0.000654)	(0.00151)	(0.00181)	(0.00166)	(0.00169)	(0.000497)	(0.000532)
HH joint	0.0589***	-0.0686***	0.0477	-0.0107	-0.37***	-0.123***	-0.0342**	-0.00964
	(0.0171)	(0.0186)	(0.0460)	(0.0462)	(0.0578)	(0.0378)	(0.0145)	(0.0127)
Husband Edu P	-0.0859**	0.0118	-0.182	-0.000425	-0.199*	-0.0232	0.138***	0.138***
	(0.0414)	(0.0407)	(0.126)	(0.124)	(0.103)	(0.0916)	(0.0314)	(0.0312)
Husband Edu S	-0.0324	0.0586*	-0.173**	-0.0181	0.198***	-0.0189	0.208***	0.201***
	(0.0249)	(0.0313)	(0.0829)	(0.0985)	(0.0695)	(0.0783)	(0.0200)	(0.0235)
Husband Edu H	0.120***	-0.295***	-0.0455	-0.0112	0.134	-0.000103	0.186***	0.146***
	(0.0357)	(0.102)	(0.152)	(0.231)	(0.134)	(0.179)	(0.0320)	(0.0476)
HH telephone	-0.036***	0.00467	0.189***	0.118***	0.333***	0.238***	0.0692***	0.0524***
	(0.0128)	(0.0133)	(0.0311)	(0.0349)	(0.0328)	(0.0319)	(0.0109)	(0.0107)
HH TV	0.0183	0.0149	-0.0130	-0.0849	0.181***	0.0149	-0.00202	-0.0191
	(0.0175)	(0.0205)	(0.0435)	(0.0544)	(0.0458)	(0.0492)	(0.0146)	(0.0162)
HH water system	0.327***	0.238***	-0.0197	0.157***	0.249***	-0.076***	0.00960	-0.000421
	(0.0224)	(0.0131)	(0.0391)	(0.0330)	(0.0405)	(0.0292)	(0.0128)	(0.0103)
Child 5	0.0516***	0.0135	0.246***	0.0393	-0.0393	0.0946***	0.197***	0.138***
	(0.0164)	(0.0172)	(0.0512)	(0.0544)	(0.0381)	(0.0333)	(0.0128)	(0.0127)
Private School	0.127***	0.0199						
	(0.0317)	(0.0469)						
Iodize Salt	0.166***	0.153***						
	(0.0131)	(0.0169)						
Health Visit	-0.206***	0.0143						
	(0.0125)	(0.0121)						
W unmarried			-0.285**	0.192				
			(0.114)	(0.123)				
W divorced			1.353***	1.462***				

			(0.0798)	(0.0858)				
Planning services					0.352***	0.321***		
					(0.0368)	(0.0371)		
Planning costly					0.0854**	0.0220		
					(0.0344)	(0.0321)		
Birth control pills							0.125***	0.116***
							(0.0167)	(0.0189)
Boys HH							0.220***	0.230***
							(0.0172)	(0.0159)
Wealth Q 2(ref =poor)	-0.137***	-0.202***	-0.131***	-0.310***	-0.0324	-0.0422	0.0153	-0.00174
	(0.0181)	(0.0161)	(0.0415)	(0.0402)	(0.0503)	(0.0337)	(0.0163)	(0.0135)
Wealth Q 3	-0.207***	-0.224***	-0.329***	-0.447***	0.0260	-0.159***	-0.0397**	-0.0232
	(0.0184)	(0.0174)	(0.0425)	(0.0465)	(0.0506)	(0.0398)	(0.0164)	(0.0146)
Wealth Q 4	-0.246***	-0.373***	-0.423***	-0.472***	0.0720	-0.0636	-0.00278	-0.0295*
	(0.0182)	(0.0191)	(0.0440)	(0.0488)	(0.0517)	(0.0418)	(0.0161)	(0.0152)
Wealth Q 5	-0.326***	-0.666***	-0.303***	-0.383***	-0.00171	0.0360	-0.00588	-0.0149
	(0.0186)	(0.0227)	(0.0441)	(0.0505)	(0.0543)	(0.0500)	(0.0164)	(0.0158)
Sindh (Ref =Punjab)	-0.789***	-1.075***	0.199***	0.144***	0.605***	0.237***	-0.0200*	0.0260**
	(0.0180)	(0.0271)	(0.0328)	(0.0417)	(0.0358)	(0.0361)	(0.0110)	(0.0122)
KPK	-0.743***	-0.772***	-0.179***	-0.0267	0.378***	0.213***	-0.00938	0.0924***
	(0.0179)	(0.0179)	(0.0393)	(0.0377)	(0.0495)	(0.0376)	(0.0124)	(0.0116)
Balochistan	-0.960***	-1.003***	-0.114**	-0.131**	-0.69***	-0.895***	0.0523***	0.0966***
	(0.0283)	(0.0347)	(0.0468)	(0.0555)	(0.0413)	(0.0371)	(0.0154)	(0.0172)
Constant	-2.005***	-1.810***	-1.378***	-0.930***	-0.94***	-0.507***	-1.539***	-1.398***
	(0.0297)	(0.0278)	(0.0670)	(0.0716)	(0.0738)	(0.0599)	(0.0398)	(0.0429)
Observations	167,676	162,410	19,195	18,695	10,121	13,142	131,515	129,017

*Dependent variables is dummy variable for women decision-making in for model 1 and 2 expenses, for models 3 and 4 marriage, and 5 and 6 family planning. While, dummy variable for model 7 and 8 is if the woman has first child son. Robust standard errors are in parentheses. The significance levels are reported as: *** p<0.01, ** p<0.05, * p<0.1*

Table A.2.7 Coefficients Estimation for Multinomial Logit Model

	Education			Employment		
Decisions by:	**Woman joint**	**Woman alone**	**Parents**	**Woman joint**	**Woman alone**	**Parents**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Woman	0.0022	0.3096***	-0.0166	0.13968***	0.36391***	-0.02744
	(0.0852)	(0.0621)	(0.0519)	(0.04806)	(0.06343)	(0.05062)
W education	0.0683***	0.0846***	0.0300***	0.02351***	0.06412***	0.02790***
	(0.0022)	(0.0020)	(0.0016)	(0.00137)	(0.00203)	(0.00157)
W age (15-24)	0.3250***	-0.3186***	-0.1134**	-0.18800***	-0.50780***	-0.21630***
	(0.0849)	(0.0621)	(0.0513)	(0.04787)	(0.06346)	(0.05007)
W age (25-34)	0.2809***	0.1022*	-0.0872*	-0.04584	-0.05827	-0.11888**
	(0.0856)	(0.0614)	(0.0511)	(0.04798)	(0.06254)	(0.04977)
W age (35-above)	0.3504***	0.0102	-0.0732	0.14495***	-0.12226**	-0.14284***
	(0.0840)	(0.0608)	(0.0506)	(0.04727)	(0.06201)	(0.04937)
W married	-0.3531***	-0.2618***	0.1606***	-0.29434***	-0.21320***	0.26474***
	(0.0265)	(0.0229)	(0.0202)	(0.01658)	(0.02377)	(0.01945)
W property	0.0965***	0.1224***	0.0417	-0.02904	0.07309**	0.00012
	(0.0343)	(0.0307)	(0.0276)	(0.02359)	(0.03225)	(0.02673)
W working	0.0203	0.1060***	0.0927***	0.06822***	0.26342***	0.11145***
	(0.0200)	(0.0171)	(0.0146)	(0.01247)	(0.01740)	(0.01417)
Head	-0.0789**	-0.0575*	-0.0258	-0.09040***	-0.08013**	-0.03232
	(0.0391)	(0.0337)	(0.0280)	(0.02429)	(0.03623)	(0.02743)
H self-employ	-0.0041	-0.2410***	-0.1402*	-0.01323	-0.18039*	-0.15373**
	(0.0977)	(0.0903)	(0.0728)	(0.06207)	(0.09543)	(0.07122)
H paid-employ	0.1479**	0.1601**	0.1618***	0.09333*	0.24658***	0.12950**
	(0.0751)	(0.0651)	(0.0534)	(0.05075)	(0.07195)	(0.05589)
H agriculture	0.1023	-0.3323**	-0.2003*	0.06092	-0.26276*	-0.06825
	(0.1554)	(0.1584)	(0.1146)	(0.09406)	(0.15810)	(0.10694)
HH size	-0.0117***	0.0000	-0.0048***	0.00627***	-0.00960***	-0.01506***
	(0.0008)	(0.0007)	(0.0006)	(0.00055)	(0.00083)	(0.00065)
HH joint	0.1053***	0.0271	0.0670***	0.02416*	-0.00501	0.04676***
	(0.0222)	(0.0192)	(0.0154)	(0.01329)	(0.01981)	(0.01479)
Husband Edu P	-0.0816	-0.1110**	0.0395	-0.08924***	-0.09961**	0.02240
	(0.0572)	(0.0470)	(0.0366)	(0.03214)	(0.04822)	(0.03575)
Husband Edu S	0.2354***	0.2683***	0.1831***	0.02195	0.10755***	0.10810***
	(0.0352)	(0.0290)	(0.0261)	(0.02320)	(0.03224)	(0.02615)
Husband Edu H	0.5990***	0.9960***	0.6102***	0.37215***	0.66898***	0.45484***
	(0.0595)	(0.0486)	(0.0489)	(0.04129)	(0.05169)	(0.04635)
HH telephone	0.4457***	0.3154***	0.0398***	0.07991***	0.26841***	0.02684**
	(0.0178)	(0.0147)	(0.0121)	(0.01026)	(0.01525)	(0.01176)
HH TV	0.0890***	0.0977***	0.1195***	0.00785	0.03403	0.08562***
	(0.0241)	(0.0203)	(0.0172)	(0.01499)	(0.02138)	(0.01670)
HH water system	0.3320***	0.9145***	0.2421***	0.21498***	0.69552***	0.16972***
	(0.0182)	(0.0181)	(0.0124)	(0.01050)	(0.01788)	(0.01205)
Child 5	-0.1701***	-0.0052	0.0390**	-0.15011***	-0.02309	0.11280***
	(0.0249)	(0.0193)	(0.0153)	(0.01353)	(0.01982)	(0.01472)
Marriage age < 25	-0.8306***	-0.0574***	0.2074***			
	(0.0150)	(0.0127)	(0.0111)			
Husband work				0.10325***	0.11106***	0.12677***
				(0.02138)	(0.03149)	(0.02435)
Live births				-0.00380***	0.00414***	0.00304***
				(0.00014)	(0.00020)	(0.00015)
Urban	0.1439***	0.1988***	0.1581***	0.03271***	0.13549***	0.12879***
	(0.0149)	(0.0129)	(0.0109)	(0.00929)	(0.01347)	(0.01062)
Wealth Q 2(ref =poor)	-0.1836***	-0.2859***	-0.0230	-0.19379***	-0.42316***	-0.05669***

	(0.0250)	(0.0205)	(0.0166)	(0.01383)	(0.02042)	(0.01592)
Wealth Q 3	-0.1753***	-0.2936***	-0.0415**	-0.26001***	-0.46580***	-0.06625***
	(0.0252)	(0.0208)	(0.0173)	(0.01447)	(0.02103)	(0.01657)
Wealth Q 4	-0.0173	-0.2187***	0.0637***	-0.25665***	-0.47231***	-0.08776***
	(0.0243)	(0.0205)	(0.0175)	(0.01466)	(0.02098)	(0.01694)
Wealth Q 5	0.2469***	0.0431**	0.1609***	-0.05296***	-0.35086***	-0.04186**
	(0.0243)	(0.0205)	(0.0183)	(0.01506)	(0.02110)	(0.01770)
Sindh (Ref =Punjab)	-0.4349***	-1.0895***	0.1397***	0.17631***	-1.13893***	0.09397***
	(0.0189)	(0.0174)	(0.0128)	(0.01127)	(0.01905)	(0.01244)
KPK	-0.6999***	-1.4243***	-0.9728***	-0.77412***	-1.67708***	-0.96846***
	(0.0185)	(0.0169)	(0.0149)	(0.01189)	(0.01969)	(0.01423)
Balochistan	-0.8363***	-2.4594***	-0.4320***	-0.09585***	-2.26383***	-0.70815***
	(0.0274)	(0.0376)	(0.0174)	(0.01457)	(0.03967)	(0.01880)
Constant	-1.8691***	-2.1757***	-1.2071***	-0.42565***	-1.73673***	-0.73966***
	(0.0348)	(0.0312)	(0.0252)	(0.02009)	(0.03023)	(0.02323)
Observations	257,539	257,539	257,539	330,086	330,086	330,086
Log-Likelihood	-286365.76			-403204.839		
Chi2: Deviance	572731.523			806409.677		
LR chi2	48448.87			37459.837		
Prob > chi2	0.000			0.000		
VIF	3.05			3.06		
AIC	572917.523			806601.677		
BIC	573890.203			807629.560		

*Dependent variable is categorical variable with value 1 mainly by woman decides, 2 mainly by father or husband decides (Reference Category), 3 mainly joint decision of parents and lastly 0 by mainly woman joint decision with father/husband for education and employment respectively. Coefficients are with the base outcome (2) represents decision-making by mainly father or husband. Other criteria of specification estimates are from Multinomial Logit Regression. Robust standard errors are in parentheses. The significance levels are reported as: *** p<0.01, ** p<0.05, * p<0.1*

A.3 Summary Statistics: By Categories

A.3.1: Summary Statistics: Marriage, Family Plan, Son Preference, HH Resources

Table A.3.1 Summary Statistics of Women Empowerment by Categories

	Marriage		Family Planning		Son Preference		HH Resources	
Decision-Making by:	**Woman alone**	**Others**	**Woman alone**	**Others**	**Woman alone**	**Others**	**Woman alone**	**Others**
	Mean	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Woman	0.3952969	0.3987601	0.2581306	0.2544764	0.3207313	0.3158588	0.3195108	0.3162221
Woman education	8.434631	8.213004	8.372191	8.267634	8.614396	8.470677	8.559504	8.482046
Woman age (15-24)	0.0799863	0.199487	0.0657277	0.0665905	0.1018618	0.1018305	0.0600038	0.1038732
Woman age (25-34)	0.0628218	0.0407525	0.0818609	0.0795258	0.0902717	0.0689713	0.0897764	0.0703233
Woman age (35-above)	0.233608	0.1507278	0.0966283	0.0942825	0.1175277	0.1347333	0.1519205	0.1319839
Woman married	0.0638517	0.0984511	0.1882202	0.1819585	0.2063402	0.1518534	0.1851328	0.156284
Woman property	0.0583591	0.0502556	0.0319249	0.0295135	0.0411439	0.0368813	0.0450984	0.0369542
Woman working	0.1979059	0.1667995	0.1453692	0.1559644	0.1513083	0.1673539	0.1359832	0.1671008
Head	0.0413663	0.053948	0.062484	0.0562485	0.0616907	0.0631328	0.033862	0.0643997
Head self-employer	0.004806	0.0065103	0.0054631	0.0069462	0.0076988	0.0072574	0.00279	0.0075243
Head paid-employ	0.0072091	0.0094253	0.0107554	0.0104655	0.0141563	0.0139326	0.0063444	0.0143274
Head agriculture	0.002918	0.0022543	0.0032437	0.0032107	0.0037404	0.003581	0.0011848	0.0037155
HH size	19.18898	21.65245	20.54597	22.85617	20.35062	20.27812	25.13793	20.04923
HH joint	0.1162032	0.1041258	0.1434059	0.1168807	0.1479705	0.1457784	0.135257	0.1465349
Husband Edu	0.0497769	0.0761412	0.1013231	0.0687515	0.137001	0.1129431	0.1217275	0.1151875
HH telephone	0.62839	0.5505179	0.5454545	0.3743517	0.6203958	0.6044467	0.5582649	0.6084701
HH TV	0.084964	0.0832928	0.0817755	0.0629168	0.080795	0.0824528	0.0991783	0.0814532
HH water system	0.6695846	0.6333832	0.5361502	0.4264942	0.6064911	0.6163403	0.8177718	0.6054254
Child 5	0.0875386	0.0734788	0.2145113	0.2111015	0.1873532	0.1488447	0.167017	0.1522368
Urban	0.5461723	0.4757176	0.467691	0.3730551	0.4843677	0.48675	0.4877126	0.4864384
Wealth Q1	0.3294393	0.2140196	0.215314	0.232591	0.192557	0.2008977	0.2917372	0.1960764
Wealth Q2	0.2169003	0.2132373	0.2493252	0.2575252	0.2126205	0.2114699	0.2070954	0.211785
Wealth Q3	0.1538162	0.198806	0.1875112	0.2114434	0.1859875	0.1889916	0.1756466	0.1892319
Wealth Q4	0.1481698	0.2037262	0.2007378	0.1832681	0.2042577	0.2027521	0.1652552	0.2045279
Wealth Q5	0.1516745	0.170211	0.1471118	0.1151723	0.2045773	0.1958887	0.1602655	0.1983788
Punjab	0.4761414	0.4194376	0.3204439	0.2583354	0.4003858	0.4308607	0.8257214	0.4082238
Sindh	0.2516306	0.195503	0.3688434	0.1797357	0.2440288	0.2459177	0.0473916	0.255387
KPK	0.1860625	0.2460112	0.1877934	0.1262966	0.2217041	0.2072101	0.1061724	0.2137464
Balochistan	0.0861655	0.1390481	0.1229193	0.4356323	0.1338812	0.1160114	0.0207147	0.1226428

Woman unmarried	0.1007552	0.2134015	2.815008	2.690906	3.015678	2.981264	2.695216	2.997348
Woman divorced	0.1740474	0.0135259	2.113188	2.739226	2.089081	2.008372	1.32188	2.050808
Planning services			0.21656	0.1022475				
Planning costly			0.2431071	0.1989071				
Birth control pills					1.939855	1.922631		
Boys HH					0.0616236	0.0291728		
Private School							0.0207147	0.0133883
Iodize Salt							0.2112364	0.1883376
Health Visit							0.3160711	0.4124555

A.3.2: Summary Statistics: Education and Employment

Table A.3.2 Summary Statistics of Women Empowerment in Education and Employment by Categories

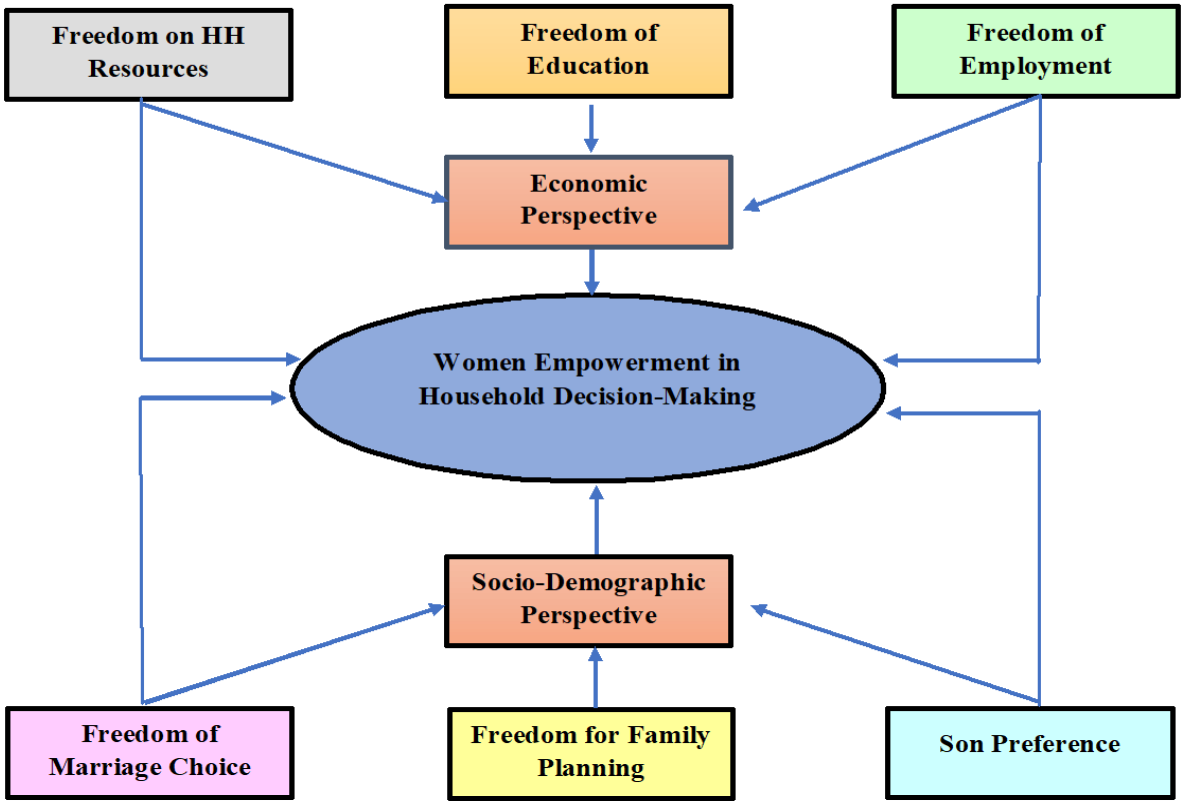
	Education				Employment			
Decision-Making by:	**Woman alone**	**F/H alone**	**Parents**	**Woman Joint**	**Woman alone**	**F/H alone**	**Parents**	**Woman Joint**
Variables	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Woman	0.3606765	0.3073857	0.304967	0.3963124	0.3479217	0.310637	0.300927	0.3234891
Woman education	9.257691	8.179173	8.610878	9.195405	8.927838	8.248473	8.531628	8.622564
Woman age (15-24)	0.1065347	0.1106255	0.1000558	0.1735087	0.0932483	0.1123288	0.0930906	0.0957476
Woman age (25-34)	0.0905759	0.0713285	0.0780995	0.0632592	0.0906825	0.0721913	0.0808008	0.057938
Woman age (35-above)	0.1509927	0.1150879	0.1141179	0.1525488	0.1509237	0.1162541	0.1139717	0.1611371
Woman married	0.168365	0.16379	0.1769133	0.1382592	0.17167	0.1642809	0.1806575	0.1302036
Woman property	0.049027	0.0371095	0.038934	0.052603	0.0470273	0.0381684	0.0384174	0.0324739
Woman working	0.1615278	0.1601528	0.1712716	0.167923	0.1847372	0.1581361	0.1787557	0.1617533
Head	0.0537933	0.0625434	0.0653952	0.0597072	0.053845	0.0622207	0.0678708	0.0639248
Head self-employer	0.0048485	0.0071084	0.0065469	0.0068601	0.0055165	0.0071898	0.0077408	0.0077596
Head paid-employer	0.0123923	0.0127803	0.0156304	0.0128796	0.0139836	0.0122507	0.0166284	0.0146182
Head agriculture	0.0016929	0.0036066	0.0031682	0.0027657	0.0022726	0.0035884	0.0038895	0.0038536
HH size	21.08415	20.66422	20.10372	19.98267	20.60529	20.77612	19.48001	20.01458
HH joint	0.1262244	0.1411549	0.1525256	0.1389371	0.1361704	0.1414291	0.1629014	0.1450252
Husband Edu	0.1701072	0.087235	0.130043	0.1428145	0.1415219	0.0928841	0.1269878	0.1306744
HH telephone	0.7179015	0.5665975	0.6103971	0.7429772	0.6827579	0.5798971	0.6123567	0.6133708
HH TV	0.0975117	0.0743631	0.0934352	0.0899403	0.0934316	0.0762461	0.0910933	0.0814956
HH water system	0.8566498	0.5463814	0.6323113	0.7282267	0.7945165	0.5646237	0.6134843	0.6277682

Child 5	0.138321	0.1657548	0.1673561	0.1055043	0.1498974	0.1635036	0.1734327	0.1271695
Marriage age < 25	0.6071922	0.6620325	0.6914122	0.4008948				
Husband work					0.0642915	0.0613225	0.074159	0.0741023
Live births					43.63185	44.7937	44.36651	37.34602
Urban	0.5575242	0.4525227	0.511636	0.5543926	0.5242284	0.4601281	0.5032588	0.4998314
Wealth Q1	0.1841079	0.1936898	0.1761753	0.1570708	0.2384076	0.1892155	0.1940875	0.2067464
Wealth Q2	0.1612454	0.2297217	0.2108153	0.1496279	0.1753009	0.2223603	0.2151041	0.205763
Wealth Q3	0.1624719	0.2020215	0.1887209	0.1590669	0.162794	0.2008497	0.1936503	0.1768675
Wealth Q4	0.2055792	0.2078229	0.2180889	0.2280492	0.1939591	0.2095969	0.2039052	0.195923
Wealth Q5	0.2865955	0.1667441	0.2061995	0.3061853	0.2295383	0.1779775	0.1932528	0.2147001
Punjab	0.7118533	0.2989106	0.4157483	0.4931399	0.7611062	0.3340156	0.4725248	0.4205794
Sindh	0.1256163	0.237175	0.3110087	0.2022777	0.1198226	0.2229693	0.3012806	0.282471
KPK	0.1396029	0.3066434	0.1459998	0.2082701	0.0953376	0.3042288	0.1415424	0.1570626
Balochistan	0.0229275	0.157271	0.1272433	0.0963124	0.0237336	0.1387863	0.0846521	0.139887

Appendix B: Figures

Figure B.1 Indicators of Women Empowerment

Figure. Women Empowerment in Pakistan



The Figure B.1 illustrates the indicators of women empowerment in household decision-making with respective to non-monetary and monetary aspects.

Figure B.2 Decision-making by Household Members (Percentage)

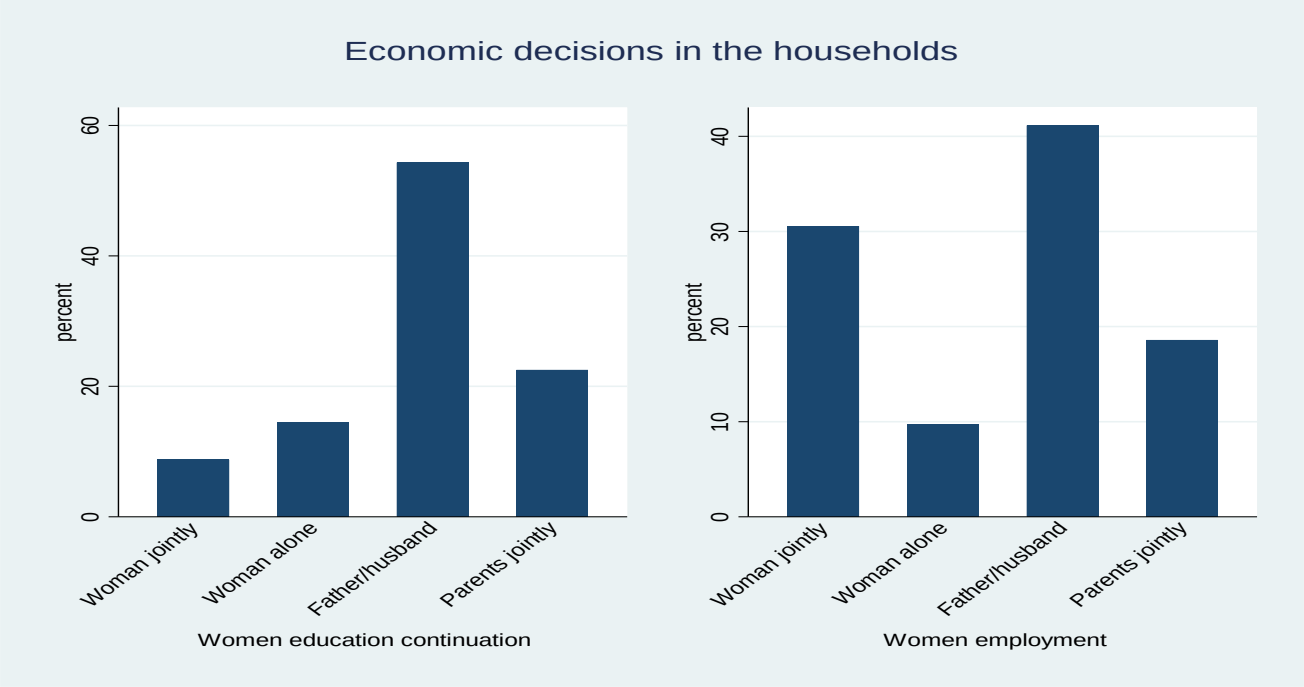


Figure B.2 illustrates the percentage of decision-making in the household for economic activities that consist of education and employment for women. The figure shows higher percentage of father or head and husband in the case of married women for the decision-making in education. On the other side of the graph, woman joint decision-making and mainly father or husband decision are incorporating for finding and continuation of the job.

Figure B.3 Decision-making by income group

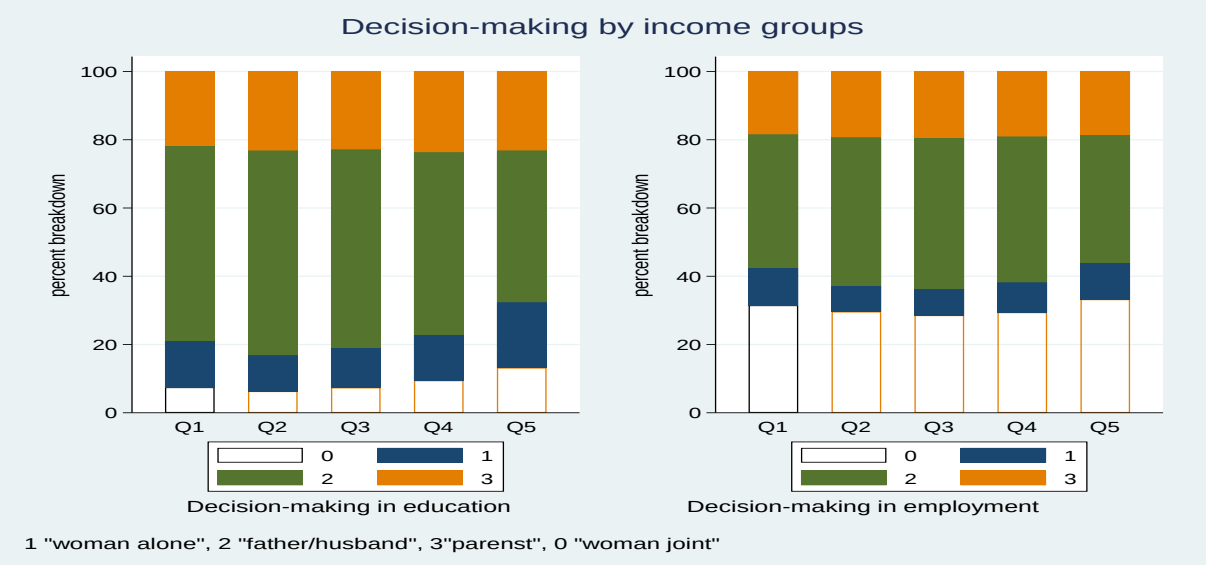


Figure B.3 describes the income groups, in which Q1 explains poorest and Q5 the wealthiest, in economic perspective for the distribution of household members' decisions respectively. The share of the woman alone decision making is quite low in both parts of the graph. The major area is visible for mainly father

or husband or head decision-making. By observing into quintiles, the higher wealth group (Q5) is comparatively allowing woman alone decision-making in education which is different for employment. Similarly, other members of the household when jointly decide with woman contribute to empower her in employment as compared to her alone decision-making.

Figure B.4 Women Decision-making by Years (Mainly Alone)

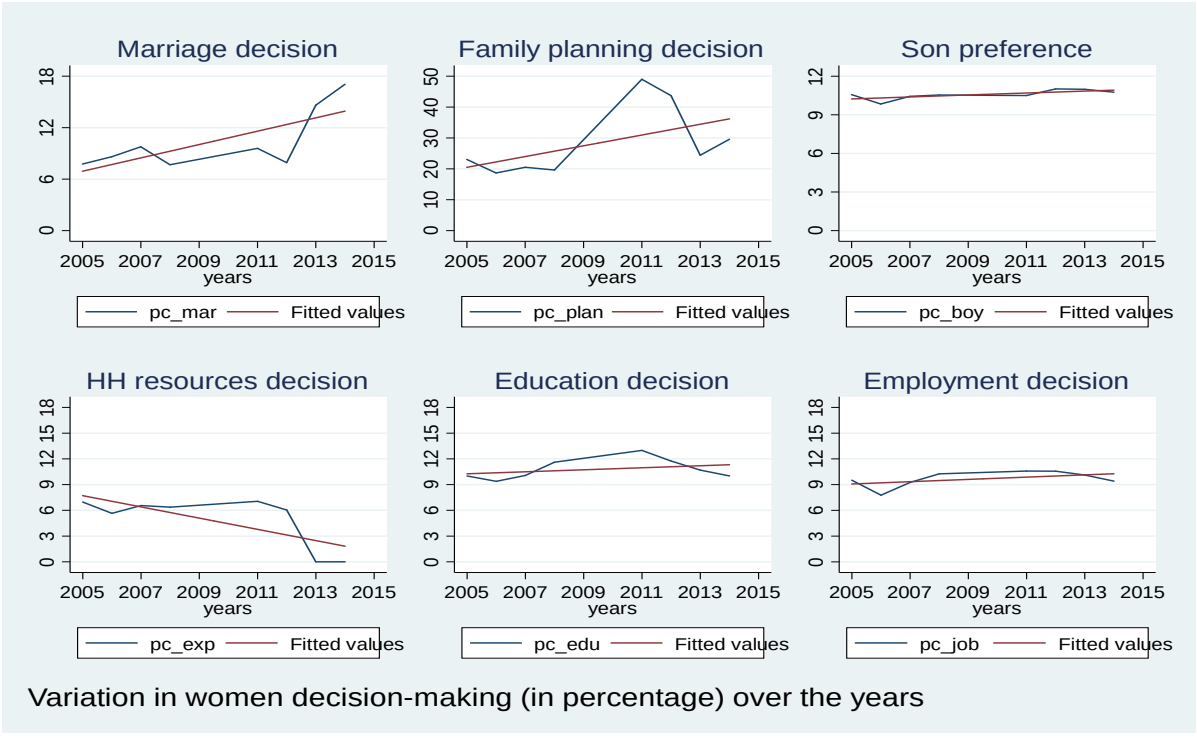
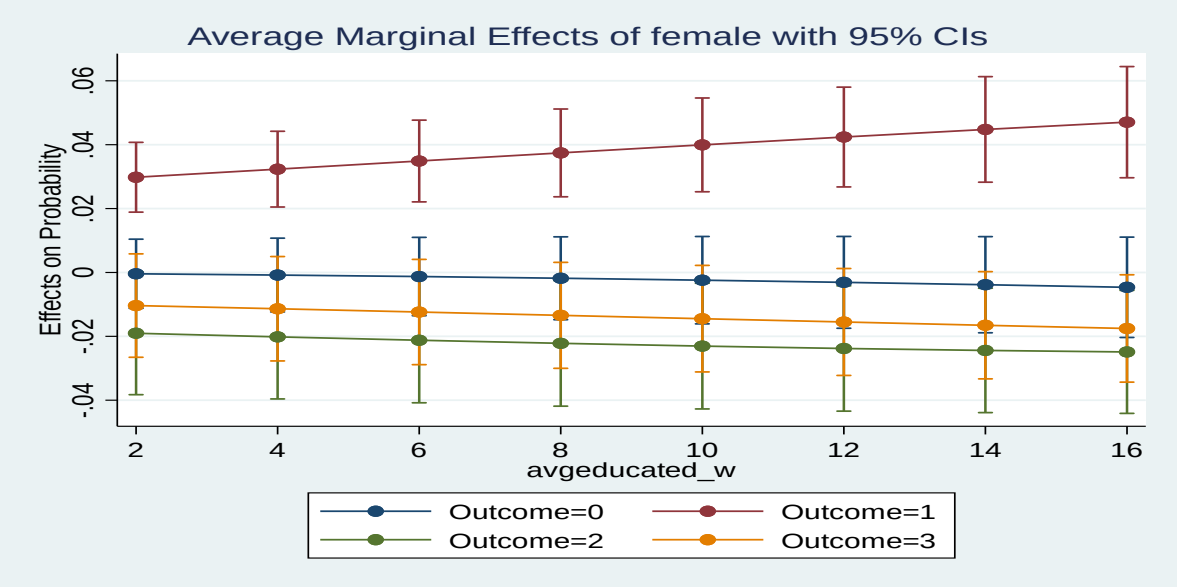


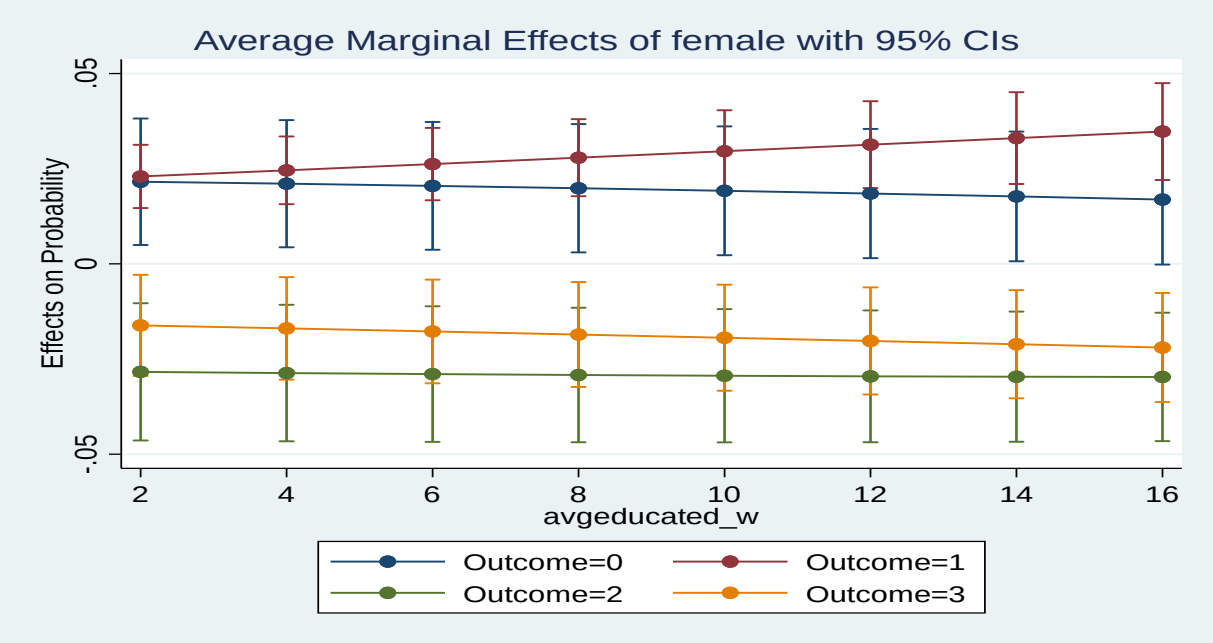
Figure B.4 This figure explains the variation in the women decision-making mainly alone over the years in percentage. In first part of the graph for marriage decision (L.H.S), the lowest point observes from 2011 to 2013 and it increases afterwards. Second part describes the trend line sharply decreases after 2013 in family planning decisions. Interesting the trend line for son preference is almost parallel to the fitted line. Meanwhile, household expenditure resources curve is negative over the years. Between 2009 and 2011, education continuation decision-making by women seem positively increasing but in recent years, it sharply declines. However, employment decisions are also falling similar to education at the last part of the illustrated graph (R.H.S).

Figure B.5 Marginal Effects for Women Empowerment in Education



The figure illustrates the average marginal effect of women education attainment on women empowerment with four possible outcomes in decision-making of education continuation. The 1 describes decision mainly by woman, 2 by the husband or father, 3 by parents and 0 by mainly woman joint decision with the household members. Data from PSLM survey used to estimate multinomial probit model regression controlling for individual and household characteristics.

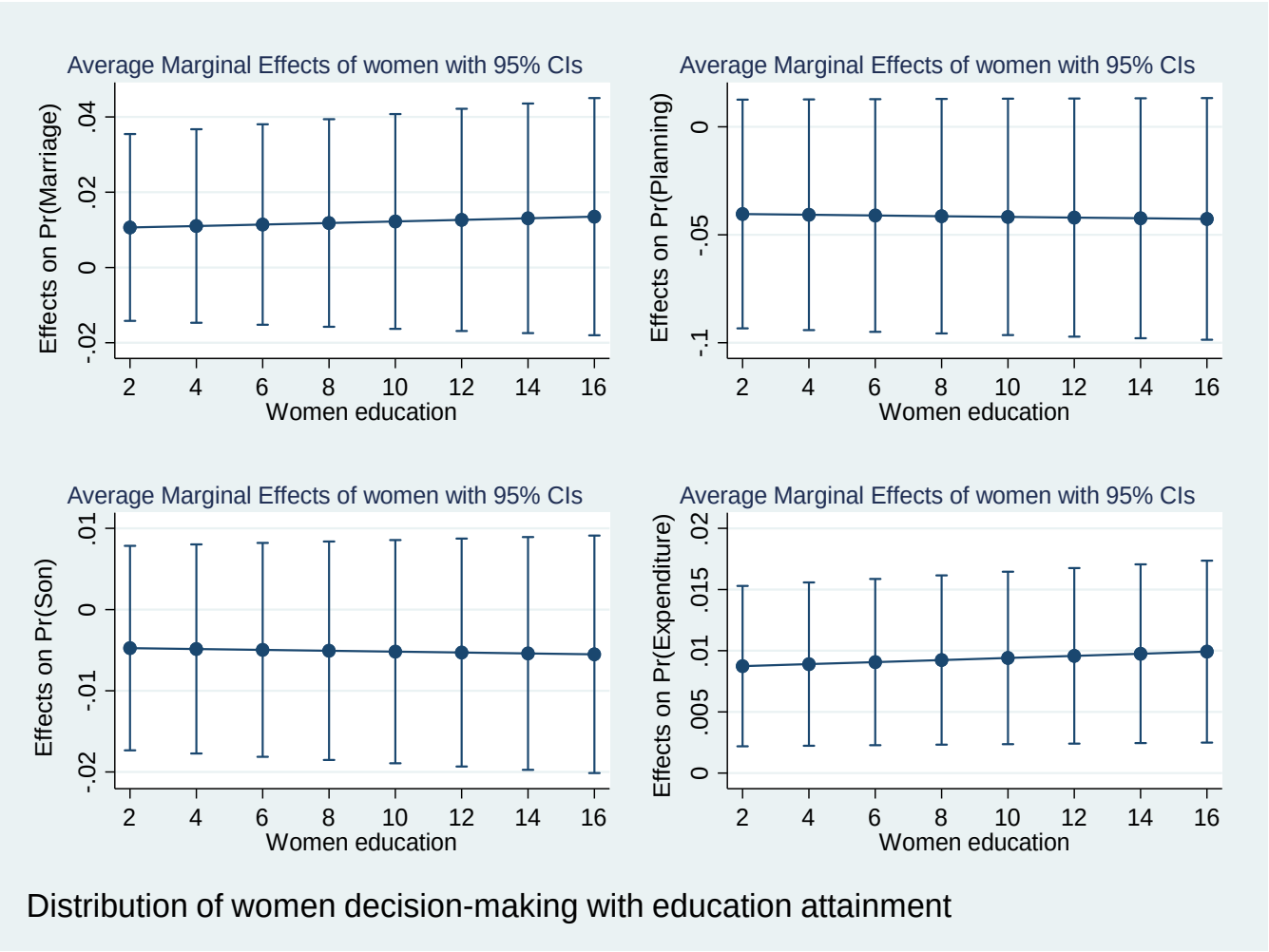
Figure B.6 Marginal Effects for Women Empowerment in Employment



The figure B.6 illustrates the average marginal effect of women education attainment on women empowerment with four possible outcomes in decision-making of employment. The 1 describes decision

mainly by woman, 2 by the husband or father, 3 by parents and 0 by mainly woman joint decision with the household members. By controlling individual and household characteristics, the estimates are calculated with multinomial probit model regression.

Figure B.7 Marginal Effects and Women Empowerment by Different Indicators



The figure B.7 illustrates the average marginal effect of women education attainment on women empowerment with two possible outcomes in decision-making of household expenditure, marriage, family planning and son preference. The value 1 denotes decision taken mainly by woman, and 0 mainly by other household members. By controlling individual and household characteristics, the estimates are calculated with probit model regression.

CHAPTER 3: Attain Education, Gain Voice: Contribution of Single Females and their Education in Economic Welfare

A slightly different version of this chapter is currently "Under Review" in Open Economies Review.

Abstract

This study focuses on economic contribution of the educated single females in the society, who are unmarried, divorced and, widows by using microdata of Pakistan Social and Living Standards Measurement Survey from 2005 to 2016. In order to analyze the impact of single females, household and socio-economic characteristics on per capita expenditure, proxy for economic welfare, the study uses multilevel model regression at two levels; individuals and households for lower level and Primary Sample Units (PSUs) for upper level. This study attempts to deal with the potential endogeneity between gender and welfare by Instrumental Variable technique. The fixed effects of random intercept model shows significant and positive effect of unmarried single females while negative effect of divorced and widow females on the economic welfare. However, primary, secondary and tertiary education of single females have positive influence on the per capita consumption expenditure. Household characteristics are strongly in the evidence of welfare improvement but they differ according to the different income groups. Male head of the household is significant but on the other hand, low-income profession of head of the household is three times less likely to increase the consumption growth than high-income profession. As compared to father, education of mother strongly effect on the welfare. Random effects of the study estimate variations between households. However, at higher level, these variations are more consistent and explain regional and economic differences within a country. In random intercept-slope models, literacy rate and poverty estimates provide noticeable impact on welfare improvement. By examining conditional model, Intra-class correlation (ICC) determines the significance of the mixed model and suggests overall variation from 40 to 60 percent by clustering at higher level. Moreover, the estimates of quantiles find consistent and robust. Lastly, this study provides valuable suggestions for policy makers to improve the living standards of the single females at micro and macro levels.

Key words: Gender, education, economic welfare, multilevel model.

JEL Codes: O12, O15, D6

1. Introduction

The interest of this study is to investigate the contribution of the single females for the economic welfare by using micro dataset of Pakistan Social and Living Standards Measurement Survey (PSLM) from 2005 to 2016. The study emphasis on the determinants of the economic welfare at macro and micro levels associated with socio-economic characteristics. It deliberately focuses on single females who are unmarried, divorced and widows and analyze the impact of their primary, secondary and higher education levels on the household welfare (Pigou 2017). Pakistan has suffered more than 50,000 causalities due to War on Terror that triggers the ratio of single females in the country and situation is deteriorating since 2001 (Mehmood 2014). During 1998, the percentage of the widows was 5.4, which has increased up to 8.5 percent in 2017 (Pakistan Bureau of Statistics). Although, financial aspects are extremely negotiable but domestic violence, marriage abuse and son preference are corresponding psychological and social factors behind divorced females. On the other side, loss of male earner, dowry system and cost of marriages have significantly augmented the number of never married females in the country.

The female education and socioeconomic characteristics are predictable dynamic channels for gender equality and economic growth in developing countries (Riches 2016; Charette et al., 1994). Therefore, single females without education and employment opportunities are vulnerable and raise questions on the quality of the households. In Pakistan enrolment rates of single females, particularly, in tertiary level is less than 9 percent[35]. Broadly, there are two main reasons for the low female literacy rate; firstly, the prevailing concept in the society regarding existence of the female is only for procreation and domestic chores (Ahmed et al., 2010). Secondly, the cost of marriage is symmetrical to the cost of education and former is preferred on later due to social stigma and cultural norms. The situation is precarious for uneducated single females as compared to educated ones, as they infer negative shock and ultimately extreme burden on per capita income of the household (King et al., 2004). The youngest population of Asia for aged 16 to 35 is the highest in Pakistan and respective ratio of females is equal to the

[35] Statistics World Bank 2019.

males. However, 5.9 percent GDP growth and only 21 percent labor force participation of females forge severe gender inequality in market[36].

According to the Global Gender Gap Report (2018), Pakistan ranked 148 out of 149 countries while Gini index has recorded 36.2 percent income inequality in the country (Statistics UNESCO 2018). There is considerable deficiency of human capital investment. It is empirically believed that aggregate income and its equal distribution are detachable indicators of the welfare (Becker 1964). Figuring out, Pakistan has started to adopt economic strategies to counter gender gap and poverty alleviation at micro and macro levels but on the other side, it has to confront hazardous situations of hyperinflation, institutional conflicts and, terrorism as well (Shahbaz 2013). Recently, 'Pakistan Vision 2025', a joint venture of government and Asian Development Bank has been introduced. This program has been working for education equality, health, social wellbeing, rural and urban development and, financial stability (Ranis et al., 2000). This is a comprehensive economic initiative towards the formation of welfare state. However, the country is facing US $104.2 Billion external debt[37] and 39 percent multidimensional poverty (World Bank 2017)[38] that demand technology advancement for structural and economic changes at ground levels.

This study contributes in the empirical literature by four major aspects. Firstly, the objective of the study is contemporary and strong. As most of the previous studies have ignored the contribution of the single females and their education for welfare and sustainable growth. The study has focused very first time on the widowed and divorced females who cannot remarry due to social stigma and limited financial resources in Pakistan. Secondly, welfare considers as macro issue associated only with income, but this study determine quality of life by using 40,000 households' micro data of Pakistan for the recent years that have not been accounted in previous research. Thirdly, the study investigate human capital investment dynamically with the help of Multilevel Model Regression that estimates between households effects at two levels. In addition, it attempts to examine different consumption patterns between poor and rich

[36]United Nations Development Program in Pakistan (Annual Report 2016) presents volunteerism with the welfare departments by the youth groups for the development particularly in KPK and Balochistan provinces that are disputed areas and it suggests that 4 out of 10 people in Pakistan are living under multidimensional poverty.
[37] Pakistan Financial Ministry 2018 and statistics of State Bank of Pakistan.
[38] Pakistan development update, November 2017: Managing risks for sustained growth.

households. Fourthly, this study deals the potential endogeneity problem for gender and welfare and, provide valuable suggestions for future research and economic policies. The structure of the study is as follows: section one describes the introduction with the stylized facts of Pakistan. In second section, I review theoretical and empirical background. Third section describes the methodology, empirical specification and model. Fourth section consists of empirical results. In last section, I discuss and conclude the results while providing recommendations and limitations of this study.

2. Stylized Facts in Pakistan

Pakistan is the sixth largest population in the world with crucial challenges since its inception. The crucial challenges include terrorism (Shahbaz et al., 2013)[39], internal and external conflicts (Schofield 2010), corruption, political unrest and low literacy rate (Zaidi 2005). Pakistani education system is divided into three main stages; primary, secondary and tertiary levels. Despite, limited number of schools and low enrolment rates, country have experienced one of the massive losses in Peshawar Attack during 2014 that killed nearly 135 students. In 2007, on average 12,000 girls have banned for going to schools. According to the Global Terrorism Database, violent campaigns against female education occur in large parts of the country. More than 10,000 teachers forced to quite their professions by closing 900 girls' schools until 2007. Apart from this, only in FATA (Federally Administered Tribal Areas) 360 schools have been destroyed since 2015. Additionally, structure of the society and underestimation of female labor force are also unavoidable factors for lower education rate. The strong patriarchal system, early marriages, gender-based market are highly interlinked. Nevertheless, it also relates with gender specific curriculum in research fields such as astronomy, biotechnology, business and accounting (Nguyen et al., 2015).

The number of widows in the society is increasing drastically and most affected indicators associated are armed conflicts and war fatalities that continue to increase. Other factors related to higher number of the widows are natural calamities, disasters, diseases and suicidal attempts. Globally, out of 350 million population of widowhood 80 percent ratio accounts for women in

[39] The country estimates $68 billion economic costs from 2000-2010 in this war (The New York review of Books, Mohsin Hamid 2011) and, nearly killed 65,000 people in Pakistan (Brown University's Cost of War Project since 2001, Dawn 2019).

2020. According to the South Asian Network for Widows' Empowerment in Development, hideous rituals are common in South Asia. The worst form of discrimination is Sati in India that demands widow burning with dead husband[40]. The Global Widow Report 2015 describe South Asia host the biggest population of the widows in the world and Pakistan ranked 10th with more than four million widows in the country.

On 23 June 2012, celebrating UN International Widows' day in Islamabad, 'A consultative workshop on mainstreaming rights of widows and single women in public policy' focus to put legal reforms and initiatives to listen the voices of the single females and provide helping hand in education and employment[41]. Educated females whether unmarried or living alone, divorced or single mothers are capable to maintain household's social and economic welfare (Kurz 2013)[42]. However, mothers suffer from domestic conflicts to avoid divorce because of their children (Zhang 2004). It can be predict categorically such as the main hindrance is the inverse relationship between income and family size, and, polygamy, trust issues and infidelity contribute equally. According to Gallup Survey Pakistan (2019), the rate of divorce has increased from 15 to 25 percent in recent years. Women urge to escape from abuse and unhappy marriages with dignity, although, they aware of its high risk in the male dominant society that presumes divorce a great sin.

The private and semi government welfare agencies such as Karvaan, Kohsar, Fazaia, Baithak, Alfalah and, Women Industrial Social Education Society have built to protect females, children and households by providing housing assistance, financial aid and, free education and health facilities but suffer from substantial public support (Rosenthal 1996). Meanwhile, some public welfare programs have launched to reduce poverty and improve female education. National Endowment Scholarships, Prime Minister Laptop Schemes, Ministry of Social Welfare and Special Education Islamabad, Green Pakistan, Under ILO Workers' Welfare Fund and USIP grants have introduced to encourage female participation in higher education. The United Nations contribute in Women's Parliamentary Caucus in Pakistan in 2008 legislation for acid attack, workplace harassment, domestic violence and female prisoners. It motivates the 'New

[40] Sati ritual in India. See for details Prevention of Sati Act 1987.
[41] For details, Widows for peace through democracy
[42] World Development Report 2018- Learning to realize education promise

Girls' Network' program to establish environment for female legislators to pass reforms on acid attacks victims for their legal and economic assistance.

The female education can establish equilibrium in budget constraints of the spouse's household and reduce gender discrimination among children (Lagerloof 2003). Another externality of education is to improve legal and political status of single females that has encouraged establishing non-political organization of Pakistan APWA (All Pakistan Women's Association) in 1949. It is a platform to provide awareness on female adult education, social and legal aid, family planning and, skill training programs in rural and urban areas. Additionally, it raises funds, charities and incorporates events like Women's International Day, UNICEF Day and United Nations Day nationally and internationally for female human capital regardless color, caste, and creed. In spite of these programs, efforts are needed to fulfill the demand of 48 percent female population in the country[43] and participation of private sectors. Consequently, joint ventures of public and private investment appear to be inevitable for female education and welfare development programs (Van de Walle 1998).

The new elected Prime Minister of Pakistan has urged to transform Pakistan as Scandinavian style Islamic welfare state. That will be providing health care facilities, free education for each level and introducing number of social and economic interventions for the citizens just like Denmark, who spends 29 percent on the welfare excluding public expenditure on education[44]. However, expected results require transparent collection of taxes, equal distribution of the public revenues and, encouraging young people without gender biasedness in public sector[45]. A strong empirical relationship between educated females and welfare has been analyzed in developing countries (Schultz 1961; Colclough et al., 2009). Investment in education foresees the economic stability and welfare improvement by mobilizing human capital and gender equality in a society.

Education policies for female education in poor countries is prerequisite (Schultz 1961) and empirical evidences proposed that efficient education reforms can guarantee of long-run economic development (Colclough et al., 2009). Pakistan has introduced several educational

[43] Pakistan Population Census 2016
[44] Social spending stays at historically high levels in many OECD countries (OECD Expenditure Report 2016).
[45] Prime Minister Imran Khan's very first address to the nation on 28th August 2018 on tax reforms and welfare state implications.

policies to achieve Millennium Development Goals. However, educational reforms such as Educational Conference (1947), Education Commission (1959), National Education Policies (1972-1980, 1978, 1992), ten-year educational strategy (2001-2011) and amendments in Education Policy (1998-2010)[46] have never achieved up to the expectations. Undoubtedly, relatable problems attribute to the distribution of public revenues in specific sectors while ignoring education and health reforms (Muralidharan 2013), political instability that halt ongoing educational projects and outdated education curriculum which needs to be integrated according to the advance technology.

3. Literature Review

Consumption expenditure has been remained important indicator of the economic welfare in past studies. It is one of the strongest medium to assess the social and economic lives of the people. Previous studies have been investigating welfare in different dimensions. The study of Azzarri et al. (2006) prefers wealth index to avoid volatility in sample data for household welfare. They investigated Albanian household consumption expenditure data from 2002 to 2003 and found that the asset index estimates are slightly different from the consumption patterns for evaluating welfare level of the households. They argued to use monetary line to estimate the welfare, which include durable goods of the households. While in most empirical literature the welfare has measured with two different methodologies namely, calories intake (Aromolaran 2004) and consumption expenditure patterns (Euler et al., 2015). To measure the mean difference between two surveys in developing countries Ravallion (2001) has taken per capita consumption expenditure as the main welfare indicator. His findings explain increase economic growth with higher level of consumption expenditure.

According to Gottfredson et al. (2004) and Armor (2003) economic welfare reflects human productive and intellectual capabilities that positively target socio-economic parameters such as, employment status, improved health care services and equal income distribution, but they find that none of them can be achieved without education attainment. It also suggested by Ram (2009) and Jones et al. (2006) who examined that the cognitive skills and human resource

[46] Federal Ministry of Education with the contribution of provincial governments after looks the curriculum development and financing the research programs. Article 25-A emphasizes the quality education freely to every citizen from age 5 to 18. Education system of Pakistan consists of primary (Grades 1 to 5), Secondary (Grades 6 to 8), higher secondary (Grades 9 to 12) and University programs leading Graduation or tertiary level of education.

development are reciprocally affective for economic growth. They consider education as social stimulus for optimum utility of human resource and economic boosters to reduce barriers for welfare achievement.

The other aspect of welfare deals with education investment in the household without gender discrimination that is well accounted by Fafchamps et al. (2014). The study examined the outcomes of the educated females in the household welfare achievement. It supports female education not only develops economy in stable shape but also demography and social welfare of the country. He used Nepalese dataset from 2001 for 520,624 households and found positive relationship between education and welfare improvement. Education of parents inversely related with the fertility rate but directly to child and household welfare.

The study of Handa (1996, 2004) suggests that female education directly correlates with the household as well as child welfare. The health status of the children are likely to increase if the education of the mother is at higher level. In terms of nutrition and better schooling, the educated mother not only focuses on the wellbeing of the child but also minimizes gender biasedness. It also estimates aggregate household welfare if the number of children are getting proper education and health care facilities. However, on the other side it is quite debatable that the returns of education discourages poor households. Colclough (2009) in the study regarding education returns supported primary level of education as compared to higher level as poor household cannot go beyond their budget constraints for their daughters' higher education attainment and it reduces their future incentives for education.

Evidence explains that lower literacy rate increases poverty level and decrease well-being of the people of the household. Developing countries like Pakistan (Cheema et al., 2012), Kenya (Geda et al., 2005) and Cote d'Ivoire (Grootaert 1997) are experiencing the lower welfare achievement while this is opposite in Malawi (Mukherjee et al., 2003) and Fiji (Gounder 2012) where enrollment ratio in higher education is encouraging. Jacob (2002) illustrates education being prerequisite solution for the gender and income equality. He focuses on the fair technological implementation in all social groups. Nevertheless, one cannot ignore the important role of saving pattern and investment decisions of the households in welfare improvement without gender discrimination among children (Schultz et al., 1982).

The female education and the welfare of the households although have strong positive effects yet they are negligible in practice in developing countries (Klasen 2002). Several studies focus on the female education for the long-term relationship and human capital growth (Dreze et al., 1999; Barro 2001). Nevertheless, social norms (Licht et al., 2007; Seguino 2007), larger family size (Litchfield in Tanzania) and higher dependency ratios (Baluch et al., 1998 in Pakistan) suggest lower economic welfare. Female education builds direct effect in improving living standards (Psacharapoulos 1994), to reduce mortality (Alderman et al., 1998) and fertility rates (Klasen 2002), labor force participation that optimally maximizes total factor of productivity (Barro 1996; Sala-i-Martin 2003; Lowson 2008; Wilde et al., 2013).

The ratio between the married and single females within and between the households also effect the welfare of the society. Studies have shown that higher education raises the welfare at one hand but on the other hand, it also supports mating choices among unmarried females (Schultz et al., 1982). The studies of Mauldin (1990) and Mincer(1974, 1984) also support capital theory in which single females who are divorced but highly educated are potentially productive for economic growth although they have faced strong external shock of separation and income. It also analyzed that the females who live separately receive financial resources that increases with their level of education. It suggests that divorced or separated females having education receive more financial resources from those women who are less educated. The capital theory also supports those females who have training or in-job experience for earning (Mincer 1962). After marital separation, gender gap has examined by Bianchi (1999) for the child and household welfare. His study formulate positive effect in gender gap reduction after separation when females are educated as compared with those who are less educated and not fully employed. Similar study (Bianchi et al., 2000) also found strong relationship of the childcare with the educated and employed mothers from the past years in which house chores and nursing activities have estimated as nonpaid works.

Glewwe (1990) has measured the quality of life with the production endowments where household members' characteristics including age, household size, education and household conditions are monitored. It defines utility grows significantly where the production of the coffee land is relatively high. Interestingly, the estimates favor age-earning high profile for the females at 44 and male 57 years of age with their higher level of education. The analysis with the most

educated male and female above 18 years, gender and other variables which are assumed exogenous in the household for determination of welfare. It explains the earnings of the educated females are stabilizers for the budget constraints. Mansour (2012) analyzed for 2008 and 2010 for population disparities and household consumption level in Jordan and found that education has potential to raise the living standards of the country.

Background on Multilevel Model: The share of learning and knowledge in economic growth and poverty alleviation has central place for bringing independent decisions and problem handling at micro and macro levels. Previous studies have investigated consumption expenditure as proxy of welfare in two ways. Most likely method is Ordinary Least Square (OLS) and the other is Quantile Regression (QR) methodology (Akter 2014; Hoddinott 1995). While, Himaz (2011) used the both methods OLS and Quantile regression for the data from household expenditure survey from 1985 to 2007 of Sri Lanka to observe the relationship between welfare and education. The study shows increasing trend of education levels with the male income distributions. Education returns are higher for higher quantiles (Martins et al., 2004). The similar results have investigated on the dataset of Cote d'Ivoire where female income share influence on the household expenditure (Hoddinott 1995; Schultz et al., 1982). The results are significant by the proportional share of the income of the spouse of the male head of the household on the welfare. Recent studies are tending towards methodologies that are more effective where the effects can be determined at the basic and higher levels as well such as multilevel model regression. This study also uses the same technique for the variation of the welfare within the households. The choice of the multilevel model has strong reasons as the welfare of the individuals vary within and between the households ranging till the provinces and giving hierarchical levels to observe these effects (Hox 1995). Because of the multilevel structure, single level model will not be enough which tends to remove some in groups' effects (Russo 2009) who also share some certain common values (Arzensek et al., 2014).

Oppositely, data structure also supports the use of multilevel regression model. The two stage consists of PSUs and the then secondary units contain individuals in the households. The other major factor, which can be important in using multilevel model to acquire different slopes that cannot be possible with simple fixed effects (MacKinnon et al., 2004). The model became highly recommended in the social sciences, biosciences and management areas to explain population

variations among different firms or individuals in the household (Woldesenbet et al., 2017). Within and between school effects have investigated for the cognitive achievement at the students-level (Gamoran 1987). However, the difficulties accompanied with the estimation have dealt with the development of the hierarchical or multilevel modeling (Burstein et al., 1981; Raudenbush et al., 1986). This method mobilizes the maximum likelihood estimation with the EM logarithm (Dempster et al., 1977; Rice 1997). Even the school sectors variability explains its role in determining the education attainment among students.

Sellstrom et al. (2006) emphasize on school environment for the child education attainment using multilevel model techniques. Among other determinants, the school and socio-economic status and good climate with the urban location count the welfare and the education attainment for the students (Hirschman 1983). While, Sorensen (2013) has observed the welfare spending with the improvement of the public education services for the longitudinal data for 22 countries. Period and cohort effects imply different with the aging effects, as the elder people desire more pension, less education expenditure but more health care and social security. The interest becomes long standing for the individual and the household characteristics. Younger people are interested in the scholarship programs and social security increment for education attainment while it is discouraged among older ones. It has observed geographical and high-level contextual effects being crucial determinants in social sciences. Looking into the positive way, using logistic regression for generalized multilevel model Slack (1999) also analyzed the school performance by the learning capabilities in improving languages and arts tests.

4. Data and Methodology

4.1 Data and Variables

The micro data, which is used in this study, is taken from the Pakistan Social and Living Standards Measurement (PSLM) survey conducted by the Pakistan Bureau of Statistics (PBS), Government of Pakistan, from 2005 to 2016 (six rounds including 2005-06, 2008-09, 2010-11, 2011-12, 2013-14 and 2015-16). The objective of PSLM is to establish the distributional impact of the development programs for the welfare of people. The data calculated from these surveys is used for the monitoring and assessing the Millennium Development Goals (MDGs) indicators

and assisting the government to formulate and design policies[47]. The sample size of PSLM surveys has approximately 80000 households.

Table 4.1 Description of variables and sources

Variables	Description	Sources
Dependent variables		
Per capita expenditure	Per capita expenditure in Pakistani Rupees and taken in log values	PSLM
Adult Equivalent	Adult equivalent consumption expenditure	PSLM
Explanatory variables		
F (unmarried)	=1 if the female is single (unmarried) aged 15 to 65 =0 if the female is married	PSLM
F (Widowed/Divorced)	=1 if the female is single (unmarried) aged 15 to 65 =0 if the female is married	PSLM
F (unmarried) education S	=1 if the single female (unmarried) has secondary education completion (Grade 6 to 12) =0 no level of education	PSLM
F (unmarried) education G	=1 if the single female (unmarried) has graduation completion (Grade 13 to 14) =0 no level of education	PSLM
F (unmarried) education H	=1 if the single female (unmarried) has post-graduation completion (Grade 15 to 16) =0 no level of education	PSLM
F (widowed/divorced) education P	=1 if the single female (widowed/divorced) has primary education completion (Grade 1 to 5) =0 no level of education	PSLM
F (widowed/divorced) education S	=1 if the single female (widowed/divorced) has secondary completion (Grade 6 to 12) =0 no level of education	PSLM
F (widowed/divorced) education H	=1 if the single female (widowed/divorced) has higher completion (Grade 13 to 16) =0 no level of education	PSLM
F Age (18-21)	Female age between 18 to 21	PSLM
F Age (22-24)	Female age between 22 to 24	PSLM
F Age (25-above)	Female age between 24 and above	
Father's education	Fathers education in years	PSLM
Mother's education	Mother's education in years	PSLM
Head	= 1 if head of the household is male =0 female head	PSLM
H Professional	= 1 if head of the household is professional (High Salaried) =0 otherwise	PSLM
H Clerk	= 1 if head of the household is clerk (low Salaried) =0 otherwise	PSLM

[47] The reasons to use PSLM data conducted by PBS are following; Firstly, PBS takes special measures for the quality and reliability of the data by monitored team with supervisors for the field wok. Entire data is taken from all the regions of Pakistan to the Islamabad Headquarters for further processing. Secondly, the survey covers wide range of topics such as; education, health, occupation, services etc. Thirdly, the survey is the main mechanism for monitoring Millennium Development Goals (MDGs) indicators in Pakistan.

HH size	The number of the people residing in the household	PSLM
HH own	=1 if woman possesses any dwelling or house =0 otherwise	PSLM
Technology	=1 if the household contains telephone, mobile or internet connection =0 otherwise	PSLM
Electricity	=1 if household has electricity =0 otherwise	PSLM
Urban	= 1 for the household in urban area =0 for the rural areas	PSLM
Sister	=1 if elder sibling is sister =0 otherwise	PSLM
Nuclear	=1 if household is nuclear family =0 otherwise	PSLM
Literacy Rate	Literacy rate of the four provinces	Labor Force Survey
Poverty	Poverty Rate of the country	World Bank
Urdu	=1 if person speaks Urdu =0 otherwise	PSLM
Punjabi	=1 if person speaks Punjabi =0 otherwise	PSLM
Sindhi	=1 if person speaks Sindhi =0 otherwise	PSLM
Pushto	=1 if person speaks Pushto =0 otherwise	PSLM

Dependent Variable: The first dependent variable of this study is per capita consumption expenditure (in log) as proxy for the economic welfare of the household. The consumption expenditures are reported annually in Pakistani currency for food and non-durable goods. I use second dependent variable of adult equivalent consumption for the robustness check (See detailed definitions in Table 4.1.1).

Individual characteristics: The interested variable consists of the single females in the households, which are aged from 15 to 65 years who are unmarried, never married, widowed and divorced. The dummy variables for their three levels of education, age and, possession of physical asset are also used (Bowles et al., 2001). Other explanatory variables includes gender of the head of the household and his professions whether high salaries or low, and dummy variables of father and mother's education in complete years (Alderman 1998).

Household characteristics: These variables include household size, availability of technology in form of internet, mobile phone or telephone connection that boost up female empowerment (Nelson 1966), facility of electricity and, location of the household in urban area (Arrow 1972).

Table 4.1.2 Descriptive Statistics

Variables	Observations	Mean
Per capita expenditure	633650	30777.23
Female (never married)	634631	0.0817388
Female (Widowed/Divorced)	634631	0.019821
Female (never married) Education S	634631	0.0252083
Female (never married) Education G	634631	0.0008068
Female (never married) Education H	634631	0.0006634
Female (Widowed/Divorced) Education p	634631	0.0023856
Female (Widowed/Divorced) Education S	634631	0.0039472
Female (Widowed/Divorced) Education H	634631	0.0001292
Female Age (18-21)	634631	0.0414367
Female Age (22-24)	634631	0.0274884
Female Age (25 & Above)	634631	0.2088095
Father's education	634631	0.0187763
Mother's education	634631	0.0617871
Head	634631	0.4393892
Head Professional	634631	0.0035249
Head Clerk	634631	0.0013614
HH size	634631	10.30461
HH own	634631	0.3474476
Technology	634631	0.4611672
Electricity	634631	0.7925235
Urban	634631	0.4537818
Sister	634631	0.0120826
Nuclear	634631	0.5337354
Literacy Rate	634631	33.25714
Poverty rate	634631	31.38509
Urdu	634631	0.3022575
Punjabi	634631	0.2276851
Sindhi	634631	0.1840629
Pushto	634631	0.1885741

Provincial characteristics: I take literacy rate of the provinces Punjab, Sindh, KPK (Khyber Pakhtunkhwa) and Balochistan. I use dummy variables for the spoken languages in the country (Alesina et al., 2005; Soroka 2007). The first one is Urdu that takes value 1 if resident speaks or 0 otherwise. Other dummy variables of languages are Sindhi, Punjabi and, Pushto. I also include poverty rate of the country in the each econometric model (Akerele et al., 2011)[48].

[48] The provincial characteristics have used from the 33rd issue of the Labor Force Survey in Pakistan (LFS) that consists of gender-specific literacy rate of each province. This survey is conducted by the Pakistan Bureau of

Multilevel Specification Characteristics in the Data: This study estimates with the help of two levels incorporated in multilevel model regression. As described by the structure of the model, higher level consists of PSU (Primary Sampling Units) which are 5468 in the dataset and the lower level is composed of 77582 households (Mackinnon et al., 2004). Each household comprises of number of individuals residing in it and total individual number of observation in the dataset is 633650 approximately.

Descriptive Statistics: Table 4.2 describes the descriptive statistics in which mean of the unmarried single female is 8 percent whereas, widows and divorced females are almost having average of 2 percent in the sample. As compared to the other levels, secondary education has mean value of 2 percent. On average, 4 percent females are between 18 to 21 years age group and mother's education has mean value of 6 percent. Average household size is 10 and mean value of the urban variable is 45 percent. More than 50 percent on average can have access to mobile, telephone and internet, lastly, most spoken language of the country is Urdu.

4.2 Methodology

4.2.1 Why to use Multilevel Model Regression

There are three main reasons for choosing multilevel technique in this study. Economic welfare is determined by the different levels, which has variation among individuals in a country. A single level approach may be not quite suitable if the problem arises between different variables as hierarchical manner (Hox 1995). It also captures group levels variation, which are not covered in single level approach (Russo 2009). The individuals in the country share similar attributes but also contribute differently according to locations and availability of the resources (Trunk et al., 2014). The next important reason among them is the structure of the data. The data is conducted by the stratified two-stage sampling in which the primary stage composed of units these are called PSUs and the secondary stage consists of households and households contains individuals. This structure supports multilevel model approach. Moreover, this approach is getting popularity

Statistics, which begins in 1963. Each year the questionnaires and methodologies have been improvised under the forum of "Panel of Labor Statistics". The survey along with quantification of major variables also calculates other economic variables such as literacy, migration and professional security. On average, the sample size of the survey comprises of more than 42 thousand households. The revised survey from 1990 with adoption of marginal economic activities likely to be carried out further for employed persons. The unit of the sample survey data is household and it is estimated for four distinct nationally representative samples those are enumerated in a given quarter.

in the recent studies such as medicines, sociology and management (Nikulina 2014). This approach has been discussed in previous literature like trade, industry development and energy but little attention has been put forward for the education of the females (Ang et al., 2015; Thieme et al., 2013; Corden 1997; Suzumura 1987). Therefore, the individuals, households and higher levels characteristics are better investigated in the multilevel approach.

4.2.2 The Model Specification

Hierarchical linear modeling also refers as Multilevel Modeling and captures under the analyses of the "mixed effect modeling". The data has multiple levels or nested structure. The common examples occur when individuals are in the households and households in different PSUs or provinces. Traditional multiple linear regression analysis assumes that all cases are independent of each other but when data has multiple levels then multilevel model regression is more suitable than multiple linear regression (Hox 2010; Gelman at el., 2006). Using this methodology puts identifying variation in the outcome on two or three levels depending on the stages of the hypothesis. The response variable consists of continuous or binary data so either linear or logistic multilevel model can be determined.

The use of multilevel modeling techniques based on the data, which is, structured hierarchically (Gamoran 1987; Lee et al., 1988). Fitting a multilevel model, one assumes that there is grand mean as well as many means because there are many clusters for each stratum (Sellström 2006). The errors that are differences between the expected and predicted observations are relative to the mean corresponding to that cluster. The random effects are corresponded as the differences between clusters' means and overall grand mean for each stratum. By including these random effects, variance of each level is obtained and its interpretation is better explained by calculating inter-class correlation (ICCs) that describe how much proportion of the unexplained variance is attributed to each included level. The model tends to be complexed by adding random slopes as effects vary within each cluster (Raudenbush et al., 2004; Singer 2003). Linear or logistic multilevel models can be achieved according to the category of the response variable and curtail identifying variation based on the certain levels. In exhibiting case, the outcome variable is continuous, and the random intercept model can be explained as,

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \varepsilon_{ij} \quad (\text{with j } = 1,2,\ldots\ldots \text{N}) \tag{1}$$

The Y_{ij} is the value of the response of the ith household (Level 1) in the jth PSU (Level 2); β_{0j} is the overall constant or intercept of the model and rests of the term are the effects of the X variables on the outcome. Whereas ε_{ij} is the variability in the outcome.

$$\beta_{oj} = \gamma_{00} + \gamma_{01} Z_j + \mu_{0j} \qquad (\text{with j } = 1,2,\ldots\ldots \text{N}) \qquad (2)$$

$$\beta_{ij} = \gamma_{10} + \gamma_{11} Z_j + \mu_{1j} \qquad (\text{with j } = 1,2,\ldots\ldots \text{N}) \qquad (3)$$

$$Y_{ij} = \gamma_{00} + \gamma_{01} Z_j + \gamma_{10} X_{ij} + \gamma_{11} X_{ij} Z_j + \mu_{0j} + \mu_{1j} + \varepsilon_{ij} \qquad (\text{with j } = 1,2,\ldots\ldots \text{N}) \qquad (4)$$

Where γ_{00} is the intercept, γ_{01} and γ_{10} are the effects of level 2 variable Z_j on level 1 X_{ij}. Whereas for the interaction models γ_{11} is the cross-level interaction between level 1 and level 2 variables.

If there are L variables X at level 1 and M variable Z at level 2, then the equation can be presented like;

$$Y_{ij} = \beta_{oj} + \sum_{l-1}^{L} \beta_{lj} X_{ij}^{l} + \varepsilon_{ij} \qquad (5)$$

$$\beta_{oj} = \gamma_{00} + \sum_{m-1}^{M} \gamma_{0m} Z_j^m + \mu_{0j} \qquad (6)$$

$$\beta_{pj} = \gamma_{p0} + \sum_{m-1}^{M} \gamma_{pq} Z_j^m + \mu_{pj} \qquad (7)$$

Then,

$$Y_{ij} = \gamma_{00} + \sum_{l-1}^{L} \gamma_{l0} X_{ij}^{l} + \sum_{m-1}^{M} \gamma_{0m} Z_j^m + \sum_{l-1}^{L} \sum_{m-1}^{M} \gamma_{lm} Z_j^m X_{ij}^{l} + \sum_{l-1}^{L} \beta_{lj} X_{ij}^{l} + \mu_{0j} + \mu_{pj} X_{ij}^{l} + \varepsilon_{ij} \qquad (8)$$

So, γ are the regression coefficients (fixed part of the model), μ are the group level residuals, and ε are the individual levels' residual. Last two are random part of the model. The degree of coincidence between two individuals belong to the same households can be estimated by the inter-class correlation which can be calculated by the following formula,

$$\rho = \frac{\sigma_{\mu}^2}{\sigma_{\mu}^2 + \sigma_{\varepsilon}^2} \times 100 \qquad (9)$$

σ_{μ}^{2} represents PSU level variance and σ_{ε}^{2} individual or household level in the linear model. The fixed part of the model demonstrates overall mean relationship between response and explanatory variables such as relationship implies in the average PSU. While the random part of the model shows, household and PSU specific characteristics relationships differ from the overall mean relationship because coefficients are based on the changes in households and PSU an individual is identified. A maximum likelihood estimator is used (Dempster et al., 1977).

Multilevel method allows data combination at different levels to see their relationships and avoid pitfalls for traditional methods and interactive approaches (Steenbergen et al., 2002). The study estimate for per capita consumption with the help of individual, household and PSUs levels characteristics. Firstly, the Ordinary Least Square regression has estimated to evaluate certain econometric criteria for goodness of fit including Wald Test, Likelihood Ratio Test and their residuals examine graphically. Secondly, the robust standard errors have estimated for each model. Wald test has specified strong evidence for the inclusion of parameters, which are presented in the model. The criteria of goodness of fit also determine with multilevel model regression.

Econometric Model: The econometric model that has applied in this study consider three determinants of the economic welfare; individuals, households at level one and PSUs characteristics at level two. The analysis are based on the per capita consumption expenditure at level 1 to focus on the participation of the single females and their education levels,

$$Economic\ Welfare = f(single\ females, individuals, households, PSUs) \quad (10)$$

4.3.3 Alternative specification

The other econometric approach associated in this study is the quantile model regression. It is favorable to indicate welfare differences of lower and higher per capita consumption of the households by incorporating household's characteristics (Glewwe 1990; Himaz et al., 2011). The effect by OLS regression estimation sought to be same over entire distribution of the household but Quantile Regression (QR) relaxes this assumption and permits different determinants to influence on different parts of the distribution (Naiman 2007). Quantile regression method provides mechanism on series of quantiles along the conditional distribution for estimating

welfare relationships. For the economic welfare of the household the model is written as (Koenker et al., 1978):

$$Y_i = X_i\beta_\theta + \mu_{i,\theta}\ with\ Quant_\theta\ (Y_i|X_i) = X_i\beta_\theta \quad (11)$$

The QR specification examines the β_θ as the parameter to be estimated for different quantile of the entire distribution and $\mu_{i,\theta}$ is the error term. Whereas X_i is a vector of exogenous variables. $Quant_\theta\ (Y_i|X_i)$ shows the θth regression quantile of response variable Y_i given X_i. It also defines robust regression to add up in the current study.

4.3.4 Endogeneity Issue

The main econometric challenge in formulating the causal effect of single females (unmarried) on household welfare results to deal with potential endogeneity. Single females (unmarried) can be endogenous for the three reasons; first, the association between the unmarried females and household expenditure effect on spurious relationship being third unobservable factors such as parents who can afford their daughters' education and delay their marriages (Jones 2007). If this factor influences, then the estimated coefficients might be biased. Secondly, the reverse causality arises if the single unmarried females with their education and age consequently increase the welfare of the household with potential future investment that might facilitate the households for the delaying in their marriages (Salaff 1976). Thirdly, unmarried females in a household are likely to be measured with error that may bias the gender estimates. This study only deals endogeneity arise due to unmarried single females as widows and divorced females associated with the negative income shock of the household (Stein 1978; Lefgren 2006).

Recognizing the potential endogeneity of variable single female (unmarried), IV approach has used to establish to deal with reverse causality with the 2SLS estimator. The family background characteristics are used as valid instruments in recent research (Hoogerheide 2012; Kolk 2012). The Instrumental Variable approach exploits variation for unmarried single females by a factor with holding other things constant; only affect the household expenditure through family background characteristics. To establish Two-Stage Least Square (2SLS) estimator, the first stage is needed to be specified as,

From Equation 1 for single females (unmarried),

$$Y_{ij} = \beta_{oj} + \beta_{sj}X_{ij}^{s} + \beta_{1j}X_{ij} + \varepsilon_{ij} \quad (12)$$

$$X_{ij}^{s} = \beta_{oj} + \beta_{1j}X_{ij} + T_{1j}\delta_{T} + \epsilon_{ij} \quad (13)$$

A valid instrument T_{1j} needs to correlate with the unmarried single females i.e.; ($\delta_T \neq 0$) and must be uncorrelated with the error term form $cov(T_{1j}, \varepsilon_{ij}) = 0$. The difference between estimates incorporate by ordinary least square regression and two stage least square estimation. I use two instruments for empirical analysis, first, dummy variable if the first child of the household is sister and second, dummy variable if the household describes as nuclear family or not[49].

Following important factors are relatable for the validation of the instruments; firstly, the study takes advantage of the birth order in the households' siblings. Among all children, older sister is potentially stronger candidate for education and household resources. It directly associates with her marriage decision as her timeline of education expands at one side, and on the other hand, she supports her younger siblings in their schooling. Secondly, the elder sister is likely to get married late by sharing responsibilities with parents, especially mother and, engaging in domestic chores for the welfare gain. Thirdly, the nuclear families are more likely to invest on the education of their children without gender discrimination as compared to joint family system. The structure of the household fosters female to achieve her educational goals and professional careers before she gets married (Noreen 2012; Blundell et al, 1999).

(a) Endogenous variable: In order to test the endogeneity of unmarried females I performed weak exogeneity test by the Smith and Blundell's (1986) and conclude that the model for economic welfare suffer from endogeneity.

(b) Exclusion restriction: An instrument should not have direct effect on dependent variable but via endogenous explanatory variable. The classical approach performs Sargan test on the validity of the instrument (Kennedy 2008). I test Sargan-Hansen test of over identifying restriction estimated with instrumental variable techniques and find valid instruments.

[49] Conjugal family that consist of traditionally father, mother and their not more than two children. See for detailed definition: Bengtson, V. L. (2001). Beyond the nuclear family: the increasing importance of multigenerational bonds: the burgess award lecture. *Journal of marriage and family*, *63*(1), 1-16.

(c) Strength of the instrument: An instrument should have a strong effect on the endogenous explanatory variable. If not, it may consider as weak instrument and not reliable to generate results (Hoogerheide, Kaashoek, Van Dijk, 2007). I report first stage regression for goodness of fit statistics. According to informal rule of thumb (Stock and Yogo 2004) F-Statistics > 10 and results exceed the threshold and satisfy the relevance condition.

5. Results and Analysis

5.1 Multilevel Random Intercept Models

The random intercept model results present in Table 5.1. The scheme is the table to extend the model with individual, household and macro level characteristics. I first illustrate the results of fixed part and after present random effects of the models. Model 1 is the unconditional model that describes suitability of multilevel model regression over the linear regression model with 1 percent level of significance. In Model 2, the variables of single females provide expected results. The never married females increase the economic welfare by 6.4 percent; conversely, widows and divorced females are negatively associated with the welfare by decreasing the per capita consumption 12.9 percent (Akter et al., 2014).

Models 3 and 4 describe results with the addition of the individual and household characteristics. All age groups have a positive effect on household welfare but with a diminishing marginal effect. The age of single females does not decrease household welfare. In both models, each level of education highly effective to increase the level of welfare. Relatively, the increase of economic welfare with the higher education of widows and divorced females are quite higher than unmarried. The unmarried females raises the economic welfare with secondary education 7.6 percent that tends to increase with 30 percent in higher education. On the other side, the effect of primary education of widow and divorced females is positive but low meanwhile, their higher education highly effective to raise the welfare 53 percent. The age has diminishing effect in Model 4 and females with the age group 22-24 are most likely to influence on the household welfare.

The results are consistent for educated parents and male head of the household provides 16 percent economic welfare. The male head of the household significantly increases the welfare, although, the extent of welfare depends on the type of his employment, as higher salaried jobs are favorable as compared to the low salaries ones. The level of welfare increases with the

decrease of the household size that might stimulate saving rate and better allocation of household resources among children. Furthermore, with the increase of poverty level there is 7.3 decrease in the welfare. Conversely, welfare of the household increase with the reduction of the poverty level (Baulch et al., 1998). Urdu language is likely to raise the household consumption level than other languages. This indicates two main reasons, firstly, Urdu being national and official language has potentially used in labor market. Secondly, its utility is higher than other languages in most developed cities of the country.

Table 5.1 Estimation Results for Multilevel Random Intercept Models

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
F (unmarried)		0.0644***	0.0390***	0.0315***	0.0905***	0.0714***	0.0551***
		(0.00208)	(0.00248)	(0.00273)	(0.00274)	(0.00262)	(0.00244)
F (widow/div)		-0.129***	-0.193***	-0.203***	-0.199***	-0.196***	-0.195***
		(0.00409)	(0.00511)	(0.00524)	(0.00518)	(0.00494)	(0.00459)
F (unmarried) Edu S			0.0759***	0.0746***	0.0767***	0.0678***	0.0605***
			(0.00433)	(0.00433)	(0.00428)	(0.00409)	(0.00380)
F (unmarried) Edu G			0.383***	0.383***	0.323***	0.294***	0.259***
			(0.0207)	(0.0207)	(0.0209)	(0.0199)	(0.0185)
F (unmarried) Edu H			0.305***	0.300***	0.273***	0.231***	0.276***
			(0.0222)	(0.0222)	(0.0220)	(0.0209)	(0.0195)
F (widow/div) Edu P			0.0880***	0.0881***	0.0589***	0.0495***	0.0352***
			(0.0127)	(0.0127)	(0.0127)	(0.0121)	(0.0113)
F (widow/div) Edu S			0.174***	0.174***	0.125***	0.110***	0.0983***
			(0.0104)	(0.0104)	(0.0109)	(0.0104)	(0.00963)
F (widow/div) Edu H			0.539***	0.540***	0.486***	0.408***	0.438***
			(0.0503)	(0.0503)	(0.0499)	(0.0475)	(0.0442)
F Age (18-21)				0.0181***	0.0849***	0.0662***	0.0469***
				(0.00324)	(0.00325)	(0.00310)	(0.00289)
F Age (22-24)				0.0245***	0.110***	0.0817***	0.0553***
				(0.00359)	(0.00361)	(0.00345)	(0.00321)
F Age (25-above)				0.0136***	0.116***	0.0794***	0.0504***
				(0.00146)	(0.00169)	(0.00164)	(0.00153)
Father Edu					0.0348***	0.0292***	0.0340***
					(0.00538)	(0.00513)	(0.00477)
Mother Edu					0.0519***	0.0440***	0.0459***
					(0.00337)	(0.00322)	(0.00299)
Head					0.169***	0.209***	0.129***
					(0.00142)	(0.00162)	(0.00153)
H Professional					0.232***	0.207***	0.210***
					(0.00955)	(0.00910)	(0.00846)
H Clerk					0.0676***	0.0516***	0.0604***
					(0.0153)	(0.0146)	(0.0135)
HH size						-0.018***	-0.018***
						(0.000146)	(0.000136)
HH own						0.105***	0.0621***
						(0.00169)	(0.00158)
Technology						0.296***	0.325***
						(0.00193)	(0.00179)
Electricity						0.242***	0.247***

						(0.00183)	(0.00170)
Urban						0.627***	0.0113
						(0.00964)	(0.00861)
Literacy Rate							-0.000160
							(0.000167)
Poverty							-0.073***
							(0.000233)
Urdu							0.144***
							(0.00302)
Punjabi							0.0248***
							(0.00348)
Sindhi							0.115***
							(0.00515)
Pushto							0.0981***
							(0.00433)
Constant	10.18***	10.18***	10.18***	10.18***	10.07***	9.514***	12.15***
	(0.00874)	(0.00874)	(0.00872)	(0.00872)	(0.00861)	(0.00869)	(0.0127)
Observations	633,650	633,650	633,650	633,650	633,650	633,650	633,650
Number of groups	5,468	5,468	5,468	5,468	5,468	5,468	5,468
Random effects	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**
PSU (Level 2)							
Var (constant)	0.41590	0.4153	0.41345	0.4132	0.39750	0.24762	0.1661
	(0.00799)	(0.00797)	(0.00794)	(0.00794)	(0.00763)	(0.0048)	(0.00349)
Var (Residual)	0.20216	0.20151	0.20116	0.20112	0.19638	0.1783	0.15406
	(0.00036)	(0.00035)	(0.00036)	(0.00035)	(0.0004)	(0.00031)	(0.00027)
ICC							
PSU	0.67290	0.67331	0.67269	0.67263	0.6693	0.58127	0.51890
	(0.00424)	(0.00424)	(0.00424)	(0.00424)	(0.00427)	(0.00482)	(0.00527)
Other Information							
AIC	814814	812777.4	811674.3	811543.9	796380.2	733378.4	639179.1
BIC	814848.1	812834.2	811799.3	811702.9	796596	733651	639519.8
Log Likelihood	-407404.0	-406383.6	-405826.1	-405757.9	-398171.1	-366665.2	-319559.5
Wald Chi-Square		2043.98	3163.59	3300.70	18738.32	87486.30	204298.9
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is per capita consumption expenditure (log). All equations provide random intercept model estimates. Model 1 is unconditional. Higher level is PSU and lower level is household. Random part takes var for variance, cons as constant. Variances have reported at 5 percent level of significance. Chi-Square LR test reports p-value. Robust standard errors are in parentheses. The significance level reports as *** p<0.01, ** p<0.05, * p<0.1*

The second part of the table provide variance components and diagnostic estimation listed (Arzensek et al., 2014). The p value of the Wald test in Model 2 shows preference of multilevel model with random effects. My study takes PSU as level two and household with individuals at level one. Random intercepts in all models differ from zero and indicate significance of the multilevel model. However, between PSUs, the variability is 41 percent to 16 percent and, between households, the variations lie from 20 to 15 percent. The appropriate way to analyze the variance component is through interclass correlation. The range of the ICC covers 67 to 51 percent and, for the full model it indicates that 51 percent variability for the economic welfare is

explained by the between PSUs differences and conversely, 49 percent variation of consumption increase is explained with between household (Wong 2012). At the Bayesian criterion information, it suggests full Model 7 is the most appropriate than others.

5.2 Multilevel Random Intercept-Slope Model

Firstly, in Table 5.2, I present fixed part and afterwards random effects of the parameter estimates. Table shows five random intercept-slope models for poverty, literacy rate, Urdu, technology and urban respectively[50]. The female variable is highly significant in each model whereas, unmarried females tend to increase the welfare by 5 percent that is opposite for the widows and divorced females. Unmarried females with the increase of education raises the household welfare particularly in Model 2 and 5 that describe for random intercept slope models for literacy rate and urbanization.

Table 5.2 Estimation Results of Multilevel Random Intercept – Slope Models

Variables	(1)	(2)	(3)	(4)	(5)
F (unmarried)	0.0491***	0.0523***	0.0534***	0.0521***	0.0549***
	(0.00239)	(0.00242)	(0.00239)	(0.00237)	(0.00244)
F (widow/div)	-0.194***	-0.194***	-0.191***	-0.182***	-0.195***
	(0.00450)	(0.00455)	(0.00450)	(0.00448)	(0.00458)
F (unmarried) Edu S	0.0603***	0.0608***	0.0567***	0.0609***	0.0610***
	(0.00372)	(0.00376)	(0.00372)	(0.00369)	(0.00379)
F (unmarried) Edu G	0.255***	0.255***	0.245***	0.245***	0.259***
	(0.0182)	(0.0184)	(0.0182)	(0.0180)	(0.0185)
F (unmarried) Edu H	0.268***	0.275***	0.258***	0.256***	0.277***
	(0.0191)	(0.0193)	(0.0191)	(0.0189)	(0.0194)
F (widow/div) Edu P	0.0340***	0.0349***	0.0371***	0.0318***	0.0353***
	(0.0110)	(0.0112)	(0.0111)	(0.0110)	(0.0113)
F (widow/div) Edu S	0.0995***	0.0983***	0.0944***	0.0912***	0.0984***
	(0.00944)	(0.00955)	(0.00945)	(0.00940)	(0.00962)
F (widow/div) Edu H	0.421***	0.429***	0.406***	0.362***	0.436***
	(0.0433)	(0.0438)	(0.0435)	(0.0430)	(0.0441)
F Age (18-21)	0.0421***	0.0452***	0.0453***	0.0450***	0.0469***
	(0.00283)	(0.00286)	(0.00283)	(0.00280)	(0.00288)
F Age (22-24)	0.0497***	0.0528***	0.0515***	0.0527***	0.0552***
	(0.00315)	(0.00318)	(0.00315)	(0.00312)	(0.00321)
F Age (25-above)	0.0430***	0.0470***	0.0471***	0.0475***	0.0504***
	(0.00150)	(0.00151)	(0.00150)	(0.00148)	(0.00153)
Father Edu	0.0337***	0.0337***	0.0337***	0.0312***	0.0338***
	(0.00467)	(0.00473)	(0.00467)	(0.00463)	(0.00476)
Mother Edu	0.0444***	0.0454***	0.0447***	0.0425***	0.0460***
	(0.00293)	(0.00296)	(0.00293)	(0.00291)	(0.00299)

[50] I also estimate interaction terms for education level, languages and rural region, however, provided consistent models in Table 5.2.

Head	0.112***	0.122***	0.123***	0.121***	0.129***
	(0.00151)	(0.00152)	(0.00150)	(0.00149)	(0.00153)
H Professional	0.213***	0.212***	0.205***	0.206***	0.211***
	(0.00829)	(0.00838)	(0.00832)	(0.00824)	(0.00845)
H Clerk	0.0641***	0.0616***	0.0611***	0.0684***	0.0603***
	(0.0133)	(0.0134)	(0.0133)	(0.0132)	(0.0135)
HH size	-0.019***	-0.019***	-0.0183***	-0.0184***	-0.018***
	(0.000134)	(0.000135)	(0.000135)	(0.000135)	(0.000136)
HH own	0.0548***	0.0594***	0.0590***	0.0566***	0.0614***
	(0.00156)	(0.00157)	(0.00155)	(0.00154)	(0.00158)
Technology	0.339***	0.330***	0.324***	0.325***	0.329***
	(0.00182)	(0.00180)	(0.00179)	(0.00739)	(0.00179)
Electricity	0.244***	0.246***	0.246***	0.250***	0.246***
	(0.00172)	(0.00171)	(0.00170)	(0.00171)	(0.00170)
Urban	0.268***	0.168***	0.0350***	0.120***	0.261***
	(0.00980)	(0.0143)	(0.00853)	(0.0108)	(0.0105)
Literacy Rate	0.000311*	7.23e-05	0.00136***	-0.0011***	-7.07e-05
	(0.000189)	(0.000603)	(0.000177)	(0.000203)	(0.000194)
Poverty	-0.057***	-0.074***	-0.0721***	-0.0761***	-0.074***
	(0.000791)	(0.000285)	(0.000243)	(0.000241)	(0.000235)
Urdu	0.145***	0.148***	0.208***	0.144***	0.144***
	(0.00315)	(0.00307)	(0.00738)	(0.00302)	(0.00302)
Punjabi	0.0175***	0.0277***	0.0875***	0.0268***	0.0244***
	(0.00370)	(0.00352)	(0.00480)	(0.00350)	(0.00348)
Sindhi	0.0831***	0.0974***	0.0469***	0.119***	0.118***
	(0.00566)	(0.00548)	(0.00819)	(0.00519)	(0.00519)
Pushto	0.0839***	0.0911***	0.0436***	0.0948***	0.0995***
	(0.00465)	(0.00458)	(0.00605)	(0.00435)	(0.00436)
Constant	11.55***	12.09***	12.05***	12.23***	12.06***
	(0.0277)	(0.0344)	(0.0129)	(0.0141)	(0.0125)
Observations	633,650	633,650	633,650	633,650	633,650
Number of groups	5,468	5,468	5,468	5,468	5,468
Random effects	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**
PSU (Level 2)					
Var(Poverty)	0.001299				
	(0.000049)				
Cov(Poverty, cons)	-0.04449				
	(0.00158)				
Var(Literacy)		0.00111			
		(0.000045)			
Cov(Literacy, cons)		-0.05539			
		(0.00235)			
Var(Urdu)			0.11739		
			(0.00370)		
Cov(Urdu, cons)			-0.02149		
			(0.00244)		
Var(Technology)				0.17224	
				(0.00476)	
Cov(Technology, cons)				-0.08159	
				(0.00362)	

Var(Urban)					0.1462
					(0.0281)
Cov(Urban, cons)					-0.02805
					(0.0143)
Var (constant)	1.62499	2.90541	0.13869	0.20714	0.10691
	(0.0522)	(0.1238)	(0.0031)	(0.0049)	(0.0031)
Var (Residual)	0.14777	0.15122	0.147301	0.1446	0.15376
	(0.000276)	(0.000271)	(0.000263)	(0.00026)	(0.000274)
ICC					
PSU	0.91664	0.95052	0.48496	0.58876	0.41014
	(0.00246)	(0.00201)	(0.00575)	(0.0058)	(0.0069)
Other Information					
AIC	615183.5	634974.2	617136.4	608627.4	637367
BIC	615546.9	635337.7	617499.9	608990.9	637730.5
Log Likelihood	-307559.73	-317455.11	-308536.18	-304281.72	-318651.48
Wald Chi-Square	100412.58	162039.52	189155.92	170748.91	198553.85
Prob > chi2	0.000	0.000	0.000	0.000	0.000

*The dependent variable is per capita consumption expenditure (log). All equations provide random intercept-slope models. Higher level is PSU and lower level is household. Random part takes var for variance, cons as constant and cov as covariance. Variances have reported at 5 percent level of significance. Chi-Square LR test reports p-value. Robust standard errors are in parentheses. The significance level reports as *** p<0.01, ** p<0.05, * p<0.1*

On the other hand, widows and divorced females increase welfare on average from 3 percent to 40 percent comparatively in primary and higher levels of education respectively. The possession of the physical asset increases welfare with almost the same proportion if the female attains at least secondary education. The results are consistent with the parents' education, gender of the household head and his profession. However, Model 1 and 3 show significant effect of literacy rate in the attainment of welfare as compared to Model 4. Furthermore, poverty estimates and languages also show consistent results. The second part of the table explains random effect in which, random intercept of each model differs from zero and explain covariance with the expected negative sign. The high disparity between PSUs observe in Model 4 and variation between households analyze in Model 2 and Model 5. The ICCs explains 91 percent maximum variation in Model 1 and minimum in Model 5. While, Akaike Criterion describe Model 4 as the most appropriate one.

5.3 Alternative Specification

Quantile regression models fit quantiles of conditional distribution as linear functions of the independent variables. It allows for the effects of independent variables to differ over the quantiles (Chamberlain 1994). The Table 5.3 shows the quantile regressions estimates. In each model, estimates are similar that are presented in random intercept models earlier. The unmarried

single females are positively significant while widows and divorced females provide negative effects in each quartile. The important factor associated with the higher quartile is the ratio of divorced and widow female although negative but slightly decreases as compared to lower quartile.

Table 5.3 Estimation Results for Quantile Regression

Quantiles	**0.25**	**0.50**	**0.75**	**0.25**	**0.50**	**0.75**	**0.25**	**0.50**	**0.75**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
F (unmarried)	0.124***	0.135***	0.149***	0.123***	0.113***	0.0981***	0.108***	0.102***	0.104***
	(0.0068)	(0.0037)	(0.0044)	(0.0043)	(0.00364)	(0.00440)	(0.00458)	(0.00412)	(0.00410)
F (widow/div)	-0.115***	-0.0306***	0.00908	-0.306***	-0.235***	-0.230***	-0.224***	-0.180***	-0.175***
	(0.0088)	(0.0087)	(0.0094)	(0.0113)	(0.0074)	(0.00603)	(0.00741)	(0.00716)	(0.00841)
F (unm) Edu S				0.107***	0.0769***	0.0726***	0.107***	0.0887***	0.0665***
				(0.0071)	(0.00815)	(0.00755)	(0.00482)	(0.00555)	(0.00607)
F (unm) Edu G				0.516***	0.521***	0.579***	0.407***	0.394***	0.433***
				(0.0548)	(0.0399)	(0.0386)	(0.0298)	(0.0283)	(0.0294)
F (unm) Edu H				0.180***	0.355***	0.405***	0.462***	0.536***	0.546***
				(0.0496)	(0.0386)	(0.0386)	(0.0405)	(0.0271)	(0.0418)
F (w/div) Edu P				0.140***	0.0774***	0.109***	0.0304	-0.0105	-0.0208
				(0.0239)	(0.0295)	(0.0307)	(0.0249)	(0.0191)	(0.0190)
F (w/div) Edu S				0.219***	0.167***	0.198***	0.175***	0.133***	0.104***
				(0.0206)	(0.0165)	(0.0189)	(0.0130)	(0.0110)	(0.0133)
F (w/div) Edu H				0.683***	0.671***	0.817***	0.924***	0.890***	1.087***
				(0.0715)	(0.120)	(0.142)	(0.0862)	(0.0672)	(0.114)
F Age (18-21)				0.068***	0.0759***	0.0825***	0.0693***	0.0687***	0.0683***
				(0.0073)	(0.00554)	(0.00517)	(0.00522)	(0.00484)	(0.00602)
F Age (22-24)				0.124***	0.129***	0.135***	0.102***	0.108***	0.110***
				(0.0061)	(0.00583)	(0.00700)	(0.00593)	(0.00582)	(0.00603)
F Age (25-above)				0.117***	0.130***	0.141***	0.104***	0.122***	0.133***
				(0.0032)	(0.00363)	(0.00347)	(0.00266)	(0.00235)	(0.00263)
Father Edu				0.038***	0.0288***	0.0306***	0.0301***	0.0281***	0.0417***
				(0.0082)	(0.00864)	(0.0108)	(0.00704)	(0.00684)	(0.00884)
Mother Edu				0.073***	0.0635***	0.0506***	0.0449***	0.0465***	0.0495***
				(0.0067)	(0.00512)	(0.00637)	(0.00649)	(0.00585)	(0.00560)
Head				0.394***	0.411***	0.383***	0.170***	0.162***	0.165***
				(0.0032)	(0.00273)	(0.00340)	(0.00254)	(0.00248)	(0.00244)
H Professional				0.599***	0.554***	0.549***	0.312***	0.336***	0.356***
				(0.0159)	(0.0147)	(0.0138)	(0.0130)	(0.0125)	(0.0120)
H Clerk				0.513***	0.411***	0.346***	0.227***	0.177***	0.169***
				(0.0189)	(0.0135)	(0.0226)	(0.0162)	(0.0182)	(0.0277)
HH size				-0.066***	-0.059***	-0.051***	-0.0387***	-0.0369***	-0.035***
				(0.0002)	(0.000212)	(0.000214)	(0.000188)	(0.000160)	(0.00021)
HH own				0.231***	0.298***	0.291***	-0.0150***	-0.0071***	0.0156***
				(0.0037)	(0.00316)	(0.00261)	(0.00206)	(0.00153)	(0.00167)
Technology				0.461***	0.402***	0.375***	0.176***	0.170***	0.184***
				(0.0022)	(0.00167)	(0.00195)	(0.00177)	(0.00154)	(0.00211)
Electricity				0.214***	0.243***	0.310***	0.236***	0.262***	0.302***
				(0.0037)	(0.00224)	(0.00174)	(0.00209)	(0.00170)	(0.00204)
Urban				0.299***	0.336***	0.362***	0.201***	0.218***	0.244***
				(0.001)	(0.00196)	(0.00228)	(0.00142)	(0.00146)	(0.00211)
Literacy Rate							0.0024***	0.0017***	0.0009***
							(0.00005)	(0.000051)	(0.00006)
Poverty							-0.0551***	-0.0561***	-0.057***

							(0.000114)	(0.000130)	(0.00018)
Urdu							0.221***	0.227***	0.223***
							(0.00336)	(0.00272)	(0.00290)
Punjabi							0.110***	0.0950***	0.0585***
							(0.00313)	(0.00240)	(0.00339)
Sindhi							0.0534***	0.0403***	0.0131***
							(0.00416)	(0.00287)	(0.00295)
Pushto							0.133***	0.121***	0.0942***
							(0.00384)	(0.00247)	(0.00238)
Constant	9.487***	10.04***	10.52***	9.478***	9.758***	10.02***	11.25***	11.56***	11.86***
	(0.00174)	(0.0013)	(0.0009)	(0.0055)	(0.00347)	(0.0039)	(0.0060)	(0.00589)	(0.00646)
Observations	633,650	633,650	633,650	633,650	633,650	633,650	633,650	633,650	633,650

*The dependent variable is per capita consumption expenditure (log). Models 1 to 3 provide results with the inclusion of single females. Models 4 to 6 include individual and household characteristics and Models 7 to 9 give results of full models. The significance level reports as *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses.*

As compared to higher degree programs, graduated unmarried females are inclined to increase welfare, on the other hand, divorced and widows females with higher degrees of education can increase household welfare from 80 to 90 percent. The age of the women increases the household welfare in higher quartile as compared to lower. The estimates also suggest that mother education provides better access to welfare as compared to father's education. At lower quartiles, occupations like high salaried perform better for welfare improvement. Each model shows that even lower quartiles perform comparatively better with the household infrastructure such as technology and electricity that direct towards higher living standards. Although across the models, literacy has significant effect on the welfare at 0.75^{th} quartile as compared to the median regression model.

5.4 Endogeneity Bias

The Table 5.4 illustrates the results after controlling endogeneity issue. Similar strategy has developed in this table to infer results as previous ones. The variable of single female is strongly significant and impact positively when unmarried and negatively when divorced and widows. However, there is difference in the ratio under the 2SLS model from 10.5 to 1.9 percent for unmarried and 24.9 to 25.4 percent for divorced and widows ones. Subsequently, the single unmarried females at lower level of education provide wider impact in the last model and gradual increase observe with the higher level of education this validate our results that female human capital can stimulate economy once equipped with research and technology. On the other side, slightly increment has examined for widows and divorced single females and evidently, their participation is 80 times higher than unmarried ones. Collectively effect of the age on

welfare improvement is almost equal in each cohort even after controlling endogeneity. The parental education remain consistent and improve household welfare however, low-income profession of the head of the households highlight more effect on the consumption level. One of the important estimates that becomes highly significant in these results is literacy rate that previously reports insignificant in the random intercept models. In sum up, most of the results are robust and consistent with our hypothesis.

Table 5.4 Regression Results for Ordinary Least Square and Two Stage Least Square Models

	Ordinary Least Square Regression					2SLS
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
F (unmarried)	0.143***	0.0311***	0.206***	0.107***	0.105***	0.0186**
	(0.00374)	(0.00490)	(0.00480)	(0.00373)	(0.00311)	(0.00945)
F (widow/div)	-0.0738***	-0.331***	-0.316***	-0.294***	-0.249***	-0.254***
	(0.00735)	(0.00939)	(0.00906)	(0.00702)	(0.00585)	(0.00778)
F (unmarried) Edu S		0.366***	0.349***	0.0906***	0.0816***	0.144***
		(0.00773)	(0.00746)	(0.00580)	(0.00484)	(0.00806)
F (unmarried) Edu G		1.063***	0.939***	0.568***	0.452***	0.454***
		(0.0370)	(0.0366)	(0.0283)	(0.0236)	(0.0280)
F (unmarried) Edu H		0.712***	0.617***	0.312***	0.510***	0.578***
		(0.0398)	(0.0384)	(0.0297)	(0.0248)	(0.0299)
F (widow/div) Edu P		0.389***	0.328***	0.127***	0.0353**	0.0356**
		(0.0227)	(0.0223)	(0.0173)	(0.0144)	(0.0165)
F (widow/div) Edu S		0.557***	0.458***	0.219***	0.163***	0.164***
		(0.0186)	(0.0190)	(0.0147)	(0.0123)	(0.0147)
F (widow/div) Edu H		1.284***	1.176***	0.743***	0.917***	0.918***
		(0.0900)	(0.0871)	(0.0674)	(0.0562)	(0.0655)
F Age (18-21)		-0.0293***	0.169***	0.0783***	0.0716***	0.108***
		(0.00583)	(0.00570)	(0.00442)	(0.00369)	(0.00515)
F Age (22-24)		0.0547***	0.301***	0.131***	0.109***	0.125***
		(0.00645)	(0.00633)	(0.00492)	(0.00410)	(0.00440)
F Age (25-above)		0.0608***	0.359***	0.125***	0.117***	0.112***
		(0.00263)	(0.00294)	(0.00233)	(0.00194)	(0.00207)
Father Edu			0.0586***	0.0301***	0.0362***	0.0359***
			(0.00945)	(0.00732)	(0.00610)	(0.00601)
Mother Edu			0.0915***	0.0646***	0.0567***	0.0554***
			(0.00592)	(0.00458)	(0.00382)	(0.00423)
Head			0.493***	0.406***	0.180***	0.175***
			(0.00242)	(0.00221)	(0.00189)	(0.00197)
H Professional			0.914***	0.560***	0.316***	0.315***
			(0.0166)	(0.0129)	(0.0108)	(0.0112)
H Clerk			0.726***	0.415***	0.168***	0.167***
			(0.0267)	(0.0206)	(0.0172)	(0.0149)
HH size				-0.0555***	-0.0359***	-0.0360***
				(0.000142)	(0.000127)	(0.000160)
HH own				0.257***	0.0111***	0.0148***
				(0.00215)	(0.00186)	(0.00193)

Technology				0.453***	0.209***	0.209***
				(0.00163)	(0.00145)	(0.00146)
Electricity				0.268***	0.286***	0.287***
				(0.00198)	(0.00176)	(0.00165)
Urban				0.335***	0.229***	0.229***
				(0.00165)	(0.00144)	(0.00143)
Literacy Rate					0.00153***	0.00153***
					(3.83e-05)	(4.23e-05)
Poverty					-0.0554***	-0.0554***
					(0.000110)	(0.000116)
Urdu					0.242***	0.243***
					(0.00244)	(0.00251)
Punjabi					0.0823***	0.0829***
					(0.00258)	(0.00264)
Sindhi					0.0498***	0.0500***
					(0.00286)	(0.00283)
Pushto					0.115***	0.116***
					(0.00278)	(0.00281)
Constant	9.996***	9.984***	9.670***	9.694***	11.50***	11.50***
	(0.00108)	(0.00121)	(0.00190)	(0.00294)	(0.00501)	(0.00518)
Observations	633,650	633,650	633,650	633,650	633,650	633,650
R-squared	0.003	0.010	0.079	0.449	0.616	0.616
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
F-Statistics	800.94	594.25	3402.59	24539.47	37694.99	
Instruments Criteria						
Hausman Test	97.6083	Sargan test	0.88150	First-stage	40195.6	
	(p=0.000)		*(p=0.356)*		*(p=0.000)*	

*The dependent variable is per capita consumption (log). The Model 6 estimates with the help of Instrumental approach. The instrumental variables are dummy variable of elder sister and nuclear family. The statistics given at the end of the Table describes for the diagnostics test for IV techniques. The Hausman test provides F-statistics and Sargan test reports Chi-Square value. It also presents the F-statistics for First stage. The first stage estimation results are in appendices. Robust standard errors in parentheses and significance level reports as *** p<0.01, ** p<0.05, * p<0.1.*

5.5 Robustness Check

Table 5.5 show estimation results of random intercept model with the second dependent variable Adult Equivalent Consumption (Kosec et al., 2018; Dary et al., 2010; Atkinson et al., 1995). The adult equivalent consumption scale has estimated by the number of the adults and the younger ones in the households (Haughton 2009)[51]. The value then estimated by taking logarithm of the adult equivalent consumption expenditure per capita. The OECD (2011) formula for the adult equivalent scale consists of as follows:$aes = 1 + (num_{adults} - 1)x0.5 + num\_childx0.3$. The Statistical Office of the European Union (EUROSTATA) adopted the traditional 1990 scale and modified the OECD equivalence scale by assigning the value of 1 for the first household

[51] (OECD Equivalence Scale formula)

member, 0.5 for the additional members and 0.3 to each child (OECD 2011, 2008, 1982). AIC provides Model 7 as the better fit to estimate the economic welfare. The rate of decrease in the welfare due to the presence of divorced and widow females are higher that is 22 percent. Meanwhile, unmarried females are significant to increase economic welfare by 1.5 percent. Comparatively, highly educated single females whether unmarried or divorced has significant role in the household welfare but it gradually decreases with their age. Parents' education and high salaried job of the head of the household are significant. The male head increases the economic welfare by 18 to 10 percent. The economic welfare has negatively associated with the poverty rate. Different ethnicity groups based on languages show that Urdu language is highly significant to improve the consumption level of the household.

Table 5.5 Estimates of Multilevel Regression Intercept Models: Alternate Specification

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
F (unmarried)		0.0190***	-0.00109	0.00553**	0.0524***	0.0315***	0.0150***
		(0.0021)	(0.00245)	(0.00270)	(0.00272)	(0.00262)	(0.00243)
F (widow/div)		-0.184***	-0.250***	-0.241***	-0.238***	-0.225***	-0.224***
		(0.0041)	(0.00504)	(0.00517)	(0.00513)	(0.00493)	(0.00458)
F (unmarried) Edu S			0.0593***	0.0604***	0.0620***	0.0557***	0.0485***
			(0.00428)	(0.00428)	(0.00425)	(0.00408)	(0.00379)
F (unmarried) Edu G			0.379***	0.378***	0.319***	0.289***	0.254***
			(0.0204)	(0.0204)	(0.0207)	(0.0199)	(0.0185)
F (unmarried) Edu H			0.271***	0.274***	0.252***	0.218***	0.263***
			(0.0219)	(0.0219)	(0.0218)	(0.0209)	(0.0194)
F (widow/div) Edu P			0.106***	0.106***	0.0774***	0.0650***	0.0507***
			(0.0125)	(0.0125)	(0.0126)	(0.0121)	(0.0112)
F (widow/div) Edu S			0.174***	0.173***	0.125***	0.106***	0.0945***
			(0.0102)	(0.0102)	(0.0108)	(0.0104)	(0.00961)
F (widow/div) Edu H			0.526***	0.526***	0.473***	0.399***	0.429***
			(0.0497)	(0.0497)	(0.0495)	(0.0475)	(0.0441)
F Age (18-21)				-0.017***	0.0354***	0.0178***	-0.00163
				(0.00320)	(0.00322)	(0.00310)	(0.00288)
F Age (22-24)				-0.016***	0.0513***	0.0247***	-0.00198
				(0.00354)	(0.00358)	(0.00345)	(0.00320)
F Age (25-above)				-0.011***	0.0695***	0.0378***	0.00852***
				(0.00144)	(0.00168)	(0.00164)	(0.00152)
Father Edu					0.0226***	0.0179***	0.0227***
					(0.00534)	(0.00513)	(0.00476)
Mother Edu					0.0498***	0.0407***	0.0426***
					(0.00335)	(0.00321)	(0.00298)
Head					0.134***	0.181***	0.100***
					(0.00141)	(0.00162)	(0.00152)
H Professional					0.176***	0.158***	0.161***

					(0.00947)	(0.00909)	(0.00844)
H Clerk					0.0133	0.00365	0.0126
					(0.0151)	(0.0145)	(0.0135)
HH size						-0.0072***	-0.0074***
						(0.000146)	(0.000136)
HH own						0.113***	0.0693***
						(0.00169)	(0.00158)
Technology						0.288***	0.318***
						(0.00192)	(0.00179)
Electricity						0.234***	0.240***
						(0.00183)	(0.00170)
Urban						0.622***	0.00238
						(0.00963)	(0.00851)
Literacy Rate							-7.33e-05
							(0.000165)
Poverty							-0.0736***
							(0.000232)
Urdu							0.141***
							(0.00301)
Punjabi							0.0210***
							(0.00347)
Sindhi							0.111***
							(0.00514)
Pushto							0.102***
							(0.00432)
Constant	10.89***	10.89***	10.89***	10.90***	10.81***	10.16***	12.82***
	(0.00828)	(0.00828)	(0.00826)	(0.00827)	(0.00820)	(0.00868)	(0.0126)
Observations	633,650	633,650	633,650	633,650	633,650	633,650	633,650
Number of groups	5,468	5,468	5,468	5,468	5,468	5,468	5,468
Random effects	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**	**Parameter (S.E)**
PSU (Level 2)							
Var (cons)	0.37275	0.37280	0.37123	0.37134	0.36004	0.24732	0.16010
	(0.00716)	(0.00716)	(0.00713)	(0.00713)	(0.00692)	(0.00490)	(0.00335)
Var (Residual)	0.19703	0.19635	0.19604	0.37135	0.19305	0.17806	0.1532
	(0.00035)	(0.00035)	(0.00035)	(0.00713)	(0.00034)	(0.00032)	(0.00027)
ICC							
PSU	0.65419	0.65502	0.65441	0.65451	0.65096	0.5814	0.5109
	(0.00436)	(0.0044)	(0.00437)	(0.00436)	(0.00438)	(0.0048)	(0.00526)
Other Information							
AIC	798060.3	795866.3	794891.9	794809.7	785078.6	732267.9	635721.7
BIC	798094.4	795923.1	795016.9	794968.7	785293.9	732540.5	636062.5
Chi-Square LR test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Log Likelihood	-399027.1	-397928.1	-397434.96	-397390.8	-392520.02	-366109.94	-317830.87
Wald Chi-Square		2201.86	3192.43	3281.12	13149.42	69690.67	186592.52
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is adult equivalent consumption (log). All equations provide random intercept model estimates. Model 1 is unconditional. Robust standard errors are in parentheses. The significance level reports as *** p<0.01, ** p<0.05, * p<0.1*

6. Discussion, Conclusion & Policy Implications

This study analyze the role of single females who are unmarried, divorced and widows in Pakistan and investigate the relationship of the education attainment and economic welfare. I devise effective strategy of multilevel model regression built on theoretical and empirical literature with the help of micro dataset of Pakistan Social and Living Standards Measurement from 2005 to 2016. This study attempts to deal with potential endogeneity between gender and welfare with two stage least square estimator. In addition, I use alternative specification to observe the human capital investment in different quantiles. I also incorporate consistency check with second outcome variable of adult equivalent consumption expenditure. The estimates are extensively consistent across specifications.

The society segregates females on social and marital status, therefore, uneducated single females are prone to gender discrimination, extreme hunger, financial burden and low empowerment rate. My findings suggest highly significant role of never married single females in the growth rate of the household consumption and results remain significant after controlling for endogeneity. The estimates provide strong evidence of inverse relationship between divorced and widowed women and economic welfare. My findings suggest education is inevitable tool to achieve the economic and social welfare (Fafchamps et al., 2014) and each level of education of single females are contributing significantly in the improvement of economic welfare, however, returns of education attribute higher with divorced and widow females (Shephard 2008; Smock 1993, 1994). My results support that single females maximize the returns of the education that primarily beneficial for the unmarried females for their suitors and provide economic stability for the divorced and widow females. Higher education improves living standards that measure women empowerment on household resources and income equality. Broadly, it form productive behavior of the society towards vulnerable females. The findings describe age has diminishing effect, although, females belong to the age group 22 to 24 have maximum tendency to increase the per capita consumption of the household. In addition, physical possession might be another protection for females against social injustice and deprivations. The results are consistent with the direct relationship of female possession of physical asset and welfare improvement (Bowles et al., 2001). Nevertheless, this increase in the welfare is proportionally equivalent to the female's primary and secondary education levels.

The education is the prerequisite for rebuilding the conflicted areas and hope, positive outlook, improve life, accessibility to the outer world, exploring new technology, gain confidence and employment opportunities. It is entirely predictable that education of the single females can mobilize disputed areas into constructive and developed cities for future generations (Shahbaz 2013). The findings indicate negative relationship between the size of the household and welfare that supports our hypothesis. Family planning and allocation of intrahousehold resources are extremely important to meet the demand of increasing population growth rate in the country. It has direct link with the education of the parents (Dreze et al., 2001). I investigate that whether education of the parents are interactive with the per capita consumption of the household. My results are consistent with Litchfield (2008) for the strong effect of parents' education in the increase of welfare. It appears to exert two important factors; firstly, the educated parents are well aware of their resources and financial limitations. Secondly, they are unbiased towards the education of their children. Educated parents can capture the persistent gender gap and contribute in the human capital investment for the long run economic growth by providing education and health facilities to their children (Gounder 2012). The findings suggest that an educated mother has more concerns how to deal with the major socio and economic problems with her cognitive skills. Therefore, mother is proportionally more effective for the child's welfare and human development as compared to the father (Handa 1996).

The findings combined with the head of the household and his profession demonstrate heterogeneity in the labor market. Analysis of the expenditure patterns in the Pakistani household support the high-income level employment (Dixon 1994; Armor 2003). The observed differences in the head occupation suggest the need of research oriented education and reduction in the income inequality. It has equal share for social understanding among household members. Major areas of Pakistan deprived from employment opportunities that restrict the female to work in her cognitive areas (Schultz 1982). This widens the earning differences where high-level income families provide better education to the females but lower income level jobs such as clerks and technicians are hardly maintaining their substantial lives. The explanation offers for the male head of the household as the society has strong roots of patriarchal system. The cultural norms refrain male members to allow their females to work outside the households (Hanushek et al., 2000). On average, a family size of 10 members implies only male earner to bear all the

household expenses and welfare provider. It fosters the autonomy of the male spouse on the household consumption resources and week bargaining power of the females.

My findings explain that intrahousehold characteristics are collective entities for welfare gain. The proportion of the variation in random slope suggest that provision of technology can outclass the vicious cycle of poverty and optimize the per capita consumption of the household (Behrman 1997). Although the household characteristics play important role in the living standard, yet they are quite associated with the people who have sufficient resources and living in the urban areas. Results remain consistent after dealing with causality and broadly suggest urban areas with wide network of roads, transport and information technology excel in providing quality of life to their residents. On the other side, rural areas suffer from higher discrepancies. Whether Jirga system or tribal autonomy, rural areas are mostly reluctant to absorb lifestyle with new approaches and advancement. There is a strong link between welfare and poverty and results are robust after controlling the endogeneity. On the other hand, it is commendable to explain that per capita consumption of the household significantly reduce the probability of the poverty. The study of (Leibbrandt et al., 2014; Cancian et al., 2001) validate my results. The borderline indicates that fostering education opportunities can address the poverty issue at micro as well as macro levels by reducing the unequal distribution of the household resources (Geda et al., 2005).

The multilevel approach adopted by this study also presents that the poverty increase is severe between the PSUs as compared between the households (Sekhampu 2013: Gounder 2004: Datt et al., 2005: Bandyopadhyay 2010). Poverty inclination is inversely proportion to achieve development goals especially at rural areas. Considering socio-demographic variability among ethnic groups based on spoken languages is highly correlated with the population census and findings support with the previous research of Collier (2000), Portes (1995) and, Soroka (2007). The estimates explains that positive dispersion in the spoken languages and literacy have potential for the welfare gain. However, on the other side, literacy rate and welfare has positive and direct effect that is helpful to reduce poverty and achieve welfare goals. Undoubtedly, other factors are also notable with the lower income level and poverty generating effects the household welfare declines that raise unemployment and social unrest.

Languages contribute in the social mechanism to build ethnic groups and they have strong effect on the development of the household (Kimenyi 2006). At one side, languages provide remarkable diversity and cultural outlook and on the other side, they mark differences in socio-economic groups. I take languages as the proxy of ethnicity because they are highly correlates and findings support our hypothesis. The vastly spoken language, Urdu, contributes very significant increase in the economic welfare. Other languages such as Punjabi, Sindhi and Pushto also have positive correlation with the consumption expenditure of the household but their effect is comparatively low. The results show that languages spoken at the tribal areas and limited resources are potentially influence on the living standards better than the advance provinces. In the random slope models, languages highly significant to impact on the welfare by reducing poverty rate. The findings provide strong evidence for improving welfare with the regional languages by incorporating random slope of literacy rate. The reason holds that when education provides in native and comprehensive language it will likely to raise the literacy rate of the country. However, between PSUs variance by incorporating random slope of urbanization explain higher effect on welfare for the languages. This establishes the difference between rural and urban inequality for the welfare gain (Soroka 2007).

The use of multilevel model approach motivates to investigate the variation between different PSUs and households (Jacob 2002). The analysis do not suffer from the second level inferences issue due to the large sample size that commonly figured out by (Raudenbush 1986). First, there is a positive correlation between the PSU effects for the economic welfare. However, some PSU with the higher rate of poverty and illiteracy have less welfare and vice versa. This appears that PSU appears to be different and effective for different kind of the households. Residuals at level 1 is significant at 95 percent confidence interval. The main objective of the use of the multilevel approach has been to show the variation between PSUs in welfare by intake role of gender and their education attainment (Hox et al., 2010). The PSUs effects depend on the welfare as well as their education and gender. A study of residual differentiated by the welfare provide evidence for individual PSUs and households about their potential problems. With increase in the variation of the between households the welfare increases, it also ensure that the model is specified well and precisely explain the parameters with reliability. The variations might attribute due to the following differences: most of the variations can account with metropolitan cities and provinces with better infrastructure that are likely Punjab and Sindh provinces. It might also indicate the

high population density in these provinces. Another potential explanation holds the political influence, parliament. The consumption behavior and the level of expenditure vary from one household to another and it has examined that the lower level of education has lower contribution in the household welfare. The analysis describe that on higher level such as at PSU variations are significant for the same households as they contribute similar characteristics. However, considering within PSUs the welfare changes drastically.

A further strategy to explore the variations in the role of gender and education attainment between low and high-income groups with the selected points on the distribution of the outcome variable is quantile regression (Hao et al., 2007). The gender play important role for the 25 percent richest households, even, negative income shock with divorced and widows females is comparatively lower. Contrary, impact of single females in the welfare is strong in middle and poor households. The results are consistent with Baluch et al. (1998) that economic welfare increases with the increase of education level of the single female. The consumption patterns in the rich household incline to increase with the age of the single females. High-income household, on balance, participating in the welfare investment with educated parents and head white color profession. Meanwhile, the male head of the household found strong association with poor households. Findings reveal that household infrastructure increases the probability to reduce poverty in poor households. The concentration of wealthy households likely to locate urban areas and spoken languages other than Urdu contribute less effective in richest households. Conversely, poor households with native languages and local communication mediums have tendency to achieve the welfare and economic development.

The findings draw valuable suggestions for the policy makers and researchers in formulating economic strategies. Government should support the increase of the household consumption of food and non-durable goods for better quality of life while considering the causes of inflation. Education programs and diplomas should be linked up with the local welfare agencies in order to provide female access to education especially at tertiary level. By considering intrahousehold income distribution, location and family size, minimum wage rate must be revised. Government should increase funding and facilitate female quota system in highly conflicted areas. Media and technology can play influential role in clarifying the misconceptions regarding single females in the society. Online vocational courses and training programs for females who have limited

mobility can boost up literacy rate in the provinces like KPK and Balochistan. It is entirely amenable that economic and welfare differences within the country generate deprivation, distress and poverty among different social classes. Effective policies must be formulated to minimize the regional differences by equal distribution of the resources. The research findings determine some extended points for future studies. Such as, the model can be investigated with multiple random slopes for further levels. It can examine the role of the single males in the larger household sizes with different income levels. The model can be examine with other aspects of the welfare determinants that remain uncovered in this study (Duflo 2012). It has been strongly convinced that the findings of this research deserve to be examined extensively by understanding the aspects of the welfare of the people for effective public resource allocation.

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Appendix A. Tables

Table A.1 Description Analysis of Specific Variables

Table A.1 Descriptive Statistics of Specific Variables

Variables	Observations	Mean	S.D	Min	Max
Per capita expenditure	633650	30777.23	32776.77	0	3001683
Father's education	634631	0.0187763	0.4274072	0	23
Mother's education	634631	0.0617871	0.7883154	0	23
HH size	634631	10.30461	5.580266	4	67
Literacy Rate	634631	33.25714	6.987796	24.3	44.1
Poverty rate	634631	31.38509	26.0772	0	60

Table A.2 Education statistics by gender

Table A.2 Education in Pakistan by Gender and Province 2005-2016 (%)

	Primary			Secondary			Higher Secondary			Graduation		
Provinces	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Punjab	61	64	63	28	25	26	5	5	5	6	6	6
Sindh	71	74	72	18	15	17	6	5	6	6	5	5
Balochistan	70	75	72	21	17	19	4	4	4	5	5	5
KPK	78	83	81	14	11	13	3	2	3	4	3	4
Total	68	72	70	22	19	20	5	4	5	5	5	5

*Table A.2 presents the distribution of the educated males and females by province. It shows minimum percentage in higher level of education. Meanwhile, percentage= (educated person per level/total educated persons)*100*

Table A.3 Education by age

Table A.3 Educated Females by Age Groups (%)

	Married Females				Single Females			
Age-Group (in years)	**Primary**	**Secondary**	**Higher Secondary**	**Graduation**	**Primary**	**Secondary**	**Higher Secondary**	**Graduation**
(15-20)	76	19	3	2	61	29	4	4
(21-25)	68	22	6	5	46	29	14	14
(26-30)	69	18	5	7	45	27	17	17
(31-35)	73	17	4	6	55	22	14	14
(36-40)	75	17	4	4	64	20	9	9
40 & above	70	19	5	6	71	17	6	6
Total	71	19	5	6	59	26	7	7

*Table A.3 demonstrates the education by age that has better percentage before 30 years for single females. Whereas, percentage = (educated females per level/total educated females)*100*

Table A.4 Instrumental variable Estimation: First Stage

Table A.4 Instrumental variable Estimation: 2SLS/First Stage Results for Economic Welfare

Variables	First Stage of the Estimation
F (widow/div)	-0.112***
	(-0.00224)
F (unmarried) Edu S	0.641***
	(-0.00166)
F (unmarried) Edu G	0.0745***
	(-0.009)
F (unmarried) Edu H	0.682***
	(-0.00941)
F (widow/div) Edu P	0.0315***
	(-0.00548)
F (widow/div) Edu S	0.0554***
	(-0.00469)
F (widow/div) Edu H	0.0715***
	(-0.0214)
F Age (18-21)	0.431***
	(-0.00132)
F Age (22-24)	0.237***
	(-0.00156)
F Age (25-above)	0.0314***
	(-0.000818)
Father Edu	-0.0287***
	(-0.00233)
Mother Edu	-0.0591***
	(-0.00147)
Head	-0.0430***
	(-0.000722)
H Professional	0.0142***
	(-0.00409)
H Clerk	0.0140**
	(-0.00656)
HH size	0.000363***
	(-4.87E-05)
HH own	0.0354***
	(-0.000706)
Technology	0.00337***
	(-0.00055)
Electricity	0.00973***
	(-0.000671)
Urban	0.00612***
	(-0.000548)
Literacy Rate	-2.73e-05*
	(-1.46E-05)
Poverty	-0.000157***
	(-4.17E-05)
Urdu	0.00585***
	(-0.00093)
Punjabi	0.00593***
	(-0.000981)
Sindhi	-0.00109
	(-0.00109)
Pushto	0.00414***

	(-0.00106)
Sister	0.346***
	(-0.00224)
Nuclear	0.128***
	(-0.000551)
Constant	-0.0424***
	(-0.00195)
Observations	633,650
R-squared	0.508
Instruments Criteria	
Hausman Test *(p value)*	0.000
Sargan Test *(p value)*	0.881
First-stage *(F-Statistics)*	40.195

*The dependent variable is single female (unmarried). The instrumental variables are dummy variable of elder sister and nuclear family. The statistics given at the end of the Table describes for the diagnostics test for IV techniques. The Hausman test and Sargan test report p values. It also presents the F-statistics for First stage. Robust standard errors in parentheses and significance level reports as *** p<0.01, ** p<0.05, * p<0.1.*

Appendix B. Figures

Figure B.1 Welfare distribution in the provinces of Pakistan

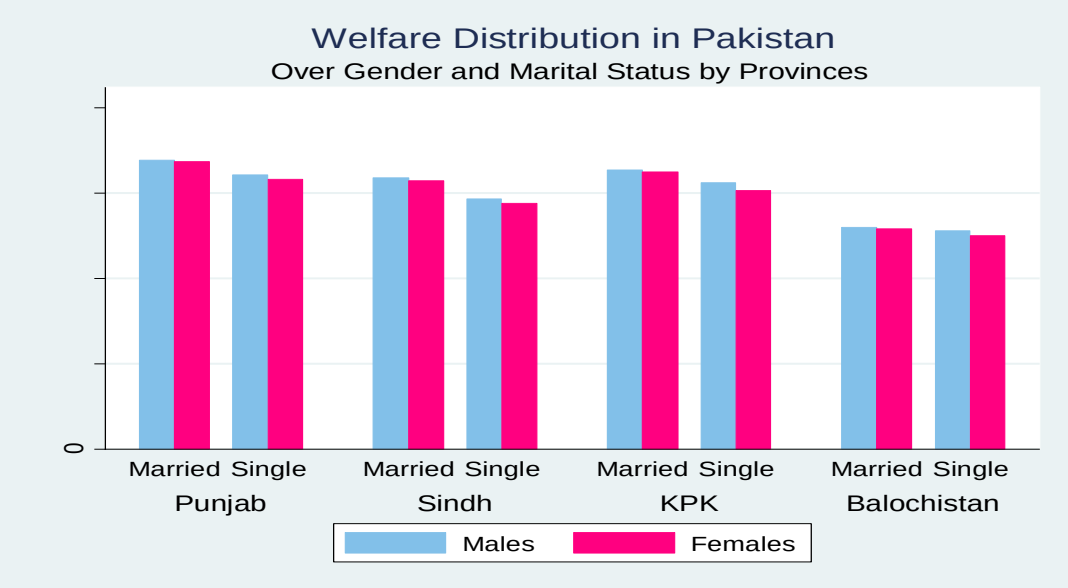


Figure B.1 explains the gender-specific welfare distribution in Pakistan. It shows high level of per capita consumption in Punjab and KPK provinces for males and females both. The lowest rate of consumption observe in Balochistan province that is highly affected area form the internal and external conflict. The span of the distribution of the welfare among provinces is from 2005 to 2016.

Figure B.2 Female Education by Age

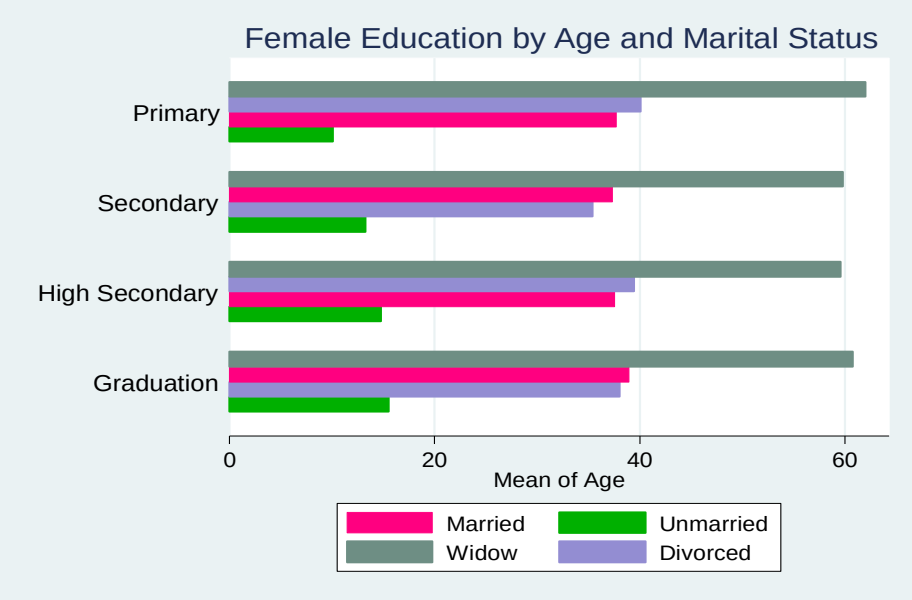
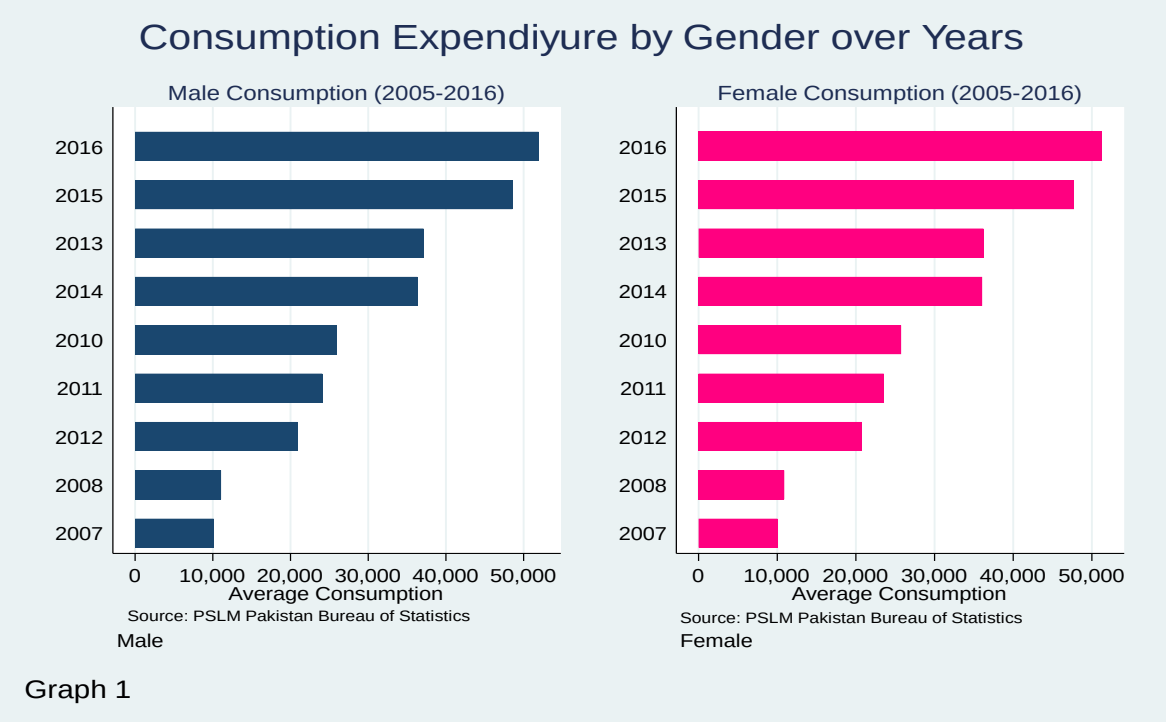


Figure B.2 describes the female education by age and marital status. It explains that with the increase of age, there is increase in the education level but comparatively widows are higher in numbers than others are. However, after the mean age of 20, the tendency of education is higher in divorced females.

Figure B.3 Consumption over the years



The figure B.3 illustrate the increase of consumption level over the years. This gender specific figure explains the in the recent year, males have high rate of consumption level as females, meanwhile, in the year of 2013 and 2014 they have almost equivalent level of consumption pattern.

CHAPTER 4: Education and Gender Differences: Are Girls Neglected in Pakistani Society?

Abstract

The prime objective of this study is to determine education attainment and current enrollment with per capita income and socio-economic characteristics of the households in the framework of gender differences by using Pakistani survey data from 2005 to 2016 with ordered logit and logit models respectively. It also deals with potential endogeneity between education and income per capita of the household by using Two Stage Residual Inclusion (2SRI) approach. Other objective of this study is to examine the impact of educational inequalities in extended models; in addition, it develops alternative strategy to highlight the effect of gender differences in education for economic growth of the household. Finally, it decomposes the gender effect to demonstrate the factors behind unequal treatment with children in a household. The findings provide statistically significant effect of household's income on education attainment and current enrollment even after controlling for potential endogeneity. However, analysis by gender reveal that the educational transition is higher from primary to secondary education attainment, and, personal attributes and household infrastructure are favorable for girls. In contrast, income per capita, educated members, digital access and provincial heterogeneity significantly contribute in boys' current enrollment. Meanwhile, as compared to standard deviation, Gini coefficient of schooling significantly reduces education among girls. The Oaxaca decomposition demonstrates explained gender disparity in education attainment and current enrollment by 61 and 41 percent respectively; however, most of the variation remains unexplained. Findings from alternative specification provides significant decrease in income per capita with gender gap in education and its impact is comparatively lower among boys. The estimates are robust by ordered probit model regression, addition of other explanatory variables and provincial heterogeneity. The study recommends government interventions to reduce gender gap by investing in females' human capital to uplift their socio-economic position in a society to meet economic challenges of the country.

Key words: Human capital, Gender, Education, Ordered logit model.

JEL Codes: O15, I24, I25

1. Introduction

This study has two main objectives; firstly, it aims to determine the education achievement, namely education attainment and current enrollment, with the help of per capita income and socioeconomic characteristics of the household in the framework of gender differences. Secondly, it examines the impact of educational inequalities in extended models; in addition, it develops alternative strategy to highlight the effect of gender differences in education for economic growth of the household. According to the Education for All (EFA) report, knowledge stimulates the stock of the human capital in an economy and increases the probability of equal distribution of the resources regardless of gender, caste, color or regions (Barro et al., 2013). Most studies highlight the impact of educational or gender inequalities restricted to countries and implication of investment returns on economic growth across countries (Bandiera et al., 2013) or within country at macro levels (Senadza 2012; Tomul 2009). Other studies have advocated gender inequality as influencer of economic growth (Sala-I-Martine 1995) while some have strictly contradicted their opinions (Klasen 2002), some do not find its considerable effects (Maitra 2003) or others determine without sufficient endogeneity concerns (Berhman 1997). Meanwhile, past studies mostly focused on the sociodemographic aspects for gender disparities[52] with unidirectional approach of educational effect on income. Some only favor the returns of education by ignoring the alternative income approach for human capital development (Aslam 2009; Tansel 2012; Card et al., 2015).

In nutshell, importance of gender inequality to reach the Millennium Development Goals (MDGs) specifically in developing countries such as Pakistan remain inconclusive and demonstrate lack of research at household or individual levels. Therefore, it requires to analyze the gender difference by examining the relationship between human capital and economic growth at micro level, and to observe the endogenous effect of household income on education achievement (Subrahmanian 2008)[53]. However, it is not straightforward and direct to measure gender gap in the framework of micro data with qualitative and quantitative approaches[54] in

[52] The previous literature focus on the determination of the education with age and grades only. They ignored the influence of each level of education with the perspective of gender equality and economic growth (Iddrisu 2014, Sackey 2007, Burney et al., 1995, Kingdon 2001, Psacharopoulos et al., 1994).
[53]For example, Berhman (1997), Chaudhri (2002) and Glick (2000) have not sufficiently examined the potential endogeneity for human resources development.
[54] Measuring gender inequality in education in South Asia (UNICEF 2006).

developing countries. Notably in Pakistan, the existence of strong patriarchy, cultural norms, regional conflicts and son preferences are among major factors behind lower female human resources.

The gender differences have transitional and long run effects and therefore, it is important to highlight those circumstances that elicit investment on a male child. Firstly, gender equality and other welfare measures remain unobserved and undocumented due to severe parental discrimination against daughters and consider unaccountable that some studies have failed to estimate in terms of education expenditures and household's income (Best et al., 2016; Odhiambo 2015). Secondly, a boy has 15 percent more chances to attend the school as compared to the girl because former is considered as financial assistance for parents in their old age. Similar, evidences provide weak correlation between household per capita income and education achievement for daughters mainly called as temporary residents (Munshi 2017). It eventually deteriorates the female employment and wage rates, empowerment and their protection rights (Postiglione 2015).

Traditionally, parents consider single-gender schools inappropriate for their daughters; therefore, 39 percent girls are not enrolled in these schools as compared to the 30 percent boys. Land ownership for school construction and the allocation of the resources have been remained politicized. In contrast, economic returns from secondary and tertiary education are accounted higher regardless of gender if the political and economic unrest have minimized (Shang et al., 2013; Bandiera et al., 2013). Addition, only 2.9 percent share of GDP in education also reveals that education is not a priority at the state level (World Bank 2017). Similarly, insufficient female teaching staff, security concerns and education expenditures discourage parents to educate their daughters (Canes et al., 1995). Besides, existing concepts regarding females for procreation and increase fertility rate, domestic chores, and early marriages have limited their human capital for economic growth (Amartya Sen 1992) and welfare of the country (Nguyen et al., 2015).

This study contributes in the existing literature in following manners. Firstly, factors that influence on the education achievement have probability of misspecification due to limited information about the child's environment and family structure; therefore, it needs to concentrate on the determinants of human capital at micro level. In addition, the issue of gender differences

in education has not received much attention among researchers in Pakistan[55]. This requires highlighting the importance of gender gap in education by examining categorically for complete years of schooling, and, currently enrolled children in the households over the years with longitudinal dataset of Pakistan that I believe has never been used so far. Secondly, this study develops and implements an empirical strategy to deal potential endogeneity of household's per capita income on education achievement[56] for non-linear models by exploiting exogenous variation of income shocks, windfall income and family background characteristics with Two Stage Residual Inclusion approach. Thirdly, it may capture the gender discrimination treatments whether it exists or not along with household investment that might has more incentives to boys as compared to girls with different parameters of inequalities and decomposition of gender effect. Fourthly, this study adopts alternative specification to analyze the effect of gender differences in education and socio-economic characteristics on household's income at micro level.

I begin with the introduction that covers the main interest of the study that is gender role in education in section one. The key features, education statistics of Pakistan of recent decades and undergoing educational programs are discussed in section two. The third section explains the importance of gender equality with the previous evidences. Fourth section describes the methodology and data description. The section five presents results and analysis, while, final section concludes and provides policy implications and limitations of the study.

2. Stylized facts in Pakistan

The educational policy in Pakistan has shown major shift of the funding from higher education to the basic education after 1990. The allocation of the funding to the grades 1 to 8 increased from 32 percent in 1983-1988 and 50 percent in 1993-1998 (Mahmood 2004, 1998) but the government expenditure as percentage of GNP (Gross National Product) has remained low from 1990 to 1996 (World Bank 2001). However, the government has given preference of increase number of girls' enrollment to meet Universal Primary Enrolment targets of MDGs but in last

[55] Few research works have observed on other areas such as on women socioeconomic profile by Raza (2013), Qureshi et al. (2012) and, Shah (1986). Others investigated on female participation by Chishti et al. (1989), cultural context in studies of Ibraz (1993), women decision making by Naqvi et al. (2002). Recent studies have considered impact of female education on labor force participation by Faridi and Basit (2009); Azid et al. (2010).
[56] Past studies have tackled endogeneity issue but they remain limited in specific domains such as Aslam (2009).

decades there have been one girls' school as compared to two boys' school[57]. Government has attempted to curb the false number of the students in the school where the education is free by sanctioning small amount of fees. Many obstacles have interrupted to achieve the educational goals such as lower per capita income of the household, mobility restriction, late admission and poor performance of the child that cause repetition of the same grade over the years (Mahmood et al., 2012).

One of the main strategies under the framework of Sustainable Development Goals (SDGs) includes females' enrollment rate in science, technology, engineering and mathematics (STEM) to increase gender equality. This agenda has framed for 2016 to 2023 having core element of the gender equality (SDG 5) which focuses not only the socio-economic side but also radical expansion in investment and business enterprises by increasing highly educated female employment opportunities with secure working environment (Munshi 2017)[58]. While, Gender Parity Index estimates for the gross enrollment rates for males and females separately has ranked Pakistan 151 out of the 153 countries that provides low portfolio of education achievement. According to UNESCO, 130 million girls between 6 to 17 years of age have never enrolled to the schools. In fact, Umbrella Facility for Gender Equality (UFGE) trust that has developed in 2012 aims to narrow the gender gap with the public collaboration among 50 developing countries. It has examined that approximately 22.6 million children of school going age for secondary level and 5 million children for primary level have never enrolled in any institution.

Even, demographically several statistics reveal severity of gender gap with the low enrolment rates. Such as, 10 percent girls are out of the school in Islamabad that is the capital and highly developed city of Pakistan. Furthermore, tribal areas in the province of Balochistan and in rural areas estimate 75 percent girls out of the schools. Critically, estimates are available that girls receive only 1.01 percent of education throughout their lives as compared to the boys of their relative age groups. Consequently, Ministry of Women Development with social welfare organizations improved retention by accommodating of half million girls in 5000 primary schools in 2006 (TAWANA Pakistan Program).

[57] Warwick, D. P., & Reimers, F. (1995). Hope or despair? Learning in Pakistan's primary schools. Greenwood Publishing Group.
[58] World Bank Group Gender Equality, Poverty Reduction, and Inclusive Growth Gender strategy 2016-2023.

To encourage literacy rates in secondary education 4 million scholarships for girls in public schools have been launched (World Bank 2017). The Punjab government with the initiative of World Bank Program is committed to build 7,000 schools to facilitate 21,000 students in rural areas. In addition, the Alternative Learning Programs (APLs) of UNICEF support 1,400 girls in traditional formal schools, besides, UNICEF and UNESCO are collaborating with Education Ministry of Pakistan to support development of SDG4 (Sustainable Development Goals) Action Plan with trustworthy monitoring mechanism and incorporating education plans and strategies.

Other relative issues across the country correlate with the political instability and mishandling of the education sector. Firstly, missing, untrained and underqualified teachers have failed to establish any incentive for parents to educate their daughters, especially in public schools. If above criteria is met, the cost associated with the education attainment is beyond the financial capacity of parents. In 1972, all schools have nationalized by the state but after Five Year plan (1983-1988), private schools were encouraged to open under government curriculum (Tan et al., 1987). This introduced another wave of gender discrimination, as parents prefer private and costly schools for the boys and, public and cheaper schools for the girls. Secondly, gender-segregated schools and degree programs manipulated the performance and cognitive skills of the girls. As empirically, it is evident that girls experience productive scores in the presence of adequate female faculty members (Carrell et al., 2010).

3. Literature Review

Education can improvise labor inputs to facilitate the long run economic growth and development (Belfield 2000) that are the basic elements of Cobb-Douglas production function and economic growth models (Romer 1994)[59]. The accumulation of human capital from school time, quality of education and educated parents with the other factors of production can derive poor countries into revolutionary process of growth (Glomm 1997). According to the Livingstone (1997, 2018) the addition of schooling remains questionable debate for human capital contribution since 1970, which can determine by the enrollment rate of the country. Many countries experienced the improvement of the enrollment rates but the continuous growth rate seems difficult to achieve.

[59] P. Roemer, Increasing returns and long-run growth', Journal of Political Economy vol. 94, 1986, pp. 1002-1037;
R. Lucas, 'On the mechanics of development planning/ Journal of Monetary Economics vol. 22, no. 1, 1988, pp. 3-42; and
R. Barro, and Xavier Sala-i-Martin, Economic Growth (New York: McGraw-Hill, 1995).

This dilemma of the human capital and education can be revisited and revised that focused not only the quantity of the education but also for the quality of education. While, similar research advocate quality of education with the socio-economic characteristics of the country for human capital growth (Vinod et al., 2007).

Past studies find significant relationship between gender equality in education and economic growth. It has examined higher marginal return to education by female students and this impact is transgenerational that reduce fertility rate. Galor and Weil (1993) in his studies "The gender gap, fertility and growth" examined the mechanism between fertility and growth with compiling three components in their models. They formulated a three-period overlapping generation model with two people; man and woman with equal brains. The first component states, women's relative income increase with addition in the capital per worker, secondly; relative wage of women reduces the fertility by increasing cost of children more than household capital and lastly; lower level of fertility rate improves again capital per worker. These factors eventually boost up the economic growth.

The relationship of demographic development and the long-run economic growth in Europe explain trends of female-to-male human capital coordination consist of equilibrium process (Digdowiseiso 2010). The study of Lagerlof (2003) focuses on the coordination games among families to invest less in girls' education as compared to boys establishing Nash equilibrium due to gender discrimination despite the symmetric sexes. They used the data of World Penn for 1990 and the key variables were number of years of schooling to people above 15 years of age and fertility rate. The paper views the gender stereotype for equal education investment on both sexes of the children by becoming optimal atomistic parent.

Allocation of time of boys and girls schooling, activities to generate income and household work have investigated using data of Peru by Illahi (2001). Boys spend most of the time outside and girls mostly remained busy in-house chores evaluating econometric findings, which suggest that for the household welfare the changes affect the schooling and housework for girls rather than boys. The study conducted by Subrahmanian (2006) "Mainstreaming gender for better girl's education: policy and institutional issues," emphasized on the needs of the implementation of policies for gender awareness by moving beyond targeting women to think systematically on

different sectors of education association and the measures attained on different points as outcomes.

Other study working on the household dataset of Nigeria, Rahji M.A.Y (2005) used the multistage sampling technique for data collection and probit modeling for the data analysis. Evidence from the estimations show that more boys have enrolled than girls, predicting gender gap of 12.56 per cent in favor of boys. Klasen and Lamanna (2003) investigated the impact of gender gap in education and employment on economic growth by applying cross-country panel regression from 1960 to 2000. The studies focused on the long run economic growth.

Empirical studies find that wage improves by enhancing female education and their returns are quite larger than males (Card et al., 2015). Evidences reveal that not only gender gap can reduce by investing in the females' education but also human development outcomes such as chances of child survival will be maximized and better status of health and average years of schooling (Schultz 1993). Furthermore, the study adopted Error Correction Mechanism by Lawanson (2009) for Nigeria from 1983 to 2007 and investigated the positive effect of the investment on health and education on economic growth.

Klasen (2000) argue the growth rates differences from 0.4 to 0.9 between East Asia and Sub Saharan Africa, South Asia and Middle East from point estimates can consider by the huge gender gaps in education having mostly influence in the latter regions. The same results found positive working with the school enrollment and other factors with different cross-countries data such as Beutel et al. (2002) work on Nepal by using number of schooling in years. Robb et al. (2012) examines the gender differences in education attainment using data of university's graduates by ordered probit model. The female students perform better than male but they are less likely to obtain first class degree. It is evident that factors such as type of institutes, individual's ability or choice of subjects are not the reason for gender differences, but the effects of these factors rise gender gap in performance. The empirical work conducted on the dataset based on university grants. It estimates education outcome with variables such as age, marriage, entry-level education, parents' occupation and subjects. The predict probabilities explains that the likelihood female students get first class degree is 5 percent, compared with 8 percent of the male students.

These differences can be explained by possible ways in which how male students are assessed, biased and prejudiced assessment or may be institution specific factors (McNabb et al., 2002). Treatment differences between sons and daughters in education by the parents in developing countries by using households' survey 1995 are estimated by Kingdon (2002). The analysis showed significant difference in the treatment of daughters' education for intra household structure that is hugely unexplained component in educational attainment. The stratified sample of 1000 households in Lucknow district Uttar Pradesh was conducted on personal and family characteristics including labor market activities. Gender gap in enrolment rates and years of schooling is statistically significant in district of Uttar Pradesh where 75 per cent of the disparity is unexplained. However, the study remain unable to control the potential endogeneity with age and women's expected returns to employment for the education outcome.

Traditional norms favors to boys as compared to girls are observed in rural China (Bauer et al., 1992; Freedman et al., 1990). The other study of Maitra (2003) explains no gender difference in the current enrolment rates between 6 to 12 years of age but higher gap in grade attainment for girls between 13 to 24 age using model of probit and censored probit model simultaneously. This study examines the results based on individual and family characteristics. The first dependent variable was dummy of current enrolment if enrolled currently or otherwise and second one was categorized from 0 to 3 with no level of education to highest level of education completed above grade 10. The explanatory variables used were religion, household size, siblings, household head education and occupation, log of per adult household expenditure and other household characteristics such as bedroom, water, toilet and availability of electricity. The data used from the Matlab Health and Socio-Economic Survey (MHSS) of 1996 in rural Bangladesh containing 149 villages and 180,000 estimated population as per 1982 census. The endogeneity issue of the permanent income tackled with the residual term of the log of the adult expenditure variable. The null hypothesis of exogeneity of permanent income could not be rejected in current enrolment estimation but could be in highest-grade estimation. The coefficient estimate of gender dummy was positive and significant referring that probability of attaining post-secondary schooling is significant in girls as compared to boys with 2.6 percent marginal effect.

In context with Pakistan, Mahmood et al. (2012) by using time series data from 1971 to 2009 for Pakistan investigated the human capital investment and economic growth. In his work, the ARDL

(Autoregressive Distributed Lag) and Ordinary Least Square (OLS here after) models show positive effect between high enrolment rate and economic growth rate in short run as well as in long run. Chaudhry (2007) in his studies "Gender inequality in education and economic growth: Case study of Pakistan" focused on the positive impact of gender equality on economic growth by increasing girls' enrolment ratio and decreasing the cultural and social barriers for female education. Naila Kabeer (2005) in her studies examined the women empowerment is inevitable without reducing gender gap in education. The freedom of choice to secure and protective lives of females from basic health issues to higher education attainment are the mainstream for the achievement of the MDGs (Bar et al., 2015). The funding shift in 1990s' education policy in Pakistan from higher education to the basic primary education was major challenge.

Interestingly, Lloyd et al. (2005) find the allocation of the budget for education add up to 50 percent increase until 1998. It appears that this access is more important for the girls as compared to the boys. The studies assessed the role of primary school availability and types including private and public schools for the boys and the girls based on the parent's decisions. This is also worth noticing that number of researchers have estimated models of the likelihood of school entry using cross-sectional data that control for relevant family and individual factors and add some measure of school access. Some of these factors include the presence of a primary school either at the time of the survey or at the time of the schooling decision such as study of Sawada et al. (2009) for Pakistan, while other explain education endowments with the distance to the nearest school (Hazarika 2001)[60].

Sabot (1992) estimated low school enrolments in rural areas and latent demand for girls' schooling using survey by International Food Policy Research Institute. The demand of schooling also channelized by other factors such as parents' education, landholdings and income (Burney et al., 1995; Khan et al., 1997). Poverty and non-availability of enough resources to education found huge dropouts from schools, which included time allocation for the take care of younger siblings. The adolescent of the girls is directly proportional to the mothers' household labor time where boys exempted from taking care of their siblings, additionally, studies (Chishti et al., 1991)

[60] The number of years a school has been present in the community for Nepal (Beutel et al., 2002), for Tanzania (Bommier et al., 2000) or the presence of a school within some fixed distance or travel time for Mozambique (Handa et al., 2000).

provide the house chores and younger siblings care have been observed in peak at girls' age 10 to 15 years.

Data used in the study of Sathar et al. (2005) gathered from 12 rural communities in provinces of Punjab and Khyber Pakhtun Khawa (KPK). The per capita consumption information was used by PIHS (Pakistan Integrated Household Survey, 1995-1996). Sixty households randomly selected and currently married women between 20-45 ages have interviewed. The data were covered 38 schools including public and private. The parents' preference was strong for separate schools for the girls (Sathar et al., 2001). The nested multinomial logit model used for estimation of mutually exclusive choices not to enroll, to enroll in public or private school. Other variables used are father's education, mother schooling, public and private schools' availability and teachers residing in the same village.

Chaudhary (2009) used censored ordered probit model to estimate the gender gap in education by using the data of Uttar Pradesh–Bihar Survey of Living Conditions, 1997-1998 for different age groups. Previous studies has focused gender gap in education but not for long period or for each level of education with respect to household income. He finds way of poverty alleviation that examined by improving female education, reducing family size and dependency ratio with expansion in the female labor participation in Southern Punjab Pakistan. He used individual, household and community level characteristics and capture parents investment on child with the additional variable of salaried employment. Therefore, ignoring the direct and reverse effect of income and schooling, the study measures the human capital development without considering consumption and income patterns. He used availability of food grains and fuel for exogeneity concerns contrary to Maitra (2003) who instrumented consumption expenditure with livestock and durable goods to analyze the education effect on the household development.

The study of Galick (2000) controlled the endogeneity with the sample segregation based on the age, without providing trend and direction of the parent's education on the children school outcomes. While, working on the cognitive achievement rate of selected 800 households for rural Pakistan, Berhman (1997) explains that returns of education is high with the quality of education and exposure of the students among different teachers. The study used current income and estimated the education expenditure with the set of family and household characteristics but the meagerly focus on the family income and its causal behavior on the cognitive achievement.

4. Methodology and Data

4.1 Data and Variables

Data:

This study uses repeated cross-sectional data from the Pakistan Social and Living Standards Measurement (PSLM) survey conducted by the Pakistan Bureau of Statistics (PBS), Government of Pakistan, for the six rounds from 2005-2016[61]. It has designed to provide social and economic indicators at provincial and district level, which started from 2004 and appears to be true presentation of the country[62]. The sample size of PSLM surveys is 80000 households approximately[63]. The total number of observations after pooling data is 749,503.

Dependent Variables:

This study uses two alternative measurements of education achievement, firstly, highest grade completed described as education attainment with four categories restricted to the age group 9-24 years of children whereas these categories are constructed by adopting past literature (Maitra et al., 2003) and school completion standards of Pakistan Education system[64]. In addition, children for primary, secondary and tertiary education attainment with respect to none education belong to age groups 9-15, 16-19 and 20-24 years while considering years for the repetition and late admission in the schools[65]. The selected children are not currently enrolled and not having status of head and working person. The second measurement describes as current enrollment in which children restricted to 5-24 years of age if they are currently enrolled or not, whereas, official entry age of child in primary school is also 5 years.

[61] 2005-06, 2007-08, 2010-11, 2011-12, 2013-14 & 2015-16.
[62] The objective of PSLM is to establish the distributional impact of the development programs considering the government expenditure expansion and welfare of people accordingly. The data calculated from these surveys is basically used for the monitoring and assessing the Millennium Development Goals (MDGs) indicators and assisting the government to formulate and design policies and strategies for poverty reduction, employment opportunities, gender equity in education and economic development.
[63] The reasons to use PSLM data conducted by PBS are following; Firstly, PBS takes special measures for the quality and reliability of the data by monitored team with supervisors for the field wok. Entire data is taken from all the regions of Pakistan to the Islamabad Headquarters for further processing. Secondly, the survey covers wide range of topics such as; education, health, occupation, services etc. Thirdly, the survey is the main mechanism for monitoring Millennium Development Goals (MDGs) indicators in Pakistan.
[64] "Education System in Pakistan Problems, Issues & Solutions". pgc.edu. 17 November 2017. Retrieved 24 March 2018
[65] For details see Table 4.1. Also, the highest grade obtained after completion of professional degrees such as MBBS, Law, Agriculture, MPhil, MS PhD and any other highest degree have accounted in survey with code 17 to 20.

I estimate results for education attainment by ordered logit model in which categories define as,

$$Education\ attainment = \begin{cases} 0 = \ None\ education \\ 1 = Primary\ education\ (Grade\ 1-5) \\ 2 = Secondary\ education\ (Grade\ 6-12) \\ 3 = Tertiary\ education\ (Grade\ 13-16) \end{cases}$$

Whereas, current enrollment is dichotomous outcome variable and is examined by using logit model for the children who are not head of the household and not having status as working person.

$$Current\ enrollment = \begin{cases} 1 = Currently\ enrolled\ in\ school\ or\ institutions \\ 0 = otherwise \end{cases}$$

Explanatory Variables:

***Child characteristics*:** The explanatory variables include dummy variables of gender, age, square of age of children depending on the measurements of education for ordered logit and logit model regressions as listed in the Table 4.1.

Individual characteristics: Other explanatory variables include marital status of the household members (Aslam 2009). I include series of dummy variables for the education of the head, and parents as well as members of the household with secondary education and numeracy skills who are above 24 years of age (Kingdon 2002). I include number of siblings (Hazarika 2001; Maitra 2003) to control the reciprocation of quantity and quality of current enrollment. Additionally, occupational heterogeneity is controlled with professions of the household's members from high salaried (office) to low salaried (labor) workers (McNabb 2002).

***Household characteristics*:** These characteristics include per capita income and size of the household. I proxy for the household infrastructure and technology advancement with the availability of the electricity and gas. The availability of the internet and broadband in the household is taken as the proxy for the digital access to the children of the household. This variable has intuition regarding the modernization of education system in the developing country such as Pakistan. As we also witness the demand of the digital access for education during the rise of pandemic in late 2019 to 2020 that shifted most of the work online. This variable can provide the avenue to establish studies in near future. The variable hold four categories for full, intermediate and limited access of the internet and broadband as compared to no access. I include

dependency ratio that is number of children less than 15 and older above 65 years divided by total household size (Chaudhry 2009). I control education spending in current enrollment model. In addition, I also control for house ownership, any establishment other than agricultural land and currently owning any part of the land where household members cultivate (Sawada 2009; Maitra 2003). Finally, I control community characteristics by including dummy variable for urban location and provinces of the country (Holmes 2003; Hazarika 2001).

Table 4.1 Description and Summary Statistics of Selected Variables

Variables	Description of Variables	Mean
For Education Attainment		
Dependent Variable		
Education attainment Primary	=1 if the highest level of the education is primary (Grade1-5) for child aged (9-15)	0.122419
Education attainment Secondary	=2 if the highest level of the education is secondary (Grade 6-12) for child aged (16-19)	0.092117
Education attainment Tertiary	=3 if the highest level of the education is tertiary (Grade13-16) for child aged (20-24)	0.021581
Education attainment None	=0 if no education aged (9-24)	0.763881
Child Characteristics		
Gender (9-24)	=1 if the child is girl aged (9-24); =0 if the child is boy aged (9-24)	0.48954
Age (9-24)	Age of the child (9-24 years)	15.9256
Sq. age (9-24)	Square if the age of the child (9-24 years)	273.5399
For Current Enrollment		
Dependent Variable		
Current Enrollment	= 1 currently enrolled children age (5-24)	0.4129264
	= 0 currently not enrolled children age (5-24)	0.5870736
Child Characteristics		
Gender (5-24)	=1 if the child is girl aged (5-24); =0 if the child is boy aged (5-24)	0.487916
Age (5-24)	Age of the child (5-24 years)	13.55091
Sq. age (5-24)	Square if the age of the child (5-24 years)	215.5698
Individuals Characteristics		
Married	=1 if the person is married; =0 otherwise	0.374965
Parents Edu	=1 if any parent of the household is educated; =0 otherwise	0.015189
Head Edu	=1 if any parent of the household is literate ; =0 otherwise	0.075203
Member Edu	=1 if the person above age 24 in the household has lower secondary education besides parents and head; =0 otherwise	0.009678
Member Numeracy	=1 if member of the household can solve simple mathematical questions; =0 otherwise	0.873446
Officer	=1 if the person in the household is senior officer; =0 otherwise	0.011924
Clerk	=1 if the person in the household is clerk; =0 otherwise	0.005813
Operator	=1 if the person in the household is machine operator; =0 otherwise	0.011678
Manager	=1 if the person in the household is senior manager; =0 otherwise	0.006759
Technician	=1 if the person in the household is technician; =0 otherwise	0.008447
Household Characteristics		

PC income	Log of per capita income of the household (in Pakistani Rupees)	9.28632
HH size	The size of the household	8.33701
Dependency Ratio	The number of children less than 15 and older above 65 years divided by total household size	0.42225
Siblings	Number of the younger siblings in the household	4.25032
Electricity	=1 if the household has facility of the electricity; =0 otherwise	0.78953
Digital None (Reference Category)	=0 No access to any internet and broadband in the household	0.01224
Digital full	=1 full access to any internet and broadband in the household	0.44182
Digital inter	=2 intermediate access to any internet and broadband in the household	0.00616
Digital limit	=3 limited access to any internet and broadband in the household	0.53975
Gas	=1 if the household has facility of the electricity; =0 otherwise	0.369322
Establishment	=1 if HH has nonagricultural establishment; =0 otherwise	0.095941
Cultivate land	=1 if HH cultivate agricultural land; =0 otherwise	0.095349
Education spending	=1 if the household spend on education; =0 otherwise	0.286248
Own house	=1 if the household have their own house; =0 otherwise	0.734726
Urban	=1 if the person lives in the Urban Area; =0 if lives in the Rural Area	0.444532
Punjab (Reference Category)	=1 for Punjab Province	0.40087
Sindh	=2 for Sindh Province	0.253882
KPK	=3 for Khyber Pakhtun Khwa Province	0.214606
Balochistan	=4 for Balochistan Province	0.130631
Instruments and Inequalities for Education Attainment		
Income Shock	= 1 if the head is unemployed ; =0 otherwise	0.09396
Grandparents' resource	=1 if grandparents have any non-labor resources; =0 otherwise	0.09998
Gini (9-24)	=Gini coefficient for education inequality in complete years of schooling for children aged (9-24)	0.32354
AYS (9-24)	=Average years of schooling in complete years of schooling for children aged (9-24)	7.553154
SD (9-24)	=Standard deviation for inequality in complete years of schooling for children aged (9-24)	2.555818
Gender gap (9-24)	=Gender gap in education attainment due to illiteracy for children aged (9-24)	-0.0084605
Gender diff. (9-24)	=Gender difference in complete years of schooling for children aged (9-24)	-0.066774
Gender Ratio (9-24)	=Gender gap ratio between boys and girls in complete years of schooling for children aged (9-24)	0.8267828
Instruments and Inequalities for Current Enrollment		
Windfall income	= Average unearned income as gifts and lottery etc.	52.4576
Income difference	= Difference of HH average per capita income and national household average per capita income in log	-203.0089
Gini (5-24)	=Gini coefficient for education inequality in currently enrolled children aged (5-24)	0.458874
AYS (5-24)	=Average years of schooling in currently enrolled children aged (5-24)	5.264408
SD (5-24)	=Standard deviation for education inequality in in currently enrolled children aged (5-24)	3.032476
Gender gap (5-24)	=Gender gap in currently enrolled children due to illiteracy aged (5-24)	0.001101
Gender diff. (5-24)	=Gender difference in currently enrolled children aged (5-24)	-0.12297
Gender Ratio (5-24)	=Gender gap ratio between boys and girls in currently enrolled children aged (5-24)	0.973261

4.2 Empirical Strategy

4.2.1 The Model:

The underlying concept for the ordered logit model for education attainment is to incorporate intermediate continuous variable says y in latent regression accompanied with observed (x_i) explanatory variables and unobserved error term (ε_i). The range of y that is divided in adjacent intervals that demonstrate four categories including: 0 = no education, 1 =primary education, 2 = secondary and 3 = tertiary education respectively related to latent variable (Y^*). The underlying process might built on the similar approach to the logit model that add error terms furthermore ordered logit model assumes continuous process relating to an unknown variable (Y^*) to independent variables (x_i) by some function.

The structural model for latent education is,

$$Y_i^* = x_i\beta + \varepsilon_i \quad (1)$$

Where, β is vector of parameters to be estimated, ε is disturbance term which is assumed to be independent across observations and y^* can take value with observations.

For the discrete choices the following are observing as,

$$Y_i = 0 \ if -\infty < x_i\beta + \varepsilon_i < \tau_0 \qquad for \ (No\ Education) \quad (2)$$

$$Y_i = 1 \ if \ \tau_0 < x_i\beta + \varepsilon_i < \tau_1 \qquad for \ (Primary\ Education) \quad (3)$$

$$Y_i = 2 \ if \ \tau_1 < x_i\beta + \varepsilon_i < \tau_2 \qquad for \ (Secondary\ Education) \quad (4)$$

$$Y_i = 3 \ if \ x_i\beta + \varepsilon_i > \tau_2 \qquad for \ (Tertairy\ Education) \quad (5)$$

Where Y is the category of education attainment and τ denotes the threshold parameters briefly explaining the transition from one category of education attainment to another category. Consequently, τ must satisfy the rule according to $\tau_0 < \tau_1 < \tau_2 < \tau_3$ as the ε_i is logistically distributed. The following probabilities can be observed as,

$$P(Y_i = 0) = P(Y_i^* \leq \tau_0) \quad (6)$$

$$P(Y_i = 1) = P(Y_i^* \leq \tau_1) - P(Y_i^* \leq \tau_0) \quad (7)$$

$$P(Y_i = 2) = P(Y_i^* \leq \tau_2) - P(Y_i^* \leq \tau_1) \quad (8)$$

$$P(Y_i = 3) = P(\tau_2 \leq Y_i^*) \quad (9)$$

Hence, the probability of outcome by observing can imply as,

$$P(Y_i = j) = F(\tau_j - x_i\beta) - F(\tau_{j-1} - x_i\beta) \quad (10)$$

Meanwhile,

$$F(.) = \frac{exp(.)}{1 + exp(.)} \; demonstrates \; as \; P(Y_i = j) = \frac{1}{1 + e^{-\tau_j + x_i\beta}} - \frac{1}{1 + e^{-\tau_{j-1} + x_i\beta}} \quad (11)$$

Whereas, the log likelihood function for ordered logistic regression,

$$\sum_{i=1}^{J} \sum_{j=1} Ln\,[F(\tau_j - x\beta) - F(\tau_{j-1} - x\beta)] \quad (12)$$

The conversion formulates in multi-equations ordered logit models with each equation presenting logit model (Williams 2005).

The Econometric Model: The main econometric model therefore is,

$$Education\ Achievement = f(PC\ Income, Individuals., HH, Provinces + \varepsilon_i) \quad (13)$$

4.2.2 Endogeneity Bias:

In determination of education achievement, per capita income of the household might be related to many bias issues. The possible endogeneity can be due to omitted variable bias, as income is likely to be measured with errors, and (reverse) causality that is main econometric challenge to identify in this study. There is possibility that per capita income is likely to be related with unobservable factors that affect the education achievement in many ways that are not included in regression and lead to omitted variables bias. In addition, causal relationship may be existed with investment in human capital. These include parental economic conditions, social status and any spurious third factor like preferences that could related to education with higher income. On the other side, reverse causality might occur if the child poor performance in education consequently relate to poor economic condition as well as child's deteriorate development outcome might associated to any external shock to mitigate the household's income level. Therefore, the best approach is to use Instrumental Variable technique to address all these issues.

The literature explores per capita income as endogenous variable that has dealt with the parental, household characteristics including employment, education, and farm activities (Behrman et al.,

1997; Bratti 2007; Hoogerheide 2012; Kuehnle 2014). Some researchers use corresponding variable as permanent income (Kingdon 2005) or union membership of head or father within community (Chavellier 2013), or some deal with government tax changes (Paul 2002). In contrast, prior research such as Chevalier et al. (2002) only focus to control children ability without dealing potential endogeneity of the household income. Other studies deal causal relationship between parents' income and the education outcome with the income shock relating to unemployment (Coelli 2005), difference of income, rainfall and climate changes for productivity concerns (Ferreira 2009; Fichera et al., 2015), and, rented-in land with the caution of the weak instrument (Okabe 2016).

In my study, I exploit exclusion restriction with first income shock related to head unemployment and grandparents' non-labor resources in the household (Bratti 2007; Behrman et al., 1997) for ordered logit model of education attainment. Whereas, endogeneity in current enrollment model captures by the set of exogenous variables including second income shock difference, estimated by household and country annual per capita income, and windfall income (Björkman-Nyqvist 2013).

There are two main reasons to proxy for income shocks; firstly, unemployment is the most important economic factors in country' development linked with individuals within the households. However, I believe unemployment of the head as compared to parents is unlikely to effect on the child' education attainment. Secondly, difference in per capita income is proxy for income shock due to retrospective analysis of the wage earning, livestock apart from agricultural goods. It has transitional effect on the economic situation of the household (Sawada 2009; Jacoby 1997). In additions, household characteristics including members such as grandparents consider as strong instruments related to their educational skills or permanent or non-labor income (Bratti 2007). Similarly, windfall income comprise mainly unearned income of the household or non-labor income that composed of lottery, inheritances, gifts, unexpected charities and irregular sources of income (Powdthavee et al., 2013; Kingdon 2005) that are exogenous (Glick et al., 2000).

Another possibility of endogeneity might arise due to relationship between education spending and current enrollment in logit model regression. The common practice in literature provides instruments relating to the household's head union membership that are lacking in our dataset

while some studies refer to the head related occupations (Maitra 2003). The estimation results after instrumenting education spending with the head occupation show that the null hypothesis of exogeneity is not rejected with the p-value 0.59. However, I try to control education spending with the addition of occupational dummy variables, house ownership and land cultivation (Shea 2000; Maitra 2004). Furthermore, standard errors could be biased due to the unmeasured determinants of education achievement within the households and can be corrected by estimating models with robust standard errors (Deaton 1997; Blundell et al., 1997)[66]. I also dealt endogeneity by Control Function approach, Two Stage Least Square (2SLS) and Instrumental Variable Probit (IV Probit) estimation for instruments validation and as alternative specification. The estimated results will be presented on demand[67].

4.2.3 Two Stage Residual Inclusion:

To apply 2SRI, the very first step to find exogenous variables although this method is different from the standard IV estimation method. The strategy behind choosing variables is that variables predict quite possible definition of exogeneity. The argument behind this method (Terza et al.,

[66] Wald test also conducted for the coefficients of the variables that are simultaneously equal to zero and for each model, test rejects the null hypothesis describing statistically significant improvement for model fit. Besides, conditional test of specification, commonly called, Link test conducted by logit and ordered logit models. In each model of gender difference, the test fails to reject the null hypothesis and describes no need of other explanatory variables to add or omit. Apart from link test, likelihood ratio chi-square with p-value report describes that model as a whole, statistically significant at 1 percent, and more appropriate than model having no predictors. Furthermore, I also report Akaike (AIC) and Bayesian Information Criterion (BIC) for model specification and sample fit (Akaike 1974; Posada et al., 2004).

[67] **Two Stage Least Square:** I start with the traditional 2SLS approach. To apply the 2SLS, I specify the following first stage equation for income: $X_{en} = Z_i\gamma_i + X_i\beta_i + \mu_i \quad (i)$
The second stage estimates as, $Y_i = \hat{X}_{en}\lambda_i + X_i\beta_i + \varepsilon_i \quad (ii)$
Whereas X_{en} presents endogenous variable, $Z0_i \; and \; X_i$ describes as instruments and explanatory variables and λ_i , γ_i and β_i are parameter coefficients with μ_i and ε_i as error terms respectively. A valid instrument implement changes in explanatory variable and does not belong to the explanatory equation but correlated with the endogenous variable. The instrumental method should be consistent for estimation when covariates are correlated with error term in the regression. A valid instrument Z_i needs to correlate with the income such as, $\gamma_i \neq 0$ and must be uncorrelated to the error term such as $cov\,(Z_i, \varepsilon_i) = 0$. The first stage of the IV method gives strong results if the instrument is correlated with the endogenous explanatory variable and it cannot be suffered with the same problem of the predicted variable. The Durbin-Wu-Hausman test compares OLS and 2SLS model coefficients under the null hypothesis of the exogeneity of the variable, which is rejected. Therefore, we need to instrument the household income. The test of overidentification exhibits validation of the instruments. According to the rule of thumb of 10, instruments are not weak. Therefore, simultaneous regressions have performed with OLS and ordered logit model for dealing with instrumental variables.

2008a) based on the suspected attempt of traditional linear instrumental variable estimator for correction of endogeneity problem. The core advantage of this method that estimated coefficients associated with the residuals from first stage regression significantly express the presence of endogeneity in the model (Huasman 1978). In this method, the first stage comprises of the OLS regression in which the endogenous variable has instrumented on the exogenous variables and rest of the explanatory variable and the second stage estimates with the ordered logit model and inclusion of the first stage residuals. At the end, whole program sets to be bootstrapped. The latent model will establish by splitting explanatory variables into exogenous and endogenous variables say, X_{ex} and X_{en} and equation transforms as,

$$Y_i^* = X'_{ex}\beta_{ex} + X'_{en}\beta_{en} + \varepsilon_i \quad (14)$$

The first stage equation of 2SRI method is estimated for income using all exogenous variables and instruments under the ordinary least square regression as,

$$X_{en} = X'_{ex}\beta_{ex} + Z\gamma + v_i \quad (15)$$

Whereas, $E(X_{en}, Z) \neq 0$ and $E(\varepsilon_i, Z) = 0$, whereas $\beta \; and \; \gamma$ are coefficient parameter and $v_i \; and \; \varepsilon_i$ are error term respectively.

The second stage of 2SRI method estimates with the residuals obtained from the first stage equation taken as control variable along with other explanatory variables and model describes as,

$$Y_i^* = X'_{ex}\beta_{ex} + X'_{en}\beta_{en} + \varphi\hat{v_i} + \varepsilon_i^* \quad (16)$$

This method holds simple test of the endogeneity that if the residual of the first stage statistically significant then the results would be biased in the first model without controlling endogeneity issue (Murray et al., 2014; Polat et al., 2017). Residuals' results are present in appendices.

4.2.4 Relationship between Education and Inequality Parameters:

This study also adopts education Gini coefficient along with other parameters of inequality such as average years of schooling and standard deviation for assessing the impact of gender differences in country (Thomas et al., 2001, 1999; Hojo 2009; Digdowiseiso 2010)[68]. These

[68] Education Gini defines as the ratio to the mean (average years of schooling) of half of the average over all pairs of absolute deviations between all pairs of people (Deaton 1997) that is further redeveloped by Thomas (2001).

measurements are calculated on distribution of respective models given the structure of the education in Pakistan for education attainment and current enrollment separately.

The implementation of these inequalities might help to examine socio-economic and intrahousehold factors behind different treatment for girls' education achievement. I also investigate the influence of average years of schooling for each model for efficient estimates. In addition, to narrow down the gender differences in education seems impossible without controlling education inequality that can be further explained with the help of standard deviation of the education that is expected to be negative associated with education achievement. Hence, I include these measurements of inequality in the main model.

Therefore, the extended model can describe as:

$$Education\ Achievement = f(PC\ Income, Inequality, Individuals., HH, ., Provinces + \varepsilon_i) \qquad (17)$$

4.2.5 Alternative Specification:

This study estimates alternative specification by examining the impact of gender differences in education achievement on per capita income of the household with ordinary least square model regression. The study uses three different measurements of the gender difference. Considering for education attainment, the first indicator described as gender gap[69] calculated by difference in illiteracy rate between girls and boys (Cooray 2011). The second indicator described as gender difference[70] in education attainment between girls and boys (Mcgillivrary et al., 2015), while final indicator is gender gap ratio[71] constructed between boys' and girls' education attainment (Digdowiseiso 2010; Klasen 2000). Similar inequalities are also calculated for current enrollment

$$E_L = (\frac{1}{\mu}) \sum_{i=2}^{n} . \sum_{j=1}^{i-1} Pi\ |y_i - y_j| P_j$$

Where, E_L is Education Gini based on education attainment, μ is average years of schooling, Pi and P_j are proportion of population and y_i and y_j are years of schooling at different educational level and n is the number of levels in attainment data.

Whereas, average years of schooling and standard deviation can be calculated as: $AYS = \sum_{i=1}^{n} P_i(y_i - \mu)^2$ and, $SD = \sqrt{\sum_{i=1}^{n} P_i(y_i - \mu)^2}$

[69] Gender Gap (Illiteracy 9-24) = number of girls illiterate – number of boys illiterate

[70] Gender Difference (Education Attainment 9-24)= Total years of schooling of girls- Total Years of schooling of boys

[71] Gender Gap Ratio (Education Attainment 9-24)= Total Years of schooling of boys/ Total Years of schooling of girls

for the children (5-24). The alternative model estimated with the linear regression model describe as:

$$PC\ Income = f(Gender\ Differences, Individuals., HH .., provinces + \varepsilon_i) \quad (18)$$

4.2.6 Gender Decomposition:

I decompose gender gap in the basic models of each specification with the mean and coefficient (Kingdom 2005) as well as by interactions of boy dummy variable (Maitra 2003). In addition, I also decompose the gender effect by variant type Oaxaca decomposition (Pal 2004; Dong et al., 2009; Golsteyn et al., 2014). The Oaxaca Decomposition (Oaxaca 1973) approach is generally used to examine the gender differences in economic returns or wage gap, however, I modify it standard approach to estimate the ordered logit and logit models for education attainment and current enrollment separately for girls and boys, which can further use to observe gender effect because of difference between them. I determine the probability of education attainment, say AT, separately for girls and boys using the ordered logit model, with characteristics, say X_g and X_b respectively. Assuming $\Pr(AT, X_i, \theta_i^*)$ is the expected probability of AT and θ_i^* is vector if maximum likelihood estimates of the parameters of ordered logit model for $i = g, b$ for girls and boys respectively.

Therefore, the expected AT for any individual would be

$$AT_g^* = \sum_{j=0}^{3} \Pr(AT_j | X_g, \theta_g^*) \quad (19)$$

$$AT_b^* = \sum_{j=0}^{3} \Pr(AT_j | X_b, \theta_b^*) \quad (20)$$

Using expected education attainment for boys and girls samples respectively, one can decompose boy-girl differential in alternative ways as follows:

$$AT_b^* - AT_g^* = \sum_{j=0}^{3} [\Pr(AT_j | X_b, \theta_b^*) - \Pr(AT_j | X_g, \theta_b^*)] + \sum_{j=0}^{3} [\Pr(AT_j | X_g, \theta_b^*) - \Pr(AT_j | X_g, \theta_g^*)]$$

$$= Explained\ Variation + Unexplained\ Variation \quad (21)$$

$$AT_b^* - AT_g^* = \sum_{j=0}^{3} [\Pr(AT_j | X_b, \theta_g^*) - \Pr(AT_j | X_g, \theta_g^*)] + \sum_{j=0}^{3} [\Pr(AT_j | X_b, \theta_b^*) - \Pr(AT_j | X_b, \theta_g^*)]$$

$$= Explained\ Variation + Unexplained\ Variations \quad (22)$$

In brief, the explained variation is attributable to the different characteristics of boy-girl while unexplained variation is attributable to different treatment of boy and girls in household by allowing parameters to vary and characteristics constant. Similar approach adopted for the current enrollment as well.

Robustness Tests:

I try to determine the education achievement with several other specifications, in which most significant and consistent results present in this study, including, ordered probit and probit models, alternative explanatory variable of per capita expenditure of the household and provincial heterogeneity to determine education attainment and current enrollment by socio-economic characteristics. In addition, I also estimated models with different age group such as children between 13-24 years, explanatory variables such as permanent income and by urban-rural decomposition that have not be presented here but can be available on demand.

4.3 Descriptive statistics

The study provides the descriptive statistics in the Table 4.1 for gender differences in education attainment and current enrollment. For education attainment, the gender variable has mean value of 48.9 percent and mean age of the child (9-24) is 15.9 percent. There are 12.2 and 9.2 percent children are in primary and secondary education within certain age limits. For current enrollment, mean value of gender is 48.7 percent while 13.5 percent is the average age of the children. Observing individuals characteristics, 37 percent people are married in the household, only 1.5 percent parents are educated and occupations such as officers and operators have similar mean value of around 11 percent. Per capita income of the household has calculated by the total annual income of the household divided by the household size and taken in log. Its mean value is 9.2. Due to larger household size such as on average it is 8.3, we also see the higher dependency ratio that is 42.2 percent. The digital access is fully available to 44 percent of the household whereas 53 percent household has limited access to any broadband and internet connection. The statistics show 44 percent people are living in urban areas where the availability of electricity is 78 percent. On average, highest populated province is Punjab and the lowest one is Balochistan. The summary statistics by gender are present in appendices.

5. Results

5.1 Determination of Education Attainment by Per Capita Income and Socio-Economic Characteristics

5.1.1 Education Attainment: Ordered Logit Model by Full Sample

Table 5.1.1 narrates average marginal effects of ordered logit model for education attainment in primary, secondary, tertiary and no education with the help of household income per capita and socio-economic characteristics. By examining results, it conclusively observes that gender is positively significant at 1 percent level and likely to increase primary, secondary and tertiary education attainment with 0.24, 0.37 and 0.12 percentage points respectively. One unit increase in the per capita income, on average, increases 0.17, 0.25 and 0.08 percent likelihood to increase primary, secondary and tertiary education attainment respectively. The effect of age is significant and increases education attainment from primary to tertiary levels.

Table 5.1.1 AMEs for Education Attainment: Ordered Logit Model Regression

	None	Primary	Secondary	Tertiary
Variables	**(1)**	**(2)**	**(3)**	**(4)**
PC income	-0.00491***	0.00165***	0.00248***	0.00078***
	(0.00040)	(0.00013)	(0.00020)	(0.00006)
Gender (9-24)	-0.00723***	0.00243***	0.00365***	0.00115***
	(0.00183)	(0.00062)	(0.00093)	(0.00029)
Age (9-24)	-0.04152***	0.01397***	0.02098***	0.00657***
	(0.00215)	(0.00073)	(0.00114)	(0.00030)
Sq. Age (9-24)	0.00128***	-0.00043***	-0.00065***	-0.00020***
	(0.00007)	(0.00002)	(0.00004)	(0.00001)
Married	0.11291***	-0.04375***	-0.05419***	-0.01497***
	(0.00407)	(0.00179)	(0.00187)	(0.00051)
Parents Edu	-0.14206	0.03718	0.07568	0.02920
	(0.29878)	(0.05514)	(0.16528)	(0.07837)
Head Edu	-0.21328***	0.04760***	0.11538***	0.05030***
	(0.02029)	(0.00214)	(0.01135)	(0.00691)
Member Edu	-0.32031***	0.05082***	0.17647***	0.09302***
	(0.00415)	(0.00063)	(0.00269)	(0.00192)
Member Math	-0.27809***	0.12885***	0.12129***	0.02796***
	(0.00165)	(0.00109)	(0.00095)	(0.00045)
Officer	-0.38672***	0.04439***	0.20804***	0.13430***
	(0.01296)	(0.00213)	(0.00622)	(0.00901)
Clerk	-0.25610***	0.05082***	0.13947***	0.06580***
	(0.01770)	(0.00102)	(0.00984)	(0.00709)
Operator	-0.02898***	0.00933***	0.01483***	0.00482***
	(0.00976)	(0.00300)	(0.00506)	(0.00170)
Manager	-0.20940***	0.04734***	0.11335***	0.04871***
	(0.01658)	(0.00187)	(0.00929)	(0.00554)

Technician	-0.25874***	0.05114***	0.14109***	0.06651***
	(0.01465)	(0.00089)	(0.00816)	(0.00591)
HH size	0.00069***	-0.00023***	-0.00035***	-0.00011***
	(0.00026)	(0.00009)	(0.00013)	(0.00004)
Dependency	0.13433***	-0.04520***	-0.06787***	-0.02127***
	(0.00515)	(0.00173)	(0.00266)	(0.00087)
Electricity	-0.08015***	0.02970***	0.03926***	0.01119***
	(0.00251)	(0.00102)	(0.00121)	(0.00035)
Gas	-0.05137***	0.01758***	0.02595***	0.00784***
	(0.00241)	(0.00084)	(0.00123)	(0.00038)
Digital Full	-0.09857***	0.03170***	0.05184***	0.01504***
	(0.01049)	(0.00393)	(0.00521)	(0.00138)
Digital Inter	0.06895***	-0.02825***	-0.03274***	-0.00797***
	(0.01651)	(0.00689)	(0.00778)	(0.00188)
Digital Limit	0.10174***	-0.04320***	-0.04736***	-0.01119***
	(0.01043)	(0.00395)	(0.00516)	(0.00135)
Establishment	0.03719***	-0.01310***	-0.01852***	-0.00558***
	(0.00349)	(0.00129)	(0.00171)	(0.00051)
Own House	0.09232***	-0.03057***	-0.04722***	-0.01453***
	(0.00218)	(0.00077)	(0.00115)	(0.00039)
Urban	-0.00512**	0.00173**	0.00258**	0.00081**
	(0.00225)	(0.00076)	(0.00113)	(0.00035)
Sindh	0.01891***	-0.00631***	-0.00959***	-0.00302***
	(0.00243)	(0.00082)	(0.00123)	(0.00038)
KPK	0.02065***	-0.00691***	-0.01046***	-0.00329***
	(0.00244)	(0.00083)	(0.00123)	(0.00038)
Balochistan	0.04152***	-0.01433***	-0.02082***	-0.00637***
	(0.00301)	(0.00108)	(0.00150)	(0.00045)
Threshold Point	Yes	Yes	Yes	Yes
Observations	154,037	154,037	154,037	154,037
Link Test	0.303			
Log-Likelihood	-105271.45			
Chi-square test	36586.09			
AIC	210603.91			
BIC	210901.26			
Pseudo R2	0.176			
Nagelkerke R2	0.313			
Prob > chi2	0.000			

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates none education. The reference category for the digital is no direct connection and any extension of broadband. AMEs stand for average marginal effects. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

In contrast, variable married is highly unlike to increase education attainment particularly at secondary level. It indicates strong evidence for reducing poverty and fertility rate with increase of education. Educated parents are insignificant but likely to increase primary education attainment. Meanwhile, educated head significantly improves the education attainment with 4.7,

11.53 and 5.03 percentage points for primary, secondary and tertiary education respectively. Similarly, educated members are likely to increase secondary and tertiary education attainment by 17.6 and 9.3 percent. Their numeracy skills also highly significant for each level of education. The results explain positive relationship between occupation and education attainment from primary to secondary levels. For example, officers are on average have probability to increase secondary and tertiary education attainment by 20.8 and 13.4 percentage points. Similarly, low status occupation such as clerk increases secondary and tertiary education attainment by 13.9 and 6.6 percentage points. Interesting, manual workers such as technicians show remarkable and higher impact on education attainment than managers. It indicates the efforts of lower income households in order to gain economic welfare and wellbeing by providing education to their children. It highlights that this sector of labor market knows the importance of education investment for future generations and human capital development. In addition, availability of electricity, digital access, gas supply and ownership of asset are highly likely to increase education attainment. The unit increase in urban location, on average, is likely to increase primary, secondary and tertiary education by 0.17, 0.26 and 0.1 percentage points respectively. By observing provinces as compared to Punjab, they are less likely to gain education attainment, however, the marginal effects are quite higher in Balochistan than Sindh and KPK provinces.

5.1.2 Education Attainment: Ordered Logit Model by Gender

Table 5.1.2 presents average marginal effects for girls' education attainment from models 1 to 4. It is consistent that per capita income significantly increases each level of education. However, it improves secondary education attainment more than primary and tertiary levels with 0.25 percentage points. The age of the child has significant and nonlinear effect. Meanwhile, marital status of the person in the household, being-married, is likely to decrease the probability of tertiary and secondary education by 1.6 and 5.1 percentage points. Interesting, the parents' education is positive however, only significant at secondary level with 21.9 percentage points. While, educated head and other members are significantly increasing tertiary and secondary education attainment by 23.8 and 16.49 percentage points respectively. It is worthy to examine that both low and high-income occupations are significant for the girls 'education. The probability to increase the education particularly at tertiary level ranges from 7.4 percentage points by clerks, 14.4 percentage points by officer, 5.6 and 0.7 percentage points from managers and machine operators respectively. Household size is likely to decrease secondary, primary and

tertiary education by 0.06, 0.04 and 0.02 percentage points. It is evident that household facilities are more likely to support girls' education such as electricity and gas. However, the ownership of the house is unlike to improve the education attainment. Similarly, non-agricultural asset is less likely to increase primary, secondary and tertiary education by 1.3, 1.8 and 0.6 percentage points. Similarly, residing in urban areas increases the probability of education attainment from primary to tertiary levels. Meanwhile, as compared to Punjab, KPK and Balochistan provinces are highly unlike to increase girls' primary and tertiary education.

From models 5 to 8, average marginal effects for boys' education attainment have estimated. The per capita income estimates are comparatively higher for boys in primary and secondary education with 0.17 and 0.26 percentage points. Age has significant and nonlinear effect on boys' education attainment. Married person in the household is unlike to increase education attainment among boys that demonstrates higher dependency on lone male earner. Observing educated head and members of the households, they significantly increase the boys' education particularly secondary level with 12 and 18.6 percentage points respectively. The findings provide negative impact of parental education on boys' education attainment. It highlights many factors behind it. The very important one is that the lower education of the parents are likely to affect negatively on boys' education. Similarly, parents particularly fathers with low education are associated with the low salaried occupation, lower socioeconomic status, unionized or nonunionized works that decrease the education attainment level among boys (Shea 2000). Results support past studies that highlight the negative impact of parental education on child's education attainment (Chevalier et al., 2004).

I observe strong impact of occupational heterogeneity on boys' education attainment, such as, officers and clerks that deliberately improve primary and secondary levels. On the other side, technicians being manual workers are highly likely to increase tertiary education among boys with 14.4 percentage points. However, availability of electricity, gas and digital access are likely to improve boys' education. Digital access estimates show higher marginal effects in primary and secondary education. In addition, ownership of the house is less likely to increase the probability by 3.7, 5.7 and 1.5 percentage points in the primary, secondary and tertiary education attainment. Further, Sindh, KPK and Balochistan provinces are less likely to increase education at tertiary and primary levels as compared to Punjab.

Table 5.1.2 Average Marginal Effects for Education Attainment: Ordered Logit Model Regression

	Girl				Boy			
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PC income	-0.00501***	0.00164***	0.00248***	0.00089***	-0.00501***	0.00172***	0.00258***	0.00070***
	(0.00056)	(0.00018)	(0.00028)	(0.00010)	(0.00056)	(0.00019)	(0.00029)	(0.00008)
Age (9-24)	-0.02912***	0.00953***	0.01441***	0.00519***	-0.05273***	0.01811***	0.02722***	0.00740***
	(0.00301)	(0.00099)	(0.00154)	(0.00050)	(0.00306)	(0.00106)	(0.00168)	(0.00037)
Sq. Age (9-24)	0.00085***	-0.00028***	-0.00042***	-0.00015***	0.00166***	-0.00057***	-0.00086***	-0.00023***
	(0.00010)	(0.00003)	(0.00005)	(0.00002)	(0.00010)	(0.00003)	(0.00005)	(0.00001)
Married	0.10831***	-0.04013***	-0.05156***	-0.01662***	0.14544***	-0.06039***	-0.06916***	-0.01589***
	(0.00510)	(0.00212)	(0.00236)	(0.00077)	(0.00703)	(0.00340)	(0.00311)	(0.00070)
Parents Edu	-0.50020	0.01178	0.21910***	0.26932	0.27268***	-0.13123***	-0.11794***	-0.02351***
	(0.45753)	(0.16515)	(0.00824)	(0.63030)	(0.00141)	(0.00115)	(0.00108)	(0.00055)
Head Edu	-0.47286***	0.02120	0.21777***	0.23389***	-0.22429***	0.05008***	0.12579***	0.04841***
	(0.06876)	(0.02147)	(0.00907)	(0.08162)	(0.02100)	(0.00213)	(0.01235)	(0.00674)
Member Edu	-0.31376***	0.04899***	0.16494***	0.09982***	-0.32440***	0.05202***	0.18689***	0.08550***
	(0.00620)	(0.00088)	(0.00369)	(0.00309)	(0.00561)	(0.00090)	(0.00392)	(0.00238)
Member Math	-0.27423***	0.12349***	0.11916***	0.03158***	-0.28050***	0.13307***	0.12292***	0.02451***
	(0.00230)	(0.00150)	(0.00134)	(0.00068)	(0.00241)	(0.00160)	(0.00134)	(0.00059)
Officer	-0.38306***	0.04287***	0.19564***	0.14455***	-0.38045***	0.04673***	0.21520***	0.11851***
	(0.01687)	(0.00260)	(0.00741)	(0.01228)	(0.02005)	(0.00316)	(0.01065)	(0.01272)
Clerk	-0.25849***	0.04897***	0.13535***	0.07416***	-0.25409***	0.05210***	0.14348***	0.05851***
	(0.02407)	(0.00125)	(0.01255)	(0.01068)	(0.02569)	(0.00161)	(0.01509)	(0.00931)
Operator	-0.03538**	0.01096***	0.01773**	0.00668**	-0.02541*	0.00840**	0.01328*	0.00373*
	(0.01425)	(0.00417)	(0.00724)	(0.00285)	(0.01341)	(0.00426)	(0.00710)	(0.00206)
Manager	-0.21426***	0.04614***	0.11210***	0.05602***	-0.20279***	0.04776***	0.11323***	0.04180***
	(0.02298)	(0.00233)	(0.01223)	(0.00862)	(0.02372)	(0.00295)	(0.01389)	(0.00703)
Technician	-0.26130***	0.04930***	0.13702***	0.07498***	-0.25503***	0.05232***	0.14416***	0.05855***
	(0.01995)	(0.00111)	(0.01044)	(0.00891)	(0.02113)	(0.00140)	(0.01244)	(0.00768)
HH size	0.00123***	-0.00040***	-0.00061***	-0.00022***	0.00012	-0.00004	-0.00006	-0.00002
	(0.00037)	(0.00012)	(0.00019)	(0.00007)	(0.00037)	(0.00013)	(0.00019)	(0.00005)
Dependency	0.14361***	-0.04698***	-0.07105***	-0.02558***	0.12596***	-0.04325***	-0.06502***	-0.01769***

	(0.00734)	(0.00240)	(0.00373)	(0.00140)	(0.00721)	(0.00247)	(0.00379)	(0.00108)
Electricity	-0.08694***	0.03176***	0.04168***	0.01350***	-0.07481***	0.02800***	0.03746***	0.00935***
	(0.00364)	(0.00148)	(0.00173)	(0.00056)	(0.00345)	(0.00141)	(0.00170)	(0.00044)
Gas	-0.05618***	0.01880***	0.02781***	0.00958***	-0.04608***	0.01602***	0.02378***	0.00628***
	(0.00344)	(0.00118)	(0.00172)	(0.00060)	(0.00337)	(0.00119)	(0.00175)	(0.00047)
Digital Full	-0.08821***	0.02733***	0.04544***	0.01545***	-0.11071***	0.03686***	0.05928***	0.01458***
	(0.01441)	(0.00514)	(0.00710)	(0.00221)	(0.01506)	(0.00592)	(0.00752)	(0.00168)
Digital Inter	0.05457**	-0.02101**	-0.02600**	-0.00756**	0.08150***	-0.03535***	-0.03839***	-0.00776***
	(0.02296)	(0.00900)	(0.01087)	(0.00314)	(0.02353)	(0.01041)	(0.01099)	(0.00222)
Digital Limit	0.09566***	-0.03866***	-0.04454***	-0.01246***	0.10445***	-0.04637***	-0.04847***	-0.00961***
	(0.01431)	(0.00517)	(0.00702)	(0.00216)	(0.01499)	(0.00596)	(0.00744)	(0.00163)
Establishment	0.03834***	-0.01315***	-0.01872***	-0.00648***	0.03516***	-0.01261***	-0.01788***	-0.00468***
	(0.00490)	(0.00176)	(0.00236)	(0.00080)	(0.00497)	(0.00186)	(0.00249)	(0.00064)
Own House	0.07305***	-0.02349***	-0.03650***	-0.01306***	0.11045***	-0.03744***	-0.05781***	-0.01521***
	(0.00306)	(0.00102)	(0.00156)	(0.00059)	(0.00311)	(0.00115)	(0.00169)	(0.00052)
Urban	-0.01509***	0.00499***	0.00746***	0.00264***	0.00394	-0.00135	-0.00204	-0.00056
	(0.00323)	(0.00108)	(0.00159)	(0.00056)	(0.00313)	(0.00107)	(0.00162)	(0.00044)
Sindh	0.02343***	-0.00763***	-0.01161***	-0.00418***	0.01419***	-0.00481***	-0.00736***	-0.00202***
	(0.00343)	(0.00113)	(0.00170)	(0.00061)	(0.00343)	(0.00117)	(0.00178)	(0.00048)
KPK	0.02171***	-0.00705***	-0.01077***	-0.00389***	0.01962***	-0.00671***	-0.01015***	-0.00277***
	(0.00347)	(0.00115)	(0.00172)	(0.00061)	(0.00341)	(0.00118)	(0.00176)	(0.00048)
Balochistan	0.04754***	-0.01606***	-0.02332***	-0.00815***	0.03685***	-0.01292***	-0.01889***	-0.00504***
	(0.00445)	(0.00158)	(0.00216)	(0.00074)	(0.00409)	(0.00148)	(0.00208)	(0.00055)
Threshold Point	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	75,651	75,651	75,651	75,651	78,386	78,386	78,386	78,386
Log-Likelihood	-51069.65				-53947.95			
Chi-square test	16668.99				20342.02			
AIC	102197.31				107954.91			
BIC	102465.10				108223.75			
Pseudo R2	0.175				0.180			
Nagelkerke R2	0.310				0.321			
Prob > chi2	0.000				0.000			

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates none education. The reference category for the digital is no direct connection and any extension of broadband. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

5.1.3 Dealing with Endogeneity for Education Attainment: Full Sample

Table.5.1.3 AMEs for Education Attainment by 2SRI Approach: Ordered Logit Model

	None	Primary	Secondary	Tertiary
Variables	**(1)**	**(2)**	**(3)**	**(4)**
PC income	-0.10929***	0.03674***	0.05527***	0.01728***
	(0.01734)	(0.00309)	(0.00241)	(0.00205)
Gender (9-24)	-0.02062***	0.00693***	0.01043***	0.00326***
	(0.00306)	(0.00114)	(0.00158)	(0.00040)
Age (9-24)	-0.05538***	0.01862***	0.02800***	0.00876***
	(0.00503)	(0.00078)	(0.00091)	(0.00022)
Sq. Age (9-24)	0.00165***	-0.00056***	-0.00083***	-0.00026***
	(0.00015)	(0.00002)	(0.00004)	(0.00001)
Married	0.12180***	-0.04758***	-0.05826***	-0.01596***
	(0.00371)	(0.00202)	(0.00221)	(0.00047)
Parents Edu	-0.12084	0.03295	0.06406	0.02383
	(0.28421)	(0.06716)	(0.10179)	(0.30924)
Head Edu	-0.37872***	0.04461***	0.20231***	0.13179***
	(0.02864)	(0.00222)	(0.01311)	(0.02301)
Member Edu	-0.31613***	0.05067***	0.17445***	0.09101***
	(0.00817)	(0.00094)	(0.00184)	(0.00430)
Member Math	-0.27520***	0.12744***	0.12006***	0.02771***
	(0.00051)	(0.00160)	(0.00042)	(0.00058)
Officer	-0.28395***	0.05123***	0.15588***	0.07684***
	(0.02385)	(0.00079)	(0.00986)	(0.00901)
Clerk	-0.18262***	0.04378***	0.09858***	0.04026***
	(0.01315)	(0.00286)	(0.00572)	(0.00214)
Operator	0.01168	-0.00400	-0.00588	-0.00181*
	(0.01450)	(0.00249)	(0.00823)	(0.00106)
Manager	-0.08536***	0.02496***	0.04475***	0.01564***
	(0.03221)	(0.00349)	(0.00646)	(0.00372)
Technician	-0.17988***	0.04350***	0.09711***	0.03927***
	(0.02740)	(0.00077)	(0.00716)	(0.00361)
HH size	0.00570***	-0.00192***	-0.00288***	-0.00090***
	(0.00074)	(0.00019)	(0.00015)	(0.00010)
Dependency	-0.00432	0.00145	0.00218	0.00068
	(0.02323)	(0.00468)	(0.00304)	(0.00268)
Electricity	-0.07943***	0.02941***	0.03894***	0.01109***
	(0.00266)	(0.00115)	(0.00199)	(0.00040)
Gas	-0.01671**	0.00566***	0.00845***	0.00260***
	(0.00753)	(0.00046)	(0.00159)	(0.00086)
Digital Full	-0.09664***	0.03288***	0.04969***	0.01406***
	(0.01102)	(0.00547)	(0.00397)	(0.00117)
Digital Inter	0.03180**	-0.01294	-0.01512**	-0.00374
	(0.01378)	(0.00972)	(0.00636)	(0.00258)
Digital Limit	0.07017***	-0.02979***	-0.03260***	-0.00778***
	(0.01355)	(0.00609)	(0.00321)	(0.00151)
Establishment	0.09315***	-0.03473***	-0.04538***	-0.01303***
	(0.00749)	(0.00107)	(0.00121)	(0.00100)
Own House	0.07810***	-0.02599***	-0.03989***	-0.01222***
	(0.00475)	(0.00046)	(0.00092)	(0.00020)
Urban	0.01534***	-0.00510***	-0.00777***	-0.00247***
	(0.00561)	(0.00112)	(0.00188)	(0.00053)
Sindh	0.06020***	-0.02089***	-0.03009***	-0.00922***
	(0.00554)	(0.00128)	(0.00113)	(0.00063)
KPK	-0.02622***	0.00795***	0.01361***	0.00466***
	(0.00924)	(0.00165)	(0.00152)	(0.00117)

Balochistan	0.07925*** (0.00407)	-0.02826*** (0.00194)	-0.03924*** (0.00117)	-0.01175*** (0.00084)
Observations	749,503	749,503	749,503	749,503
Instruments Criteria				
Hausman Test	190.846 *(p=0.000)*			
Overid Test	0.7090 *(p=0.709)*			
First Stage	196.125 *(p=0.000)*			

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates no education. The reference category for the digital is no direct connection and any extension. The instruments are income shock described as head unemployed and grandparents' resources. The validity of instruments estimates with 2SLS estimators. The Hausman test provides F-statistics and test of overidentification states P-value. The value for First Stage regressions give F-statistics. Bootstrapped standard errors are presented in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

Table 5.1.3 shows results of ordered logit model regression/2SRI approach after dealing endogeneity between income and education attainment. The estimates provide quite higher marginal effects in IV approach. Similarly, the impact of per capita income on education attainment is consistently higher from primary to tertiary level while maintaining its significance as previous from 3.7 to 1.7 percentage points. The results explain that age increases the probability of education attainment that is inverse for marital status. The estimates remain consistent for parental education, however, there is drastic increase in AMEs for educated head, meanwhile, other educated members also effect positively and significantly but their impact is slightly lower especially for primary education attainment. Particularly, in urban areas where manual work with limited education are likely to provide more employment as these areas are suffering with higher poverty and inflation rate. While dealing with potential endogeneity in household income per capita with income shock has developed some inverse relationship particularly between urbanization and education attainment that might be because of two main reasons. By observing income shock, the growing unemployment rate in business and labor market is strongly effecting urban areas. Secondly, population density is higher in urban location. Most of the households are struggling to maximize their utility by scarce means at higher inflation rate. It eventually costs the education investment within the households. However, it is interesting to observe that effective education policies with the proper monitoring and public investment can cope the higher illiteracy rate that are demonstrated by the estimates of KPK.

5.1.4 Dealing with Endogeneity for Education Attainment: By Gender

Table 5.1.4 AMEs for Education Attainment by 2SRI Approach: Ordered Logit Model

	Girl				Boy			
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PC income	-0.11676***	0.03817***	0.05778***	0.02081***	-0.11014***	0.03781***	0.05691***	0.01543***
	(0.01966)	(0.01072)	(0.00846)	(0.00692)	(0.01875)	(0.00245)	(0.01251)	(0.00084)
Age (9-24)	-0.04468***	0.01460***	0.02211***	0.00796***	-0.06644***	0.02281***	0.03433***	0.00931***
	(0.00564)	(0.00182)	(0.00198)	(0.00096)	(0.00325)	(0.00089)	(0.00334)	(0.00039)
Sq. Age (9-24)	0.00128***	-0.00042***	-0.00063***	-0.00023***	0.00203***	-0.00070***	-0.0011***	-0.00028***
	(0.00015)	(0.00006)	(0.00006)	(0.00003)	(0.00009)	(0.00003)	(0.00010)	(0.00001)
Married	0.12053***	-0.04507***	-0.05718***	-0.01829***	0.14718***	-0.06124***	-0.0699***	-0.01603***
	(0.00067)	(0.00355)	(0.00121)	(0.00043)	(0.00825)	(0.00017)	(0.00454)	(0.00082)
Parents Edu	-0.48492	0.01674	0.21839	0.24979	0.27277***	-0.13130***	-0.1180***	-0.02352***
	(0.51812)	(0.02407)	(0.15668)	(0.31577)	(0.00055)	(0.00134)	(0.00130)	(0.00073)
Head Edu	-0.61238***	-0.03657***	0.16628***	0.48267***	-0.38404***	0.04548***	0.21558***	0.12298***
	(0.02172)	(0.00488)	(0.02357)	(0.14243)	(0.01640)	(0.00248)	(0.00805)	(0.02370)
Member Edu	-0.30963***	0.04894***	0.16293***	0.09776***	-0.32010***	0.05181***	0.18481***	0.08348***
	(0.01514)	(0.00077)	(0.00415)	(0.00419)	(0.00608)	(0.00192)	(0.00749)	(0.00411)
Member Math	-0.27111***	0.12201***	0.11782***	0.03128***	-0.27752***	0.13159***	0.12164***	0.02429***
	(0.00401)	(0.00248)	(0.00208)	(0.00072)	(0.00069)	(0.00274)	(0.00182)	(0.00079)
Officer	-0.27505***	0.04917***	0.14493***	0.08095***	-0.27391***	0.05249***	0.15611***	0.06532***
	(0.02691)	(0.00202)	(0.01672)	(0.01363)	(0.02237)	(0.00291)	(0.01082)	(0.00958)
Clerk	-0.18274***	0.04235***	0.09537***	0.04502***	-0.17857***	0.04424***	0.09940***	0.03493***
	(0.00354)	(0.00397)	(0.02368)	(0.00896)	(0.02738)	(0.00363)	(0.01401)	(0.00495)
Operator	0.00595	-0.00196	-0.00294	-0.00105	0.01712**	-0.00603*	-0.00877	-0.00233
	(0.00651)	(0.00425)	(0.00643)	(0.00697)	(0.00850)	(0.00327)	(0.00645)	(0.00244)
Manager	-0.08305***	0.02367***	0.04238**	0.01701**	-0.07752***	0.02349***	0.04157	0.01247***
	(0.02008)	(0.00813)	(0.01763)	(0.00856)	(0.02546)	(0.00316)	(0.02830)	(0.00190)
Technician	-0.18112***	0.04225***	0.09461***	0.04426***	-0.17181***	0.04329***	0.09549***	0.03302***
	(0.03034)	(0.00392)	(0.00320)	(0.01148)	(0.02055)	(0.00163)	(0.00796)	(0.00473)
HH size	0.00652***	-0.00213***	-0.00323***	-0.00116***	0.00523***	-0.00179***	-0.0027***	-0.00073***
	(0.00069)	(0.00044)	(0.00049)	(0.00033)	(0.00095)	(0.00018)	(0.00069)	(0.00004)
Dependency	-0.00439	0.00143	0.00217	0.00078	-0.01390	0.00477	0.00718	0.00195
	(0.03078)	(0.01472)	(0.00922)	(0.00905)	(0.02969)	(0.00400)	(0.01854)	(0.00133)
Electricity	-0.08638***	0.03153***	0.04143***	0.01342***	-0.07402***	0.02769***	0.03709***	0.00924***
	(0.00328)	(0.00122)	(0.00138)	(0.00070)	(0.00138)	(0.00127)	(0.00119)	(0.00064)
Gas	-0.01879**	0.00621*	0.00930***	0.00329	-0.01154	0.00398***	0.00596	0.00160***

	(0.00755)	(0.00343)	(0.00263)	(0.00216)	(0.00888)	(0.00065)	(0.00548)	(0.00021)
Digital Full	-0.08596***	0.02827***	0.04332***	0.01437***	-0.10872***	0.03832***	0.05678***	0.01362***
	(0.01165)	(0.00949)	(0.00681)	(0.00249)	(0.01462)	(0.00326)	(0.01165)	(0.00172)
Digital Inter	0.01723	-0.00659	-0.00821	-0.00243	0.04249	-0.01830	-0.02006	-0.00413**
	(0.01248)	(0.01676)	(0.01366)	(0.00563)	(0.02626)	(0.01114)	(0.01731)	(0.00165)
Digital Limit	0.06238***	-0.02517**	-0.02900***	-0.00821**	0.07239***	-0.03216***	-0.0335***	-0.00672***
	(0.00924)	(0.01276)	(0.00737)	(0.00325)	(0.01485)	(0.00296)	(0.00966)	(0.00169)
Establishment	0.09753***	-0.03550***	-0.04662***	-0.01541***	0.09203***	-0.03503***	-0.0457***	-0.01135***
	(0.01302)	(0.00506)	(0.00344)	(0.00276)	(0.01205)	(0.00274)	(0.00624)	(0.00045)
Own House	0.05834***	-0.01886***	-0.02910***	-0.01038***	0.09584***	-0.03266***	-0.0501***	-0.01311***
	(0.00676)	(0.00184)	(0.00192)	(0.00198)	(0.00583)	(0.00050)	(0.00155)	(0.00039)
Urban	0.00701***	-0.00228	-0.00347	-0.00126	0.02439***	-0.00823***	-0.0127***	-0.00351***
	(0.00147)	(0.00223)	(0.00241)	(0.00217)	(0.00287)	(0.00019)	(0.00220)	(0.00039)
Sindh	0.06743***	-0.02290***	-0.03295***	-0.01157***	0.05590***	-0.01974***	-0.0286***	-0.00761***
	(0.00627)	(0.00371)	(0.00268)	(0.00309)	(0.00793)	(0.00350)	(0.00405)	(0.00059)
KPK	-0.02867***	0.00836**	0.01453***	0.00578	-0.02773***	0.00859***	0.01476*	0.00438***
	(0.01039)	(0.00388)	(0.00513)	(0.00455)	(0.00818)	(0.00152)	(0.00830)	(0.00081)
Balochistan	0.08757***	-0.03060***	-0.04242***	-0.01455***	0.07497***	-0.02719***	-0.0379***	-0.00987***
	(0.00313)	(0.00491)	(0.00375)	(0.00211)	(0.00652)	(0.00241)	(0.00312)	(0.00016)
Observations	749,503	749,503	749,503	749,503	749,503	749,503	749,503	749,503
Instruments Criteria								
Hausman Test	190.846							
Overid Test	0.7090							
First Stage	196.125							

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates no education. The reference category for the digital is no direct connection and any extension. The instruments are income shock described as head unemployed and grandparents' resources. The validity of instruments estimates with 2SLS estimators. The Hausman test provides F-statistics and test of overidentification states P-value. The value for First Stage regressions give F-statistics. Bootstrapped standard errors are presented in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

The estimates suggest higher AMEs for girls to increase education attainment by per capita income of the household after dealing with endogeneity particularly at secondary level with 5.8 percentage points. The marital status of the person in the household and family size are likely to reduce primary education among girls that exhibits the importance of late-marriages and development of female human capital. Members with education and numeracy skills as well as educated head remain significantly positive and consistent. However, the effects are quite different for tertiary education for girls when compared to boys even after controlling endogeneity. The estimates show that the partial digital access can influence on girls' tertiary education positively. Urban location losses its significance but interesting as compared to Punjab, KPK province appears to positively significant for the girls' primary education attainment.

I find consistent and higher impact of household income on boys' education attainment from primary to tertiary levels after controlling the endogeneity issue. Interestingly, marginal effects becomes lower for boys than girls that were higher in previous model. In contrast, educated members are more inclined towards boys' education as compared to girls at primary and secondary levels. Educated head is unlike to increase girls' primary education while likely to increase boys' education with 4.5 percentage points. Other estimates such as officer, clerks and technicians appear to be consistent for boys' education attainment. As compared to the household infrastructure, the digital access is comparatively higher for boys; however, its full access can also improve girls' education attainment. Meanwhile, urban variable becomes insignificant for boys' education that can be interpreted by following reasons. The school-to-work ratio is higher among boys as they assume to be the main earners and income source of the household. Boys consider as the main pillar of the household to take care all financial responsibilities and lastly, most of the employment sectors are male oriented in urban areas that likely to attract young boys to start their work at earlier age. Meanwhile, KPK province provide positive and significant increase of primary and secondary education for boys[72].

[72] I also estimate potential endogeneity with 2SLS, IV Probit and Control Function approaches. Due to the nature of the dependent variable as categorical, 2SLS and IV Probit are not suitable, however, I estimate results ignoring its nature. In contrast, the Control Function method is more suitable and it is almost similar to the 2SRI approach. In first step, per capita income of the household estimated with the instrumental and explanatory variables and second step estimated with ordered logit model with the addition of the residual from the first stage. In brief, in each estimation, I have found consistent and statistically significant results for full sample and by gender. The results can

5.2 Determination of Current enrollment by Logit Model and 2SRI Approach

Table 5.2 describes the average marginal effects from two approaches without (Model 1 to 3) and with (Model 4 to 5) dealing endogeneity in current enrollment with the help of logit model and 2SRI approach for full sample, girls and boys respectively. The estimate of variable gender is highly significant and negative that produces opposite results from previous studies (Maitra 2003). It shows that being girl is likely to decrease the probability of current enrollment by 1.4 percentage points. Interestingly, income per capita is likely to increase the girls' current enrollment with 0.52 percentage points that is higher than boys' current enrollment. The effect of age is non-linear with the addition of square term and illustrate that with the increase in age there is decrease in the current enrollment. Marital status of the person in the household is unlike to increase current enrollment by 17.2 and 13.0 percentage points in girls and boys respectively. Parents' education becomes insignificant but positive, however, educated members are likely to increase boys' current enrollment with 15.2 percentage points.

The results suggest that occupations that are traditional reflection of the social class or status of the household have negative impact on children, particularly boys' current enrollment. There are three possible interpretations of this: first, in our case, these findings demonstrate that educational cost of the households' occupations fall disproportionately on children. Secondly, they give less time and low involvement in children. It further explains associated factors such as over-time work, less indicative skills to teach children at home and the behavioral effects. Even the higher salaried occupation do not guarantee the child's academic performance. Thirdly, the household structure and larger families play vital role to let parents and other members of the household to increase their working hours per day in order to fulfill the basic needs that directly affect children' education. Previous studies of San (2015), Azizollah (2013), Sawada (2009), (IIyod 2005) and Kingdon (2002) also find negative and significant impact of occupation on child's education. Moreover, the establishment and land cultivation have negative effect on current enrollment among children because of possible three main reasons; people who hold property or ownership of land are less motivated to participate in the labor market so as for the education attainment. Secondly, the increase of monetary assets do not provide incentive to

be presented on demand. Additionally, I dealt endogeneity in education attainment by splitting categorical variables into dummy variables of Primary, Secondary and Tertiary levels with the help of IV Probit. Each model with full sample and by gender has provided consistent results. I have not presented these tables here but can be available on demand.

transit from lower education to higher education level. Thirdly, with the increase of current enrolment there is decrease in the land productivity and cultivation. The allocation of the time shifts from the agricultural activities to the schools.

Table 5.2 Average Marginal Effects for Current Enrollment

	Logit Model: Without Endogeneity			Logit/2SRI Model: With Endogeneity		
	Both	Girl	Boy	Both	Girl	Boy
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PC Income	0.00464***	0.00519***	0.00407***	0.0580***	0.0552***	0.0597***
	(0.00039)	(0.00054)	(0.00056)	(0.00483)	(0.00824)	(0.0133)
Gender (5-24)	-0.01394***			-0.0109***		
	(0.00177)			(0.00150)		
Age (5-24)	0.06093***	0.04950***	0.07091***	0.0589***	0.0477***	0.0680***
	(0.00099)	(0.00139)	(0.00139)	(0.00187)	(0.00159)	(0.00130)
Sq. age (5-24)	-0.00209***	-0.00166***	-0.00247***	-0.00201***	-0.00158***	-0.00235***
	(0.00004)	(0.00005)	(0.00005)	(6.82e-05)	(4.68e-05)	(5.64e-05)
Married	-0.15821***	-0.17206***	-0.13034***	-0.151***	-0.166***	-0.125***
	(0.00340)	(0.00397)	(0.00672)	(0.00566)	(0.00269)	(0.00953)
Parents Edu	0.11875	0.14539	0.09850	0.0927	0.109	0.0794**
	(0.12854)	(0.14607)	(0.17726)	(0.119)	(0.139)	(0.0359)
Head Edu	0.01061	-0.04850	0.01637	0.0208	0.268***	0.206**
	(0.01146)	(0.05343)	(0.01219)	(0.0144)	(0.0935)	(0.0966)
Member Math	0.30440***	0.28926***	0.31814***	0.294***	0.279***	0.307***
	(0.00179)	(0.00254)	(0.00253)	(0.00166)	(0.00282)	(0.00355)
Member Edu	0.14836***	0.14363***	0.15262***	0.130***	0.124***	0.132***
	(0.00536)	(0.00776)	(0.00740)	(0.00465)	(0.00755)	(0.00348)
Officer	-0.06570***	-0.07085***	-0.06276***	-0.0842***	-0.0879***	-0.0828***
	(0.00855)	(0.01112)	(0.01299)	(0.00890)	(0.00875)	(0.0140)
Clerk	-0.07179***	-0.08719***	-0.05638***	-0.0787***	-0.0954***	-0.0650***
	(0.01183)	(0.01699)	(0.01663)	(0.00973)	(0.0249)	(0.0151)
Operator	-0.14813***	-0.12568***	-0.16479***	-0.144***	-0.125***	-0.161***
	(0.00805)	(0.01199)	(0.01094)	(0.00994)	(0.0139)	(0.0181)
Manager	-0.03053**	-0.02112	-0.03729**	-0.0611***	-0.0518***	-0.0706***
	(0.01230)	(0.01783)	(0.01706)	(0.0175)	(0.0129)	(0.0117)
Technician	-0.06752***	-0.07377***	-0.06233***	-0.0768***	-0.0840***	-0.0720***
	(0.01010)	(0.01400)	(0.01441)	(0.0111)	(0.00427)	(0.0115)
HH size	-0.02364***	-0.02370***	-0.02355***	-0.0250***	-0.0253***	-0.0254***
	(0.00056)	(0.00080)	(0.00079)	(0.000547)	(0.000606)	(0.00143)
Dependency	0.04885***	0.02464***	0.07035***	0.0558***	0.0246**	0.0779***
	(0.00628)	(0.00890)	(0.00887)	(0.00280)	(0.0120)	(0.00807)
Electricity	0.06797***	0.07632***	0.06236***	0.0586***	0.0679***	0.0524***
	(0.00248)	(0.00357)	(0.00346)	(0.00239)	(0.00334)	(0.00409)
Gas	0.09801***	0.09920***	0.09648***	0.0732***	0.0733***	0.0717***
	(0.00233)	(0.00330)	(0.00327)	(0.00172)	(0.00707)	(0.00397)
Cultivate	-0.13287***	-0.13194***	-0.13313***	-0.137***	-0.136***	-0.138***
	(0.00302)	(0.00424)	(0.00429)	(0.00279)	(0.00482)	(0.00190)
Establishment	-0.15533***	-0.14884***	-0.16149***	-0.162***	-0.155***	-0.169***
	(0.00272)	(0.00376)	(0.00392)	(0.00283)	(0.00367)	(0.00520)
Edu Spend	0.26920***	0.26910***	0.26932***	0.306***	0.304***	0.308***
	(0.00162)	(0.00228)	(0.00230)	(0.00227)	(0.00813)	(0.00990)
Siblings	0.03077***	0.03297***	0.02859***	0.0348***	0.0371***	0.0333***
	(0.00087)	(0.00123)	(0.00122)	(0.000852)	(0.000858)	(0.00191)
Urban	0.01279***	0.02054***	0.00611*	-0.000195	0.00776***	-0.00757
	(0.00222)	(0.00316)	(0.00313)	(0.00293)	(0.00181)	(0.00613)
Sindh	-0.05840***	-0.06457***	-0.05202***	-0.0659***	-0.0713***	-0.0614***

	(0.00224)	(0.00314)	(0.00319)	(0.00137)	(0.00235)	(0.00510)
KPK	0.05305***	0.04540***	0.06107***	0.0555***	0.0469***	0.0631***
	(0.00243)	(0.00344)	(0.00344)	(0.00128)	(0.00451)	(0.00385)
Balochistan	-0.01372***	-0.03382***	0.00339	-0.0270***	-0.0470***	-0.0115
	(0.00284)	(0.00409)	(0.00394)	(0.00364)	(0.00534)	(0.00873)
Observations	221,313	106,444	114,869	749,503	749,503	749,503
Linktest	0.881					
Log-Likelihood	-111048.68	-51505.82	-59383.47			
Chi-square test	36178.75	17974.32	18232.44			
AIC	222151.36	103062.65	118819.95			
BIC	222430.63	103311.61	119070.89			
Pseudo R2	0.202	0.216	0.191			
Nagelkerke R2	0.314	0.330	0.300			
Prob>Chi2	0.000	0.000	0.000			
Instruments Criteria						
Hausman Test				72.1936		
				(p=0.000)		
Overid Test				0.1591		
				(p=0.159)		
First Stage				38.3886		
				(p=0.000)		

*The dependent variable current enrollment is binary. The category 1 displays for current enrollment in primary, secondary or tertiary education and 0 demonstrates no current enrollment. The set of instruments used in these models are, first, income windfall and second, income difference. The validity of instruments estimates with 2SLS estimators. Robust standard errors are in parentheses. The Hausman test provides F-statistics and test of overidentification states P-value. The value for First Stage regressions give F-statistics. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

The household infrastructure and urban location are more likely to increase girl's current enrollment. It demonstrates that availability of facilities and living in cities can improve female human capital. That is why the gender gap ratio are higher in rural areas. Meanwhile, estimates provide higher dependency ratio in boys that further strengthen our previous statements regarding lone male earners and work-to-school ratio. The quantity-to-quality trade-off observes more in girls that is indicative for higher cost of education within the household. It reveals parental preferences for education investment when the number of children increases in the household. In the end, there is positive association between KPK province and current enrolment in which boys have higher marginal effects. This is due to new setup towards betterment of the provinces and since 2013 (KPK Government Statistics 2018).

Models 4 to 6 present average marginal effects for current enrollment after dealing with endogeneity by instrumenting per capita income of the household with exogenous shocks of income difference and windfall income. The results describe more likelihood to increase the probability of boys' current enrollment as compared to the girls. The household per capita

income increase five times higher than previous models. However, it increase current enrollment among boys higher than girls do. The variable gender reduces the probability of current enrollment with 1.09 percentage points. I find quite interesting estimates after capturing endogeneity issue such as educated head turns to be positive and significant to increase current enrollment, however, the effects are higher among girls. Similarly, parents' education is highly significant and positive for boys' current enrollment demonstrating parental preferences for education investment. Additionally, sons being permanent members and robust asset of the household in long run are more appropriate for parental education investment. While, looking at the estimates for educated members and numeracy skills, they are more likely to increase boys' current enrollment. In opposition, household infrastructure and urban location are supportive to increase girls' enrollment. Meanwhile, education spending appears equally effecting boys and girls current enrollment. On the other hand, estimates of different occupations remain consistent and negative. Most of the estimates remain same after controlling endogeneity such as marital status, parents' education, household size, dependency ratio, establishment and ownership but with higher marginal effects. Similarly, estimates of KPK as compared to Punjab remain positive and significant with the increase of education enrolment in which boys significantly have two times higher chances to enroll in the school. The results describe wider gap for current enrollment in Sindh and Balochistan, particularly for girls[73].

5.3 Impact of Educational Inequalities and Education Attainment

Table 5.3.1 represents the average marginal effects for education attainment by incorporating different education inequalities such as Gini, average years of schooling and standard deviation of schooling for full sample in Panel A, B and C with ordered model regressions. By examining the Panel A, the Gini coefficient is highly significant but inversely proportional to education attainment in secondary and tertiary level. While, per capita income of the household is significantly increasing to determine education along with other characteristics. The education inequality decreases the probability to attain tertiary education with 5.5 percentage points, in contrast, it increases sharply by 11.4 and 2.2 percentage points at no and primary education.

[73] I examine the potential endogeneity in income per capita with other methods including 2SLS, IV Probit and Control Function approaches. Except 2SLS, which is for the continuous dependent variable, other approaches are more relevant for determining current enrollment. While, results describe significant association between income and current enrollment and demonstrate consistent advantage for boys in household' income, attributes related to educated members of the household and provinces. The estimations can be available on demand.

Furthermore, Panel B presents an improvement in education attainment by average years of schooling by 0.29 and 0.19 percentage points in secondary and tertiary levels. It also points that literacy rate in the country can be improved by sufficient supply of education according to the increasing demand regardless of gender. Meanwhile, in Panel C, unit increase in standard deviation of schooling reduces 0.121 secondary education attainment. However, it is opposite for primary education level that has positive relationship with it.

Table 5.3.2 presented impact of educational inequalities on education attainment by gender in extended models. The Gini coefficient demonstrates sharp increase of educational inequality among girls by 6.0 and 8.1 percentage points in tertiary and secondary education attainment respectively. Furthermore, Panel B presents an improvement in education attainment by average years of schooling particularly among girls at tertiary level. Meanwhile, the standard deviation increases the gap with 0.20 and 0.07 percentage points in secondary and tertiary education attainment in girls. By examining boys' sample, Gini coefficient of schooling increases the educational inequality by 7.9 and 4.7 percentage points at secondary and tertiary education attainment. In contrast, Panel C describes insignificant results of standard deviation of schooling for boy. Moreover, average years of schooling is positive with education attainment among boys at secondary and tertiary levels. Overall, results explain comparative increase in per capita income at secondary and tertiary levels for boys and at primary level for girls.

Table 5.3.1 AMEs for Education Attainment with Education Inequalities by Ordered Logit Model

	None	Primary	Secondary	Tertiary
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Panel A				
Gender (9-24)	-0.00361***	-0.00070***	0.00258***	0.00174***
	(0.00042)	(0.00008)	(0.00030)	(0.00020)
Age (9-24)	0.00612***	0.00118***	-0.00437***	-0.00293***
	(0.00066)	(0.00012)	(0.00046)	(0.00031)
Sq. Age (9-24)	-0.00070***	-0.00013***	0.00050***	0.00033***
	(0.00002)	(0.00001)	(0.00002)	(0.00001)
Gini (9-24)	0.11420***	0.02205***	-0.08152***	-0.05473***
	(0.00967)	(0.00192)	(0.00674)	(0.00462)
PC income	-0.00071***	-0.00014***	0.00051***	0.00034***
	(0.00008)	(0.00002)	(0.00006)	(0.00004)
Sindh	-0.00097*	-0.00019*	0.00069*	0.00046*
	(0.00055)	(0.00011)	(0.00039)	(0.00026)
KPK	-0.00226***	-0.00044***	0.00161***	0.00109***
	(0.00056)	(0.00011)	(0.00039)	(0.00027)
Balochistan	-0.00055	-0.00010	0.00039	0.00026
	(0.00072)	(0.00014)	(0.00051)	(0.00034)
Observations	154,037	154,037	154,037	154,037
Log-Likelihood	-45015.692			

Chi-square test	22298.461			
Prob>Chi2	0.000			
Panel B				
Gender (9-24)	-0.00359***	-0.00070***	0.00256***	0.00172***
	(0.00042)	(0.00008)	(0.00030)	(0.00020)
Age (9-24)	0.00606***	0.00117***	-0.00433***	-0.00290***
	(0.00065)	(0.00012)	(0.00046)	(0.00031)
Sq. Age (9-24)	-0.00070***	-0.00013***	0.00050***	0.00033***
	(0.00002)	(0.00001)	(0.00002)	(0.00001)
AYS (9-24)	-0.00405***	-0.00078***	0.00289***	0.00194***
	(0.00063)	(0.00012)	(0.00045)	(0.00030)
PC income	-0.00067***	-0.00013***	0.00048***	0.00032***
	(0.00008)	(0.00002)	(0.00006)	(0.00004)
Sindh	-0.00085	-0.00016	0.00061	0.00041
	(0.00055)	(0.00011)	(0.00039)	(0.00026)
KPK	-0.00204***	-0.00040***	0.00145***	0.00098***
	(0.00056)	(0.00011)	(0.00039)	(0.00027)
Balochistan	-0.00033	-0.00006	0.00023	0.00016
	(0.00072)	(0.00014)	(0.00051)	(0.00034)
Observations	154,037	154,037	154,037	154,037
Log-Likelihood	-45055.384			
Chi-square test	22220.173			
Prob>Chi2	0.000			
Panel C				
Gender (9-24)	-0.00828***	0.00182***	0.00483***	0.00163***
	(0.00260)	(0.00057)	(0.00151)	(0.00051)
Age (9-24)	-0.05623***	0.01237***	0.03279***	0.01107***
	(0.00328)	(0.00075)	(0.00199)	(0.00057)
Sq. Age (9-24)	0.00150***	-0.00033***	-0.00087***	-0.00029***
	(0.00011)	(0.00002)	(0.00007)	(0.00002)
SD (9-24)	0.00207**	-0.00046**	-0.00121**	-0.00041**
	(0.00083)	(0.00018)	(0.00049)	(0.00016)
PC income	-0.00602***	0.00133***	0.00351***	0.00119***
	(0.00056)	(0.00013)	(0.00033)	(0.00011)
Sindh	-0.00286	0.00061	0.00168	0.00057
	(0.00344)	(0.00073)	(0.00202)	(0.00069)
KPK	0.01047***	-0.00232***	-0.00610***	-0.00205***
	(0.00343)	(0.00077)	(0.00200)	(0.00067)
Balochistan	0.02193***	-0.00502***	-0.01271***	-0.00419***
	(0.00443)	(0.00106)	(0.00256)	(0.00083)
Observations	84,885	84,885	84,885	84,885
Log-Likelihood	-76067.719			
Chi-square test	24113.955			
Prob>Chi2	0.000			
Threshold Point in Panels	Yes	Yes	Yes	Yes

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates none education. Panel A contains Gini Coefficient, Panel B includes Average Years of Schooling and Panel C includes Standard Deviation, calculated for complete years of schooling of children (9-24). Each panel is individual estimation and contains individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

Table 5.3.2 AMEs Estimation for Education Attainment with Education Inequalities by Gender: Ordered Logit Model

	Girl				Boy			
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Variables	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Panel A								
Age (9-24)	0.00960***	0.00126***	-0.00623***	-0.00463***	0.00346***	0.00091***	-0.00273***	-0.00164***
	(0.00101)	(0.00015)	(0.00065)	(0.00047)	(0.00086)	(0.00022)	(0.00067)	(0.00040)
Sq. Age (9-24)	-0.00081***	-0.00011***	0.00053***	0.00039***	-0.00061***	-0.00016***	0.00048***	0.00029***
	(0.00004)	(0.00001)	(0.00002)	(0.00002)	(0.00003)	(0.00001)	(0.00002)	(0.00001)
Gini (9-24)	0.12600***	0.01653***	-0.08177***	-0.06076***	0.10040***	0.02638***	-0.07910***	-0.04769***
	(0.01475)	(0.00214)	(0.00935)	(0.00708)	(0.01263)	(0.00331)	(0.00973)	(0.00599)
PC income	-0.00083***	-0.00011***	0.00054***	0.00040***	-0.00065***	-0.00017***	0.00051***	0.00031***
	(0.00012)	(0.00002)	(0.00008)	(0.00006)	(0.00011)	(0.00003)	(0.00009)	(0.00005)
Sindh	0.00049	0.00006	-0.00032	-0.00023	-0.00229***	-0.00060***	0.00181***	0.00108***
	(0.00083)	(0.00011)	(0.00054)	(0.00040)	(0.00073)	(0.00019)	(0.00057)	(0.00035)
KPK	-0.00083	-0.00011	0.00054	0.00040	-0.00335***	-0.00088***	0.00263***	0.00160***
	(0.00085)	(0.00011)	(0.00055)	(0.00042)	(0.00073)	(0.00020)	(0.00057)	(0.00035)
Balochistan	0.00119	0.00015	-0.00078	-0.00057	-0.00183**	-0.00048**	0.00145**	0.00086**
	(0.00114)	(0.00015)	(0.00075)	(0.00054)	(0.00092)	(0.00024)	(0.00072)	(0.00044)
Observations	75,651	75,651	75,651	75,651	78,386	78,386	78,386	78,386
Log-Likelihood	-22608.047				-22239.618			
Chi-square test	12184.374				44479.235			
Prob>Chi2	0.000				0.000			
Panel B								
Age (9-24)	0.00958***	0.00126***	-0.00622***	-0.00462***	0.00339***	0.00089***	-0.00267***	-0.00161***
	(0.00100)	(0.00015)	(0.00065)	(0.00047)	(0.00086)	(0.00022)	(0.00067)	(0.00040)
Sq. Age (9-24)	-0.00081***	-0.00011***	0.00053***	0.00039***	-0.00060***	-0.00016***	0.00048***	0.00029***
	(0.00004)	(0.00001)	(0.00002)	(0.00002)	(0.00003)	(0.00001)	(0.00002)	(0.00001)
AYS (9-24)	-0.00523***	-0.00069***	0.00339***	0.00252***	-0.00309***	-0.00081***	0.00243***	0.00146***
	(0.00097)	(0.00013)	(0.00062)	(0.00047)	(0.00082)	(0.00021)	(0.00064)	(0.00039)
PC income	-0.00079***	-0.00010***	0.00052***	0.00038***	-0.00060***	-0.00016***	0.00048***	0.00029***
	(0.00012)	(0.00002)	(0.00008)	(0.00006)	(0.00011)	(0.00003)	(0.00009)	(0.00005)
Urban	-0.00625***	-0.00086***	0.00413***	0.00297***	-0.00239***	-0.00064***	0.00189***	0.00113***
	(0.00074)	(0.00012)	(0.00049)	(0.00035)	(0.00064)	(0.00017)	(0.00051)	(0.00030)
Sindh	0.00063	0.00008	-0.00041	-0.00030	-0.00220***	-0.00058***	0.00173***	0.00104***
	(0.00083)	(0.00011)	(0.00054)	(0.00040)	(0.00073)	(0.00019)	(0.00057)	(0.00035)
KPK	-0.00059	-0.00008	0.00038	0.00029	-0.00313***	-0.00083***	0.00246***	0.00149***

	(0.00085)	(0.00011)	(0.00055)	(0.00041)	(0.00072)	(0.00020)	(0.00057)	(0.00035)
Balochistan	0.00147	0.00019	-0.00096	-0.00070	-0.00165*	-0.00043*	0.00130*	0.00077*
	(0.00114)	(0.00015)	(0.00075)	(0.00054)	(0.00092)	(0.00024)	(0.00072)	(0.00043)
Observations	75,651	75,651	75,651	75,651	78,386	78,386	78,386	78,386
Log-Likelihood	-22626.935				-22258.257			
Chi-square test	12163.268				10301.835			
Prob>Chi2	0.000				0.000			
Panel C								
Age (9-24)	-0.03929***	0.00842***	0.02235***	0.00852***	-0.06975***	0.01556***	0.04169***	0.01250***
	(0.00467)	(0.00103)	(0.00273)	(0.00093)	(0.00460)	(0.00109)	(0.00289)	(0.00071)
Sq. Age (9-24)	0.00094***	-0.00020***	-0.00054***	-0.00020***	0.00193***	-0.00043***	-0.00115***	-0.00035***
	(0.00015)	(0.00003)	(0.00009)	(0.00003)	(0.00015)	(0.00004)	(0.00009)	(0.00002)
SD (9-24)	0.00355***	-0.00076***	-0.00202***	-0.00077***	0.00039	-0.00009	-0.00023	-0.00007
	(0.00120)	(0.00026)	(0.00069)	(0.00026)	(0.00115)	(0.00026)	(0.00069)	(0.00021)
PC income	-0.00586***	0.00126***	0.00333***	0.00127***	-0.00649***	0.00145***	0.00388***	0.00116***
	(0.00081)	(0.00017)	(0.00046)	(0.00018)	(0.00079)	(0.00018)	(0.00047)	(0.00015)
Urban	-0.00416	0.00089	0.00237	0.00090	0.01579***	-0.00348***	-0.00944***	-0.00287***
	(0.00452)	(0.00097)	(0.00257)	(0.00097)	(0.00427)	(0.00094)	(0.00255)	(0.00078)
Sindh	0.00134	-0.00028	-0.00076	-0.00030	-0.00699	0.00151	0.00420	0.00128
	(0.00496)	(0.00103)	(0.00283)	(0.00109)	(0.00477)	(0.00102)	(0.00287)	(0.00088)
KPK	0.01429***	-0.00309***	-0.00813***	-0.00308***	0.00755	-0.00170	-0.00451	-0.00134
	(0.00493)	(0.00108)	(0.00280)	(0.00105)	(0.00476)	(0.00108)	(0.00284)	(0.00084)
Balochistan	0.02904***	-0.00654***	-0.01642***	-0.00608***	0.01711***	-0.00396***	-0.01017***	-0.00298***
	(0.00677)	(0.00161)	(0.00380)	(0.00137)	(0.00586)	(0.00139)	(0.00347)	(0.00100)
Observations	41,473	41,473	41,473	41,473	43,412	43,412	43,412	43,412
Log-Likelihood	-37138.189				-38723.619			
Chi-square test	11021.215				13466.325			
Prob>Chi2	0.000				0.000			
Threshold Point in Panels	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*The dependent variable is education attainment that is categorical variable. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates none education. Panel A contains Gini Coefficient, Panel B includes Average Years of Schooling and Panel C includes Standard Deviation, calculated for complete years of schooling of children (9-24). Each panel is individual estimation and contains individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

5.4 Estimations of Current Enrollment by Inequalities

Table 5.4 AMEs Estimation for Current Enrollment with Education Inequalities by Logit Model

	Panel A			Panel B			Panel C		
	Gini			Avg. Years of Schooling			Standard Deviation		
	Both	Girl	Boy	Both	Girl	Boy	Both	Girl	Boy
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini (5-24)	-4.07726***	-3.50969***	-4.56796***						
	(0.10456)	(0.14814)	(0.14744)						
AYS (5-24)				0.67111***	0.63842***	0.69898***			
				(0.00447)	(0.00632)	(0.00631)			
SD (5-24)							-0.00129**	-0.00232***	-0.00036
							(0.00052)	(0.00075)	(0.00072)
Gender (5-24)	-0.01393***			-0.01201***			-0.01687***		
	(0.00176)			(0.00166)			(0.00212)		
Age (5-24)	0.05961***	0.04867***	0.06916***	0.05380***	0.04515***	0.06125***	0.01495***	0.00802***	0.02040***
	(0.00098)	(0.00139)	(0.00139)	(0.00092)	(0.00130)	(0.00130)	(0.00112)	(0.00162)	(0.00155)
Sq. age (5-24)	-0.00206***	-0.00164***	-0.00242***	-0.00188***	-0.00154***	-0.00217***	-0.00098***	-0.00069***	-0.00122***
	(0.00004)	(0.00005)	(0.00005)	(0.00003)	(0.00005)	(0.00005)	(0.00004)	(0.00006)	(0.00006)
PC income	0.00475***	0.00529***	0.00420***	0.01497***	0.01517***	0.01491***	0.00710***	0.00737***	0.00686***
	(0.00039)	(0.00054)	(0.00056)	(0.00139)	(0.00200)	(0.00192)	(0.00041)	(0.00058)	(0.00058)
Sindh	-0.05733***	-0.06277***	-0.05169***	-0.04555***	-0.05079***	-0.04014***	-0.05438***	-0.06796***	-0.04139***
	(0.00224)	(0.00313)	(0.00318)	(0.00211)	(0.00297)	(0.00300)	(0.00293)	(0.00422)	(0.00408)
KPK	0.05182***	0.04441***	0.05958***	0.04019***	0.03342***	0.04729***	0.00509*	-0.00283	0.01303***
	(0.00242)	(0.00342)	(0.00342)	(0.00230)	(0.00324)	(0.00325)	(0.00270)	(0.00387)	(0.00378)
Balochistan	-0.01117***	-0.03020***	0.00485	-0.00765***	-0.02486***	0.00669*	-0.05742***	-0.08367***	-0.03542***
	(0.00283)	(0.00410)	(0.00392)	(0.00263)	(0.00381)	(0.00364)	(0.00339)	(0.00503)	(0.00459)
Observations	221,313	106,444	114,869	221,313	106,444	114,869	192,312	91,903	100,409
Log-Likelihood	-110356.44	-51247.54	-58950.04	-27052.65	-12075.27	-14921.92	-117392.38	-55637.62	-61634.00
Chi-square test	36639.89	18080.17	18621.46	10182.79	4865.68	5395.09	23355.04	11919.72	11575.34
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is current enrollment that is binary. The category 1 displays current enrollment in primary, secondary and tertiary education and 0 demonstrates no current enrollment. Panel A contains Gini Coefficient, Panel B includes Average Years of Schooling and Panel C includes Standard Deviation, calculated for currently enrolled children (5-24). Each panel is individual estimation and contains individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

The relationship between current enrollment and educational inequalities present in Table 5.4. In Panel A, with the increase of Gini coefficient, there is significant decrease in the current enrollment in full sample. While, examine the marginal effects by gender, the probability to decrease current enrollment among boys are quite higher with Gini coefficient. However, the relationship between Gini coefficient and current enrollment among girls also exhibits statistically negative. It means the impact of educational inequalities target both children almost equally as well as its impact finds higher for boys between 5-24 years of age. This evidence is also supported by examining the Panel B. The average years of schooling in currently enrolled children is higher for boys with 9.9 percentage points. It indicates that with the increase of education, boys have almost 0.6 times advantage to be enrolled in school than girls. It also explains that gender equality can be achieved with the consistent supply of education.

These results are further explaining the educational inequality with standard deviation in currently enrolled children. Surprisingly, there is insignificant impact of standard deviation among boys' current enrollment while it is opposite for girls. Unit increase in standard deviation decreases the probability in girls' current enrollment by 0.23 percentage points that is even higher than the full sample. In addition, the impact of per capita income in these extended models are comparatively higher for girls that can be evidence towards gender equality in education by incorporative socio-economic characteristics.

5.5 Alternative Specification: Relationship between Income and Gender Inequalities in Education

5.5.1 Gender Inequalities in Education Attainment:

Table 5.5.1 present alternative specification for the relationship between household's income and gender inequalities with socio-economic characteristics. The assumption behind this specification is that most of the studies rely on the macro level dataset between countries or across the countries to determine the income or growth rate with education inequalities (Dollar 1999). Fewer studies have developed to provide gender and educational differences or gap that highly effects the economic status of the households. Many developing countries find girls' education costly and therefore to minimize education investment appears as an appropriate economic choice (Klasen 1999). On the other side, failures and under productivity of the markets are highly interconnected with the lower investment in girls. It will be interesting and important to determine economic status of the household with gender and educational differences along

with socioeconomic characteristics that range from parental to the social preferences including personal choices, tradition, and culture (Lagerlöf 1999).

In Panel A, income per capita of the household is determined with the gender gap due to illiteracy in girls and boys (9-24) with other characteristics. There is negative relationship between gender gap and income in full sample and likely to decrease with 5.8 percentage. In addition, gender gap has stronger impact to reduce the income for girls as compared to boys' sample approximately 7 times higher than boy do with 9.3 percentage. On the other side, in Panel B, the relationship of income and gender difference in education attainment between girls and boys has estimated. The higher difference exhibits higher disparity in education. For example, in full sample, gender differences is likely to reduce income by 3.3 percent and even higher among girls with 4.6 percentage. While, the gender difference in education attainment is lower among girls with 90 percent level of significance. Similarly, gender gap ratio between boys and girls are also estimated for education attainment of children (9-24). It presents higher and significant gender inequality among girls and likely to reduce household's income with the unit increase in the gender gap ratio. The results conclusively explain the negative relationship between gender inequalities and income per capita of the household as well as comparative disadvantage among girls.

5.5.2 Gender Inequalities in Current enrollment:

Results from Table 5.5.2 demonstrate inverse relationship between gender differences in current enrolled children (5-24) and income per capita of the household. The gender gap in currently enrolled children due to illiteracy has significant impact and likely to decrease income per capita with 4.7 percentages in full sample. However, by examining the impact by gender, it is conclusively provides higher disparity among girls rather than boys. For example, there is 5.9 percent decrease in income of the household in girls' sample with unit increase in gender gap due to illiteracy. Meanwhile, observing full sample, the gender difference in currently enrolled girls and boys in Panel B demonstrate 0.7 percent significant decrease in the household's income. Similarly, girls are significantly reducing 2 percentage of income of the household as compared to boys. In Panel C, the results describe wider disparity in income due to gender gap ratio in girls with 2.8 percent as compared to boys that is 1.8 percent respectively.

Table 5.5.1 Relationship between Gender Inequalities and Education Attainment by OLS: Alternative Specification

	Panel A			Panel B			Panel C		
	Gender Gap			Gender Difference			Gender Gap ratio		
	Both	Girl	Boy	Both	Girl	Boy	Both	Girl	Boy
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender gap (9-24)	-0.05864***	-0.09300***	-0.02633						
	(0.01181)	(0.01700)	(0.01634)						
Gender diff. (9-24)				-0.03301***	-0.04584***	-0.00967*			
				(0.00370)	(0.00551)	(0.00498)			
Gender Ratio (9-24)							-0.01044*	-0.03136***	0.00852
							(0.00581)	(0.00917)	(0.00770)
Gender	-0.11512***			-0.09138***			0.01302		
	(0.01018)			(0.01031)			(0.01218)		
Age (9-24)	-0.13452***	-0.13205***	-0.13383***	-0.13582***	-0.12606***	-0.13565***	-0.05351***	-0.03319**	-0.08051***
	(0.00927)	(0.01379)	(0.01248)	(0.00927)	(0.01380)	(0.01252)	(0.01149)	(0.01610)	(0.01642)
Sq. age (9-24)	0.00361***	0.00313***	0.00393***	0.00365***	0.00301***	0.00397***	0.00142***	0.00081*	0.00221***
	(0.00028)	(0.00041)	(0.00037)	(0.00028)	(0.00042)	(0.00037)	(0.00034)	(0.00047)	(0.00048)
Constant	10.35098***	10.07741***	10.50855***	10.34618***	10.02070***	10.52265***	9.17108***	9.02150***	9.39913***
	(0.09448)	(0.14500)	(0.12080)	(0.09444)	(0.14522)	(0.12098)	(0.12961)	(0.18698)	(0.17970)
Individual Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	215,308	105,371	109,937	215,308	105,371	109,937	37,398	20,493	16,905
R-squared	0.06916	0.07941	0.06650	0.06943	0.07981	0.06651	0.17966	0.19467	0.16353
Log-Likelihood	-483838.535	-239463.70	-243681.60	-483807.45	-239440.38	-243680.00	-55969.00	-30573.07	-25354.33
AIC	967731.07	478980.53	487415.21	967669.91	478935.76	487414.01	336065.01	61200.14	50763.66
BIC	968019.90	479238.80	487675.62	967957.75	479193.05	487673.41	336296.833	61414.19	50972.51
Nagelkerke R2	0.0699	0.0802	0.0672	0.0702	0.0806	0.0673	0.0820	0.203	0.171
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is household's per capita income. Panel A includes Gender Gap in Illiteracy, Panel B contains Gender Difference and Panel C is the ratio between boys and girls, each of these inequalities calculated for education attainment of children (9-24). Each Panel contains individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

Table 5.5.2 Relationship between Gender Inequalities and Current Enrollment by OLS: Alternative Specification

	Panel A			Panel B			Panel C		
	Gender Gap			Gender Difference			Gender Gap Ratio		
	Both	Girl	Boy	Both	Girl	Boy	Both	Girl	Boy
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender gap (5-24)	-0.04728***	-0.05913***	-0.03779***						
	(0.00764)	(0.01094)	(0.01065)						
Gender diff. (5-24)				-0.00743**	-0.01955***	0.00288			
				(0.00299)	(0.00435)	(0.00415)			
Gender ratio (5-24)							-0.0242***	-0.0281***	-0.0184**
							(0.00568)	(0.00858)	(0.00762)
Gender (5-24)	-0.11036***			-0.10627***			-0.0724***		
	(0.00893)			(0.00889)			(0.0123)		
Age (5-24)	0.00096	0.02557***	-0.01757***	0.00099	0.02626***	-0.01708***	0.0226***	0.0453***	0.00128
	(0.00464)	(0.00695)	(0.00622)	(0.00464)	(0.00695)	(0.00622)	(0.00650)	(0.00951)	(0.00887)
Sq. age (5-24)	-0.00076***	-0.00192***	0.00013	-0.00076***	-0.00195***	0.00011	-0.00163***	-0.00283***	-0.000521*
	(0.00016)	(0.00024)	(0.00021)	(0.00016)	(0.00024)	(0.00021)	(0.000227)	(0.000337)	(0.000304)
Constant	8.86869***	8.57043***	9.01258***	8.86334***	8.55926***	9.00737***	8.640***	8.424***	8.781***
	(0.04224)	(0.06284)	(0.05674)	(0.04225)	(0.06289)	(0.05684)	(0.0598)	(0.0870)	(0.0819)
Individual Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community Ch.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	268,277	130,856	137,421	268,277	130,856	137,421	155,064	80,374	74,690
R-squared	0.08439	0.09456	0.08130	0.08426	0.09450	0.08120	0.082	0.087	0.081
Log-Likelihood	-598373.24	-295085.28	-302479.75	-598392.53	-295090.96	-302486.94	-354489.15	-186135.63	-168008.52
AIC	1196800.48	590223.56	605010.50	1196837.07	590232.93	605024.88	709032.30	372321.26	336065.04
BIC	1197083.98	590477.88	605265.10	1197120.56	590486.26	605280.48	709301.99	372563.92	336296.56
Nagelkerke R2	0.0853	0.0955	0.0822	0.0852	0.0954	0.0821	0.0833	0.0879	0.0820
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is household's per capita income. Panel A includes Gender Gap in Illiteracy, Panel B contains Gender Difference and Panel C is the ratio of between boys and girls, each of these inequalities calculated for current enrollment of children (5-24). Each Panel contains individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

5.6 Explaining Gender Gap and its Decomposition

5.6.1 Explaining Gender Gap in Education Attainment:

The columns 1 to 3 provides mean statistics and differences between them for main model of education attainment. The estimates suggest that most of the household characteristics in which household size, occupation such as operators, urban, and infrastructure are in favor of girls. However, personal attributes such as age also have mean probability higher for girls' education attainment. While, boys are having higher proportion of values of educated members, head and parental education, occupations such as managers and clerks.

Table 5.6.1 Gender Differences in Education Attainment: By Mean, Coefficient and Interaction Estimations

	Mean Estimates			Coefficient Estimates			Interactions
	Girl	Boy	T Test	Girl	Boy	Wald Test	Boy-Girl Difference
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Education Attainment	0.360066	0.382371					
PC income	9.199137	9.313229	0.114***	0.03489***	0.03398***	0.02	0.0018
Age (9-24)	16.06317	15.79366	-0.270***	0.20277***	0.35787***	27.56***	-0.0211**
Sq. age (9-24)	278.0577	269.2072	-8.850***	-0.00593***	-0.01130***	31.22***	0.186*
Married	0.182426	0.062682	-0.120***	-0.82482***	-1.18229***	17.58***	-0.295***
Parents Edu	3.12E-05	2.25E-05	-0.0000088	3.23409	-12.3333***	14.07***	-18.98***
Head Edu	0.001358	0.014239	0.0129***	2.99917***	1.35217***	8.19***	-1.599***
Member Edu	0.017025	0.02013	0.00311***	1.88635***	1.92678***	0.71	-0.164***
Member math	0.878727	0.897737	0.0190***	3.49462***	3.43973***	0.20	-0.0903
Officer	0.01053	0.008736	-0.00179***	2.32387***	2.28891***	0.04	-0.232
Clerk	0.004887	0.005151	0.000264	1.56722***	1.52264***	0.05	-0.182
Operator	0.011116	0.012277	0.00116**	0.23835**	0.16873*	0.30	-0.0715
Manager	0.005659	0.005877	0.000217	1.31069***	1.22786***	0.19	-0.173
Technician	0.007587	0.007494	-0.0000937	1.58256***	1.52722***	0.11	-0.128
HH size	8.563826	8.518098	-0.0457**	-0.00854***	-0.00080	4.54***	0.00869**
Dependency	0.388302	0.384899	-0.00340***	-0.99988***	-0.85479***	4.19***	0.165**
Electricity	0.809464	0.799033	-0.0104***	0.64108***	0.52893***	8.34***	-0.137***
Gas	0.376755	0.373195	-0.00356	0.37810***	0.30494***	5.44***	-0.0786**
Digital full	0.428954	0.494929	0.0010	0.50727***	0.60724***	0.64	0.0811
Digital Inter	0.006198	0.078483	-0.00179	-0.35721**	-0.53153***	0.62	-0.190
Digital limit	0.524569	0.499398	-0.00198	-0.66633***	-0.70666***	3.86***	-0.0215
Establishment	0.085998	0.084197	-0.00180	-0.27659***	-0.24568***	0.36	0.0302
Own house	0.721225	0.710726	-0.0105***	-0.48268***	-0.69392***	61.87***	-0.180***
Urban	0.452341	0.453275	0.000934	0.10436***	-0.02681	18.20***	-0.118***
Sindh (Ref=Punjab)	0.240596	0.427447	0.00951***	-0.16121***	-0.09517***	3.99***	0.0701**
KPK	0.226889	0.418822	-0.0053***	-0.14912***	-0.13225***	0.26	0.0187
Balochistan	0.123896	0.329465	0.0178***	-0.33611***	-0.25263***	3.73***	0.0866**

It describes that there is significant differences among girls and boys, although, the mean values corresponds quite random verdict as more of the household infrastructure favor girls while on the other side, other residents favor boys in education attainment. Wald test Similarly, Wald test reveals significance difference in personal attributes, educated members, head and parents' education. Location and provinces except KPK are also significantly different. The difference between boy-girl is presented in last column by interacting boy variable with each explanatory variable as additional regressor in the basic model presented in Table 5.1.1 for full sample with ordered logit model regression. The estimates finds favorable values for girls' education attainment in parental and head education, household background characteristics and provinces.

5.6.2 Explaining Gender Gap in Current Enrollment:

Table 5.6.2 Gender Differences in Current Enrollment: By Mean, Coefficient and Interaction Estimations

	Mean Estimates			Coefficient Estimates			Interactions
	Girl	Boy	T Test	Girl	Boy	Wald Test	Boy-Girl Difference
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Current enrollment	0.398869	0.42597	0.0271***				
PC income	9.177841	9.269991	0.0922***	0.03239***	0.02349***	3.67***	-0.00890*
Age (5-24)	13.67987	13.42803	-0.252***	0.3087***	0.40919***	68.72***	0.100***
Sq. age (5-24)	219.5639	211.7643	-7.800***	-0.0103***	-0.01425***	81.70***	-0.00393***
Married	0.136889	0.046733	-0.0902***	-1.2196***	-0.82797***	43.47***	0.392***
Parents Edu	2.34E-05	1.67E-05	-0.0000066	0.90682	0.56837	0.06	-0.338
Head Edu	0.001019	0.010615	0.00960***	-0.30250	0.09448	1.36	0.397
Member Math	0.876582	0.892513	0.0159***	2.82400***	2.86320***	0.25	0.0392
Member Edu LS	0.014327	0.01662	0.00229***	0.89582***	0.88064***	0.05	-0.0152
Officer	0.007901	0.006513	-0.00139***	-0.46917***	-0.37795***	0.64	0.0912
Clerk	0.003667	0.00384	0.000173	-0.58845***	-0.33804***	2.35*	0.250
Operator	0.008341	0.009152	0.000812**	-0.88911***	-1.10790***	2.62*	-0.219
Manager	0.004247	0.004381	0.000134	-0.13385	-0.22039**	0.31	-0.0865
Technician	0.005693	0.005586	-0.000107	-0.49036***	-0.37534***	0.72	0.115
HH size	8.652469	8.593838	-0.0586***	-0.14782***	-0.13588***	3.03*	0.0119*
Dependency	0.434981	0.432317	-0.00266***	0.15370***	0.40595***	11.04***	0.252***
Electricity	0.793733	0.784722	-0.00901***	0.49474***	0.36802***	15.56***	-0.127***
Gas	0.358888	0.354473	-0.00442**	0.60886***	0.54993***	4.57***	-0.0589**
Cultivate	0.090869	0.091296	0.000427	-0.91467***	-0.83900***	2.71*	0.0757*
Establishment	0.089879	0.087953	-0.00193*	-1.05028***	-1.04558***	0.012	0.00470
Edu Spend	0.29515	0.300061	0.00491**	1.67838***	1.55407***	27.83***	-0.124***
Siblings	4.758273	4.738508	-0.0198*	0.20562***	0.16498***	14.90***	-0.0406***
Urban	0.436514	0.435043	-0.00147	0.12771***	0.03525*	12.07***	-0.0925***
Sindh	0.246383	0.255889	0.00951***	-0.41617***	-0.30911***	14.44***	0.107***
KPK	0.226954	0.221667	-0.00529***	0.27046***	0.33984***	6.19***	0.069***
Balochistan	0.13109	0.148872	0.0178***	-0.21216***	0.01941	45.11***	0.2315***

The columns 1 to 3 provides mean statistics and differences between them for main model of current enrollment. The estimates suggest that most of the household characteristics in which

household size, occupation such as operators, urban, and infrastructure are in favor of girls. Similarly, personal attributes such as age also has mean probability higher for girls' enrollment. While, boys are having higher proportion of values of educated members, head and occupations such as clerks, managers and operators. It describes that there is significant differences among girls and boys, although, the mean values corresponds quite random verdict as more of the household infrastructure favor girls while on the other side, other educated residents favor boys' current enrollment. Wald test presents significance difference in personal attributes like age and married, as well as per capita income of the household. Occupations are significantly having difference in coefficients. Household infrastructure, dependency ratio, location and all provinces are also significantly different. Last column display boy-girl difference by interacting boy variable with each explanatory variable as additional regressor in the main model presented for full sample with logit model regression. The estimates finds favorable values for girls' current enrollment in per capita income, age and married as well as household background characteristics and provinces.

5.6.3 Explaining Gender Decomposition in Education:

Now I examine the implications of the ordered logit model estimates for explaining the gender differences in education attainment and logit model for current enrollment from main models. I have calculated the predicted probabilities of education attainment for primary, secondary, tertiary and no education levels for girls and boys by incorporating four scenarios. Such as, girls using estimated parameters obtained from girls' equation, girls using estimated parameters obtained from boys' equation, boys using estimated parameters obtained from boys' equation, and boys using estimated parameters obtained from girls' equation, that demonstrate gender differences in education attainment and current enrollment respectively (Pal 2004). The estimates present the sum of the predicted probabilities of education attainment from primary to tertiary and current enrolled children in the Table 5.6.3. Comparatively, boys are having two times lower corresponding probabilities than their actual ones. Oppositely, probability of girls 'education attainment increases three tines probability for education attainment. On the other hand, similar proportion of increase observe in girl's current enrollment while two times lower probabilities for boys' current enrollment form actual equation. The estimates for differences are similar with reference of girls and boys, that is why, I present results here with the boys' reference. The results provide evidence that differences in attributes are relatively significant in explaining

gender differences in education attainment and current enrollment with 61 and 41 percent approximately (Dong et al., 2009). However, gender differences in both specifications covers the higher percentage in coefficients.

Table 5.6.3 Gender decomposition by Predicted Probabilities

Education Attainment			Current Enrollment		
Expected Education Attainment	**Probability**	**%**	**Expected Current Enrollment**	**Probability**	**%**
Girl's equation	0.2589		Girl's equation	0.4791	
Boy's equation	0.2718		Boy's equation	0.4912	
Boy using girl's equation	0.2518		Boy using girl's equation	0.4703	
Girl using boy's equation	0.2792		Girl using boy's equation	0.4862	
Expected Difference	0.013		Expected Difference	0.0121	
Due to			Due to		
Coefficients	0.021	161%	Coefficients	0.0071	58.7
Explanatory Variables	-0.008	-61%	Explanatory Variables	0.005	41.3

5.7 Robustness Tests

Alternative Models Specifications: I find consistent estimates for education attainment with ordered probit model regression and for current enrollment by probit model regression in Tables A.1.1 and A.1.2 respectively (McNabb et al., 2002). In both models, results are highly significant and provide evidence for previous estimations. The variable girl is more likely to increase primary education attainment. Additionally, there is marginal increase in the tertiary education for girls and boys both as compared to previous results. Similarly, unit increase in income per capita is marginally higher in probit model regression.

Alternative Explanatory Variables: Above mentioned Tables also provide results with the alternative explanatory variable of per capita expenditure. The findings show increase probability with the increase of per capita expenditure, particularly in girls' sample. Most of the estimates

are consistent with the previous findings, in addition, estimates find significantly more effective for boys' current enrollment[74].

Heterogeneity by Provinces: Table A.3.1 shows education attainment results by provinces with full sample and by gender with ordered logit model. In full models, it is interesting to examine that girl variable is having higher ratio in Balochistan province that is underdeveloped and lack most of the educational infrastructure. However, the returns of economic contribution is highly associated in KPK province for education attainment. On the other side, in Punjab, age variable provides maximum likelihood to increase education attainment. As far as concern about the provincial diversity by gender, I examine higher rate of girls' education attainment on average in KPK province followed by Sindh and boys' education attainment in Punjab followed by Balochistan. Additionally, the probability to increase education attainment by gender with unit increase of income per capita has observed higher in KPK after that in Sindh and Punjab provinces. As far as concern about the provincial diversity in current enrollment presented in Table A.3.2, I examine higher rate of current enrollment on average in Sindh province followed by Balochistan and KPK. The probability to increase current enrollment with unit increase of income per capita has observed in Sindh by gender, followed by Balochistan and KPK. It is one of the important findings that KPK and Balochistan are more underdeveloped with tribal composition and patriarchal systems as compared to Sindh. However, these areas can maximize the returns once provided with education. Detailed estimation results for each robustness test can be available on demand.

6. Conclusion & Policy Implications

This study focuses on two main objectives such as, at first place, it determines two measurements of education, say, education attainment and current enrollment, by income and socio-economic characteristics of the household. Empirically, the link between household income and education is difficult to construct, therefore, most of the studies rely on macro datasets. Furthermore, this study attempts to deal with the potential endogeneity by exploiting exclusion restrictions in per capita income in order to establish a relationship with education

[74] I also estimated models with permanent income of the household for both specifications. The gender remains significant and positive at each level of education attainment. Unit increase in permanent income raise the primary and secondary education attainment more in boys than girls while latter has advantage at tertiary level. In addition, there is sharp increase in boys' current enrollment with unit increase in permanent income.

achievement with help of advance approach of instrumental variable (2SRI) for non-linear models. At second place, the extended models have estimated education attainment and current enrollment with different measurements of educational inequalities, in addition, this study analyze the relationship between household's income and different measurements of gender inequalities in education separately for girls and boys. Lastly, it develops gender decomposition based on mean and coefficient differences, interaction terms, and Oaxaca type variations.

Supporting first objective, the gender differences in education attainment and current enrollment are significant in Pakistan and findings remain consistent even after controlling for endogeneity. The important factors behind girls' education attainment are personal attributes such as age, parents' education and occupations with high salaries as well as household infrastructure that further enhance their education completion rate. The estimates suggested that 61 and 41 percent of the gender difference in education attainment and current enrollment are explained respectively, however, major part of the variations remains unexplained that might be due to parental differential treatment. This includes strong patriarchy, son preference and higher cost of education associated with girls' education. The education incentives are higher for boys as members of the households, occupations and provincial variations highly motivated for their education attainment and current enrollment.

Ram (1990) used standard deviation for Kuznets curve; I apply here to determine the education attainment and current enrollment. Average years of schooling considers as the one of the channel to develop human capital development (Psacharopoulos 1994; Nehru et al., 1994), however past studies focused this measurement only for macro levels. The findings reveal negative relationship between Gini coefficient and education attainment except at primary level. As expected, girls are less likely to attain tertiary education as compared to boys with the education inequalities that explains second objective of this study. Similar results obtain with standard deviation of education attainment and current enrollment in which girls are significantly less likely to complete higher grades. The positive correlation finds between average years of schooling and completion of grades almost equal marginal effects in boys and girls; they are consistent but different in current enrollment. My findings support Jacob (2002) that highlights the positive relationship of education attainment and per capita income and significant transformation of education from lower level to higher level. However, after controlling for

endogeneity findings indicate lower education attainment and current enrollment for girls as compared to boys because of three important factors. Firstly, minimum returns associated with female education as fragile asset, particularly, in poor and middle-income families with strong patriarchy, however marital status might be ignored. Secondly, high cost associated with education and differ by gender indicate limited supply of education with fewer colleges and universities for girls. Lastly, education accessibility highly depends on cultural restrictions on females' mobility for out-of-home education, especially, in tribal and rural areas. Findings reveal that lower rate of female education has direct link with lower income level, larger household size and low skilled occupations that support previous studies (McNabb et al., 2002). Findings support Munshi (2017) in which educational transition in a socio-cultural framework highlights the importance of women empowerment for choice of marriage. Besides marital status, larger households, number of siblings and dependency ratio also support this notion and formulate trade-off or time allocation for domestic chores especially for girls that is evident to past studies of Maitra (2003). The findings imply that effect of age in boys determine economic returns at higher levels that is the plausible explanation of delayed admission in the tertiary education. My findings accord with the Delgado-Gaitan (1990) and Galick (2000) that explains importance of parental education but only for boys' current enrollment. However, education of other members of the household and head have strong effect on girls' education attainment and current enrollment.

Furthermore, there is comparative increase in the tertiary education attainment for girls with most of the explanatory variables indicating plausible explanation such as; female cognitive skills are equally productive for the labor market and economic growth if they attain higher grades (Aslam 2009). Secondly, there is a tradeoff between fertility and mortality rates with the increase in the female higher education (Galor 1993). Thirdly, households with weak economic structure are inclined to facilitate their children with higher education and educated members can diversify social concepts associated with the females for advance skills. Alternatively, educated mothers-in-future positively associated with tertiary education attainment revealing long-run economic growth (Huang et al., 2009). In addition, findings suggest that not only high-salaried occupations such as officers as well as low-salaried ones equally tend to increase the probability of education attainment and current enrollment particularly among girls and generally in boys that contradicts Chowdary et al. (2011) and suggest that lower socio-economic backgrounds can

provide higher aspirations for education achievement. In contrast, possession of physical assets have inverse relationship with education attainment and current enrollment that might represent following reasons. Firstly, transition of work force from cultivated land to the industrial cities that also indicated by higher marginal effects associated with urban location, secondly, lower purchasing power with the increase of education as higher cost associated with the current enrollment and lastly, people inclined towards more research and development rather than accumulating wealth. These highlight step towards The Capability Approach (Sen 1980) and educational externalities regarding social responsibility and uplifting of households from vicious cycle of poverty (Chaudhry 2009).

However, children belong to the household having occupations such as officers have advantage in education attainment over those who have occupations related to manual or labor work that strongly support the past literature (McNabb 2001). The findings suggest household infrastructure increases the probability of education attainment and provide related gender differences at each level of education that remains limited in transitional approach by Willis (1979). In contrast, the digital access to broadband is more favorable to boys' education attainment that can observe during existing pandemic of Covid-19[75] and highlight to curb the gender differences in education. Therefore, the recent shifts from in-site to remote learning might decrease the probabilities of girls' education attainment particularly in rural areas due to gender bias in social mobility and freedom of communication (Wutoh et al., 2004)[76]. The gender-specific variations are accounted, as other provinces are less likely to increase the probability of tertiary education achievement as compared to Punjab. The strong negative effects are associated with the primary grades for both girls and boys. However, the worst situation of education estimated in Balochistan and KPK with tribal and conflicted areas that are suffering from schools destruction, ban on the female education and freedom of mobility. Summing up, this study has investigated gender differences in education attainment and current enrollment in Pakistan from 2005-2016 by using logit and ordered logit models. Firstly, the findings favor the education

[75] COVID-19 is infectious disease that outbreak in Wuhan China in December 31, 2019. The first two cases were confirmed on 26 February 2020 in Pakistan (Government of Pakistan, Ministry of Health) and the first closing of schools to avert the spread of the virus was 13 March 2020.

[76] The total broadband users are 70 million (Pakistan Telecommunication Company Ltd., 2020; Pakistan telecommunication Authority; Tribune Pakistan July, 2020) out of the total population of 212.2 million (World Bank 2018). They suffer from the internet speed, limited ISPs and disrupted networks.

attainment with the individual and household characteristics and strive to exercise transition of female education for human capital investment. Secondly, it emphasizes the importance to establish the existence of potential endogeneity between income and education in order to facilitate assistance to the policy makers. Although, the probability of education attainment increases with income but it declines from primary education to higher education for girls. The probability of educational transition favors boys and higher marginal effect associated with the high-income occupations and regional distribution, however, household infrastructure seems to evolve effective mediums to narrow gender gap. The findings indicate to counter household growth rate that can eventually increase the likelihood of completing education of girls for primary and specifically tertiary levels. The findings are robust with alternative specification, other control variables and distribution of dataset according to the provinces. Lastly, the findings highlights valuable recommendations for policy makers to perpetuate gender equality.

- Reforming education policies by prioritizing rural and tribal areas with adequate public and private funds and cost effective education.
- Allocation of incentives, scholarships and financial support on merit for talented and hardworking females particularly at tertiary education.
- Targeting policies to minimize the gap between having enrolled and not having enrolled by helping parents with low salaries.
- Improving supply of education with mobile learning, schools, colleges, universities and research labs by federal and local governments that can directly raise the transitional effect of education to maximize gender equality.
- Efforts to develop educational framework from primary to tertiary education that incorporate committees by collaboration of parents and teachers in order to get rid gender biased curriculum and awareness campaigns for equal treatment within households.

Finally, some potential limitations should be noted that might suggest for future research. Firstly, this study focused on education attainment for children 24 years of age and less however, other age groups, particularly for tertiary level might be considered. Secondly, the study dealt with the potential endogeneity between education and income, on the other sides, explanatory variables, especially, parents ‘education might also suffer. Thirdly, further qualitative research urge to develop with household characteristics other than that I have used in this study.

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Appendix A: Tables for Robustness Check

A.1.1 Education Attainment by Alternative Model and Explanatory Variable

Table A.1.1 AMEs Education Attainment by Ordered Probit Model and PC Expenditure

	Ordered Probit Model				Per Capita Expenditure			
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Full Sample								
PC income	-0.00525***	0.00165***	0.00261***	0.00099***				
	(0.00040)	(0.00013)	(0.00020)	(0.00008)				
PC expenditure					-0.04590***	0.01539***	0.02323***	0.00728***
					(0.00171)	(0.00057)	(0.00087)	(0.00030)
Gender (9-24)	-0.00947***	0.00298***	0.00471***	0.00178***	-0.00726***	0.00243***	0.00367***	0.00115***
	(0.00183)	(0.00058)	(0.00091)	(0.00035)	(0.00183)	(0.00061)	(0.00093)	(0.00029)
Age (9-24)	-0.02844***	0.00895***	0.01414***	0.00534***	-0.04174***	0.01400***	0.02112***	0.00662***
	(0.00197)	(0.00062)	(0.00101)	(0.00035)	(0.00214)	(0.00072)	(0.00114)	(0.00030)
Sq. Age (9-24)	0.00077***	-0.00024***	-0.00038***	-0.00014***	0.00129***	-0.00043***	-0.00065***	-0.00021***
	(0.00006)	(0.00002)	(0.00003)	(0.00001)	(0.00007)	(0.00002)	(0.00004)	(0.00001)
Observations	154,037	154,037	154,037	154,037	153,818	153,818	153,818	153,818
Log-Likelihood	-105784.82				-104845.797			
Chi-square test	38583.71				36201.955			
AIC	211629.64				209751.594			
Nagelkerke R2	0.307				0.317			
Prob > chi2	0.000				0.000			
Girls								
PC income	-0.00527***	0.00162***	0.00257***	0.00109***				
	(0.00055)	(0.00017)	(0.00027)	(0.00012)				
PC expenditure					-0.04645***	0.01516***	0.02300***	0.00829***
					(0.00242)	(0.00079)	(0.00121)	(0.00048)
Age (9-24)	-0.01881***	0.00576***	0.00917***	0.00388***	-0.02929***	0.00956***	0.01450***	0.00523***
	(0.00275)	(0.00084)	(0.00137)	(0.00055)	(0.00300)	(0.00098)	(0.00154)	(0.00050)
Sq. Age (9-24)	0.00044***	-0.00013***	-0.00021***	-0.00009***	0.00086***	-0.00028***	-0.00043***	-0.00015***
	(0.00009)	(0.00003)	(0.00004)	(0.00002)	(0.00010)	(0.00003)	(0.00005)	(0.00002)
Observations	75,651	75,651	75,651	75,651	75,551	75,551	75,551	75,551
Log-Likelihood	-51237.967				-50859.020			
Chi-square test	17649.50				16596.543			
AIC	102533.93				101776.040			
Nagelkerke R2	0.305				0.314			
Prob > chi2	0.000				0.000			
Boys								
PC income	-0.00549***	0.00177***	0.00279***	0.00094***				
	(0.00056)	(0.00018)	(0.00029)	(0.00010)				
PC expenditure					-0.04527***	0.01548***	0.02341***	0.00638***
					(0.00241)	(0.00082)	(0.00125)	(0.00038)
Age (9-24)	-0.03720***	0.01197***	0.01888***	0.00634***	-0.05300***	0.01812***	0.02742***	0.00746***
	(0.00282)	(0.00091)	(0.00149)	(0.00044)	(0.00304)	(0.00105)	(0.00167)	(0.00037)
Sq. Age (9-24)	0.00106***	-0.00034***	-0.00054***	-0.00018***	0.00168***	-0.00057***	-0.00087***	-0.00024***
	(0.00009)	(0.00003)	(0.00005)	(0.00001)	(0.00010)	(0.00003)	(0.00005)	(0.00001)
Observations	78,386	78,386	78,386	78,386	78,267	78,267	78,267	78,267

Log-Likelihood	-54295.24				-53735.887			
Chi-square test	21651.92				20045.485			
AIC	108648.49				107529.774			
Nagelkerke R2	0.313				0.324			
Prob > chi2	0.000				0.000			
Threshold point	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*The dependent variable is education achievement that is categorical variable. AMEs stand for average marginal effects. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates no education. The reference category for digital is no direct connection and any extension. Each model is individual estimation and include individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1*

A.1.2 Current Enrollment by Alternative Model and Explanatory Variable

Table A.1.2 AMEs for Current Enrollment by Ordered Probit Model and PC Expenditure

	Probit Model			Per Capita Expenditure		
	Both	**Girl**	**Boy**	**Both**	**Girl**	**Boy**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PC income	0.00457***	0.00516***	0.00394***			
	(0.00038)	(0.00053)	(0.00055)			
PC expenditure				0.07839***	0.07893***	0.07753***
				(0.00144)	(0.00202)	(0.00205)
Gender (5-24)	-0.01411***			-0.01289***		
	(0.00177)			(0.00186)		
Age (5-24)	0.06108***	0.05003***	0.07074***	0.06139***	0.05099***	0.07053***
	(0.00097)	(0.00138)	(0.00137)	(0.00105)	(0.00149)	(0.00148)
Sq. age (5-24)	-0.00209***	-0.00167***	-0.00245***	-0.00211***	-0.00171***	-0.00246***
	(0.00003)	(0.00005)	(0.00005)	(0.00004)	(0.00005)	(0.00005)
Observations	221,313	106,444	114,869	220,963	106,285	114,678
Log-Likelihood	-111149.73	-51554.49	-59435.49	-119753.04	-55872.17	-63750.65
Chi-square test	39002.70	19236.04	19855.04	25243.39	12676.50	12647.70
AIC	222354.46	103161.98	118923.98	239558.09	111794.35	127549.30
Nagelkerke R2	0.313	0.329	0.299	0.223	0.236	0.212
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000

*The dependent variable is current enrollment that is binary. The category 1 displays current enrollment in primary, secondary and tertiary education and 0 demonstrates no current enrollment. Each model is individual estimation and include individuals, household and community characteristics. AMEs stand for average marginal effects. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1.*

A.2.1 Determination of Education Attainment by Provinces

Table A.2.1 Coefficients Estimations for Education Attainment by Provinces

	Punjab	Sindh	KPK	Balochistan
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Full Sample				
PC income	0.02497***	0.08154***	0.03246***	0.06504***
	(0.00387)	(0.01017)	(0.00438)	(0.01573)
Gender (9-24)	0.09906***	0.01217	0.01234	-0.01923
	(0.01886)	(0.02562)	(0.02733)	(0.03928)
Age (9-24)	0.31610***	0.18482***	0.34979***	0.24735***
	(0.02253)	(0.02944)	(0.03183)	(0.04534)
Sq. Age (9-24)	-0.00955***	-0.0062***	-0.0105***	-0.00751***
	(0.00073)	(0.00096)	(0.00103)	(0.00149)
Observations	59,337	38,596	35,110	20,994
Log-Likelihood	-46148.12	-25720.45	-21978.33	-11031.12
Chi-square test	15937.23	8996.0	7481.12	4030.41
Pseudo R2	0.154	0.164	0.201	0.224
Prob > chi2	0.000	0.000	0.000	0.000
Girls				
PC income	0.02674***	0.09431***	0.03506***	0.06760***
	(0.00537)	(0.01534)	(0.00636)	(0.02467)
Age (9-24)	0.22515***	0.13029***	0.28396***	0.07855
	(0.03150)	(0.04304)	(0.04477)	(0.06858)
Sq. Age (9-24)	-0.0062***	-0.0041***	-0.0086***	-0.00221
	(0.00102)	(0.00140)	(0.00145)	(0.00227)
Observations	29,917	18,503	17,608	9,623
Log-Likelihood	-23291.0	-12072.5	-10751.01	-4743.11
Chi-square test	7371.23	4097.78	3371.25	1647.08
Pseudo R2	0.153	0.168	0.194	0.221
Prob > chi2	0.000	0.000	0.000	0.000
Boys				
PC income	0.02460***	0.07398***	0.03094***	0.06713***
	(0.00562)	(0.01371)	(0.00607)	(0.02042)
Age (9-24)	0.41216***	0.22452***	0.39760***	0.37286***
	(0.03249)	(0.04066)	(0.04562)	(0.06154)
Sq. Age (9-24)	-0.01298***	-0.0077***	-0.01196***	-0.01132***
	(0.00105)	(0.00132)	(0.00148)	(0.00203)
Observations	29,420	20,093	17,502	11,371
Log-Likelihood	-22735.17	-13582.20	-11143.78	-6245.33
Chi-square test	8608.13	4997.09	4135.09	2418.19
Pseudo R2	0.157	0.164	0.212	0.230
Prob > chi2	0.000	0.000	0.000	0.000
Threshold point	Yes	Yes	Yes	Yes

*The dependent variable is education achievement that is categorical variable. AMEs stand for average marginal effects. The category 1 displays for primary, 2 for secondary and 3 for tertiary level of education and 0 demonstrates no education. The reference category for digital is no direct connection and any extension. Each model is individual estimation and include individuals, household and community characteristics. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1.*

A.2.2 Determination of Current Enrollment by Provinces

Table A.2.2 Coefficients Estimations for Current Enrollment by Provinces

	Punjab	Sindh	KPK	Balochistan
	(1)	(2)	(3)	(4)
Full Sample				
PC income	0.01646***	0.17501***	-0.00545	0.19575***
	(0.00323)	(0.01399)	(0.00364)	(0.01826)
Gender (5-24)	-0.01277	-0.12471***	-0.09925***	-0.28604***
	(0.01598)	(0.02228)	(0.02232)	(0.03239)
Age (5-24)	0.37261***	0.38840***	0.31756***	0.38515***
	(0.00938)	(0.01299)	(0.01224)	(0.01812)
Sq. age (5-24)	-0.01280***	-0.01341***	-0.01091***	-0.01312***
	(0.00033)	(0.00047)	(0.00044)	(0.00066)
Observations	90,710	53,609	48,241	28,749
Log-Likelihood	-47506.01	-25332.59	-24843.58	-12391.90
Chi-square test	13715.84	8399.61	7743.45	5383.02
Pseudo R2	0.179	0.196	0.214	0.300
Prob > chi2	0.000	0.000	0.000	0.000
Girls				
PC income	0.02120***	0.19860***	0.00141	0.21664***
	(0.00451)	(0.02223)	(0.00532)	(0.03343)
Age (5-24)	0.35644***	0.33025***	0.23952***	0.24582***
	(0.01348)	(0.01960)	(0.01767)	(0.02803)
Sq. age (5-24)	-0.0118***	-0.01131***	-0.00805***	-0.00773***
	(0.00048)	(0.00072)	(0.00064)	(0.00105)
Observations	45,207	25,236	23,373	12,624
Log-Likelihood	-23112.37	-11209.09	-11584.49	-5040.22
Chi-square test	7028.73	4144.02	3925.99	2413.42
Pseudo R2	0.191	0.225	0.227	0.321
Prob > chi2	0.000	0.000	0.000	0.000
Boys				
PC income	0.01147**	0.15722***	-0.01158**	0.18322***
	(0.00465)	(0.01803)	(0.00505)	(0.02129)
Age (5-24)	0.38809***	0.43068***	0.38456***	0.47086***
	(0.01309)	(0.01743)	(0.01704)	(0.02403)
Sq. age (5-24)	-0.0136***	-0.01490***	-0.01332***	-0.01627***
	(0.00046)	(0.00062)	(0.00061)	(0.00086)
Observations	45,503	28,370	24,868	16,125
Log-Likelihood	-24343.47	-14056.52	-13204.90	-7304.00
Chi-square test	6763.01	4242.48	3836.19	2986.21
Pseudo R2	0.169	0.175	0.203	0.285
Prob > chi2	0.000	0.000	0.000	0.000

*The dependent variable is current enrollment that is binary. The category 1 displays current enrollment in primary, secondary and tertiary education and 0 demonstrates no current enrollment. Each model is individual estimation and include individuals, household and community characteristics. AMEs stand for average marginal effects. Robust standard errors are in parentheses. Significance levels denote as *** p<0.01, ** p<0.05, * p<0.1.*

A.3 Significance of the Residuals from 2SRI Approach

Table A.2.3 Residual Estimations from 2SRI Approach

	Education Attainment			Current Enrollment		
Variables	**Both**	**Girl**	**Boy**	**Both**	**Girl**	**Boy**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Residuals: both	-0.718***					
	(0.0598)					
Residuals: girl		-0.211***				
		(0.0495)				
Residuals: boy			-1.504***			
			(0.148)			
Residuals: both				-0.0375***		
				(0.00576)		
Residuals: girl					-0.0348***	
					(0.00867)	
Residuals: boy						-0.0390***
						(0.0143)
Child Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
HH Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Provincial Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	749,503	749,503	749,503	749,503	749,503	749,503

There is simple test for 2SRI approach for endogeneity by providing the assumptions underlying the instrumental variable method, the residuals of the first stage should be statistically significant, indicating that it may bias the estimates from the original model. The residuals from the first-stage regression for income per capita of the household are statistically significant in all samples, suggesting that failure to use an IV approach would lead to biased coefficients. The first stage is OLS while second stage is ordered logit for education attainment and logit for current enrollment. The instruments are income shock described as head unemployed and grandparents' resources for education attainment, and income windfall and income difference are for current enrollment.

A.4 Summary Statistics of Selected Variables by Gender

Table A.4 Summary Statistics of Selected Variables by Gender

Variables	Education Attainment		Current Enrollment	
	Girl	Boy	Girl	Boy
	Mean	Mean	Mean	Mean
	(1)	(2)	(3)	(4)
Education attainment Primary	0.1135818	0.1309749		
Education attainment Secondary	0.0873935	0.0966908		
Education attainment Tertiary	0.023899	0.0193382		
Education attainment None	0.7751258	0.7529961		
Current Enrollment			0.3988685	0.4259696
Current Enrollment None			0.6011315	0.5740304
PC income	9.199137	9.313229	9.177841	9.269991
Age (9-24)	16.06317	15.79366	13.67987	13.42803
Sq. age (9-24)	278.0577	269.2072	219.5639	211.7643
Married	0.182426	0.062682	0.136889	0.046733
Parents Edu	3.12E-05	2.25E-05	2.34E-05	1.67E-05
Head Edu	0.001358	0.014239	0.001019	0.010615
Member math	0.878727	0.897737	0.876582	0.892513
Professional	0.01053	0.008736	0.007901	0.006513
Clerk	0.004887	0.005151	0.003667	0.00384
Operator	0.011116	0.012277	0.008341	0.009152
Manager	0.005659	0.005877	0.004247	0.004381
Technician	0.007587	0.007494	0.005693	0.005586
HH size	8.563826	8.518098	8.652469	8.593838
Dependency	0.388302	0.384899	0.434981	0.432317
Electricity	0.809464	0.799033	0.793733	0.784722
Gas	0.376755	0.373195	0.358888	0.354473
Establishment	0.085998	0.084197	0.089879	0.087953
Urban	0.452341	0.453275	0.436514	0.435043
Sindh (Ref=Punjab)	0.240596	0.427447	0.246383	0.255889
KPK	0.226889	0.418822	0.226954	0.221667
Balochistan	0.123896	0.329465	0.13109	0.148872
Digital full	0.428954	0.494929		
Digital Inter	0.006198	0.078483		
Digital limit	0.524569	0.499398		
Own house	0.721225	0.710726		
Member Edu	0.017025	0.02013		
Member Edu LS			0.014327	0.01662
Cultivate			0.090869	0.091296
Siblings			4.758273	4.738508
Edu Spend			0.29515	0.300061

Appendix B: Figures

Figure B.1. Education Attainment by Age (2005-2016)

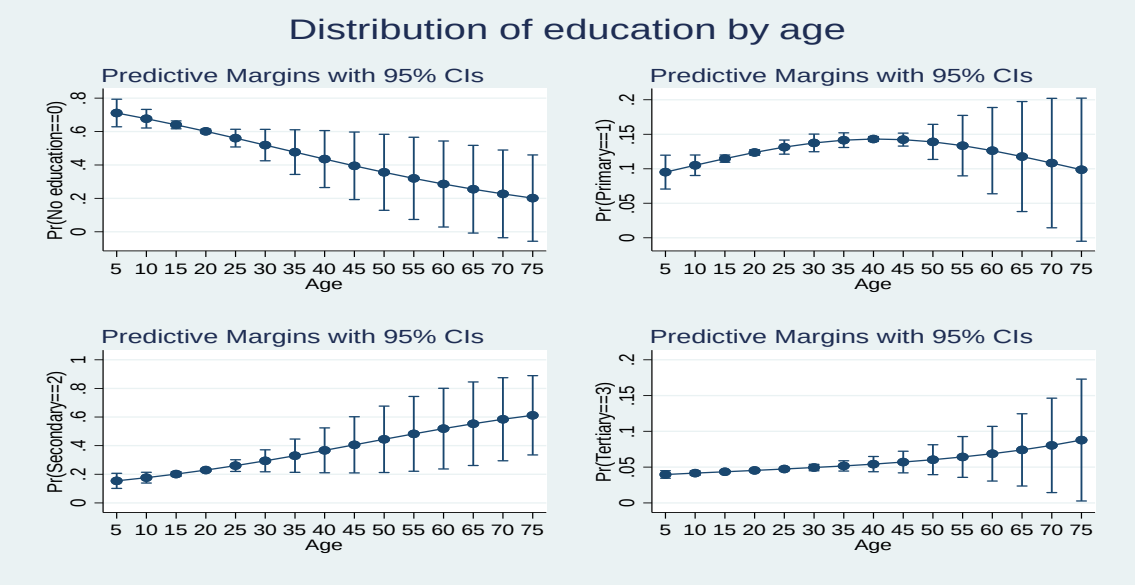

Figure 1 describes the predictive margins between age and education levels. The probability to complete primary education decreases after the age 40, whereas, it is opposite for the tertiary level. Meanwhile, with the increase of age, it is more likely to complete secondary education level.

Figure B.2. Relationship between Income and Age

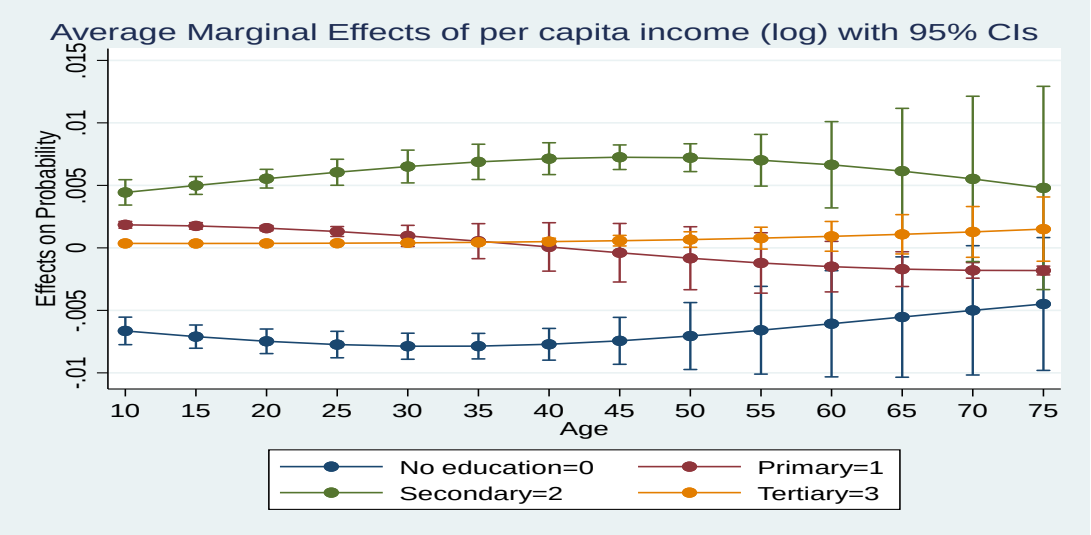

Figure 2 shows the average marginal effects of per capita income with age and education. With no education, there is less likely to increase the probability of income per capita. However, with the increase in age after 40, the completion of secondary education is likely to increase per capita income of the household. Contrary, tertiary level show meager effect on the contribution of income of the household.

General Conclusion

General Conclusion

Achieving the mechanism and strategic maps of gender equality and human capital constitute as a main objective of the public policy and wellbeing of the state. Definitely, these trajectories enhance social tolerance and acceptance for variety of groups based on caste, color, creed, religion and cultures regardless of gender that consequently as a whole transform society for long run economic growth. It is definite that each province or region of the country contribute differently in the economic stream however, their main goal remains associated with the creation of possible opportunities for the people. That is why, developing country, like Pakistan, should consider that how it can mobilize female human capital with equal opportunities that influence on the distribution of the resources across the fields. The role of female human capital as medium for development can stimulate the economy being catalyst in the society. The potential of female human capital is likely to reduce gender differences and human rights violations to curtail poverty and social unrest by maximizing returns efficiently.

In Pakistan, female education has not received much attention in the past to address the disparities among prominent socio-economic features such as household welfare, empowerment and education equality. While, a developing country needs to explore advance and effective measures to use its human asset that perpetuate possibilities for quality of life with freedom of mobility, power of decision-making, employment, health and most importantly education achievement. Specifically, one of the main differences between developing and developed economies is female education, and, Pakistan should opt immediate step to reduce gender discrimination in order to achieve sustainable economic growth. Broadly, female education considers as intermediate way by incorporating household and community factors to benefit each sector of the economy that no one remains deprive of one's basic needs of life. It promotes educational and public objectives in a way that challenges outdated traditions and patriarchal society, which believe female as inferior human being.

Therefore, the objective of this thesis has focused on the status of the female in general. While, it analyze the impact of female education on the economic and demographic aspects of the country specifically. To do so, I have presented three essays in which different econometric techniques and approaches have used to assess the contribution of the female human resource in improving the country of Pakistan.

Main Results

Chapter 2 examines the women education and its contribution for achieving empowerment through decision-making in the household. The relationship between women education attainment and empowerment deserve extreme attention as 'right of say' to one's own life, while, life strategic choices provide resources to achieve the goals of welfare and economic stability of the country. Any discrimination and deprivation in the socio-demographic and socio-economic structures of the society indirectly change the economic setup. The capability approach (Sen 1980) is the believer that the human abilities are the moderators of the society and economy whereas the agency and resources are defined by Kabeer (1999) facilitate one to attain productive outcome, however, my study considers that socio-demographic and socio-economic perspectives need availability of the resources that might vary by households and cultural set ups. By large, focusing on the patriarchal system, it is not easy to imply these factors for the women empowerment.

With the help of multinomial probit model and by using the dataset of PSLM over the period of 2005-2014, I examine the impact of education attainment on women empowerment. The study discusses the two perspectives of women empowerment in monetary and non-monetary terms. In case of non-monetary or widely say as, socio-demographic perspective, the household decision-making has analyzed by the freedom of choice of marriage, family planning and preference of sons over daughters. While, the monetary or socio-economic perspective elaborate the decision-making for household consumption expenditures, education continuation and employment. I capture the reverse causality for the latter term by the instrumental variable technique. The specific objective is to figure out the status of women within the household and in the society, which optimize human resources with provision of equal opportunities. My findings show that in contrast of unitary, joint decision-making for marriages is likely to increase women empowerment with the contribution of education attainment, however, working-women are more likely to gain control for suitors as compared to non-working women. The findings highlight the importance of family planning with joint decision-making of the couple, while, the ratio differs by age, region, occupations and wealth quantiles. On the other side, even the educated husband are likely to enhance women empowerment with the son preference. Nevertheless, women associated with labor market is undistinguished for son preference. Additionally, lower income

groups and provinces with low infrastructure, limited mobility and exposure to the outer world are highly likely to increase women empowerment if the mother has first-born child a son.

In contrast, education attainment increases the probability of decision-making in education continuation and seeking employment. I find that joint decision-making of parents are likely to increase women empowerment subjective to age and marital status in education continuation, meanwhile, working husband prefer their spouse to contribute in the labor market and that increases with their education level. Alternatively, rural and tribal areas of the country are less likely for women empowerment in education and employment decision-making, while, higher income groups are more likely to decrease parental preference on education investment. The findings explore the positive relationship of women decision-making in the household resource expenditure with education attainment. In opposition, working males are less likely to transfer control to women that is subject to the household size, structure of the family and preferably due to the associated economic burden in the patriarchal society. My study provide explanations to reform public policies by understanding the issue of rights deprivation at the micro level in which education attainment and socio-economic characteristics mainly play major role in determining women empowerment.

Chapter 3 explores the relationship of education of single females and household welfare in Pakistan over the period of 2005-2016. This chapter focuses that part of population who assumed to be non-productive and negative shock on the economy including never married, divorced and widow women, oppositely, these single female have immense potential to help themselves and society with their education. This is the very first study in the literature who address the economic aspect of the household by incorporating single females in Pakistan, additionally; it aims to examine those gender disparities, which are barriers for the long-run economic welfare and growth. In order to measure the impact of single females with their education I use multilevel model regression at two levels; households and individuals at lower level and Primary Sampling Units (PSUs) at higher level. It also capture the potential endogeneity with the help of two stage least square technique. Contrary to Allendorf (2012) that measure the welfare by kinship and spousal support, my study deals with other aspect of the society. Meanwhile, to determine economic welfare, other socio-economic characteristics also play their roles effectively. The results providence evidence that divorced and widowed females are negatively associated with

the welfare of the household; meanwhile, it is equally dimming their societal status making indefensible for living. However, if they are likely to improve their living standards with the increase of age. The findings explain that poverty reduces with the increase of the economic welfare while different ethnic groups based on languages are more likely to increase welfare but their proportion according to the population equally matters.

The findings reveal that random intercept-slope models of poverty, technology, urbanization, languages and literacy rate provide variation that are highly likely between PSUs as compared to household. The variations in technology find comparatively higher, nevertheless, variation against literacy rate and urbanization indicate the need of progress in those areas who are deprived from basic infrastructure and educational rights. The study highlights micro as well as macro determinants of economic welfare to reform public policies within household and across the country by incorporating single female human resources in efficient and productive ways.

Chapter 4 explains that income and socio-economic characteristics are highly likely to determine education attainment and current enrollment for understanding gender differences among children in Pakistan from 2005 to 2016. It also captures the potential endogeneity between income and education with more advance techniques for non-linear models describe as two-stage residual inclusion approach by using instruments such as income shock, windfall income and grandparents' characteristics. My findings suggest the transitional effect is not equal among different educational levels in education attainment as most of the secondary educated children unable to enter in tertiary level. Similarly, strong patriarchy also reveals by the results as educated members and head are supportive in education investment for boys; moreover, girls are inversely proportional to the current enrollment even after controlling for endogeneity. Similar findings provide significant and inverse relationship of educational inequalities and girls' current enrollment. It further explains by Oaxaca decomposition that explained variations are less than the unexplained variations that might be due to unequal treatment towards girls. My findings suggest developing public and educational policies by understanding the nature and behaviors of the background characteristics and economic growth of the household side by side for curbing gender differences. It draws certain points that might be helpful to make public reforms according to demand and supply of education by implementing household and provincial strategies in society.

Recommendations

The analysis of the studies have shown that the women education and socio-economic indicators play critical role in the development, empowerment and welfare of the country by decreasing gender differences in the society. One of the main recommendations emphasizes on the allocation and equal distribution of the power within the household in strategic life choices by bring down discrimination and adopting goals to achieve education. The government should revise public policies to facilitate free education, income generation and employment opportunities regardless of gender, region and province. Government should introduce family policies to ensure the participation of women in the labor force while reforming protection laws for them in order to facilitate with secure learning and working environment. As far concern about the basic human rights, NGOs and public-private partnership institutes should initiate campaigns for self-awareness, and gender equality while media can play its role as well. Considering the dominancy of the strong patriarchal relations, self-awareness campaigns, remote education and incentives towards paid employment for women can diversify income of the household for poverty alleviation. The high dependency rate indicates the increasing demand that must engaged with the employment opportunities with the Federal and Local bodies of the government to cope future economic shocks. In addition, educated and working mothers can also contribute within the communities to encourage and educated parents for equal treatment among children. One of the main recommendations is that health measures should be taken at each region of the country and family planning campaigns should be expended to villages to promote advance health techniques and balance between family size and resources. Furthermore, government should focus on the fundamental structural household matters that directly affect society and create gender discrimination at provincial levels. The enforcement on the marriage age must be monitored strictly, as early marriage escalate early parenthood with less education attainment. It makes economic circumstances of the household more vulnerable but also transmit those societal practices that negatively effect on women empowerment and education attainment. The Ministry of Labor of Pakistan should initiate female labor union membership and employment strategies to cover up the gender wage gap.

The other recommendation suggests that the educational power of the single females is equally productive as men in achieving economic welfare in following manners; firstly, government should take immediate initiatives to protect single females and provide food, shelter and security

specifically at the conflicted areas. It should increase quota in employment and educational sectors in order to support single females financially that they might firm their position in the society. Government should initiate policies of self-employment programs for single females as human capital directly increases the labor force participation to enhance the business performance and economic development of the country. In addition, local government bodies should provide support to diversify the employment opportunities to bring down the dependency ratio (in our case might be due to widows and orphan-hood). Secondly, government should implement those policies that directly help to sustain domestic consumption expenditure such as food products. It can provide dual benefits. To reduce poverty and increase basic facilities of living. The welfare programs particularly for rural areas can promote knowledge and trade transfer as the findings evidently support availability of infrastructure for quality of life. Thirdly, non-profit institutes, media, and local government should introduce remote help to provide education, food and health facilities where there are no schools, hospitals and proper transportation.

Moreover, the findings indicates possible intervention of government as there is positive impact of income on education. By increasing employment opportunities, government can potentially support for poverty alleviation and on the other side, these can improve the transition ratio from primary to higher education levels. Similarly, the opening of female universities might be another policy option to reduce the gender gap in education attainment. The building of credit constraints with interest free loans, scholarship programs and free education up to higher secondary level can possibly improve the enrollment ratios among girls. Furthermore, cost effectiveness programs must be initiated such as monitoring on the construction of the schools in inappropriate location where parents are highly unlikely to send their daughters must be controlled. Secondly, targeting ghost schools (non-functioning schools only present in papers) that are approximately 30,000 in Pakistan (Transparency International 2013), and finally, allocation of resources based quality of education must be considered in national action plans for education. In order to increase the enrollment rate, the proportion of female teachers, construction of single-sex schools and communication facilities must be provided according to the population density. Funding to low income groups and opening science universities in each province can be possible joint ventures of local government and the communities. Furthermore, education sector should thoroughly consider the dropout rate after the secondary education.

Limitations and Possible Extensions

These studies draw other specific concerns to be dealt in respective domains. In chapter 2, the family structure and information regarding polygamy are not considered in the decision-making. The study is limited to the women aged 15-49 that is available in the household survey, whereas, senior women older than 49 can be examine. Other indicators in the household-decision making such as school leaving age, domestic violence and wealth index can be interesting elements in the future studies. Similarly, other socio-economic characteristics can be examined to investigate woman's unitary and reconciliation strategies for the economic development of the household. Furthermore, in Chapter 3, study is limited to single females, however, contribution of single males in the household's economic welfare might be of interest and their comparison can extend the possibilities to reduce gender difference. The study provides random intercept-slope models limited to specific indicators that can be investigated for other areas. Similarly, in Chapter 4, other socio-economic characteristics, quality of education indicators such as teacher ratio by number and gender, and school infrastructure are not covered in this study due to data unavailability. Definitely, quality of education may provide other differences in boys and girls that are not examined in this study. These listed limitations are possible future avenues that can spur the policy effectiveness by incorporating other socio-economic characteristics to give useful information to policy makers.

Résumé Extensif En Français

1.1 Contexte

L'investissement en capital humain dans l'éducation est le canal le plus dynamique pour établir une croissance économique à long terme dans les pays en développement qui s'efforcent d'obtenir des droits fondamentaux en matière d'égalité des sexes, de bien-être économique et d'autonomisation (Teles et al., 2008). D'autre part, il permet aux économies pauvres de briser le cercle vicieux de la pauvreté, du chômage, de l'inflation et de l'injustice sociale (Zamaz, 2008). Il a le potentiel de maximiser les rendements qui augmentent directement le revenu par habitant, améliorent les modèles de dépenses de consommation et, surtout, renforcent la confiance et l'estime de soi (Thomas et al., 2001). Il établit une stabilité économique en levant les barrières des coutumes, des castes, des croyances, des langues, des couleurs et des différences entre les sexes.

Tout en reconnaissant cette valeur, des aperçus critiques des différences entre les sexes pour l'investissement dans l'éducation et l'allocation des ressources soutiennent les conditions économiques, la prise de décision unitaire et conjointe, les préférences fondamentales et les différentiels socio-économiques au sein et entre les ménages (Akram et al., 2011). Au Pakistan, les femmes, quel que soit leur âge ou leur région, sont susceptibles d'être privées d'éducation, de santé, d'emploi et de droits humains fondamentaux. Ces privations correspondent à des mentalités socio-économiques qui doivent être modifiées. La situation récente des femmes dans le pays révèle d'une part des injustices et des atrocités sociétales et d'autre part soulève des questions sur la gestion de la planification des ressources humaines. Les taux de travail des enfants, de mariage précoce et de mortalité sont plus élevés pour les filles, ce qui met en évidence l'absence d'éducation et les violations des droits de l'Homme.

Selon la Banque asiatique de développement, sur 49% de la population féminine, seulement 7% ont accès à des ressources financières, ce qui est assez maigre. Le Pakistan se classe 151ème sur 153 pays pour l'indice mondial d'écart entre les sexes (Forum Économique Mondial 2020). En outre, il présente un écart salarial entre les sexes de 34% par rapport à 73 pays dans le monde (Organisation Internationale du Travail 2018). La plateforme indique quatre aspects majeurs sur lesquels le niveau d'éducation est un critère essentiel pour examiner l'inégalité des salaires entre les sexes. À l'échelle nationale, 21,9 pour cent de participation féminine dans le rapport de travail

contre 68 pour cent de ratio de participants masculins faisant 5,1 pour cent de chômage féminin dans le pays (Banque Mondiale 2019).

La privatisation des écoles et des établissements d'enseignement dans le pays a été introduite en 1979 pour la qualité de l'éducation et de l'environnement d'apprentissage, mais les parents qui appartiennent aux groupes à revenu moyen ou moyen inférieur ne sont pas en mesure d'envoyer leurs enfants, en particulier leurs filles, en raison du coût élevé. Le taux d'alphabétisation des hommes et des femmes, qui se situe entre 70 et 43%, démontre la disparité entre les sexes dans le pays. Les fils sont privilégiés par rapport aux filles en termes d'éducation, de santé, de génération de revenus, de législation, de leadership et de prise de décision, de liberté de communication et d'emploi, voire d'exemption de certaines coutumes. La structure de l'enseignement est généralement divisée en trois niveaux, à savoir le primaire (classes 1 à 5), le secondaire (classes 8 à 12) et le supérieur (classes 13 à 16).

Après le 18ème amendement constitutionnel adopté par le Parlement en 2010, l'éducation est devenue un sujet provincial au Pakistan. Sur une population de 22 millions d'enfants scolarisés, il n'y a que 17 millions d'inscrits, tandis que les différences entre les sexes se creusent chaque année. Récemment, le taux d'inscription des garçons dans l'enseignement primaire était de 57%, contre 43% pour les filles. Dans l'enseignement secondaire, 6 millions d'enfants sont inscrits, dont seulement 44% de filles, contre 56% de garçons. Ces statistiques tiennent également compte du fait que 146 185 écoles primaires, 42 147 écoles secondaires inférieures et 29 874 écoles secondaires fonctionnent actuellement (Rapport UNESCO 2015). Le ratio de filles diminue marginalement avec l'augmentation du niveau d'éducation, tandis qu'au niveau du secondaire supérieur, le ratio femmes-hommes passe de 42 à 58 pour cent (Gender Parity Index 2015).

Une autre mesure de la qualité de vie et du bien-être avec le niveau d'éducation et les connaissances pour une évaluation à long terme est l'indice de développement humain (IDH) qui rapporte un indice de 0,53, classant le Pakistan au 147ème rang sur 188 pays avec une augmentation de seulement 2,9% du nombre moyen d'années de scolarité au cours des vingt dernières années. Cependant, un indice basé sur le genre par le RDH, connu sous le nom d'indice de développement du genre, place le pays au rang le plus bas avec 0,91 points (IDG 2014). Le facteur important contribue à l'allocation et à l'investissement du revenu national dans le secteur de l'éducation, susceptible d'offrir des opportunités d'apprentissage aux enfants. Alors que l'indice

de développement de l'éducation classe le Pakistan au 11ème rang sur 120 pays pour l'investissement dans l'éducation. Les écoles féminines pour le primaire (grade 1-5) sont 40 548, pour le moyen (grade 6-8) 7 927 et pour le haut (grade 9-10) sont 5 175 par rapport à 78 601 écoles primaires, 8 501 écoles moyennes et 7 401 écoles secondaires masculines (Pakistan Education Statistics 2017). Les zones les plus difficiles à atteindre du pays ne sont pas en mesure de fournir des établissements physiques ou virtuels pour les filles, ce qui nécessite un partenariat public-privé, le nombre d'écoles privées atteignant 68 000 dans le pays.

1.2 La rareté de l'éducation pour l'autonomisation

La majorité des chercheurs préconisent l'autonomisation des femmes par le biais de la conscience de soi, de la mobilité, de la prise de décision au sein du foyer et du pouvoir de négociation qui sont étroitement liés au développement économique du pays (Blumberg 2005). Comparativement, on peut se demander si ces facteurs renforcent l'autonomisation ou s'il faut transformer la structure du ménage en envisageant une participation égale et conjointe des femmes à la prise de décision. Des recherches antérieures affirment que les mesures de santé et le bien-être de l'enfant sont associés à l'autonomie maternelle (Gupta et al., 2006; Basu et al., 2005; Bloom et al., 2001). Alors que le pouvoir de négociation est également considéré comme le pouvoir de déplacement des hommes vers les femmes en particulier dans un ménage (Quisumbing 2000), cependant, la distribution du travail dans un ménage contribue proportionnellement à obtenir le contrôle des ressources (Craig et al., 2016 ; Killewald, 2011; Bianchi et al., 2000).

De même, les chercheurs ont examiné empiriquement l'impact de la possession physique, qu'elle soit héritée ou achetée, en termes de droits fonciers et l'influence de la stabilité politique pour déterminer la position des femmes dans la société (Burton, 1993 ; Lechene et al., 1992). D'autre part, la participation des femmes à l'allocation effective des ressources du ménage et aux décisions économiques du ménage sont des éléments de preuve du gain de pouvoir (Blumberg, 1984). Des études récentes attribuent une distribution égale des ressources éducatives au bien-être économique et à l'égalité des sexes pour évaluer les objectifs de développement durable dans les pays les moins avancés (Miller et al., 2016; Schultz et al., 2012).

En examinant la définition de l'autonomisation au Pakistan, elle démontre les faits suivants. Premièrement, il y a un énorme fossé entre les droits et les responsabilités, et ces dernières sont

davantage attendues des femmes, ce qui perpétue la discrimination pour les droits légaux (Constitution du Pakistan, article 25(2), 1965). Ensuite, l'indisponibilité des services de santé publique (le taux de mortalité chez les femmes adultes est de 138% (pour 1 000 femmes adultes) selon les statistiques de la Banque mondiale de 2018) et le manque d'éducation (taux de scolarisation de 9 % au-dessus de l'enseignement secondaire, base de données PSLM de 2016). Il capture le scénario vague de l'autonomisation ne parvient pas à livrer pour les générations futures à moins que les normes traditionnelles, les configurations sociales et les droits fondamentaux ne s'établissent pas pour répondre aux demandes de 49 pour cent de la population féminine (6e recensement de la population et du logement 2017). Selon le rapport Women, Peace and Security (WPS 2019-2020), le Pakistan se classe au quatrième rang des pays les moins performants en termes de sécurité pour les femmes, avec un score de 0,46. En outre, 73 % des hommes ne permettent pas aux femmes de travailler en dehors du foyer et, chaque année, 27 % des femmes sont confrontées à des violences domestiques. Cela met également en évidence la faible participation des femmes au parlement (17% aux élections de 2013) et l'escalade de la disparité entre les sexes (143 sur 144 pays dans l'écart entre les sexes selon le Forum économique mondial 2017) dans une société patriarcale en violant les lois fondamentales et constitutionnelles (Klein et al., 1992; Mehdi, 2004).

Les choix stratégiques importants permettent de comprendre les raisons de la faiblesse de l'autonomisation et du statut des femmes au sein et en dehors des ménages, notamment l'éducation, l'emploi, les ressources du ménage, le mariage, la planification familiale et la préférence pour les fils. D'une part, ils sont liés à la liberté des droits et à la mobilité et d'autre part, ils représentent le rôle individuel et collectif des femmes dans la croissance économique du pays. Le taux d'abandon scolaire plus élevé des filles au Pakistan parmi les pays d'Asie du Sud indique la pauvreté et la préférence parentale dans l'investissement dans l'éducation pour maximiser les rendements à long terme (Saeed, 2007). La nécessité d'une participation accrue des femmes à l'éducation met délibérément l'accent sur les efforts de collaboration pour les entreprises publiques-privées et les initiatives en faveur de l'éducation gratuite dans le pays. En général, les barrières culturelles et les problèmes de sécurité dépendent fortement de l'environnement de travail d'une femme. D'une part, obtenir une éducation n'est pas une tâche facile avec une taille moyenne de ménage de 8,33 et d'autre part, la liberté de mobilité est difficile à atteindre. Il existe des paramètres opposés sur le marché du travail, conçus en fonction du sexe.

En fin de compte, les emplois sont également biaisés en fonction du sexe et de nombreux secteurs d'emploi, en particulier l'industrie et la technologie, offrent des opportunités axées sur les hommes. Sans éducation, 88% des femmes sont associées à l'agriculture sous la forme d'un chômage déguisé et seulement 29% des femmes obtiennent un emploi rémunéré (Pakistan Employment Trend 2018).

Dans le chapitre 2, cette thèse examine l'impact du niveau d'éducation sur l'autonomisation des femmes dans la prise de décision au sein du foyer afin de contribuer au bien-être et au développement économique du Pakistan. Le lien entre l'éducation et l'autonomisation mérite qu'on s'y attarde, car les ressources humaines féminines et la prise de décision au sein des ménages sont les principaux indicateurs du bien-être des ménages et de la société. Toute discrimination en matière de contrôle du pouvoir, de classement des ressources de consommation ou de droits humains fondamentaux a des répercussions considérables au niveau des ménages, ce qui crée des troubles dans la société. La discrimination entre les sexes dans la prise de décision au sein du ménage réduit l'autonomisation des femmes et affecte directement la croissance économique du pays en diminuant le taux d'alphabétisation, la participation de la main-d'œuvre féminine, la production de ressources, l'égalité des chances et la libéralisation sociale.

L'approche par les capacités introduite par Sen et Nussbaum (1980) préfère la liberté substantielle à l'utilité ou à l'accès aux ressources. D'autre part, Kabeer (1999) explique l'autonomisation comme un processus à trois dimensions interdépendantes visant à obtenir le bien-être. La question se pose de savoir si ces définitions ou d'autres définitions antérieures de l'autonomisation représentent la position sociodémographique et socio-économique des femmes dans les pays les moins développés, alors qu'il s'agit d'un phénomène latent. Le taux de participation des femmes le plus bas d'Asie du Sud, les attaques à l'acide et les brûlures signalées dans un millier d'endroits et l'augmentation de la mortalité maternelle aggravent l'importance d'une distribution égale des ressources et du pouvoir de décision avec le canal dynamique de l'éducation au Pakistan. Les filles sont un fardeau économique si elles ne se marient pas à un âge approprié ou si elles ne sont pas des ressources humaines productives pour participer au développement du pays.

L'objectif de cette étude est de clarifier et de définir le concept d'autonomisation des femmes dans la prise de décision dans le contexte de la société pakistanaise. En outre, l'étude examine les

approches sociales et économiques pour mesurer l'autonomisation des femmes à l'aide des caractéristiques individuelles et des ménages en utilisant les micro-données de l'enquête Pakistan Social and Living Standard (PSLM) de 2005-2014 avec la régression des modèles Probit et Multinomial Probit. Les indicateurs socio-économiques pour ces deux approches comprennent : premièrement, le choix du mariage, le planning familial, les préférences en matière de fils, et deuxièmement, les dépenses en ressources intra-ménage, la poursuite des études et l'emploi. En outre, un autre objectif de cette étude est de traiter la causalité inverse entre le niveau d'éducation et l'autonomisation à l'aide de la technique de variable instrumentale pour les perspectives économiques.

1.3 L'éducation dans la poursuite de la réalisation du bien-être social

L'éducation s'avère être la solution la plus attrayante et la plus préalable à l'inégalité entre les sexes pour atteindre le bien-être économique et réduire la pauvreté. Dans la littérature empirique, le bien-être est mesuré à l'aide de deux méthodologies différentes, à savoir l'apport calorique (Aromolaran, 2004) et les modèles de dépenses de consommation (Hoddinott, 1995). L'éducation des femmes joue un rôle important dans la prospérité des familles, car elles sont les véritables bâtisseuses de la nation (Bernhardt et al., 2002). En particulier dans les pays en développement, les femmes instruites, mères célibataires, non mariées ou vivant dans des familles plus nombreuses, peuvent améliorer le bien-être des ménages grâce à leur part de revenu, à la prise de décision unitaire ou conjointe, à un faible taux de fécondité et à la régulation des dépenses (Thomas, 1995; Behrman, 1997-2010). Le choix de l'accouplement et la valeur du temps modifient les préférences des femmes avec l'effet du niveau d'éducation et des revenus (Schultz et al., 1982). Le soutien éducatif devient un outil efficace pour la stabilité économique lorsque les parents mettent l'accent sur la répartition égale des ressources domestiques entre leurs enfants.

Depuis sa création, le Pakistan est confronté à d'innombrables obstacles qui affectent directement le bien-être de ses citoyens. La récession qui a débuté en 1990 a eu de fortes répercussions, observées dans la baisse du taux de croissance de 5,7%, l'augmentation de 18% de la population sous le seuil de pauvreté et la dette extérieure de 40% depuis le milieu des années 2000 (ministère des Finances du Pakistan, 2018). Selon le Programme des Nations unies pour le développement (PNUD 2016), 4 personnes sur 10 au Pakistan vivent dans une pauvreté multidimensionnelle. Actuellement, il y a une pauvreté multidimensionnelle de 39 pour cent et seulement un taux

d'alphabétisation de 60 pour cent qui a escaladé le chômage, la population, l'inflation et la disparité entre les sexes dans tout le pays (Banque Mondiale 2017). L'allocation et la distribution égale du revenu national est une panacée pour les conflits institutionnels, la corruption, le terrorisme, la discrimination de genre et le handicap économique (Chaudhary, 1982). L'éducation des femmes et leur participation à la vie active apparaissent comme des moyens importants dans l'implication des politiques pour maximiser les rendements économiques (Kimenyi, 2006; Nguyen et al., 2007).

Le chapitre 3 évalue l'impact des femmes célibataires éduquées (jamais mariées, veuves et divorcées) dans la société et leur contribution au bien-être économique du ménage. Plus précisément, ce chapitre a été conçu pour se concentrer sur deux perspectives principales. Premièrement, il souligne l'importance des femmes célibataires qui restent ignorées et font face à une discrimination extrême, leur statut marital devenant un stigmate tout au long de leur vie. Deuxièmement, il analyse s'il est possible d'offrir des opportunités économiques aux femmes célibataires et si elles peuvent influencer positivement le bien-être du ménage en s'assurant une position équitable dans la société.

La société fait une ségrégation des femmes en fonction de leur statut socio-économique et matrimonial, par conséquent, les femmes célibataires sans éducation sont sujettes à la discrimination de genre, à la faim extrême, à la charge financière et à un faible taux d'autonomisation. L'éducation est la condition préalable à la reconstruction des zones de conflit, à une perspective positive, à une vie améliorée, à l'accessibilité au monde extérieur, aux technologies avancées, à la confiance et aux opportunités d'emploi. D'autre part, l'éducation des femmes et les caractéristiques socio-économiques des individus et des ménages sont des canaux dynamiques prévisibles pour l'égalité des sexes et la croissance économique dans les pays en développement comme le Pakistan. Cependant, la plupart des régions du pays sont privées d'éducation et de liberté de mouvement, ce qui empêche les femmes de travailler et d'explorer leurs domaines cognitifs. De plus, la lutte contre le terrorisme et l'instabilité régionale et politique ont fortement contribué à l'arrêt des projets éducatifs en cours depuis quelques décennies. Les réformes éducatives qui intègrent la paix et l'égalité semblent difficiles à mettre en œuvre, en particulier dans les zones rurales, tribales et conflictuelles, pour obtenir un bien-être économique.

L'objectif de cette étude est de déterminer le bien-être économique du Pakistan avec la contribution des femmes célibataires, leur éducation et leurs caractéristiques socio-économiques aux niveaux micro et macro. En outre, cette étude examine le bien-être économique en utilisant les micro-données de l'enquête Pakistan Social and Living Standards Measurement (PSLM) de 2005 à 2016 avec la régression du modèle multiniveau. En outre, un autre objectif de cette étude est de traiter l'endogénéité potentielle entre le genre et les dépenses de consommation, qui est un proxy du bien-être économique, à l'aide de la technique de variable instrumentale. La structure des données de l'étude permet l'utilisation d'un modèle de régression multiniveau. L'utilisation d'un modèle multiniveau permet d'obtenir différentes pentes, ce qui n'est pas possible avec de simples effets fixes. L'utilisation de cette méthodologie permet d'identifier les variations du résultat à deux ou trois niveaux en fonction des étapes de l'hypothèse.

1.4 Le manque d'éducation et les différences entre les sexes

Selon le rapport " Éducation pour tous " (EPT), " l'éducation améliore le stock de capital humain d'une économie non seulement par son offre mais aussi par l'égalité de la distribution de l'éducation indépendamment du sexe, des régions et des secteurs " (Banque mondiale 2017). Elle démontre délibérément l'impact de l'éducation des femmes pour améliorer la croissance économique spécifiquement dans les pays en développement (Lanzi, 2007). L'évaluation des avantages de l'éducation des femmes était tout à fait opposée juste une décennie auparavant, estimant que "tous les aspects de l'éducation sont souvent considérés comme défavorables aux femmes" (Jacob, 1996 ; p.156). Aujourd'hui, le scénario a changé et les femmes excellent par rapport aux hommes, non seulement en termes de niveau d'éducation, mais aussi en termes de perspectives socio-économiques de la vie. Les statistiques montrent qu'en moyenne, une fille a potentiellement de meilleurs résultats scolaires qu'un garçon. Cependant, les filles ont des taux de scolarisation très faibles par rapport aux garçons, ce qui fait que ces pays sont à la traîne en matière de progrès économique (Mickelson, 1989).

En utilisant les données de l'enquête socio-économique pakistanaise (PSES) 1999 menée par l'Institut pakistanais d'économie du développement, Arif et al., (1999) ont déterminé le taux d'inscription à l'école primaire pour les enfants âgés de 5 à 12 ans. Ils examinent par régression logistique que les filles ont besoin de plus de ressources financières pour aller à l'école et que l'égalité de la pauvreté a un impact probable sur le taux d'inscription à l'école primaire

indépendamment du sexe. Dans une étude similaire de Chaudhary (2007), en utilisant les données de 1970-2005 de l'enquête économique du Pakistan, leurs résultats suggèrent que les femmes ont un meilleur impact sur les conditions socio-économiques au Pakistan une fois que l'écart entre les sexes se réduit avec l'augmentation des taux de scolarisation. Les résultats montrent que le ratio de participation des femmes et des hommes a un impact positif sur la croissance économique. En revanche, certaines études (Mahmood, 2004) préfèrent examiner le ratio de transition entre l'école primaire et l'école secondaire. Elles soutiennent que les femmes rurales sont liées à une faible fréquentation et à des taux élevés de discontinuité, sur la base des données du recensement de 1998 sur le niveau d'éducation. Les résultats suggèrent que le déficit d'inscription dans l'éducation provient de la population féminine appartenant aux zones rurales et que le taux d'abandon plus élevé peut être minimisé avec l'augmentation de la demande d'éducation, en particulier pour l'inscription primaire universelle (EPU).

Dans les pays en développement, comme le Pakistan, il est très probable que les ménages à faible revenu préfèrent les fils aux filles pour investir dans l'éducation, mais il est intéressant d'étudier s'il existe des résultats pour les groupes à revenu moyen qui souhaitent aider leurs filles à acquérir une éducation. De même, il est tout à fait certain que les groupes à revenu élevé ont une attitude abordable et impartiale envers l'investissement dans l'éducation. D'un autre côté, la région, la culture existante et le comportement sociétal contribuent largement à l'éducation des femmes.

Par conséquent, le chapitre 4 détermine le niveau d'éducation et l'inscription actuelle dans le cadre des différences entre les sexes au Pakistan avec la contribution du revenu des ménages et des caractéristiques socio-économiques en utilisant les micro-données de l'enquête Pakistan Social and Living Standards Measurement (PSLM) de 2005-2016 avec des régressions de modèles logit et logit ordonnés en fonction des variables de résultat. En outre, elle traite de l'endogénéité potentielle entre le revenu et l'éducation par la technique de variable instrumentale avancée de la méthode d'inclusion résiduelle en deux étapes. Un autre objectif de cette étude est d'examiner les inégalités d'éducation et de genre sur l'éducation et le revenu du ménage.

1.5 Contribution à la littérature et résultats

Le capital humain féminin est un élément indispensable au bien-être des ménages et au développement économique. En général, les études empiriques ont examiné la contribution significative des femmes dans le développement économique mais certaines restent limitées aux

données transversales, d'autres se concentrent sur les femmes mariées ou ignorent totalement le rôle spécifique du genre, tandis que, certaines considèrent la seule relation linéaire qui manque de contribution dynamique et économétrique dans les études longitudinales. De même, les chercheurs et les études antérieures menées au Pakistan dans le contexte de "l'accumulation du capital humain dans les pays en développement" ne lui accordent pas une attention suffisante.

La plupart des études ne fournissent pas d'analyse approfondie de la participation des femmes dans des perspectives sociodémographiques et socio-économiques qui négligent principalement le rôle de la prise de décision du ménage dans divers choix stratégiques, le bien-être du ménage et le niveau d'éducation. Par conséquent, pour combler cette lacune, cette recherche fournit une analyse dynamique de l'autonomisation des femmes dans la prise de décision au sein du ménage tout en se concentrant sur le niveau d'éducation primaire à supérieur. Plus précisément, elle détermine la plupart des facteurs sociodémographiques et économiques possibles pour souligner l'importance de la position des femmes dans la société pakistanaise et leur rôle indépendamment de leur statut marital.

Les chercheurs précédents se sont concentrés sur les déterminants de l'éducation avec les contributions des droits des femmes à l'emploi, la part de revenu et la liberté de mobilité, cependant, dans mon étude, j'essaie de capturer des spécifications alternatives afin de tirer des estimations robustes pour les ressources humaines féminines. Les études antérieures soutiennent la participation des femmes dans les ménages et la société avec des informations limitées tout en négligeant la structure et les préférences culturelles du Pakistan, tandis que j'essaie d'examiner l'importance de la prise de décision unitaire et conjointe pour le bien-être économique et social du ménage dans lequel la décision individuelle reçoit moins d'attention et est souvent rejetée en raison de barrières culturelles.

En ce qui concerne la méthodologie, les études antérieures ont examiné les caractéristiques socio-économiques et démographiques séparément pour les probabilités d'autonomisation des femmes dans la prise de décision tout en se concentrant sur la dimension particulière avec seulement des modèles binaires. Par conséquent, cette étude comble cette lacune avec six dimensions majeures de la vie socio-économique des femmes avec des modèles logit multinomiaux et logit et contribue de manière significative à capturer la causalité inverse entre le niveau d'éducation et l'autonomisation dans laquelle principalement la femme, principalement le mari ou le père,

conjointement avec les parents et conjointement avec le mari fournissent des estimations appropriées pour discuter de l'importance de l'éducation des femmes. Il est à noter que la plupart des études antérieures se concentrent sur les femmes mariées et analysent leur contribution à la croissance économique du pays.

Il s'agit de la première étude sur les femmes célibataires au Pakistan à présenter une analyse dynamique à deux niveaux : les ménages et les PSU (Primary Sampling Units). Le Pakistan a subi plus de 70 000 pertes dans la "guerre contre la terreur", la majorité des victimes étant des enfants et des femmes. En outre, les conflits régionaux et nationaux, les conditions économiques et politiques incertaines, les calamités (sécheresse, inondations et tremblements de terre) entre 2000 et 2010 sont autant de facteurs qui expliquent l'augmentation du nombre de femmes célibataires dans le pays. Cette étude a pour la première fois mis en lumière les femmes célibataires qui, considérées comme un fardeau économique ou un stigmate social de la société, ont le potentiel de transformer le pays en un État-providence grâce à leur niveau d'éducation. Elle décrit les variations au sein des ménages et entre eux à l'aide d'un modèle de régression à plusieurs niveaux et constate des différences de traitement subjectives en fonction des langues, de la pauvreté, de l'emplacement et de l'alphabétisation. Cette étude est unique en son genre car elle utilise les données regroupées d'une enquête transversale répétée auprès des ménages pour examiner l'impact de l'éducation des femmes célibataires sur le bien-être et établir une interférence causale entre le sexe et les dépenses de consommation.

En comprenant les facteurs socio-économiques qui affectent le niveau d'éducation et l'inscription actuelle, cette étude explique les différences entre les sexes au niveau individuel. Elle fournit une analyse dynamique de la transformation du taux de réussite d'un niveau d'éducation à un niveau supérieur à l'aide d'un modèle logit ordonné qui n'a jamais été pris en compte dans les recherches précédentes en utilisant les données PSLM. Une meilleure compréhension de ce mécanisme peut permettre de stimuler la croissance économique du pays. L'analyse des déterminants de l'éducation dans les pays en développement permet d'atteindre les objectifs du Millénaire pour le développement (OMD) et d'élever le niveau de vie des populations. Cette étude comble les lacunes de la littérature en fournissant des estimations cohérentes qui établissent un lien avec le niveau d'éducation en termes d'années complètes de scolarité et de scolarisation actuelle, afin d'explorer les différences entre les sexes au sein du ménage et d'expliquer le rôle du revenu par

habitant dans l'amélioration de l'éducation. La plupart des études antérieures se sont concentrées sur l'impact des inégalités d'éducation et de genre entre les pays au niveau macro, ou démontrent l'effet entre les pays. Compte tenu des différences entre les sexes et de la discrimination en matière de capital humain dans les ménages, cette thèse contribue à la compréhension des rendements de l'éducation au niveau microéconomique avec des prédicteurs multiples. Outre les variables explicatives standard telles que l'âge, la taille du ménage, etc., cette étude inclut un large éventail de caractéristiques individuelles, de ménage et de communauté, ainsi que la profession, la variation régionale et les choix individuels qui n'ont jamais été examinés au Pakistan auparavant.

Elle explore d'une part, les déterminants de l'éducation avec le revenu et les coefficients de Gini, et d'autre part, elle détermine le revenu du ménage avec les inégalités de genre dans le niveau d'éducation et l'inscription actuelle qui n'ont jamais été abordées d'un seul coup. Enfin, je détermine l'effet de genre à nouveau avec de multiples approches disponibles dans la littérature existante pour mettre en évidence un autre aspect de variation dans l'éducation pakistanaise. En outre, mon étude utilise une technique économétrique avancée pour résoudre le problème de l'endogénéité avec l'inclusion des résidus en deux étapes pour les modèles non linéaires. À ma connaissance, aucune étude antérieure n'a abordé le problème de l'endogénéité potentielle dans les modèles non linéaires pour les ressources humaines féminines et le revenu des ménages au Pakistan. En outre, j'ai appliqué des approches de fonction de contrôle, IV Probit et 2SLS pour démontrer la cohérence des résultats avec et sans prise en compte de la nature des variables dépendantes.

En bref, cette étude tente de déterminer les différences entre les sexes, l'autonomisation des femmes et le bien-être économique pour combler le vide discuté dans la littérature en utilisant des données groupées de PSLM de 2005 à 2016. Une enquête par échantillon aléatoire de données couvrant six sections transversales d'environ 80 000 ménages à travers le Pakistan fournit une taille d'échantillon unique et une véritable représentation du Pakistan dans l'analyse de la contribution des femmes dans l'économie et la société. Alors que la plupart des études antérieures se limitaient à quelques districts, provinces ou années particulières et étaient collectées à partir de différentes enquêtes, ce qui ne constitue pas un échantillon aléatoire pour une analyse cohérente. Étant donné l'évidence de la discrimination entre les sexes au Pakistan en matière d'éducation, il

est intéressant d'évaluer et de déterminer le statut des femmes, l'étendue de l'écart entre les sexes et le potentiel de reconstruction du pays avec des compétences modernes et avancées à l'aide de la décomposition non linéaire et des techniques multiniveaux.

Pour les résultats, le deuxième chapitre de cette thèse examine l'éducation des femmes et sa contribution à l'autonomisation par la prise de décision au sein du foyer. La relation entre le niveau d'éducation des femmes et l'autonomisation mérite une attention extrême car le "droit de parole" sur sa propre vie, tandis que les choix stratégiques de vie fournissent des ressources pour atteindre les objectifs de bien-être et de stabilité économique du pays. Toute discrimination et privation dans les structures socio-démographiques et socio-économiques de la société modifie indirectement la configuration économique. L'approche par les capacités (Sen, 1980) part du principe que les capacités humaines sont les modérateurs de la société et de l'économie, tandis que l'agence et les ressources, telles que définies par Kabeer (1999), permettent d'atteindre des résultats productifs. Cependant, mon étude considère que les perspectives sociodémographiques et socio-économiques nécessitent la disponibilité de ressources qui peuvent varier selon les ménages et les contextes culturels. En se concentrant sur le système patriarcal, il n'est pas facile d'impliquer ces facteurs pour l'autonomisation des femmes.

À l'aide d'un modèle probit multinomial et en utilisant les données du PSLM sur la période 2005-2014, j'examine l'impact du niveau d'éducation sur l'autonomisation des femmes. L'étude examine les deux perspectives d'autonomisation des femmes en termes monétaires et non monétaires. Dans le cas de la perspective non monétaire, ou plus communément appelée perspective sociodémographique, la prise de décision du ménage a été analysée par la liberté de choix du mariage, la planification familiale et la préférence des fils sur les filles. Alors que la perspective monétaire ou socio-économique élabore la prise de décision pour les dépenses de consommation des ménages, la poursuite des études et l'emploi. Je capture la causalité inverse pour ce dernier terme par la technique de la variable instrumentale. L'objectif spécifique est de déterminer le statut des femmes au sein du ménage et de la société, ce qui permet d'optimiser les ressources humaines en assurant l'égalité des chances. Mes résultats montrent que, contrairement à la prise de décision unitaire, la prise de décision conjointe pour les mariages est susceptible d'augmenter l'autonomisation des femmes avec la contribution du niveau d'éducation, cependant, les femmes qui travaillent sont plus susceptibles d'obtenir le contrôle des prétendants par rapport

aux femmes qui ne travaillent pas. Les résultats soulignent l'importance de la planification familiale dans le cadre de la prise de décision conjointe du couple, tandis que le ratio diffère selon l'âge, la région, les professions et les quantiles de richesse. D'un autre côté, même les maris instruits sont susceptibles d'améliorer l'autonomisation des femmes en privilégiant les fils. Néanmoins, les femmes associées au marché du travail ne se distinguent pas de la préférence pour les fils. En outre, les groupes à faible revenu et les provinces où les infrastructures sont peu développées, la mobilité limitée et l'exposition au monde extérieur sont très susceptibles d'accroître l'autonomisation des femmes si la mère a un fils comme premier enfant.

En revanche, le niveau d'éducation augmente la probabilité de prise de décision dans la poursuite des études et la recherche d'un emploi. Je trouve que la prise de décision conjointe des parents est susceptible d'augmenter l'autonomisation des femmes subjectivement à l'âge et au statut marital dans la poursuite de l'éducation, tandis que le mari qui travaille préfère que son épouse contribue au marché du travail et cela augmente avec leur niveau d'éducation. Par ailleurs, les zones rurales et tribales du pays sont moins susceptibles de permettre aux femmes de prendre des décisions en matière d'éducation et d'emploi, tandis que les groupes à revenu élevé sont plus susceptibles de diminuer la préférence parentale en matière d'investissement dans l'éducation. Les résultats explorent la relation positive de la prise de décision des femmes dans les dépenses de ressources du ménage avec le niveau d'éducation. En revanche, les hommes qui travaillent sont moins susceptibles de transférer le contrôle aux femmes, ce qui dépend de la taille du ménage, de la structure de la famille et, de préférence, de la charge économique associée dans la société patriarcale. Mon étude fournit des explications pour réformer les politiques publiques en comprenant la question de la privation des droits au niveau micro dans lequel le niveau d'éducation et les caractéristiques socio-économiques jouent un rôle majeur dans la détermination de l'autonomisation des femmes.

Le troisième chapitre explore la relation entre l'éducation des femmes célibataires et le bien-être des ménages au Pakistan sur la période 2005-2016. Ce chapitre se concentre sur la partie de la population qui est supposée être non productive et avoir un impact négatif sur l'économie, notamment les femmes jamais mariées, divorcées et veuves, alors que ces femmes célibataires ont un immense potentiel pour s'aider elles-mêmes et aider la société grâce à leur éducation. Il s'agit de la toute première étude dans la littérature qui aborde l'aspect économique du ménage en

intégrant les femmes célibataires au Pakistan, en outre, elle vise à examiner les disparités entre les sexes, qui sont des obstacles pour le bien-être et la croissance économique à long terme. Afin de mesurer l'impact de l'éducation des femmes célibataires, j'utilise un modèle de régression multiniveau à deux niveaux : les ménages et les individus au niveau inférieur et les unités primaires d'échantillonnage (PSU) au niveau supérieur. Elle capture également l'endogénéité potentielle à l'aide de la technique des moindres carrés en deux étapes. Contrairement à Allendorf (2012) qui mesure le bien-être par la parenté et le soutien du conjoint, mon étude traite d'autres aspects de la société. Entre-temps, pour déterminer le bien-être économique, d'autres caractéristiques socio-économiques jouent également leur rôle de manière efficace. Les résultats prouvent que les femmes divorcées et veuves sont négativement associées au bien-être du ménage ; en même temps, cela diminue également leur statut social, ce qui les rend indéfendables pour vivre. Cependant, si elles sont susceptibles d'améliorer leur niveau de vie avec l'augmentation de l'âge. Les résultats expliquent que la pauvreté diminue avec l'augmentation du bien-être économique, tandis que les différents groupes ethniques basés sur les langues sont plus susceptibles d'augmenter le bien-être, mais leur proportion par rapport à la population a également de l'importance.

Les résultats révèlent que les modèles d'interception aléatoire et de pente de la pauvreté, de la technologie, de l'urbanisation, des langues et du taux d'alphabétisation fournissent des variations très probables entre les UPE par rapport aux ménages. Les variations dans la technologie sont comparativement plus élevées, néanmoins, les variations par rapport au taux d'alphabétisation et à l'urbanisation indiquent le besoin de progrès dans les zones qui sont privées d'infrastructures de base et de droits à l'éducation. L'étude met en évidence les déterminants micro et macro du bien-être économique afin de réformer les politiques publiques au sein des ménages et dans tout le pays en intégrant les ressources humaines féminines uniques de manière efficace et productive.

Le quatrième chapitre examine que le revenu et les caractéristiques socio-économiques sont très susceptibles de déterminer le niveau d'éducation et l'inscription actuelle pour comprendre les différences entre les sexes chez les enfants au Pakistan de 2005 à 2016. Il capture également l'endogénéité potentielle entre le revenu et l'éducation avec des techniques plus avancées pour les modèles non linéaires, comme l'approche d'inclusion résiduelle à deux étapes, en utilisant des instruments tels que le choc de revenu, le revenu exceptionnel et les caractéristiques des grands-

parents. Mes résultats suggèrent que l'effet de transition n'est pas égal entre les différents niveaux d'éducation en termes de niveau d'éducation, la plupart des enfants ayant fait des études secondaires ne pouvant pas accéder au niveau tertiaire. De même, un patriarcat fort est révélé par les résultats, car les membres et le chef de famille éduqués soutiennent l'investissement dans l'éducation des garçons ; de plus, les filles sont inversement proportionnelles à l'inscription actuelle, même après contrôle de l'endogénéité. Des résultats similaires fournissent une relation significative et inverse des inégalités éducatives et de la scolarisation actuelle des filles. Ils expliquent en outre par la décomposition de Oaxaca que les variations expliquées sont inférieures aux variations inexpliquées qui pourraient être dues à l'inégalité de traitement envers les filles. Mes résultats suggèrent de développer des politiques publiques et éducatives en comprenant la nature et les comportements des caractéristiques de base et de la croissance économique des ménages pour réduire les différences entre les sexes. Il en ressort certains points qui pourraient être utiles pour faire des réformes publiques en fonction de la demande et de l'offre d'éducation en mettant en œuvre des stratégies de ménage et de province dans la société.

1.6 Recommandations et limites

L'analyse des études a montré que l'éducation des femmes et les indicateurs socio-économiques jouent un rôle essentiel dans le développement, l'autonomisation et le bien-être du pays en réduisant les différences entre les sexes dans la société. L'une des principales recommandations met l'accent sur l'allocation et la distribution égale du pouvoir au sein du ménage dans les choix stratégiques de la vie en éliminant la discrimination et en adoptant des objectifs pour atteindre l'éducation. Le gouvernement devrait réviser les politiques publiques pour faciliter l'éducation gratuite, la génération de revenus et les opportunités d'emploi indépendamment du sexe, de la région et de la province. Le gouvernement devrait introduire des politiques familiales pour assurer la participation des femmes à la force de travail tout en réformant les lois de protection pour elles afin de faciliter un environnement d'apprentissage et de travail sûr. En ce qui concerne les droits de l'homme fondamentaux, les ONG et les instituts de partenariat public-privé doivent lancer des campagnes de sensibilisation et d'égalité des sexes, tandis que les médias peuvent également jouer un rôle. Compte tenu de la prédominance de relations patriarcales fortes, les campagnes de sensibilisation, l'éducation à distance et les incitations à l'emploi rémunéré pour les femmes peuvent diversifier les revenus des ménages et réduire la pauvreté. Le taux de dépendance élevé indique une demande croissante d'opportunités d'emploi auprès des organes

fédéraux et locaux du gouvernement pour faire face aux futurs chocs économiques. En outre, les mères instruites et qui travaillent peuvent également contribuer au sein des communautés à encourager et à éduquer les parents pour une égalité de traitement entre les enfants.

L'une des principales recommandations est que des mesures de santé doivent être prises dans chaque région du pays et que des campagnes de planning familial doivent être menées dans les villages pour promouvoir les techniques de santé avancées et l'équilibre entre la taille de la famille et les ressources. En outre, le gouvernement devrait se concentrer sur les questions structurelles fondamentales des ménages qui affectent directement la société et créent une discrimination entre les sexes au niveau provincial. L'application de l'âge du mariage doit faire l'objet d'une surveillance stricte, car les mariages précoces entraînent une parentalité précoce avec un niveau d'éducation moindre. Il rend la situation économique du ménage plus vulnérable mais transmet également les pratiques sociétales qui ont un effet négatif sur l'autonomisation des femmes et leur niveau d'éducation. Le ministère du Travail du Pakistan devrait lancer des stratégies d'adhésion à des syndicats de femmes et d'emploi pour combler l'écart salarial entre les sexes.

L'autre recommandation suggère que le pouvoir éducatif des femmes célibataires est aussi productif que celui des hommes pour atteindre le bien-être économique de la manière suivante : premièrement, le gouvernement devrait prendre des initiatives immédiates pour protéger les femmes célibataires et leur fournir de la nourriture, un abri et de la sécurité, en particulier dans les zones de conflit. Il devrait augmenter les quotas dans les secteurs de l'emploi et de l'éducation afin de soutenir financièrement les femmes célibataires pour qu'elles puissent consolider leur position dans la société. Le gouvernement devrait lancer des politiques de programmes d'auto-emploi pour les femmes célibataires, car le capital humain augmente directement la participation de la main-d'œuvre, ce qui améliore les performances des entreprises et le développement économique du pays. En outre, les organes du gouvernement local devraient fournir un soutien pour diversifier les opportunités d'emploi afin de réduire le taux de dépendance (dans notre cas, cela pourrait être dû aux veuves et aux orphelins). Deuxièmement, le gouvernement devrait mettre en œuvre les politiques qui contribuent directement à soutenir les dépenses de consommation intérieure, comme les produits alimentaires. Cela peut apporter un double avantage. Réduire la pauvreté et améliorer les conditions de vie de base. Les programmes d'aide

sociale, en particulier dans les zones rurales, peuvent promouvoir le transfert de connaissances et de commerce, car les résultats montrent clairement que la disponibilité des infrastructures contribue à la qualité de vie. Troisièmement, les instituts à but non lucratif, les médias et le gouvernement local devraient introduire l'aide à distance pour fournir des services d'éducation, d'alimentation et de santé là où il n'y a pas d'écoles, d'hôpitaux et de transports appropriés.

En outre, les résultats indiquent une intervention possible du gouvernement, car il existe un impact positif du revenu sur l'éducation. En augmentant les opportunités d'emploi, le gouvernement peut potentiellement soutenir la réduction de la pauvreté et, d'autre part, cela peut améliorer le ratio de transition entre les niveaux d'éducation primaire et supérieure. De même, l'ouverture d'universités pour femmes pourrait être une autre option politique pour réduire l'écart entre les sexes dans le niveau d'éducation. La réduction des contraintes de crédit par des prêts sans intérêt, des programmes de bourses et la gratuité de l'enseignement jusqu'au niveau secondaire supérieur peuvent éventuellement améliorer les taux de scolarisation des filles.

En outre, des programmes de rentabilité doivent être lancés, tels que le contrôle de la construction d'écoles dans des endroits inappropriés où les parents sont très peu susceptibles d'envoyer leurs filles. Ensuite, il faut cibler les écoles fantômes (écoles non fonctionnelles présentes uniquement dans les journaux) qui sont environ 30 000 au Pakistan (Transparency International 2013), et enfin, l'allocation des ressources en fonction de la qualité de l'éducation doit être considérée dans les plans d'action nationaux pour l'éducation. Afin d'augmenter le taux de scolarisation, la proportion d'enseignantes, la construction d'écoles non mixtes et les moyens de communication doivent être prévus en fonction de la densité de la population. Le financement des groupes à faibles revenus et l'ouverture d'universités scientifiques dans chaque province peuvent être des projets communs possibles entre le gouvernement local et les communautés. En outre, le secteur de l'éducation devrait examiner attentivement le taux d'abandon scolaire après l'enseignement secondaire.

Ces études font ressortir d'autres préoccupations spécifiques qui doivent être traitées dans les domaines respectifs. Dans le chapitre 2, la structure familiale et les informations concernant la polygamie ne sont pas prises en compte dans la prise de décision. L'étude est limitée aux femmes âgées de 15 à 49 ans qui sont disponibles dans l'enquête sur les ménages, alors que les femmes âgées de plus de 49 ans peuvent être examinées. D'autres indicateurs dans la prise de décision des

ménages tels que l'âge de fin de scolarité, la violence domestique et l'indice de richesse peuvent être des éléments intéressants dans les études futures. De même, d'autres caractéristiques socio-économiques peuvent être examinées pour étudier les stratégies unitaires et de réconciliation des femmes pour le développement économique du ménage. En outre, dans le chapitre 3, l'étude se limite aux femmes célibataires, mais la contribution des hommes célibataires au bien-être économique du ménage peut être intéressante et leur comparaison peut élargir les possibilités de réduire la différence entre les sexes. L'étude fournit des modèles aléatoires d'interception et de pente limités à des indicateurs spécifiques qui peuvent être étudiés pour d'autres domaines. De même, dans le chapitre 4, d'autres caractéristiques socio-économiques, des indicateurs de qualité de l'éducation tels que le ratio d'enseignants par nombre et par sexe, et l'infrastructure scolaire ne sont pas couverts dans cette étude en raison de la non-disponibilité des données. Il est certain que la qualité de l'éducation peut fournir d'autres différences entre les garçons et les filles qui ne sont pas examinées dans cette étude. Ces limites énumérées sont des pistes futures possibles qui peuvent stimuler l'efficacité des politiques en incorporant d'autres caractéristiques socio-économiques pour donner des informations utiles aux décideurs politiques.