Human Capital Investment and Employment in Iran: The Importance of Urban-Rural Distinctions

Izadi, G.

Human Capital Investment and Employment in Iran: The Importance of Urban-Rural Distinctions

Gissa Izadi

A thesis submitted in partial fulfilment of the requirements of the University of Westminster for the degree of Doctor of Philosophy

May 2018

Acknowledgment

I would like to dedicate this thesis to my father, Javad Izadi, who instilled in me that not even being born in one of the most religious cities of the world could stop me from fulfilling my dreams. To my mother, Mehri Oraee, who inspired me with her patience, and to my husband, Dr Peyman Pakyari, without whom I could never succeed in my PhD. I would also like to express my thanks and appreciation to my supervisors, Professor Franz Buscha, Professor Peter Urwin and Dr Augusto Cerqua, for their courage to accept such a difficult country to conduct research, and their patience and advice.

I declare that all material contained in this thesis is my own work. All errors and omissions are solely my responsibility

Gissa Izadi

Abstract

This thesis explores factors related to private investment in education in Iran. All of the three empirical chapters pay particular attention to the very different findings obtained when considering urban versus rural contexts and the implications this has for gender in Iran. For the first two empirical chapters, we use data from the Household Expenditures and Income Survey (HEIS), while for the last chapter, we employ data from the Labour Force Survey (LFS).

Household/parental educational expenditure on children is one factor related to private investment in education. We study determinants of household/parental educational expenditure on children, and results in this chapter indicate two interesting findings; firstly, richer parents, especially in urban areas, spend more money on their children's education, which suggest possible existence of intergenerational mobility. Secondly, in rural areas maternal education is not significantly related to determining the decision to spend on education, the amount spent, and the proportion of household expenditure allocated, which suggest possible existence of gender discrimination in rural areas. Chapter 5 explores both naïve and causal returns to education in terms of wages by using both OLS and Instrumental Variable techniques. Our OLS results provide strong evidence for non-linearity, and higher returns to schooling for women, and suggest that returns to education are similar between urban and rural areas. Our IV estimates are higher than OLS estimates, and imply that returns to education are higher for urban than rural areas, and for women than men. Finally, we examine job mismatch in the Iranian labour market in Chapter 6; particularly determinants of under/over employment. Most of our findings are consistent with the existing studies of under/over employment. However, notably we find that marriage and education have different implications for men and women, and more educated women suffer from higher

underemployment, while the opposite is true for men. We also find that single and divorced women are suffering from high underemployment, while marriage is not significantly related to men's probability of job-mismatch.

Overall, studying various factors related to private investment in human capital in Iran suggests the possible existence of increasing intergenerational mobility, but also discrimination, against women within the Iranian labour market.

Table of Contents

List of Figures

List of Tables

Chapter 1: Introduction

1.1 Aims and objectives

This thesis examines various factors related to investment in education in Iran and the outcomes of such investment. The analysis focuses on factors such as the determinants of parental expenditure on children's education, returns on investments in education in terms of wages, and job mismatches in terms of under/over employment in Iran. Like many other countries in the Middle East and North Africa (MENA), the literature on Iran's educational economy, and specifically the determinants of investment in human capital, is quite scarce and underdeveloped. The thesis gathers the existing literature on these topics in Iran written in English or Persian language. In analysing the determinants of educational investment, their returns and the extent of over/under-employment, we pay particular attention to the very different findings obtained when considering urban versus rural contexts, and the implications this has for gender in Iran. Considering these dimensions is one of the most important contributions of this thesis, because it provides key insights for Iranian policymakers in the areas of education, training, and the labour market.

Observing each section separately, our first empirical chapter is on the determinants of household educational expenditure. To the best of our knowledge there has been only one study in this area by Kashi (2010), which examines the trend of household proportion of educational expenditure in Iran by using Household Income and Expenditure Survey data. Apart from Kashi (2010), most of the existing literature on this subject focuses on food, health, and housing expenditures in Iran. Hence, our first empirical chapter, which focuses on the determinants of parental educational expenditure, is innovative and new in the literature. Our second empirical

chapter reveals that the literature on returns to education in Iran is more extensive; however, none of these studies differentiate between urban and rural regions/areas, and by gender. Hence, our contribution to existing literature on returns to education in Iran comes from differentiating between these two areas; while also examining the potential for gender to impact differentially in these two types of regions. We also make a methodological contribution to the existing literature, using IV methods to get at the causal returns to education in Iran. Previous studies on returns to education by Salrhi-Isfahani et al. (2009) have examined estimates that do not tackle the potential endogeneity of education. Finally, our third empirical chapter is on the magnitude of job-mismatches in Iran, specifically, under/over employment. This topic is also original, and to the best of our knowledge, no other studies exist on this important feature of Iran's labour market. The focus of this final analytical chapter developed as the thesis progressed, because the study of under/over employment in Iran raises very different issues for rural and urban settings, particularly in terms of gender differences. A focus on under/over employment is also partly driven by the opportunities that our data source (the Iranian Labour Force Survey) presents, as it comprises particularly interesting and informative statistics on under/over employment.

The first chapter of our thesis attempts to create a background for the next chapters of our thesis. In order to do so, in the next section (section 1.2), we briefly mention some historical background we believe has shaped the Iranian educational system, and the labour market characteristics. In section 1.3, we examine Iran's education system. Section 1.4 provides a brief outline of the Iranian labour market characteristics. Finally, section 1.5 outlines the empirical aims and chapters in this thesis. At the end, we suggest that while demographic changes and the expansion of educational attainment in the 1980s could be used to promote economic growth and

prosperity, the persistence of existing rigidities in the labour market (such as high unemployment among educated youth, over-education, and low female labour participation) will present the greatest challenge to the Iranian government in the near future. If the Iranian government misses its chance to use the evolution of its population demographic, it will face a period of high unemployment, especially among the educated youth and women. This could create not only economic but also political and social crises in the near future. This thesis sheds important light on some of the key challenges facing Iranian policymakers and concludes with some key recommendations for the future.

1.2 Historical background relevant to educational changes

1.2.1 Stylised facts about Iran

Iran is the second largest economy in the MENA region after Saudi Arabia. With 79.8 million people, Iran has the second largest population of the region. Iran owns the largest natural gas supply in the world, and the fourth-largest oil reserve, which means it can exercise considerable influence on international energy, security, and the global economy. Figure 1.1 provides a map of Iran with its neighbouring countries, demonstrating that it shares border with many strategically important countries such as Afghanistan, Iraq, and Turkey.

Figure 1.1: Map of Iran

Source: Google map

Although Iran is one of the most important regional powers in one of the most conflicted and complex parts of the world, there remains a gap in available data and economic analysis. One of the main reasons is the reluctance of the Iranian government to make its collected microdata available to the public or researchers. According to Salehi-Isfahani (2014), one justification is:

'[There is] the old argument that information is power, and governments prefer that ordinary people not have access to the same information as they do, that armed with the same information they might challenge government claims about the state of the economy and how things are changing'. (Salehi-Isfahani, 2014)

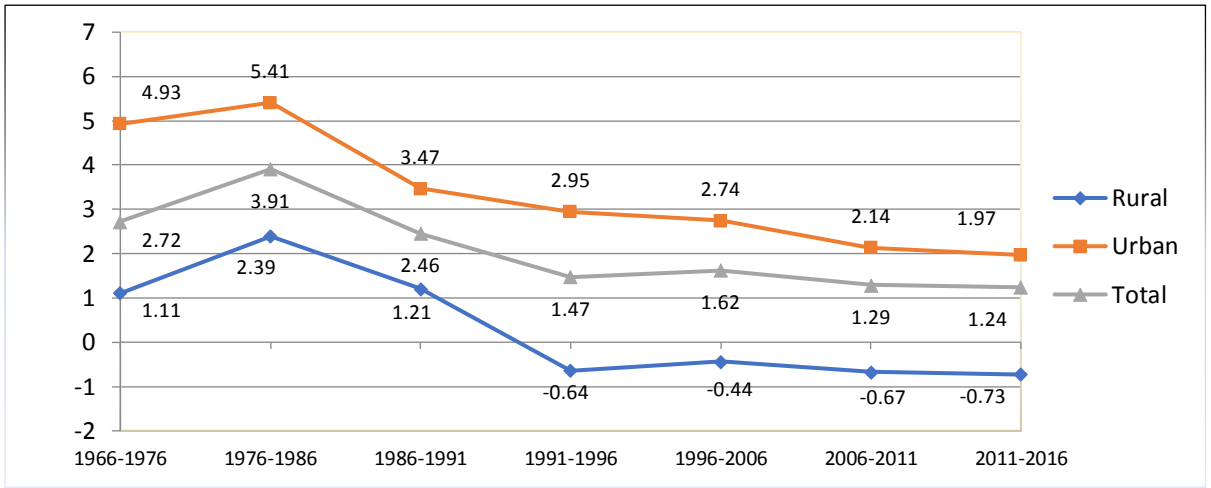
The result of such policies for the past few years is that 'Iranian papers are filled with not always accurate analyses of [its economy] by independent researchers' (Salehi-Isfahani, 2014). However, it seems that the Statistical Centre of Iran (SCI) is gradually moving to avail the microdata it collects to a wider community of researchers. There are currently three types of microdata available to study the Iranian economy: the Household Expenditures and Income Survey (HEIS), School to Work Transition Survey, and Labour Force Survey (LFS). In this thesis, we use two of these surveys: the HEIS and LFS.

1.2.2 Population rise

Probably the most important incident in the 20th century that shook the Iranian economy, its educational system, and the structure of its labour market was the Islamic Revolution in 1979, and the proceeding eight-year war with Iraq. The Islamic revolution and the war had large impacts on the social and educational structure of Iran. One of the important effects was large number of war casualties, and its effects on family structure, as more women became the head of households (Khoury, 2013). According to Koolaee (2014) 55,996 women lost their husbands during the war. However, the most important effect of the revolution and the war was its leaders' emphasis on marriage and family formation as basic Islamic virtues. As a result, the new government suspended all family planning programs (Mehryar, 2004). As Abbasi (2002) rightly points out 'With the start of the eight-year war with Iraq, this facilitation of population increase went beyond being an ideology and began to be considered a matter of comparative advantage' (Abbasi, 2002, p.6). Subsequently, the demographic significances of such an ideology became evident fast as the rate of population growth accelerated dramatically, and the population rose from 33.7 million in 1976 to 49.4 million in 1986 (an average annual rate of growth of 3.8% during the decade). Figure 1.2 presents the average annual population rate from 1966 to 2016, for urban and rural areas separately, where we can observe a total rise of 3.91% in the population from 1966 to 1986. We can also see that this population rise was higher in urban areas compared to rural areas (5.41% versus 2.39%). This could be explained by a higher population rise as well as migration from rural to urban areas. In addition, population growth has been declining constantly since 1991, especially in rural areas, where we observe negative population growth rates. The reverse effects of such a sharp decline in Iranian

population need further investigation. However, the population cohort under study in this thesis consists mostly of those who were born during the 1980s baby boom in Iran.

Figure 1.2: Average Annual Population Growth Rate (%)



Source: Iranian Census (2016)

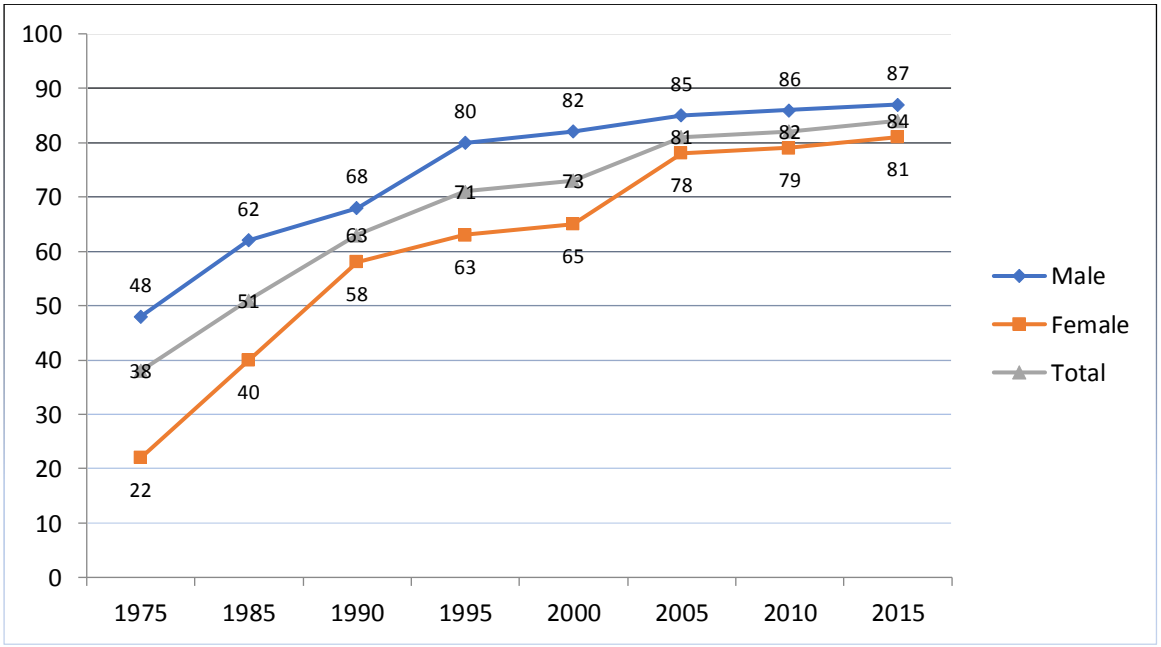
1.2.3 Education expansion

One of the most important challenges presented by the population's drastic increase was a sudden increase in the demand for education. For instance, the cohorts born between 1976 and the early-mid 1990sentered formal schooling during early and mid-1990s, which in turn raised demand for primary education facilities. The government reacted by increasing its investment in primary education, specifically recruiting and training more teachers for this level and constructing schools. However, since building schools would not address shortages immediately, they started introducing a two-shift schooling system that allowed the use of the same premises by two different groups of children, teachers, and administrators. When this cohort reached the age of 12, the junior secondary school system experienced a similar pressure. It would happen again when the wave reached age 15 and a higher demand for senior secondary school facilities became evident. This pressure continued in universities, when the large number of children born between

1976 and 1986 reached the age of higher education in the early-mid 1990s(Salehi-Isfahani, 2005). However, the current population decline implies that there will be many empty seats in universities across Iran in the near future.

One of the most important characteristics of educational expansion was the equal opportunities created for both men and women, which is also evident in Figure 1.3. We see from this figure that while the educational attainment of both men and women increased constantly since 1975, the educational gap (in terms of the literacy rate) between men and women has also narrowed. For instance, while in 1975 the gap between the literacy rates of men and women was 26%, this gap has declined to only 6% in 2015.

Figure 1.3: Literacy Rate for Population Age 15 and Older (%)



Source: UNESCO (2016)

This dramatic improvement occurred not only in literacy rates, but also in higher educational levels, as we can observe from Table 1.1. Iran transformed from a country with low participation in tertiary education into an exceptionally highly educated one. For instance, between

1995 and 2015 alone, Iran's tertiary gross enrolment rate increased from 18.29% to 71.9%. According to World Education News and Reviews (WENR), this is a higher ratio than countries like Italy, Japan, or the United Kingdom, and twice as high as the global average. We can also observe from Table 1.1 that the rate of female students entering universities also increased rapidly. For instance, while the gap between the male and female enrolment rate at the tertiary level was nearly 10% in 1995, in 2005, this gap was nearly 0% in 2010. As Salehi-Isfahani (2008) points out although the closing gender gap in education has been praised as one the achievements of the Islamic Republic of Iran, there are concerns inside Iran about 'women taking up precious spaces in universities', aswomen have outnumbered men in the entering classes of universities for the last several years. Salehi-Isfahani(2008) suggests that these concerns will soon begin in other Middle Eastern countries where the same phenomenon has occurred.

Table 1.1: Gross Enrolment Ratio, Tertiary Level (%)

Year	**1975**	**1980**	**1995**	**2005**	**2010**	**2015**
Total	4.10	4.49	18.29	22.87	48.52	71.88
Male	5.66	5.94	23.09	22.23	48.56	75.89
Female	2.43	2.93	13.46	23.52	48.47	67.65

Source : UNESCO (2016)

1.3 Iranian Educational System

In the previous section, we discussed issues that raised demand for human capital in Iran. In this section, we will examine characteristics of the Iranian education system such as various levels, organisations responsible for education, and recent related policies. Table 1.2 briefly

presents some current indicators of Iranian education, demonstrating very high standards in youth literacy rates, enrolment ratios in primary and secondary school, and adult literacy rates. We can see that although most of these variables show similar levels of educational attainment for women and men, women still lag behind men across all categories.

Table 1.2: Education Indicators for Iran

Indicators (%)	**Men**	**Women**
Youth literacy rate	98.8	98.5
Primary school participation, Gross enrolment ratio	108.1	106.8
Primary school participation, Survival rate to last primary grade	98.1	96.7
Secondary school participation, Net enrolment ratio	82.4	79.8
Adult Literacy Rate	91.4	83.18

Source: World Bank, 2015

1.3.1 Education levels

Four stages characterise the Iranian education system: primary, lower secondary, upper secondary/high school, and higher education. In the proceeding sections, we will examine each level in detail. We should note that since 2014, there have been some organisational changes in Iran's educational system. According to the new structure, the elementary cycle is extended to 6

years (instead of 5 years), lengthening basic education to a total of 9 years. Consequently, the new educational structure has one year less in high school (WENR, 2017). However, the cohorts this thesis observes studied under the previous educational system, and we hence focus in this section on the old structure.

1.3.1.1 Basic education

According to the old educational structure, the basic education cycle lasted eight years, and it is complimentary until this grade. It was divided into a five-year elementary education cycle and a three-year lower secondary cycle. The primary level involves 24 to 31 teaching hours per week. The curriculum in these two levels covers Islamic studies, Persian studies (including reading, writing and comprehension), social studies, mathematics, and science. These subjects are uniform for all schools. Provincial authorities conduct national exams at the end of each level, and if students fail, they will have a second chance to repeat the exam. However, if they fail twice, they need to repeat the whole year. Depending on the grades achieved in the relevant subjects at the end of grade 8, students are eligible to continue their education in the academic or vocational/technical branches of the secondary cycle (Iranian Education Ministry, 2017).

There are some drawbacks to Iran's basic education system, which were recognised by the Iranian Education Ministry. For instance, one of the most recent reports by the Iranian Education Ministry (2014) highlights the pressing need to improve enrolment rates in basic levels, especially in rural areas. According to this report, students in rural areas still do not have equal access to primary education with a remaining 2% discrepancy in favour of boys. Furthermore, the report stresses that in rural areas, large portions of this age cohort enrol with delays. Finally, the report warns of a high number of school dropouts at this level (approximately 6%), especially in rural

areas. It then claims that many of these students might turn into working children; while 'the statistical systems for the identification and screening of out-of-school children are not fully operational either' (Iranian Education Ministry, 2014.p12).

1.3.1.2 Upper secondary

Upper secondary education lasts three years (grades 10 to 12) for students aged 15 to 17, and is not mandatory. This level requires students to complete between 90 to 96 credits, and students undertake 30-32 teaching hours per week. There are three types of schools at the high school level: academic, technical, and vocational. Students in the academic branch follow one of four streams in the third year of upper secondary: humanities and literature, mathematics and physics, experimental sciences, or Islamic theology. On the other hand, technical and vocational schools prepare students to enter the job market in trade, agricultural, and industrial professions. Students in the technical stream follow one of three specialisations: technical (industry), business and vocational (service industry), or agriculture (Arani, 2012).

At the end of the third year, there is a national exam, and students who successfully complete this level will obtain a high school diploma (equivalent to a GCSE Level in the UK) and the right to attend a pre-university year, and take *Konkur,* which is a national entrance exam for public universities(Iranian Education Ministry, 2014). It is very competitive, and only around 10% of those who take the exam are admitted into public universities. The competitive nature of the Konkur has been criticised by many scholars of education economics in Iran and politicians (Kamyab, 2015). Another national examination is conducted on the day following Konkur for students with lower chances of getting into public universities, who choose to apply to private universities. These private universities charge a tuition fee, and thus admission is not as competitive as that for public

universities (Kamyab, 2008). Table 1.3 provides information on the educational structure of Iran and different stages of this system.

Table 1.3: Structure of the education system for Iran

Level of Schooling	Ages	Grades	Number of Years	Number of Sessions per Week
Primary	7–11	1–5	5 years	25 (45 minutes each)
Lower Secondary	12–14	7–9	3 years	30 (50 minutes each)
Upper Secondary	15–18	10–12	4 years[1]	35 (50 minutes each)
Vocational	15–18	10–12	4 years[2]	40 (50 minutes each)

Source: TIMSS (2015)

1.3.1.3 Higher education

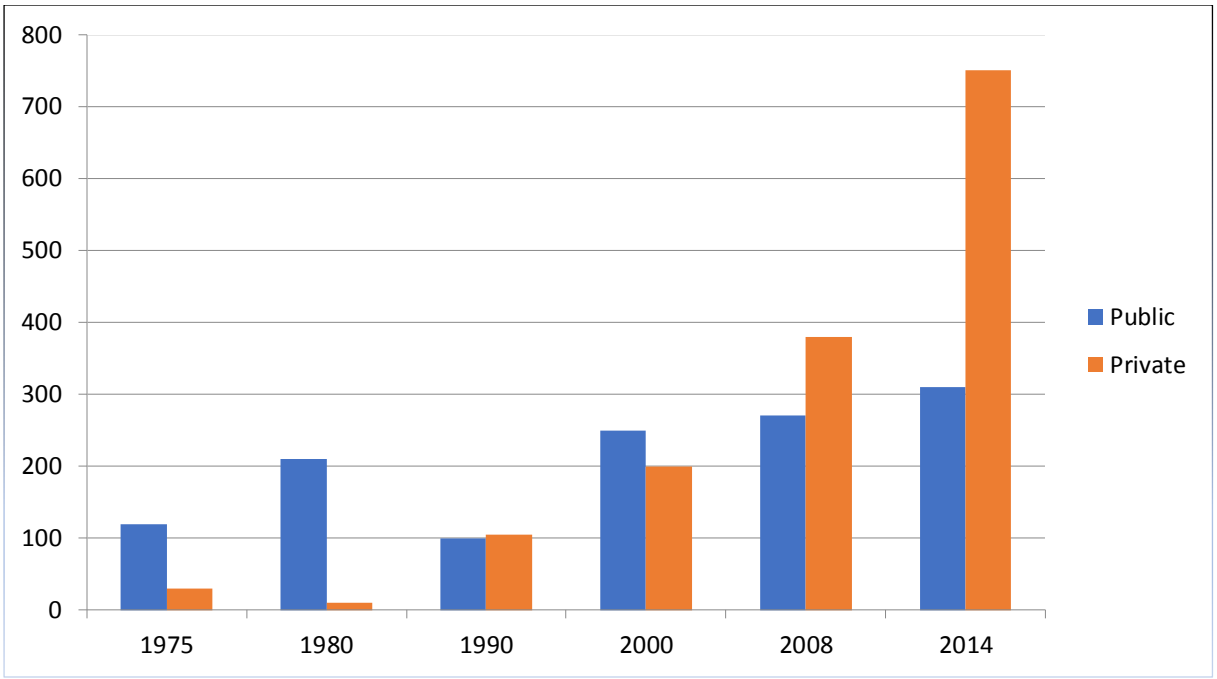
Following the Islamic Revolution, all universities were closed between 1980 and 1983, during which the curriculum was revised. Upon reopening, all universities became nationalized, as the new Islamist government held an unfavourable view of private education. It was nearly ten

[1]Please note that this table represents the new Iranian educational system, while in the thesis(as explained in section 1.3.1) we refer to the old educational structure

years after the revolution, once the reformist government came to power and placed pressure on the higher education sector, when private universities reopened (WENR, 2017).

Apart from the public universities, another semi-public university, called the Iranian Azad University (IAU), was also allowed to operate. IAU was managed by trusted government officials and was established in 1981. This semi-public university, which is financed by students' tuition fees, has expanded dramatically since its establishment. It currently has 350 campuses across Iran, as well as international branches in Dubai, Lebanon, Oxford, Afghanistan, Tanzania, and Armenia. However, all courses at the IAU must be approved by the Supreme Council of the Cultural Revolution and recognized by the Ministry of Science, Research and Technology (Habibi, 2016). Figure 1.4 presents the growth of private universities in Iran over time. As the figure shows, though there were once many more public universities, currently, private university campuses outnumber public campuses across Iran. This figure also reveals a sharp increase in the overall number of universities in Iran.

Figure 1.4: Growth of Public and Private Universities in Iran, 1975–2014



Source: Habibi, 2016

1.3.2 Organisations Responsible for Education

As the Trends in International Mathematics and Science Study (TIMSS) put it rightly, 'the education system in Iran is a social and cultural institution that serves as the most important organisation for the edification, dissemination, and transfer of culture in Iranian society, helping students to lay appropriate foundations and develop appropriate values' (TIMSS, 2015). Hence, it is not surprising that all private and public schools must conform to the Ministry of Education's regulations. However, there are public and private schools at all levels, from elementary school through university: approximately 7% of primary schools, 10% of lower secondary schools, 18% of upper secondary schools, and 18% of technical and vocational institutions are private(Habibi,2016).

Under the Iranian system, different ministries are responsible for education. For instance, the Iranian Ministry of Education is responsible for basic and secondary education, including

teacher training programmes. The Ministry of Education itself is composed of several deputy ministries, organisations, and centres with specific administrative responsibilities, including developing goals and strategies, conducting and supervising educational activities, developing curricula and textbooks, publishing and distributing educational materials, planning and conducting professional development for teachers, teacher education, carrying out student assessment and examinations, and defining human resource policies within the ministry. Furthermore, The Technical and Vocational Training Organization (TVTO) is in charge of vocational education, while The Ministry of Science, Research and Technology is responsible for all levels of tertiary education. The only exception within university education is the medical education, which falls within the remit of the Ministry of Health, Treatment and Medical Education (nuffic, 2010).

1.3.3 Current and recent educational policies

Since the 1979 revolution, a variety of policies were incorporated in the five-year national development plans to moderate the circumstances of implementing educational programs. Table 1.4 summarises this development policy for the education sector, specifically mentioning the three most recent plans. As we can observe in Table 1.4, eliminating regional disparities and gender inequality in education have been part of objectives of all Iranian governments since 2000. The persistence of regional and gender inequalities in Iran highlight the importance of differentiating between urban and rural inequalities, and gender differences in any study of education in Iran, which we have tried to accomplish in this thesis.

Table 1.4: Iranian Educational Development Plan 2000 - 2014

3rd Development Plan 2000-2004	4th Development Plan 2005-2009	5th Development Plan 2010-2014
Regional development and eliminating disparity Promoting human resources especially teachers Regulating educational spaces Supporting development and construction of schools in different regions Mobilizing financial resources in addition to state budget Improving gender equality	Regional development and eliminating disparity Renovation, resilience, and standardization of schools Adopting legislation for recruiting and preserving teachers in less developed regions Extending boarding schools Developing remote and media learning Developing educational and sport spaces improving gender equality in educational attainment and eliminating girl's drop outs in schools	Regional development and eliminating disparity Developing technical education Developing secondary education in humanities Adjusting the majors of secondary education with respect to social needs Teaching at least one skill to secondary school students promoting students' physical and psychological health Eliminating the factors causing failure at school especially for girls after primary school

Source: Iranian Ministry of Education, 2014

1.3.4 Critics of the Iranian education system

Many researchers have criticised the current Iranian educational system for being too 'credentialist' (such as Salehi-Isfahani, 2012; Assad, 2013; Babaie, 2011). Salehi-Isfahani (2012) argued, 'like the rest of the Middle East, Iran has a test-based education system, which limits the set of skills that individuals are encouraged to learn' (Salehi-Isfahani, 2012, p.12). Assad (2013) examines Iranian students' poor results in the TIMSS (Trends in Mathematics and Science Studies)

exam, where only 1% of Iranian 4th graders and 2% of 8th graders scored above the 'high international benchmark for mathematics'. Referring to these results, he then points out that 'Iran's [educational] system disproportionately rewards the ability to absorb and retain a lot of information at the expense of creativity' (Assad, 2013, p. 32). Safi (2000) also studies students who participated in the TIMSS test, and paid special attention to their family background. He finds that about one-third of the inequality in the maths and science scores of Iranian 8th graders could be explained by their family background and where they were raised. He then concludes that 'Iran's free and meritocratic public education system has failed to provide a level playing field for its youth' (Safi, 2000, p.12).

Babaie (2011) sought to explain the high demand for higher education in Iran. He explains that this is due to a type of reward that university graduates receive, that is, 'escaping low-wage work', arguing that due to the low quality of higher education in Iran, 'more education will not mean greater productivity for most youth, but simply an escape from working at a lower wage than they are comfortable with'. He argues that 'this is well-known to afflict oil-rich countries; the downside of a rent-based economy that supports a high standard of living above what national productivity can achieve' (Babaie, 2010, p.31).

Peivandi (2012) criticises Iranian educational institutions for 'becoming a place of political and ideological propaganda'. He supports his argument by presenting the first legislation conducted by the Islamic government in 1987 regarding the objectives of education in Iran. He argues that this legislation outlines 14 main objectives for the Iranian education system, of which nine directly address religious, ideological, ethical, and political issues. These objectives include 'encouraging moral virtues and respect for religious traditions, promoting the purification of the

spirit, understanding and learning the Koran, understanding Islamic culture, understanding moral and religious values, reinforcing the belief in God, developing religious obedience, and understanding the obligation of religious practices' (Peivandi, 2012, p.4).

Iravani (2011) points to important disparities that still exist both in terms of gender disparities and in urban and rural inequalities in the Iranian education system. He points out that while literacy rates improved considerably in both rural and urban areas, the former still lags the latter, and both individual and family literacy rates are higher in urban areas. Furthermore, the literature contains some evidence of gender bias differences between urban and rural areas at lower educational levels. For instance, male literacy rates are still higher than female literacy rates are, while this difference is close to zero in urban areas. There are still considerable disparities between male and female literacy, as well as major discrepancies between the types of female education offered. He then concludes that the Iranian government should pay particular attention to rural areas in education policymaking. Finally, a field research was conducted jointly by the Ministry of Education, and UNICEF (2016) in areas of Tehran to examinethe gender gap in education. This research proposed that the most frequently stated issues for girls schooling drop-outs were as follows: cultural factors (traditional thinking regarding the uselessness of education for girls; prioritizing the education of boys over girls); economic factors (financial poverty; mothers' need for the help of girls in housework; the family's need for the economic, income-generating activities of girls); and educational factors (absence of female teachers; co-educational schools).

1.4 Labour market characteristics of Iran

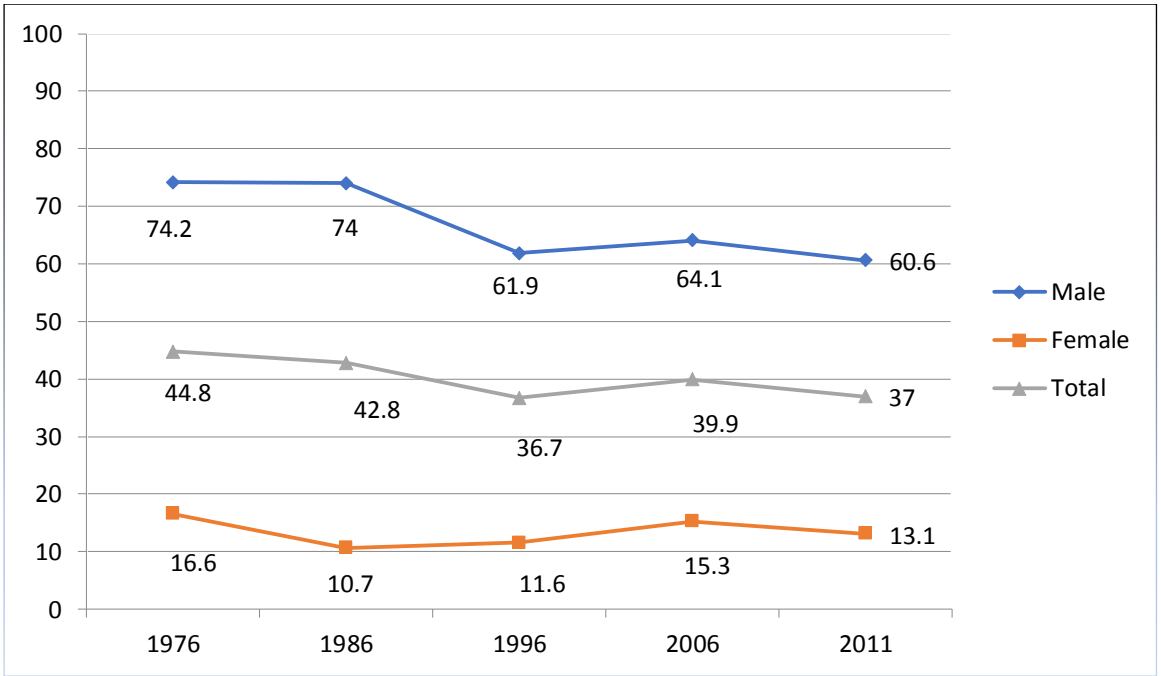
In the last sections, we discussed the dramatic educational expansion started between 1976 to 1991 in Iran, which happened in response to the striking increase in Iran's population. Years

later, these birth cohorts gradually entered the Iranian labour market, which recently confronted the Iranian government with enormous problems of unemployment and job creation, which shaped the characteristics of the Iranian labour market. In this section, we examine these unique features of the Iranian labour market, such as high unemployment among the youth and university graduates, and low female participation in the labour market. We will also examine current Iranian labour market policies such as minimum wage, working hours, laws regarding small-sized firms, temporary contracts, child labour, and Gozinesh.

1.4.1 Youth labour force participation

One of the most important features of the Iranian labour market is the low youth participation, especially for women. As Figure 1.5 shows, in 1976, nearly 45% of youth participated in the labour force (74% for men and 16.6% for women); this ratio fell to 37% in 2011, with 61% for men and 13% for women. Furthermore, we can observe that young women's participation declined over the last four decades. There are a few explanations for this decline; the most relevant might be that the youth not participating in the labour market were mainly pursuing school and university education.

Figure 1.5: Youth Labour Force Participation Rate (%), 1976-2011



Source: Iranian Census (2016)

1.4.2Unemployed youth

Various researchers (such as Salehi-Isfahani and Egel, 2007) advised that creating enough jobs for the educated youth is going to be the most important challenge faced by the Iranian government since the revolution. According to the latest report by the Iranian census in 2016, the unemployment rate for young men was 22.1% and 40.6% for women, while unemployment among urban and rural youth are 27% and 18%, respectively. This report claims that in the coming years, on average, 1.2 million young people will join the labour market each year, while only 300,000 retire annually.

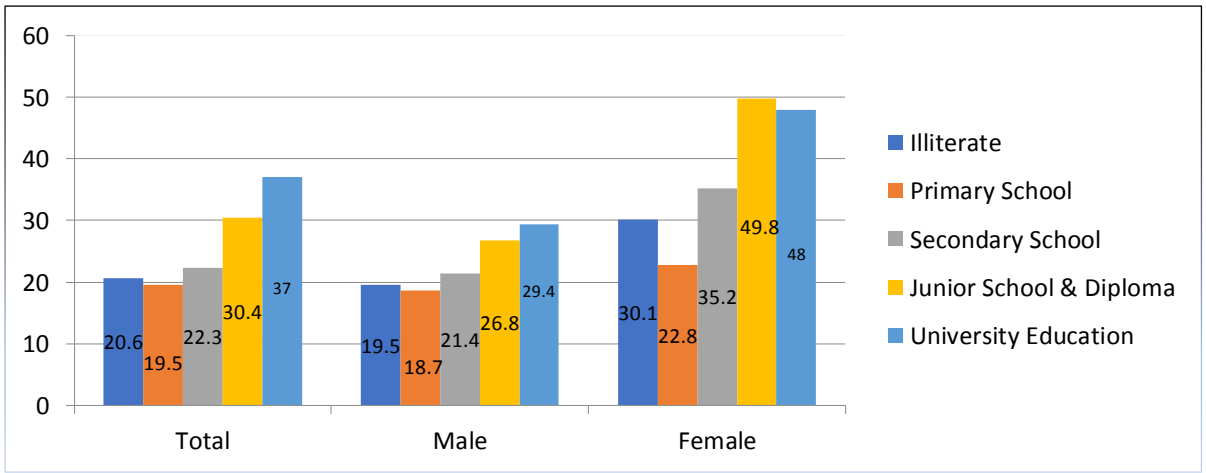
A report conducted by the ILO (2005) blamed existing Iranian labour laws such as those that 'protect jobs for older workers by raising the cost of layoff' but 'allow employers to avoid those

costs by offering young workers contracts of less than a year in duration' for high unemployment among the educated youth. This report suggests that Iran's formal labour market has preferences for older and already employed workers. This study points to the high duration of unemployment after graduation for youth as a major obstacle, where on average, male graduates wait 1.25 years to find a job, and this duration is even higher (3 years) for recent female university graduates. This survey also revealed the extent of labour market segmentation for youth and adults; adult jobs tend to be permanent with low turnover, while youth jobs are often temporary, with youth switching frequently between the formal and informal sectors.

1.4.3 University graduate unemployment

Another feature of the Iranian labour market is the high unemployment rate among its university graduates. Figure 1.6 presents the unemployment levels for individuals with certificates at different levels. The figure shows that male university graduates have the highest unemployment rates, 29.4%, compared to those at other educational levels. Women with a high school diploma have the highest unemployment rate of 49.8%, followed closely by university graduates (48%).

Figure 1.6: Youth Unemployment Rate by Level of Education (%), 2016

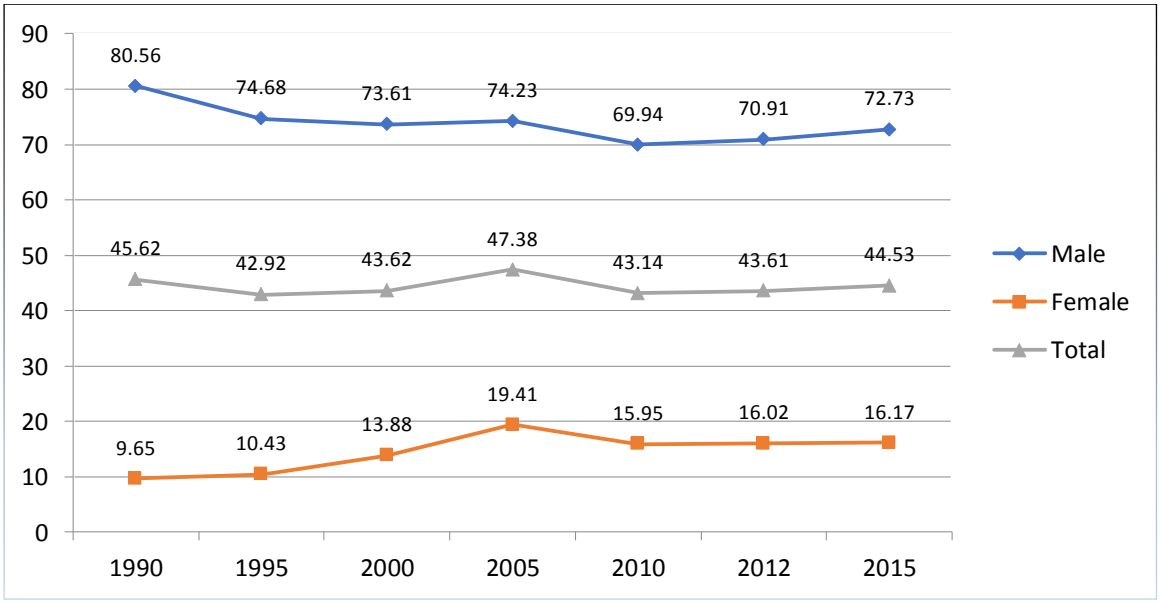


Source: Iranian Census (2016)

Gender disparity is a significant characteristic of the Iranian labour market, which is evident in the low labour force participation rate among women and higher levels of unemployment for women than among men. As we can observe from Figure 1.7, women's labour force participation is only approximately 17%, despite the fact that women comprise over 50% of university graduates. As the result of high gender disparities, the Global Gender Gap report (2015), produced by the World Economic Forum, ranks Iran among the bottom five countries (141 out of 145) for gender equality, including equality in economic participation.

On the other hand, according to the latest World Bank indicators, the unemployment rate among women is approximately 19%, which is twice the figure for men (around 11%). Darvishpour (2015) suggests that gender discrimination, the patriarchal structure of families, and the state's anti-women's rights ideology have kept female employment rates low in Iran since the 1979 Revolution.

Figure 1.7: Labour Force Participation Rate (%)



Source: World Bank Indicators, 2017

1.4.5 Over-education

Although there is no formal analysis of over-education in Iran, several government officials have expressed concerns about the excess supply of college graduates to media. Nemati (2011) uses the 2007 unemployment rate statistics to show that the unemployment rate among college graduates with two- and four-year degrees is higher than that for high school graduates. In 2012,Research Centre of Parliament, warned that according to the long-term educational plans, only 37% of students in tertiary education must study four-year degrees (and the rest must take two-year degrees), but 64% are studying at this level. At the same time, the percentage of college students in two-year degrees is below the optimal level, and the result will be an excess supply of university graduates with four-year degrees.

In a more analytical study, Saidi-Rezvani et al. (2007) track the labour market performance of a sample of university graduates with degrees in education and psychology. Their interview responses reveal that only 64% of these college graduates were employed and nearly all of the employed graduates were working for government agencies. Other studies track the job performance of university graduates in other fields. Mohamadzadeh (2006) finds that nearly 40% of university graduates in agriculture-related fields were unemployed, while another 32% were working part-time. In another study, Salehi-Omran (2006) finds that only 57% of the female graduates of Mazandaran University (a university in Northern Iran) were working, while the rest were unable to find unemployment. The study also finds that 62% of those with a job were government employees. Furthermore, only 3% of the employed females in this survey reported that their college education was relevant to the tasks they were performing.

1.4.5 Current and recent Iranian labour market policies

1.4.5.1 Minimum wage

According to Iranian Labour law, the minimum wage is regulated based on inflation and is determined by the Supreme Labour Council. However, employees may also be entitled to additional minimum allowances if they are married and have children. 'In addition, the determination of the minimum wage varies at the national or regional level and in terms of socio-economic sectors and its sub-sectors' (Abadi, 2015, p.13). Currently, the national minimum daily wage for 2017 is approximately 237,475 Rials (US$ 7.56) (Iranian Census, 2016). However, trade union activists reportedly express dissatisfaction with this minimum wage, and argue that it does not match the country's inflation rate, which is currently above 30 per cent (Abadi, 2015).

1.4.5.2 Working hours

According to Iranian Labour law (Article 51) working hours should not exceed 8 hours daily. Employees in Tehran typically work Saturday to Wednesday, with Thursday and Friday off for the weekend. In more rural areas, employees commonly work Saturday to Wednesday and a half day on Thursday. However, this article states that with an agreement between the employer and workers, the employer can increase work hours on some days, as long as the workweek does not exceed 44 hours. For those in hard and harmful professions, working hours should not exceed 6 hours a day and 36 hours per week. However, if the worker agrees to extra working hours, then he or she is entitled to receive a 40% extra wage. In addition, employees are entitled to a minimum of one calendar month's paid annual leave and can carry forward nine days of annual leave from one year to the next. Female employees are entitled to 270 calendar days of maternity leave. Finally,

employees are entitled to take one month's unpaid leave to perform their religious pilgrimage once during the course of their employment (Abadi, 2015, p.13).

1.4.5.3 Exclusion of establishments with less than 10 employees

Under the Labour law (Article 191), establishments of less than 10 employees, which currently employ about half of Iran's wage and salary workers, are excluded from some of the Labour law provisions, such as:

1. Exemption from paying the employee on the grounds of employment contract termination, total disability, retirement, or a decrease in the employee's physical or mental ability;

2. Exemption from provision and enforcement of the Occupation Evaluation and Classification System;

3. Labour law provisions regarding periodic work, leave, and holidays; and

4. Exemption from provisions regarding welfare facilities.

As Salehi-Isfahani (2008) points out 'This exclusion aims to give smaller firms more freedom to set their compensation and personnel policies. This is particularly effective when viewed from the youth perspective because small firms are the most likely to hire young, first-time job seekers. Exemption from the Labour law also enables smaller informal firms to become formal, which would help youth treat jobs in these firms more seriously as places to gain work experience and display skills that formal education does not provide'(Saleh-Isfahani, 2008, p.69). However, there are also concerns regarding this law, because these small firms constitute one third of the Iranian economy and are the main employer of the youth. At the same time, since there is no authority on these firms, they might not provide a decent environment for workers (Sadr, 2017).

1.4.5.4 Child labour

Iranian Labour law (Article 79) prohibits children to work under the age of 15; notably, Iran has not ratified the ILO's 'fundamental' Convention on Minimum Age. However, children between the ages of 15 and 18 are limited to working one half hour less than 'normal working hours'. While the Labour Code establishes that children under the age of 18 should not perform hazardous work, it does not define what constitutes such conditions; rather, the determination is left to the Ministry of Labour and Social Affairs (Harper, 2013).

1.4.5.4 Gozinesh

The Gozinesh Process is a means to screen individuals upon their application to public sector employment. It requires individuals to assert loyalty to the government, Islam and the principle of Velayat-e Faqih (Islamic Jurist)(Harper, et al. 2014).The central law that governs the Gozinesh process is the 1995 Selection Law based on Religious and Ethical Standards ('1995 Law'). It guides a full analysis of the individual's beliefs, previous political opinions, affiliations and repentance of any former political opinions are researched. It consists of criteria including, but not limited to:

1. Belief in Islam or one of the official religions set out in the Constitution of the Islamic Republic of Iran;

2. Practical engagement in the laws of Islam;

3. Belief and engagement in the Velayat-e Faqih; the state order of the Islamic Republic and the constitution;

4. Low moral corruption as well as any tendencies towards sin;

5. Cleared of any record of membership or support of parties, organisations and groups declared illegal

One could argue that the Gozinesh Process serves as a final layer of analysis but also barrier to state employment, and there is the concern that it breaches the international human rights law related to the right to work for everyone (Harper, 2013).

1.5 Summary

In summary, this thesis focuses on factors determining investment in human capital, such as determinants of parental educational expenditure, returns on education, and job-mismatches in Iran. We also investigate the effects of urban/rural differences and gender variations.

The main objectives of this thesis are:

- To identify the determinants of parental educational expenses on children;
- To examine returns on education in terms of wages;
- To examine the determinants of over- and under-employment; and
- To identify the impact of urban/rural and gender differences on each topic above.

The thesis is structured as follows. Chapter 2 provides a brief outline of educational theories, including the human capital model and the theory of signalling and screening. In Chapter 3, we review some of the existing literature on educational attainment. Chapter 4 examines the determinants of parental educational expenditure, with reference to urban/rural and gender differences. In Chapter 5, we explore both naïve and causal effects of education on wages. Chapter 6 examines the determinants of over/under employment in Iran for urban and rural areas and for men and women. Chapter 7 concludes with a summary and suggestions for further research.

Chapter 2: Theoretical Background

2.1 Introduction

This thesis examines the various factors that affect the decision to invest in human capital in Iran. Specifically, we examine the determinants of parental educational expenditure, returns on education in terms of wages, and determinants of under/over employment in Iran. Becker (1964) introduced the idea of human capital and the theoretical framework that encompasses such choices. The human capital model regards education as an investment good and offers a theoretical explanation for why some individuals may decide to invest in their own or their families' education. The following sections provide more detailed discussions of the theory of human capital theory. First, we examine human capital theory. Then, we explore how human capital theory justifies household investment in education, as this is related to Chapter 4, in which we explore the determinants of parental educational expenditure on children. Afterwards, we explore human capital theory in relation to returns on education and the Mincerian function. This sets the theoretical background for Chapter 5. We also examine human capital theory and its examination of job mismatch in the labour market, which is related to Chapter 6. Finally, we discuss the theory of signalling and screening as an alternative to human capital theory.

2.2 Human capital

Mincer (1974), Schultz (1961), and Becker (1964) developed the human capital model, which introduces the concept that individuals (parents) may invest in themselves (dependents) via education, training, medical treatment, and so on. Such investments can be seen as analogous to investing in physical means of production such as factories and machinery. Therefore, education

can be regarded as an investment good where individuals invest more in education when their discounted marginal return from doing so is positive. At the margin, the cost of investing in more education must not exceed the return. In its simplest form, this can be written as:

$$C = \int_t^T R_i \, e^{-ri} di \qquad (2.1)$$

where C is the cost of the marginal unit of education

T is the time horizon

t is the end of the education period

R_i is the period *i* return from the marginal unit of education

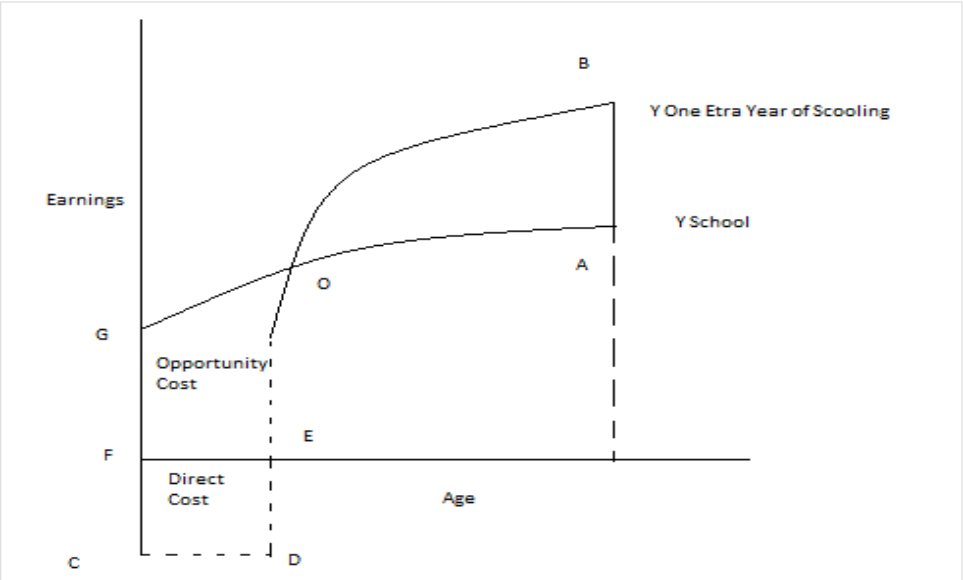
i is the discount rate

The implication of equation (1) is that when the discounted marginal cost of education is equal to the discounted marginal benefit of education, the accumulation of further education will discontinue. That is, education is chosen to maximize the expected present value of the stream of future incomes until retirement, net of the costs of education, such that at its optimum, the present value of the ith year of schooling equals the cost of the ith year of education. The costs of investing in more education have direct costs such as tuition fees, books, and materials; and indirect costs, namely, the opportunity cost of foregone earnings. Lower costs, higher returns, and lower interest rates will lead to additional investment in education, *ceteris paribus*. Note that the estimates of the costs and benefits are made on an individual basis, implying that the rate of return from an additional unit of education is subjective. The human capital model thus formalizes the decision of individuals to continue or discontinue education. Individuals perceive the expected return of additional schooling as less than the associated costs. One can model such a process through a binary choice model, where those continuing education perceive that the returns on education

outweigh the costs, and those discontinuing education consider the costs to outweigh the benefits. A logical point for such an analysis would be after the age of 16 at the end of compulsory education, and possibly after the age of 18, before entrance into higher education.

Figure 2.1 shows two hypothetical age-earnings profiles: go to work or continue studying for at least one extra year (for example, going to college). If one decides to work, they will earn $G initially, and then over their life-cycle, their earnings rise to profile Y (high school). On the other hand, acquiring an extra year of schooling means that one would have zero earnings in the first year, plus the direct costs of schooling (tuition fees, books, etc.), which results in negative earnings of -$C. However, this individual's earnings profile Y (college) would result after he or she enters the labour market. In other words, obtaining one extra year of schooling enhances future earnings by the vertical distance between OA and OB, yet has a direct cost depicted by the two areas composed of the direct outlay (area DEFC), and indirect opportunity cost (area GFEO).

Figure 2.1: Stylized age-earning profile



Source: Polachek, 1993

Human capital theory, and its underlying assumption that education increases productivity, can have important implications for all three empirical chapters of this thesis. The theory predicts that the more educated, and therefore the more productive, individuals receive higher wages, better employment status, and less mismatch in the jobs they have. Hence, parents, individuals, and government have an incentive to invest in education; for example, universal primary education is often considered one of the more important United Nations Millennium Development Goals for this very reason.

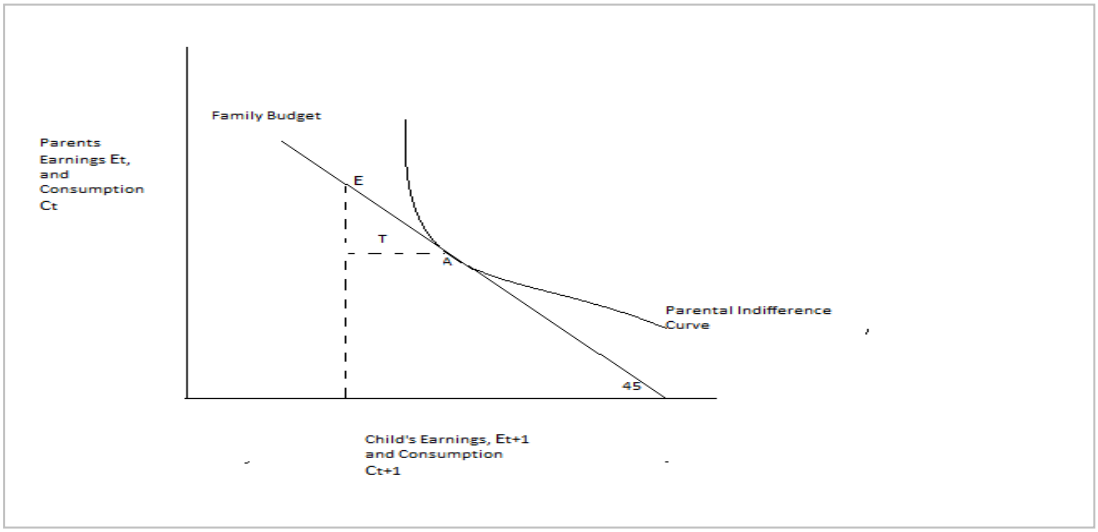
Human capital theory is related to Chapter 4, where we discuss the determinants of parents' educational expenditure on children. This is because according to human capital theory, parents, as rational individuals, are aware of the impact of educational attainment on their children, namely, higher productivity. Hence, this provides them with an incentive to invest in their children, especially if their later life may partly depend on their children's economic prosperity. Human capital theory is also directly related to Chapter 5, in which we examine the wage returns on education. If we find that more educated individuals earn more money, then according to human capital theory, this higher wage is due to individuals' higher productivity in the labour market. The varying rates of return on this investment can be an important 'diagnostic' tool for developing countries and an important determinant of where to allocate limited resources. Finally, human capital theory is also related to Chapter 6; according to human capital theory, more educated individuals are more productive, and hence find better matches in the labour market. The extent of this mismatch can be an important piece of information in active labour market policies and to help reduce hidden underemployment or overemployment. In the next sections,

we provide more detailed analysis of human capital theory with household investment and job mismatch in the labour market.

2.3 Human capital and household investment in children

So far, we assumed that individuals are investing in their own general education, while it is usually parents who invest in their children. The importance of family background such as parents' wealth or parents' education has been the subject of human capital theory for a long time. The basic Becker-Tomas (1986) model was one of the first advocates of the human capital theory that stressed the importance of parent's role in increasing children's human capital. Figure 2.2 describes this theory graphically and presents parent's[3] utility curves with respect to his/her consumption and the child's consumption. This model assumes that the parent is an altruist, meaning that he or she values the child's consumption and makes income transfers to the child. However, these transfers also depend on the child's own earnings.

Figure 2.2: Transfers within the Family



Source: Polachek, 1993

[3]For simplicity, we present only one parent.

The family budget constraint, F, which appears as a -45 degree slope in Figure 2.2, is the sum of the child's earnings E_{t+1}, and the parent's earnings, E_t:

$$F = E_{t+1}, + E_t \qquad (2.2)$$

The child's consumption, C_{t+1} is his/her income plus transfes from parents

$$C_{t+1} = E_{t+1}, + T \qquad (2.3)$$

Furthermore, parental consumption, which is the same -45 degree sloped line, equals his/her income minus transfers to the child, $C_t = E_t, - T$, which can be written as:

$$F = C_{t+1}, + C_t \qquad (2.4)$$

Note that the parent's consumption line in Figure 2.2 moves up and down by varying transfers T. For example, if we start from point E, with the given indifference curve, the parent will transfer T, and will move to point A.

Various interesting aspects of intergenerational transfers can be examined in this model; first, a more able child will receive fewer transfers from his/her parents, because the parents will expect the child to earn more at later stages. Second, if parental income rises, their transfers to the child will also rise, but at a diminishing rate, suggesting that the proportion of total income allocated diminishes. Third, while richer parents will make higher rates of transfers to their child, the importance of such transfers in the form of educational expenditure is lower for richer families. Once the rate of return on the child's human capital has reached the rate of return on physical capital, the parent will make further transfers in the form of physical capital. This suggests a limit to unequal educational attainment, and hence a limit to earnings inequality.

Chapter 4 explores the determinants of parental investment in education in the context of human capital theory. It will focus on factors that determine how much parents transfer to their

children, with a comparison of urban and rural households. We have no proxy for 'child's ability' to observe whether parents will spend less on educational expenses on a more able child. However, we can examine other implications of this theory by observing whether richer parents spend more on their children's education, and whether this relationship is linear, or, as the theory suggests, it is at a diminishing rate. Furthermore, by observing the proportion of educational expenditure, we will also be able to compare the share of educational expenditures of families with different incomes.

2.4 Human capital and returns on education

Human capital theory provides a standard way to estimate returns on education via a Mincerian earning equation. The Mincer equation (1974) explains wage income as a function of schooling and experience. The equation is recognised as the foundation for studies of education economics and is 'one of the most widely used models in empirical economics' (Lemieux, 2006, p.130). According to Heckman et al. (2003), Mincer's equation estimates two separate economic concepts. First, it estimates how the labour market rewards productive attributes like schooling and work experience, which characterise it as a 'pricing equation'. Second, it estimates the rate of return on schooling, which we can compare with the interest rate to determine the efficiency of investment in human capital.

The Mincer (1974) method in its simplest form can be represented as:

$$lnw_t = \beta_0 + \beta_1 S + \beta_2 \chi + \beta_3 \chi^2 + \beta_4 Z + \varepsilon \quad (2.5)$$

where lnw_t is the log wage at time t, S is years of schooling, χ denotes years of labour market experience, and Z is a vector of other miscellaneous observed variables. χ is quadratic to

allow for any possible decline in post-school human capital formation. Here, β_1 is the marginal effect of schooling in percentage on log wages.

Chapter 5 explores the returns on education in terms of wages by employing the Mincer function above. Specifically, we compare returns on education in urban and rural areas, and between men and women.

2.5 Human capital and job mismatch

Regarding job mismatch, human capital theory suggests that although there can be a job mismatch in the short term (Green et al., 2006), eventually, a natural equilibrium will be reached. The theory proposes that in the long term, the employer will make the necessary adjustments in order to make full use of the skills available; alternatively, the employee will seek a more appropriate match to achieve his/her production potential and hence maximize earnings (Ramos, 2016).

Kalleberg (2007) advocates that labour markets usually operate inefficiently; thus, the matching of persons to jobs may result in matches that are unsatisfactory from the point of view of workers, employers, or both. In this regard, human capital theory has been criticized for failing to explain rigidities (such as under/over employment) in the labour market (Carnoy, 1994). These inefficiencies may be caused by limited information about the choices available; geography, or the inability to access the job location's, being unable to go to where the jobs are; supply and demand mismatch; and qualifications or skill level mismatch (Kalleberg, 2007). Desjardins and Rubenson (2011) refer to this as search theory and suggest that the mismatch exists due to imperfect information available to employees about the nature of the job, and to employers regarding employees' actual skills (Desjardins and Rubenson, 2011). Another alternative theory to the human

capital model is job competition theory, which focuses on the supply side in the labour market. This theory highlights the institutional rigidities in which marginal products, and consequently earnings, are associated with job characteristics and not with individual characteristics (Thurow, 1975). Jobs are allocated based on the available supplies of workers and jobs; workers may possess more education and skills than their jobs necessitate. In the extreme, education simply serves as a means to obtain the job, and there is a zero return on human capital beyond that required to do the job, as all workers in a given job are paid the same wage. Another alternative model that tries to explain such rigidities in the labour market is Sattinger's (1993) assignment theory, which asserts that there is an allocation problem in assigning heterogeneous workers to jobs that differ in complexity. The frequency distributions on the demand and supply side are unlikely to match, and education mismatches may be a persistent problem if the job structure is relatively unresponsive to changes in the relative supplies of educated labour.

The alternative theories discussed in this section can have important implications for our thesis. Most of these theories confirm the existence of market rigidities as the main explanation for job mismatches in the labour market. Such rigidities are even more prevalent in developing countries, where access to perfect information is not possible. Lack of high quality data, lower technological access, and inconsistent research are only a few possible explanations for such inconsistencies. Job competition theory is also relevant to our area of research, where institutional rigidities in the supply side of the labour market still exist. As mentioned in the previous section, an ILO study blamed existing rigidities in Iranian labour market laws (such as those that protect jobs for older workers but allow employers to offer young workers contracts of less than a year in duration) for job mismatches in this market. Chapter 6 aims to make a contribution to this literature

by investigating the extent, and determinants, of job mismatches in Iran with a specific focus on over- and under-employment.

2.6 Signalling and screening

Signalling theory is an alternative theory of how people make decisions about how much to invest in education (Spence, 1973; Arrow, 1973; Stiglitz, 1975). Whereas human capital theory is based on the idea that education raises a worker's productivity, signalling is based on the idea that employers cannot directly observe a worker's ability and instead use their education as a signal to determine who will be a productive worker. We can assume that the cost of achieving high levels of education is lower for more able or high-productivity individuals, for example, because they will not have to spend as much time studying. For this reason, high productivity workers will be willing to incur the costs of higher education and attain the qualification, which acts as a signal to employers and secures them a higher wage. Although low-productivity workers would also like to earn the higher wage, it is too costly for them to attain the university qualification. In this way, high-level education, such as university education, acts as an effective signal that help firms correctly distinguish between high and low productivity workers.

This theory has important implications for this thesis (especially Chapter 5, in which we examine returns on education), and we should note that this theory might be more relevant to MENA countries, where the low productivity of education has been confirmed in studies about the social rate of return on education, with estimates close to zero (for example, Pritchett, 1999). If this were the case, then our results and estimates would still be valid, although there would be a shift in interpretation: they would not be viewed as effects arising from human capital formation via the school system, but rather as effects arising from innate skill and ability formation that occur

naturally and are independent of the school system. In such a case, educational success simply acts as a signal revealing underlying productivity differentials between groups of individuals. Nevertheless, 'despite the low productivity of education, families and youth still believe in education as the main path to social and economic success and continue to invest heavily in schooling' (Salehi-Isfahani et al., 2009, p.2).

However, we should point out that observing which of these theories is 'true' is very complicated using empirical methods, as both have the same implications. Whilst various innovative ideas have been used to try to determine which theory is more accurate (e.g., see Tyler et al., 2000, which uses difference-in-difference methodology to ascertain the signalling effect of the GED), the evidence is still divided. In fact, it is likely that both explanations play a role; that is, that education increases worker's productivity, and sends a signal about their ability level. There is a plethora of evidence regarding the human capital model and the 'signalling and screening' hypothesis. Support for the human capital model can be found aplenty in Psacharopolous (1985), Psacharopolous and Patrinos (2004), Ashenfelter and Kruger (1994), Card and Kruger (1992), Mitch (1984), Lorenz and Wagner (1993) and Johnes (1998), to mention a few. A number of studies found weak evidence supporting signalling and screening (Brown and Sessions, 2004; Shabbir, 2011).

2.7 Summary

Human capital theory has become a core theory within labour economics and has implications for many important empirical questions. As discussed above, it demonstrates the source of people's motivation to invest in their own and their children's education. The link between investment in education and later returns via higher wages was also explored in human capital theory. This theory postulates that individuals will invest in human capital to the point

where the marginal benefit is equal to the marginal return. This has important implications for an individual's decisions about their investment in their own education, and affects parental decisions regarding investment in their children, and hence the transmission of earnings and wealth through generations. Determinants of investment in human capital have become an important theme in recent empirical literature, and the next chapter will explore this literature in detail.

Chapter 3: Literature Review

3.1 Introduction

The private and social benefits of education are not concealed from anyone. It is widely accepted in the literature that individuals with higher levels of education are more likely to achieve economic success in terms of higher wages and a higher probability of employment (Becker, 1964). On the other hand, education has social benefits such as reduced crime and poverty rates, and social equality. Additionally, more educated individuals usually enjoy healthier life-styles, participate more in democratic and political processes, and care about environmental sustainability (Barro, 2001; Sen 1999).

This thesis explores determinants of parental education expenditure, returns to education, and the determinants of job mismatch in Iran; with a particular focus on urban/rural distinctions and the extent to which the experiences of women [and men] differ between these regions. In this section, we provide a literature review in a wider context to embody these subjects. Nevertheless, each empirical chapter will provide a more specific literature review as well. Accordingly, this chapter discusses the existing literature on the determinants of human capital theory (in developed, developing, and MENA countries), the importance of regional (urban and rural) disparities, and significance of gender inequality in determining educational attainment.

In the first section of this chapter, we present factors such as household and personal characteristics, schooling, and neighbourhood factors that affect educational attainment. Furthermore, we specifically dedicate a separate section to the determinants of educational attainment in developing and MENA countries because these countries differ in their socio-

economic status, school practices, teachers, students, cultures, and political systems from industrialized countries (Badr et al, 2012). At the end of this section, we conclude that according to the existing literature, parental background such as education and wealth are the most important determinants of children's educational attainment. The underlying discussion and literature in this section is closely related to the next chapter of this thesis, where we discuss the determinants of parental educational expenditure in Iran.

The second goal of this literature review is to evaluate the literature on the importance of regional inequality in education, specifically urban versus rural differences. We dedicate a separate section to this important factor because in all upcoming empirical chapters, we examine the impacts of urban and rural differences. For instance, in our first empirical chapter, we examine differences between the educational expenditures of urban and rural parents, while in the second empirical chapter, we focus on the differences in returns on education for individuals in urban and rural areas of Iran; in our final empirical chapter, we examine various determinants of job mismatches in urban and rural areas of Iran. Our goal is to emphasize the importance of regional inequalities in education and that any study of the determinants of education must examine both urban and rural differences to draw a full picture of any given country.

Third, we review the literature on the importance of gender inequality in education. Again, we dedicate a separate section of our literature review to this important factor because one of the main goals of this thesis is to shed light on the gender differences in education in Iran, and in each empirical chapter that follows, we differentiate between men and women. In this section, we examine biological factors, family resources, returns on education, schooling characteristics, and

institutional factors as the main challenges in the existing literature in gender inequality in education.

3.2 Determinants of Educational Attainment

In this section, we examine determinants of educational attainment according to four main categories: parental/household inputs, personal characteristics, schooling, and neighbourhood effects.

3.2.1 The effect of Household Characteristics

The effects of family background on children's educational attainment can be divided into four main categories: income, employment, parents' educational status, and household structure.

The importance of family income for children's educational attainment was first supported by the human capital model (1964). This model argues that in the absence of perfect capital markets, individuals from wealthier households have lower marginal costs for educational attainment. In other words, lower resources imply higher opportunity costs associated with continued education, which in turn leads to early labour market entry and lower educational attainment. Thereafter, many studies (such as Brooks-Gunn et al., 1998; Gregg and Machin, 2000; and Acemoglu and Pishke, 2001) find similar results and argued that family income is one of the most important determinants of children's educational attainment. For instance, Blanden et al. (2004) estimate the relationship between family income and educational attainment to be around one third of the raw correlation in the UK. Later on, Blanden et al. (2007) update their previous study and add that it is not easy to separate the influence of income from other aspects of family background, and argue that if 'unobserved child or family heterogeneity is positively correlated with income, this will generate an upward bias in the relationship between income and child

educational attainment' (Blanden et al., 2007, p19). On the other hand, Cameron and Heckman (2001) dispute the literature on the importance of family income for children's educational attainment and argue that the literature exaggerates the importance of family income. Some economists agree with these arguments and find weak linkages between families' financial constraints and educational attainment (for example, Cameron and Taber, 1999; Altonji and Dunn, 1996).

Linked to parental income is employment status, which can also affect children's educational attainment. The evidence on the effect of parental employment on children's educational attainment in the UK and US is rather mixed, and various researchers have studied the effects of employment from different aspects. For instance, Ermisch et al. (2000) suggest that a mother's full-time employment has a negative impact on children's educational attainment, while Joshi and Verropouloum (2000) find that if the mother works when the child is already a teenager, then there are positive effects due to the extra income and positive role modelling. Overall, most of the analyses suggest mixed and inconsistent results (Kiernan, 1997; Gregg and Machin, 2000; Harvey, 1999).

However, probably the most important determinant of children's educational attainment is their parents' educational status (Haveman and Wolfe, 1995). The literature on the impact of parental education on children's educational attainment is rather clear and consistent, and all of the existing literature confirms a positive relationship between the two. For instance, Haveman et al., (1991) investigate the effect of parents' college graduation on children's educational attainment in the US, and find a significant and positive relationship between both the mothers' and fathers' educational attainments and their children's educational attainments. Chavalier

(2003) also support these results, and argue that maternal education is the most important determinant of children's educational attainment. Breen and Goldthorpe (1997) argue that there is a positive relationship between parental education and their children's educational attainment because parents who reach a certain educational level expect their children to reach at least the same level of education.

Another household characteristic economists examine is family structure. Most of these studies (Hanushek, 1992; Ribar, 1993; Haveman et al., 1991) find that educational attainment decreases with family size. The implication is that as the number of siblings increase within a household, individual average attainment falls as limited 'parenting time' is allocated to more children. Parents' marital status has also been studied as a determinant of children's educational attainment. For example, McLanhan and Sandefur (1994) suggest that children who grow up in a single or step parent family have lower educational attainment compared to those who live with their biological parents. Bilbalarz and Raftery (1999) also find that children living with their biological parents achieve higher outcomes in terms of education and later occupation, even after controlling for mothers' education and occupation. Ribar (1993), Astone and McLanahan (1991), Bogges (1998), and Ginther and Pollack (2004) provide similar results.

3.2.2 The effect of Personal Characteristics

Personal characteristics such as earlier educational attainment and ethnicity can also contribute to an individual's educational attainment.

Previous educational accomplishment is an imperative contributor to educational attainment. Robertson and Symons (2003) show that high test scores at age 7 to 11 are closely associated with high test scores at age 16. However, Currie and Thomas (1999) point out that

interaction between earlier exam performance and parents' socio-economic status may exist, though this causes an endogeneity problem with children from higher socio-economic groups performing less well if they had better prior exam results than children from lower socio-economic groups.

Another important personal characteristic that contributes to educational attainment is ethnicity. According to Bell (1997) immigrants in the UK have 1.1 more years of schooling compared to the indigenous population. Dolton et al., (1999) find similar results: Asian men have higher rates of educational attainment than men of white or other ethnic groups at the GCSE level. For the US, most studies (Manski et al., 1999; Sander and Krautman, 1995; Nguyen and Talor, 2003) find that black Americans are more likely to graduate from high school than whites are, and find the opposite for Hispanics. These findings are interesting because they demonstrate that in contrast to common perception, ethnic minorities obtain above-average educational attainment results (except Afro-Caribbeans). These interesting results are generally not recognized in the literature due to the high socio-economic disparities that exist between white and other ethnic groups. In other words, the issue of ethnic minorities performing worse than their white counterparts is not a race issue but one of ethnic groups coming from poorer family backgrounds with fewer resources at their disposal (Buscha, 2007).

3.2.3 The effect of Schooling

School quality is one avenue that has attracted a lot of attention from researchers (for example, Behrman and Birdsall, 1983). Researchers use variables such as expenditure per pupil, class size, or institutional differences between private and public schools as a proxy for quality of schooling (Buscha, 2007). Feinstein and Symons (1999) find that grammar schools do notably better

compared to comprehensive schools. Dustman (2004) finds similar results, and points out that private schools do better than grammar schools in achieving high educational attainment rates. Dearden et al., (1997) and Dolton et al., (1997) report similar findings. A critical observation of these studies conducted in the UK is that few adequately address the issue of endogeneity of school choice (Buscha, 2007), hence there is need to investigate whether 'pupils attending selective schools would perform on a similar level had they chosen to attend comprehensive schools' (Buscha, 2007, p.57).

Empirical analysis of the impact of class size on educational attainment is rather mixed. Experimental evidence of the STAR class-size experiment advocates that 'the internal rate of return from reducing class size from 22 to 15 students is around 6%'(Kruger, 2003,p.34). However, Hanushek and Kimko (2000) suggest that the effect of class size depends on the age and ability level of the class. Feinstein and Symons (1999) find a negative impact of class size on attainment, but their regression results are not significant in any of their models. On the other hand, Akerhielm (1995) finds small and positive effects of the pupil-teacher ratio. Studies of the impact of class size on educational attainment for the UK are more uniform and consistent. Most studies (Iacovou, 2002; Bradley et al., 2000) suggest that students in smaller classes outperform larger. In contrast, the literature on the effects of school size in the UK, suggests that larger schools can do better than smaller schools. According to these studies, smaller schools cannot compete on a cost effective scale with large schools that can raise more funds. These studies suggest that the deficiency of small schools could be explained by their financial challenges and tight budget rather than poor administrative running or teaching.

3.2.4 The effect of neighbourhood

The earliest literature regarding the effects of neighbourhood on schooling was conducted by Wilson in 1987, and he proposed that the concentration of poverty in particular regions in the US has adverse effects on the educational development of these residents. Garner and Raudenbusch (1991) in Scotland find that a change from being in the 90th percentile of neighbourhood deprivation to a 10th percentile will result in higher attainment outcomes of about two O-level passes. For Australia, Jensen and Seltzer (2000) examined adverse effects of neighbourhood characteristics (such as the average income, the rate of unemployment, and the average educational attainment) on children's schooling dropouts. Finally, Gibbons (2002) suggests that children raised in the same neighbourhood attain similar educational achievement, however, he argues that the effect of neighbourhood on educational attainment should not be exaggerated, as the estimates are much smaller than family background variables.

3.3 Determinants of educational attainment in developing countries

It is important to recognize that less-developed countries have very different socio-economic conditions compared to more industrialised societies. As Buchmann et al. (2001) stress, 'these differences may include class structures that are less differentiated, educational systems that vary in the extent to which they have been institutionalized, and occupational structures that are shaped by low levels of economic development and a weak position in the world system' (Buchman et al., 2001, p.78). They then suggest that research on developing countries is important as it can provide opportunities 'for testing, refining, and extending theoretical perspectives that have emerged from research on industrialized countries' (Buchman et al., 2001, p.80). We agree

with their argument, and hence provide a separate section of this chapter to review the literature on the determinants of educational attainment in developing countries.

Heyneman and Jamison (1980) conducted one of the first studies on education in developing countries, in Uganda, and argue that family background is less important than school factors in determining academic achievement. Heyneman and Loxley (1983) re-examine Heyneman and Jamison's (1980) findings for other developing countries and report similar results. They also point out that their research suggests that the effect of schooling and teacher quality become much larger for poorer countries (Heyneman and Loxley, 1983). More than a decade later, Baker et al. (1999) conduct the same OLS model as Heyneman and Loxley (1983), but also use hierarchical linear modelling procedures to observe whether large school effects still exist. Their research contradicts previous work by Heyneman and Loxley (1983) and suggests that family factors are more important predictors of educational achievement than school factors. However, they acknowledge that in very poor developing countries, the school effect is still very large. In the years following, many studies aimed to assess determinants of educational achievement in a wide range of developing countries. Some reports marked disparities in enrolment and attainment associated with socioeconomic status (Sathar and Lloyd, 1993 for Pakistan; Stash and Hannum, 2001 for Nepal; Hannum, 2000 for rural China; Patrinos and Psacharopoulos, 1996 for Bolivia and Guatemala), while others find that family income is the predominant determinant of schooling for children. For instance, Bacolod and Ranjan (2008) analyse the impact of poverty on educational attainment of children in the Philippines and ascertain that household wealth is the most important factor in determining whether a child goes to school or not. They then advocate that 'while other factors—including mother's labour supply, the presence of a family business, and access to good school

quality—contribute to these decisions, household wealth is the most important determinants of child human capital attainment' (Bacolod and Ranjan, 2008, p. 10). Suryadarma et al. (2010) investigate the causes of low secondary school enrolment in Indonesia using a longitudinal household survey dataset and find similar results. Drajea et al. (2014) find a significant relationship between parents' income and the quality of support for their children's education in rural Uganda. They employ a mixed-methods study with an ethnographic element, and argue that their findings confirm Feinstein et al.'s (2008) assertion that 'the effect of income on children's achievement can be an effect of prior parental education, which this study has shown has a mediated positive effect on children's educational outcome overall' (Drajea, 2014, p. 32). However, their qualitative approach included only 21 participants, so their findings cannot be generalized to every household in rural Uganda. For India, Jayachandran (2002) investigates the socio-economic determinants of school attendance by exploring boys and girls separately. He finds a positive and significant relationship between poverty and child school dropouts. Possibly the most comprehensive study on school attainment in developing countries was conducted by Filmer and Pritchett (1999), which includes 35 countries in Africa, the Middle East, South Asia, and East Asia. This study reveals substantial cross-country variation in the differences between median years of school obtained by students in the top 20% of the wealth distribution compared to those in the bottom 40%. Their results suggest that all countries in the study (except Kazakhstan) show a difference between rich and poor children's attainment; the largest wealth gaps emerged in South Asian countries (Buchmann, and Hannum, 2001).

Studies of the impact of parental education on children's educational attainment in developing countries have the same opinion on the importance of this factor. For instance,

Behrman and Wolfe (1987) on Nicaragua, King and Bellew (1989) on Peru, and Birdial (1985) on Brazil, suggest a strong relationship between parental education and children's schooling. Bahreman and Wolfe's (1987) study also reveals that the maximum effect happens at the 8th or 9th year of education for parents, with diminishing returns on parent's education thereafter. However, while Bahreman and Wolfe (1987) find that maternal education matters more than paternal education, King and Bellew (1989) propose the opposite argument for Peru. King and Bellew (1989) find that the effect of father's education for sons is twice that of maternal education, while for daughters, both parents' education has the same impact.

On the other hand, there are mixed results for the effect of family size on children's educational attainment in developing countries. For sub-Saharan Africa, Lloyd (1994) hypothesizes that the effect of family size differs between urban and rural areas; urban areas are more likely to show a negative relationship, while rural areas will show a positive one. Some studies investigate the influence of particular family structures on children's schooling. For instance, Lloyd and Gage-Brandon (1994) examine the impact of younger and older siblings on girls' schooling compared to boys' schooling for Ghana. They find that girls' dropout rates were higher and educational attainment lower when they had younger siblings compared to boys who had younger siblings. Their findings suggest that older children's household responsibilities, especially for girls in caring for younger children, may adversely affect their educational achievement. Fuller and Liang, (1999) analyse the effects of female headship on children's schooling in seven sub-Saharan African countries using Demographic and Health data, and find that although female-headed households are poorer than other households, their children are more likely to be enrolled in school. They explain this by suggesting that 'female household heads are more likely to invest resources,

including time, money and emotional support, in facilitating the education of children living in their household' (Fuller and Liang, 1999).

Buchmann, and Hannum (2001) review the literature on the impact of school factors on educational attainment in developing countries, and suggest that some of these studies (Heyneman and Jamison, 1980; Heyneman and Loxley, 1983; Lockheed et al., 1986; Behrman and Birdsall, 1983) find that 'basic material inputs such as textbooks, libraries, and teacher training strongly determine achievement while more expensive inputs such as science laboratories, increased teachers' salaries, and reduced class sizes appear to have little effect'(Buchmann, and Hannum, 2001, p.86). They then conclude that, it seems that there is a concurrence among these studies that in countries with unequally distributed educational resources, basic material inputs are most important, while in countries with a minimum level of basic resources, the importance is less evident. However, there are some criticisms of the methodological approaches in school effect studies. As Buchman (2001) points out, 'Indeed, one shortcoming of most studies of the impact of school effects versus family effects was their reliance on OLS regression analysis and the total variance in achievement (R2) to measure the impact of family and school effects on student achievement' (Buchman, 2001, p. 88). In contrast to previous studies employing the production function approach, few studies (for example, Riddell, 1989 for Zimbabwe; Lockheed and Longford, 1991 for Thailand) use multi-level models to examine school effects in developing countries. Interestingly, with this approach, they find greater effects of family background than school factors on educational achievement. In their analysis, Lockheed and Longford (1991) find that in Thailand, family's socio-economic status explains 68% of students' success in math scores, while school effects explain only 32%. Finally, when observing the impact of schooling factors on educational

attainment, it is important to evaluate 'how schools impact achievement in developing countries (Buchmann, and Hannum, 2001, p.88). For instance, Lockheed and Komenan (1989) examine the effects of quality of teaching, while Fuller and Snyder (1991) examine class room dynamics such as classroom management and hours of instruction. Interestingly, all few mentioned studies above find out that these factors have significant impact on educational attainment. However, lack of high quality data regarding schooling has made it difficult for scholars to provide high quality school-based data (Buchmann, and Hannum, 2001).

3.4 Regional inequality in education: urban versus rural

Regional effects are the social interaction that influences individuals' behaviour and educational outcomes (Buscha, 2007). In this section, we investigate the different impacts that living in urban and rural areas has on children's educational attainment. These impacts are specifically interesting for us because this thesis highlights the urban and rural differences in all upcoming empirical chapters.

As we discussed in Section 2.2 of this chapter, many studies (such as Brooks-Gunn et al., 1998; Gregg and Machin, 2000; and Acemoglu and Pishke, 2001) analyse determinants of educational outcomes. However, studies that consider the relevance of geography in children's educational attainment are less common. Empirical analysis on the differences in educational outcomes between students in rural and urban areas started in the US during the 1980s; however, these studies do not arrive at a consistent conclusion. For instance, Edington and Martellaro (1984) find no significant differences in the outcomes of students in urban and rural schools in the US state of New Mexico, while Kleinfeld et al. (1985) and Blackwell and McLaughlin (1999), find that for the whole of the US, the rural-urban location variable is significant in explaining students'

performance. However, one should note that such variations might differ by level of development of each specific country. For instance in developed countries, inner-city areas might be less well off. Furthermore, as Ramos (2012) implies 'the differences in the performance of students in rural and urban schools are not due to the location per se, but rather to the fact that the characteristics of the students, their families and the schools differ in these two groups' (Ramos, 2012, p.4). This is because students in rural areas usually belong to households with less financial resources, their parents' levels of education is lower compared to their urban counterparts, and the schools they attend are usually poorly endowed in terms of facilities. Researchers such as Hannaway and Talbert (1993) and Young (1998) confirm this argument and claim that these differences in the characteristics of urban and rural areas account for most of the differences in students' performance, and not the location variable itself. Hence, the gap in students' educational attainment in urban and rural areas can be explained by many factors. For instance, according to Human Rights and Equal Opportunity Commission (2000), in Australia, the main factors that explain why rural children remained disadvantaged in terms of educational attainment are costs and availability of transport and levels of family income support (HREOC, 2000). In a comparative study of urban and rural schools in China, Hao et al. (2015) suggest that the quality of the education that rural students receive is the main negative factor that has adverse effects on children in rural areas. They explain that rural children face limited choices in course subjects, and hence many have limited options to pursue their field of interest; and even if they find their field of study, educational facilities in rural areas are far behind those in urban areas. A comprehensive study of OECD countries in 2015 that focuses on different facilities offered in urban and rural areas suggests 'overall in most OECD countries urban schools are usually larger, have a more socio-economically

advantaged student body, enjoy greater responsibility for resource allocation, are less likely to experience staff shortages, are more likely to have a higher proportion of qualified teachers, and have higher student-teacher ratios than schools in rural areas and towns' (OECD, 2013, p. 24). Another factor that explains the educational gap in urban and rural areas is the difference in household structures between these two areas (McLaughlin et al., 1999). Usually, rural families are more likely to have two parents, which can have a positive impact on children's educational attainment, according to existing literature that suggests that children belonging to single-parent families perform worse in terms of educational attainment (Downey, 1995).

Overall, we can observe that all the important factors mentioned in Section 2.2 as main contributors to children's educational attainment can be directly or indirectly affected by urban/rural differences. These regional differences can affect households' socio-economic characteristics such as income and educational status. These can affect the level of school quality and neighbourhood characteristics of households. Hence, any comprehensive study of development in education should provide an insight into the differences in urban and rural areas.

3.5 Gender Inequality in Education

Many aspects can explain the existing gender gap in educational attainment, such as biological factors, family resources, returns to education, school-related factors, and institutional factors. Below, we examine these factors.

An area within gender inequality that researchers study is how boys and girls perform differently in different subjects of test scores (for example, Baker and Jones, 1999; Willingham and Cole, 1997; Gallagher and Kaufman, 2005). However, despite the large literature in this area, disagreements remain on several fronts. For instance, while most of the results indicate that boys

have higher test scores in mathematics and girls have higher test scores in reading (Nowell and Hedges, 1998; Buchmann et al., 2008, Marks, 2007), there is considerable variation in the size of these gaps. However, all of these studies consistently agree that there is a life course component to gender differences in test scores; generally, girls and boys have similar performance in mathematics and reading in the early years of schooling, though as they get older, boys obtain more advantage in maths scores, while girls obtain a higher advantage in reading scores (Maccoby and Jacklin, 1974; Buchmann et al., 2008). There is also evidence that suggests gender gaps in test scores are more pronounced among low-income children (Hinshaw, 1992;Buchmann et al., 2008). For example, Buchmann et al. (2008) suggest that 'although girls and boys start first grade with similar reading scores, a female-favourable gap in reading emerges by fifth grade, but only for children from economically disadvantaged families, while boys and girls from middle- and upper-class families have very similar reading scores'(Buchmann et al.,2008, p.322). Jacobs et al. (2005) suggests that parents provide more 'math-supportive environment' for their sons, by providing more math and science toys for them during their early childhood. Steele (1997) points to an interesting line of research into how traditional gender stereotypes and norms might influence students' perceptions of their own abilities. Steele (1997) argues that due to conventional notions that men outperform women in mathematics, women experience a heightened anxiety during test taking that interferes with their test performance.

Another area within the literature on gender differences is whether or not parents' decision to spend time and money on children differs by their child's gender. Household educational expenditure on children is the topic of our first empirical chapter (Chapter 4), where we provide a comprehensive literature review; hence, we do not discuss it here. On the other hand, regarding

parental time with children, Stevenson and Baker (1987) find some evidence of gender bias, noting that at early stages, parents are more involved in their sons' school activities and in home activities with their daughters; however, as children grow older, parent's time involvement with boys declines, while it remains constant with girls. On the one hand, Muller (1998) contradicts Stevenson and Baker's findings (1987) that parental involvement in children's schooling is gender specific. However, 'the empirical basis for these claims is questionable for the simple reason that parenting styles and parental expectations may be responsive to the personalities and behaviour of their children, and thus may be consequences as well as causes of gender differences'(Buchman e al., 2008,p.315).

Studies of gender gaps in educational performance also examine teachers and the school and classroom environments for possible explanations. There is an ongoing debate regarding whether teachers favour one gender over the other. Research based on classroom observations in the early 1990s talked about 'how schools short-change girls', with teachers calling on and praising boys more often than girls (Sadker and Sadker, 1994). Meanwhile, more recent studies argue that the opposite is true and that schools favour girls and contribute to a 'war against boys' (Sommers, 2000). The empirical evidence on whether and how teachers' gender plays a role in gender differences in educational outcomes is inconclusive. Some studies find that males perform no better when taught by male teachers than by female teachers (Sokal et al., 2007). In contrast, others (Dee, 2005) find that having a female teacher instead of a male teacher in specific subjects raises girls' achievement and lowers boys' achievement.

Institutional-level factors also shape gendered patterns of educational attainment. These include socio-cultural changes in gender roles and expectations about life course trajectories for

both women and men. Some studies (Averett and Burton, 1996; Perna, 2003) suggest that the rising educational inequality in favour of women is the result of higher returns on education for educated women than for men. Continuing this argument, DiPrete and Buchmann (2006) argue that in studying returns on education for women, if we move beyond changes in wages and consider changes in the probability of getting married, the family standard of living, and insurance against poverty, then returns on education for women are even higher than the common estimates. Hence, due to women's expectation of high returns on education, which is higher than that for men, they continue their studies further on. We examine returns on education in Chapter 5 of this thesis and will provide a comprehensive literature review then. Finally, shifts in the structure of the labour market such as declining discrimination against women can also impact individual incentives to acquire education (Spencer et al., 1999).

3.6 Determinants of educational attainment in MENA countries

The existing literature on the determinants of educational attainment in the MENA region is limited and quite scarce. Badr (2012) points out that this scarcity is mainly due to the lack of micro-level data. The only available data to use for research on children's educational attainment in this region is the TIMSS, which offers comprehensive data on international student achievement test scores. In the TIMSS, studies tested samples of eighth graders in math and science, and the data includes information about these test scores, as well as family background, school resources, and teacher characteristics (Glewwe, 2002).

Employing TIMSS data, Badr (2012) explores determinants of educational attainment in the eight MENA countries of Algeria, Egypt, Jordan, Iran, Saudi Arabia, Syria, Turkey, and Tunisia. He employs three methodologies: first he estimates an educational production function for each

country to examine the effect of school resources and households' socioeconomic background on test score achievements in math and science. Second, he employs a meta-analysis approach to compare the test results in these countries and to identify whether any factors are significant across the countries. Finally, he employs quantile regressions to examine if the influence of factors on children's educational attainment varies by level of attainment. He finds that in all these countries, parental socioeconomic characteristics are strongly related to their children's educational attainment. However, in Algeria, Saudi Arabia, and Egypt, the relationship between student's math performance and parents' level of education is weaker compared to Turkey, Jordan, and Iran. Their research also suggests that school characteristics such as class size and teacher characteristics are statistically and positively related to students' performances only for Iran and Turkey. However, according to this study, even in these two countries, the schooling effect is much smaller than parental effects. Other studies also stress the importance of parental background in MENA countries. Tansel (2002a) for Turkey and Al-Qudsi (2003) for Kuwait, Jordan, Gaza, and Yemen, for instance, agree with Badr (2012) in that parental education and income are the most important determinants of education for children in these countries. Namora and Roushdy (2007) also provide evidence on the importance of parents' educational level for enrolment and drop out in Egypt's primary education. However, all of these studies use the same data (TIMSS), because as previously mentioned, for most countries in the region, this is the only comprehensive data available to compare the determinants of educational attainment.

Using another data source (the 1994 Household Budget Survey), Tansel (1998) examines gender inequality in educational attainment in Turkey, and finds that parental education and income has the highest impact on children's educational attainment, and that the effect of parents'

income and education is larger for girls than for boys. He explains that the stronger impact of parental education on girls' schooling suggests less social mobility for girls than for boys. He then points out that children in urban areas of Turkey have much higher educational attainment than those in rural areas do. Ahlburg et al. (2004) also raise the issue of gender and urban/rural differences in educational attainment in the context of Egypt's education system. The author's note that the enrolment rate of rural girls aged 6-14 was only 72% of that of rural boys. Updating Ahlburg et al.'s (2004) research in Egypt, Namora and Roushdy (2008) and Rammohan and Dancer (2008) show that boys are more likely to receive more education than girls are, while Hanushek et al. (2008) note that girls' dropout rate is 0.06 higher than that of boys in elementary schools. Al-Samarrai and Peasgood (1998) also stress the importance of gender differences in educational attainment and find that household characteristics such as parental education may have a totally different impact on the education of females and males in Tanzania.

Smits (2007) analyses the effects of socio-economic, cultural, demographic, and geographic background characteristics on educational attainment for five Arab countries, namely, Morocco, Algeria, Tunisia, Egypt, and Syria using a multilevel logistic regression. He suggests that in all of these countries, rural areas are lagging behind urban areas in terms of educational attainment, especially with regard to girls' participation in education. They argue that the higher educational attainment of rural boys compared to that of rural girls indicates that infrastructural restrictions are only part of the problem in MENA countries, and that families' preferences for boys' education over girls' education also plays a role. Sanchez (2009) also investigates the differences in educational achievements between urban and rural areas in Yemen, and reveals that improving the public infrastructure network to reduce the time needed to travel to school would remarkably

raise the probability of entry and attendance in basic education by, respectively, 33% and 22%, and by around 10% for entry and attendance in high school. The author points out that this probability can be even higher for females, as parents would be more willing to send their daughters to school if improved public infrastructure shortens the distance and the time to travel to school considerably. The study concludes that spending on public infrastructure would be more cost-effective than spending to build more schools and hire more teachers for basic education. Chaaban (2012) studies the effect of having books and computers at students' homes in Tunisia, Turkey, and Iran, and argues that this could be a good proxy to estimate household characteristics because they are related to both parental education and other unobserved abilities such as motivation and capability to help children at home with their studies. Chaaban (2012) asked students to report the number of books at home and find that in all countries, the effects of having books is high, at 33 and 27 points, respectively. Interestingly they find that having computers at home improves students' performances in Iran, while in Turkey and Tunisia, it worsens their performance in maths and science scores.

Assad et al. (2014) employ the Household Income, Expenditure, and Consumption Surveys (HIECS) from eight MENA counties, Syria, Tunisia, Yemen, Iraq, Egypt, Palestine, Iran, and Jordan. They analyse both the probability of entry and of reaching secondary school using a censored ordered probit model, and find that in all countries, parental background has the highest impact in later stages of study. They suggest that households' income more strongly affects the likelihood of reaching secondary education than the probability of ever entering school. However, they explain that these results are not surprising because basic education is complimentary in these countries. They then conclude that although 'countries of MENA have made notable progress in raising the

education level of their citizens. However, this progress has been limited to the average years of schooling and little has been achieved in terms of education quality or equality of educational opportunities' (Assad et al., 2014, p. 2).

Overall, it seems that there is limited research conducted on the determinants of educational attainment in MENA countries, and this is due to the scarcity of data available on this subject. The main comprehensive dataset is the TIMMS, which many scholars use for this subject. The literature mentioned above suggests that most scholars agree on the importance of parental education and income for children's educational attainment (Tansel, 2002; Al-Qudsi, 2003; Badr, 2012; Namora and Roushdy, 2007). The existing literature also suggests that gender differences in educational attainment are persistent in MENA countries (Ahlburg, 2004; Namora and Roushdy, 2007; Rammohan and Dancer, 2008; Handshake, 2008; Al-Samarrai and Peasgood, 1998). It is also widely accepted that rural areas are lagging behind urban areas in educational attainment (Smitts, 2007; Sanchez, 2005). In terms of the effects of school qualities, it is evident from the existing literature that while its importance should not be neglected, its effect is not as large as the effect of parental income and education (Chaaban, 2012; Badr, 2012).

3.7 Summary

In this chapter, we first presented a review of the literature on the determinants of educational attainment. We discussed the effects of household and personal characteristics, schooling, and neighbourhood effects. This section suggests that most studies consistently agree that household income and parental education are the most important factors shaping children's educational attainment.

Second, we provided a literature review on the determinants of educational attainment in developing countries, and later on MENA countries. The rationale for dedicating a separate section to developing and MENA countries is that the study context for this thesis, Iran, is a developing country within the MENA region, and we believe that the characteristics of these countries such as their class structures, educational systems, institutions, and occupational structures differ from those in developed countries. A review of the literature in this section suggests that earlier studies of the determinants of education status in developing countries imply that schooling factors are more important than household factors, which is in contrast to the existing research in developed countries. However, more recent studies stress the importance of household factors such as household income and education. The review of the existing literature for MENA countries is specifically constructive for our upcoming empirical chapters, as it informs us what type of variable choices might be more relevant in our analysis. Needless to say, we do not have all of the suggested variables (especially those related to schooling) available; however, we will try to operationalize the available data in our empirical setups. The overall review of the literature for developing countries suggests that, in most of these countries, if they lack basic educational facilities, then the effect of schooling is bigger than that of household characteristics; however as these countries obtain certain standards for educational facilities, then the effect of household characteristics become more predominant. Furthermore, we found that for MENA countries, most studies concede that while schooling factors are also important, family income is the most important factor in children's educational status. Following this, as we stated in chapter one of this thesis, it appears that Iran has a well-developed education system compatible with minimum standards worldwide. This suggest that household factors are more important in Iran, and this will be the path of our

investigation, where in the following sections, we examine the effects of household characteristics on various factors that determine educational attainment (such as household investment in children's educational expenditure and returns on education).

Finally, we also provided a brief literature review on the importance of regional (specifically, urban and rural) and gender inequality in education. Our review of the literature on urban and rural disparities suggests that regional disparities shape all household socio-economic characteristics as well as the schooling status that students face. We suspect that such regional inequalities are higher in a country like Iran, where, like most developing countries, the government's limited resources compel a focus on urban areas. Our review of literature on gender inequality also suggests that many factors can affect higher educational achievements for men, and some of these factors, such as parents' decision to spend money on children and returns on education are the subjects of the next chapters of this thesis.

Chapter 4. Determinants of Household Educational Expenditure

4.1 Introduction

This chapter examines the determinants of household expenditure on education in Iran and focuses on a comparative analysis between urban and rural areas, with a particular focus on differential gender impacts between these two geographies. There are several reasons why such a study is important. First, urban and rural divides are particularly significant in developing countries, where wide differences in economic development, resource distribution, and opportunity still exist(Rodriguez-Pose, et al., 2005), and this implies that there might be large variations between Iranian urban and rural households' educational expenditure, which we investigate in this chapter. Second (as will be discussed in the literature review section), there is evidence that in some developing countries child's gender might affect the household's decision regarding educational expenditure (Huy, 2012; Tansel, 2002a). This problem might be more prevalent in countries of the MENA region, where religious ideology is the priority for these countries' policy makers. Third, a study of household educational expenditure in Iran is important and has both policy and research implications because the government's role as the main spender on education has decreased sharply over the past 30 years, and the ministry of education has announced that it is planning to increase students' enrolment rates in private schools from 8.5% to 20% in 8 years (Kurd, 2014). Fourth, the continued decline in public expenditure resulted in poor quality public schools, which have been criticised by many scholars (such as Assad, 2013, 2014; Babaie, 2011), which meant that the role of household-level decision-making on education spending is more important than ever, and understanding educational investment in terms of private resources is now as important as

public expenditure for researchers and policy makers. Finally (as mentioned in the first chapter), in all three Iranian development plans since 2000, improving gender equality in education and eliminating regional disparities for education are the main objectives of the government. Hence research on determinants of private expenditure on education is important for policymakers, to understand Iranian household's characteristics in terms of educational expenditure, especially potential differences that urban and rural households have.

This chapter intends to make three contributions. First, to our knowledge, only one study of household expenditure on education in Iran currently exists, which is in Farsi language, and this study only focuses on the proportion of educational expenditure in rural and urban households' budget. Other Iranian studies on parental investments in children focus primarily on expenditures such as food, clothing, transportation, and health care (for example Fazaeli et al.,2016; Ghiasvand et al., 2015), and the few studies that do look at educational expenditure typically combined these costs with other goods and services (Zare et al., 2014, Azadeh et al., 2016). Second, we only focus on private expenditure on education, while most of the existing literature on education in Iran focuses on public expenditure on education (Ahmadi et al., 2010; Akbarian, 2010). This is probably because education is free in Iran, and the Iranian government is the main contributor to the education system. However, households often make additional expenditures on educational goods, like tuition for private schools or extra books and supplies, and these investments are likely to affect educational outcomes and have implications for policymaking (Tabar et al., 2017). Third, existing studies used data from surveys restricted to a small number of villages in a province (Emadzadeh, 2000; Behkish, 2003). However, this study will use the HEIS to cover a sample of the

whole population, which allows for a more detailed overview of the effects of socio-economic and geographic differences on household educational expenditure.

This section of our thesis intends to answer these three interrelated objectives. We first investigate the extent to which various factors such as parental background, parental education, marital status, and so on are related to household decisions to spend or not spend money on their children's education. Second, we will examine the extent to which the same factors are related to variations in educational expenditures greater than zero. Our final objective is to investigate variations in the 'proportion' of educational expenditure.

The rest of the chapter is organised as follows. Section two critically reviews the literature on the determinants of educational expenditure; Section three discusses the data; Section four explains the econometric methodology; the results are presented in Section five, followed by a conclusion in Section six.

4.2 Literature Review

4.2.1 Cost of education

Household costs of education can be divided into two categories: direct and indirect costs. Direct costs include payments made to a school (such as tuition and examination fees), as well as expenditures on textbooks, stationery, uniforms, transport, private tuition, and so on (Shafiq, 2007). In contrast, indirect costs refer to opportunity costs, in this case, foregone earnings. This chapter comprises only the direct costs incurred by households educating their children.

On the other hand, investment in education occurs in two realms: the individual and the institutional (Tilak, 2002). The former is contributions by students and/or their parents, also referred to as household or family investment in education, while the latter investment is known

as public, or government, investment in education. Researchers have examined the relationship between them, however as Tilak (2002) rightly points out 'while public investment can provide educational facilities, only household investment can enable their utilisation. The two are inter-dependent, so in the absence of either, there is likely to be an under allocation of resources to education' (Tilak, 2002. p.2). However, Penrose (1998) argues that household investments can be a substitute for public investments in education. For example, if publicly funded schools are perceived to be inadequate, then even the poorest households might be compelled to spend money on private education. In this case, the poorer the quality of public schools—ceteris paribus—the higher the level of household expenditure to fill the gap. Wisniewski (2013) agrees with Simmons' (2013) argument and suggests that high household expenditure cannot always be considered a positive indicator, as it might denote low quality public provision (Wisniewski, 2013). Tilak (2002), on the other hand, points to the positive impacts government investment can have on household expenditure on education and argues that when a government spends more on providing high quality education, households are likely to feel enthusiastic and more willing to contribute to their children's education, thus supplementing public efforts.

Summing up, household and government investments in education are closely related, either substituting for or complementing each other. This chapter, however, is concerned with understanding household investment in education, and will not examine levels of government expenditure.

4.2.2 Share of household education expenditure

The main categories of household expenditure are usually divided into six groups, which include housing, food, transportation, clothing, health care, and education, with housing

expenditure usually the largest budgetary share in a household's total expenditure. The share of education expenditure in each household varies depending on many factors, and various studies (such as Mauldin, 2001, and Lino, 1995) try to estimate the cost of education. For example,Mauldin (2001) finds that education costs for a child were 13% of the total expenditure for raising a child and 14% when including college expenditures. Lino (1995) suggests that the share of each category varies according to a household's income. He then estimates that among middle and higher income groups, the largest budgetary expenditure was housing and the smallest was health, while the smallest budgetary expenditure was childcare and education among households within the lower income groups.

Overall, most studies estimate educational expenditure at between 6% and 14% of a household's total budget. However, the share can change according to households' socio-economic characteristics. In the next section, we examine the existing literature on the determinants of households' educational expenditure.

4.2.3 Determinants of household expenditure

According to Kornich et al. (2012), there are three ways to understand parental expenditure on children. The first is the extent of parental investment, which indicates the amount of spending. The second is to consider the composition of spending, which determines what households buy with the money they spend on their children. The final way is to understand the relationships between spending and household characteristics, or the 'determinants' of spending. They propose that 'shifts linked to household characteristics tell us how parents respond to changing social demands on the family and whether this differs for different segments of the population' (Kornrich

et al., 2012, p.34). This section surveys the literature related to the latter factor, namely, on the 'determinants' of household educational spending on children.

4.2.3.1 Household characteristics

Various studies suggest that household characteristics are crucial components of households' expenditures on education (Knight and Shi, 1996; Qian and Smyth, 2011; Choudhury, 2011; Lakshamanasamy, 2006; Tilak, 2002). The most relevant characteristics are the parental education level and income, employment status, age, race, and family size. In this section, we examine each of these factors.

Various studies examine the impact of parents' human capital on their educational spending on their children, and while most of these studies (such as Choudhury, 2011; Kutty, 2008; Shipler, 2004; Laureau, 2003) find that parental education is an important determinant, some also question the importance of parental education, and believe that there are other more important factors. For example, Sulaiman et al. (2012) find that for Indonesia, parent's education is not a significant determinant of their educational expenditure on children. They then explain this by claiming that households with lower education levels are more concerned with their children's education because they suffered discrimination against them due to their own low human capital, which leads them to spend more on their children's education. However, we should note that this research was conducted in Indonesia, which is a developing country, while most theories that stress on the importance of human capital stem from research in developed countries. On the other hand, many researchers, such as Choudhury (2011), stress that parental education is the single most important determinant of household expenditure on children's education. Choudhury (2011)

explains that this is because households who are better educated are aware of the importance of investing in education and have a greater appreciation for children's education. Kutty (2008) also emphasises that parents with higher levels of education have seen the benefits of higher education in terms of higher wages and better occupational opportunities and hence are more likely to invest in their children's education (Kutty, 2008). Overall, most studies of the determinants of household educational expenditure agree on the important effect of parental education on educational expenditures for their children (for example Shipler, 2004; Laureau, 2003). Interestingly, some studies (Kohli and Ḱunemund, 2003) emphasise the intergenerational impact of education, and how parents' experience of educational expenditure by their family shapes their future expenditure on educating their children.As Steelmann and Powell (1991) accurately point out, 'parents' attitude to the education of their children depends on the parents' own human capital, which in turn was shaped by the grandparents' attitude to the education of the parents, etc.'. Steelmann and Powell (1991) then claim that parents whose college education was financed by their parents are also more likely to spend on their children education. As they conclude 'investments in human capital do not only affect the immediate recipient, that is, the next generation, but also future generations'(Steelmann and Powell, 1991, p.15). Finally, it is important to note that although most research on the effect of parental human capital on educational expenditure agree about the importance of parents' education, there is disagreement regarding whether it's the mother's, father's, or both parents' education that matters. For instance, Al-Samarra and Peasgood (1992) analyse household survey data in rural Tanzania using a logit model, and reveal that the father's education has a greater influence on households' education expenditure on boys, whereas the mother's education has a greater influence on households'

educational expenditure for girls. They explain these findings by implying that more educated mothers usually have more household decision-making power and have a relatively stronger preference for their daughter's education. On the other hand, Qian and Smyth (2011) analyse 32 cities in China and find that while maternal education is an important determinant of household educational expenditure, paternal human capital does not have any significant effect on household educational spending.

Researchers also find that family income is an important factor in determining how much parents spend to educate their children (Kane, 1994; Rouse, 1994; DesJardin et al.; 1999; Ellwood and Kane, 2000). However, although all these studies agree that family income is important, it is central to note that the definition of income varies across studies. For instance, Ellwood and Kane (2000) measure income in quartiles, Des Jardin et al. (1999) use dummy variables to control for income, while others use continuous measures of income.

Parents' employment status may also be related to expenditures on a child's education. Mauldin (2001) suggests that even 'after controlling for income, employment status may influence parents' perception of the relationship between human capital investments and returns on thoseinvestments' (Mauldin, 2001, p.222). Qian and Smyth (2011) analyse data from China and suggest that the father's professional occupations rather than those of the mother has an important impact on educational spending. Criticizing existing studies, Ermich (2000) claims that it is difficult to estimate the effect of parental occupation on educational expenditure on children because 'parents choose their occupation in conjunction with choices about the way they spend their time and money on children'. This emphasises the need to account for other factors that affect decisions regarding educational spending; however, he argues, 'no matter how many

parental variables are measured, they are still likely to omit some important aspects of family background that exert an influence'. For this reason, such estimates based on comparisons of young adults from different families are unlikely to identify the 'effect' of parents' employment patterns (Ermich, 2000, p.146).

Models of household expenditure also include family size measured by the number of siblings as an explanatory variable. According to Bradley and Nguyen (2003) ‘there is a trade-off between child quality and quantity, and families are solving a constrained maximisation problem. The trade-off exists since parents’ resources and time are limited and must be spread more thinly among more children’ (Bradley and Nguyen, 2003, p.15). This implies that the larger the number of siblings in the family, the less time and financial resources available for each; hence, household educational expenditure per child also declines. However, it is important to note that number of siblings that the child has can be endogenous and it is thus important to test for such a problem. This variable may be endogenous because ‘parents make fertility and labour market decisions jointly and because they may decide to have fewer children if they wish to educate them more’ (Kambhampati, 2008, p.5).

Some researchers (for example, Lino, 1995; Sulaiman et al., 2012) study the impact of parents’ age on their decision to spend to educate their children, and there is usually agreement that educational expenditure increases with parents’ age, but at a decreasing rate. This means that children with younger parents have a smaller probability of education spending. Mussa (2013) suggests that age echoes experience, and it is commonly accepted that older parents have a better understanding of the benefits of education. Mauldin (2001) argues that older parentshave more financially stability, so they are more able to spend higher a proportion of their earnings on

children's educational expenses. However, Sulaiman et al. (2012) point out that, for Indonesia, it is the age of the head of the family, and not the mother, that is important. They argue that due to social and cultural factors, the father is the main breadwinner in the household; hence, his age profile and not the mother's affects households' educational expenditure. Their study also shows that educational expenditure is likely to peak around middle ages, when the head of the household is likely to have higher school grade level children.

Finally, race is another determinant of household educational expenditures. Fan and Lewis' (1999) study shows that different racial groups within the same income group allocate their budgets differently for educational expenditures on their children. For instance, for the US, various studies (Fan, 1999; Lareau, 2011) reveal that among lower expenditure households, white households spend a higher percentage of their total expenditures on education than do African American, Hispanic, and Asian American households. These findings suggest that non-White children in low-expenditure households are at an educational disadvantage. However, among higher expenditure households, Asian American households have the highest expenditures on education, and white households the lowest. The present literature is inconclusive about how family and race jointly determine parents' spending on children.

4.2.3.2 Child characteristics

Various studies suggest that factors related to child characteristics such as age, returns on education, and gender also affect parents' decision to spend money on education.

The existing literature on the relationship between child gender and parental education expenditure is rather inconclusive, and related to many complicated social and cultural factors. For

instance, Huy (2012) claims that in some developing countries, parents invest less in their daughter's education because in the future, she will become part of her husband's household after marriage, and her income will contribute to her husband's households, and not to her own parent's. On the other hand, some researchers, such as Tansel (2002a), argue that due to the higher return on education for girls, parents are willing to spend more money to educate their daughters than their sons. Kambhampati (2008) also suggests that returns on education is an important determinant of parents' spending on children. Estimating returns on education separately for Indian boys and girls, he reveals that the rate of return on education significantly increases households' educational expenditure, although the impact was much larger at secondary level and for girls. Kingdon (1998) considers the impact of returns on education on households' investment in education by decomposing the gross gender differential in earnings using the Blinder-Oaxaca method. She concludes that girls face lower returns on education, and this has a significant impact on parents spending on educating their daughters.

On the other hand, there is evidence that parents distribute investments very differently during the life cycle of their children, with higher education expenses during the earlier stages of children's education (Kornich and Furstenberg, 2008). Huy's (2012) survey of Vietnamese households testifies such results and find a positive and significant relationship between children's years of school and their parents' educational expenditure. His results show that households with more primary school age or secondary school age children spend more on education, while households with pre-school age or college age children spend less.

4.2.4 Worldwide literature

Numerous empirical studies investigate the determinants of household expenditure on education in different countries. In this section, we examine these studies.

McMahon (1984) develops a future-oriented family utility function to examine the factors that affect families' investment in education in the US. He observes expected non-monetary returns, family disposable income, tax subsidies, student loans, family size (number of brothers and sisters), order of birth, and estimates the demand function using academic scores and parents' schooling level. He concludes that children's ability and mother's education are the most important factors that determine households' educational expenditure in the US.

Tilak (2002) studies the determinants of household education expenditure in rural India by employing an Ordinary Least Squares (OLS) estimation. He also examines the elasticity of the household expenditure on education to changes in household income on the one hand and government expenditure on education on the other. He finds that in rural India, while household expenditure is large, there is no gender difference in educational expenditure. He also reveals that household characteristics such as household income, household size, and the education level of the head of the household are the most important determinants of expenditure on education. He also points out that household expenditure is highly elastic to household income levels. However, this study is based on cross-sectional evidence, while the dynamics of household investment decision making in education cannot be captured by evidence provided by cross-sectional surveys. Tilak (2002) accepts such criticism and explains that time series data on household expenditure on education in India are not available.

Focusing on only one province (Delhi), Choudhury (2011) examines the pattern and determinants of household expenditure on engineering education in India. The data were collected from a student survey of final year students pursuing IT courses, and uses the OLS technique. The findings reveal that the larger expenditure on engineering education is not due to high tuition and other fees charged by an institution, but rather due to higher expenditures on non-fee expenditures (such as dorm/housing, food, textbooks, transport) and additional expenditures (such as private fees to improve English and a computer, cost of computer, expenditure on internet and phones). He then concludes that the pattern of household expenditure on education does not confirm the general perception that a significant portion of the household expenditure goes towards fees. However, both Tilak and Choudhury (2011) use an OLS estimation, and hence fail to allow for the large number of zero expenditures on education. In order to capture non-spenders on education, Kambhampati (2008) employs an educational expenditure model instead of a simple OLS methodology. He reveals that the rate of return on education is the most significant variable that increases parent's likelihood of spending on education for both for boys and girls. Furthermore, his study shows that the impact of variables is much larger at the secondary level and for girls.

Sulaiman et al. (2012) examine the determinants of expenditure on education using the OLS model with data from a household survey in Malaysia. An interesting part of their study was that apart from common variables such as households' background, they also examine the impact of globalisation on households' educational expenditure. They confirm that in Indonesia, household income and age of head of household are significantly and positively related to expenditure on education. Interestingly, they find that years of education of the head of the household and mother

are statistically not significant. The study indicates that the level of education among household heads correlated positively but is not significant, while years of education of mothers are negatively correlated with educational expenditure. This implies that households with lower education levels are more concerned with their children's education, which leads them to spend more on their education. They also indicate that demand for education is unitary elastic, which means that it is neither a necessity nor a luxury item in the consumer's budget. Finally, they find that parental awareness of globalisation was significantly and positively related to their expenditure on children's education. However, this study employs a simple OLS model and fails to consider the possibility that at least one of their variables in the model might not be exogenous and does not correct for such endogeneities. For instance, household income may be endogenous because parents who wish to spend more on children’s education may work harder to earn more to pay for it. Alternatively, it is possible that parents who spend less on education have children who work rather than attend school, which would also influence household expenditure.

Duong (2004) conducts a primary survey in Vietnam and finds that both parents' education, household income, and their social class are important determinants of educational spending on children. However, Quang (2012) criticizes this study and argues that since it is a primary survey, its results cannot be generalised to all areas in Vietnam. Following this criticism, he employs the Vietnamese Household Living Standards Survey using the Tobit model. His findings are similar to those of Duong (2004) in terms of the importance of parental income. However, his results suggest that it is only the education and occupation of the head of the household that has most significant impact on households’ educational expenditures. This study also adds that children's school age is significantly related to educational expenditure, and proposes that households with children at

primary school or secondary school age spend more on education compared to those with pre-school or college age children.

Donkoh and Amikuzuno (2011) use a logit model to find the socio-economic determinants of a household's probability of spending on education using the Living Standards Survey for Ghana. They employ a logit model to estimate the probability of incurring education expenditure as the dependent variable. They find two categories of households with greater probability of spending on education. The first consists of households whose heads are relatively young and those whose heads have formal education and own land, and other durable assets. The second category includes female headed households, households with a greater number of children of school age, rural households, and households living farther away from the nation's capital. However, their study focuses only on one aspect of educational expenditure, namely probability of spending, and did not examine other factors such as amount of expenditure. Taking a similar approach, Ogundari and Awudu (2014) focus only on the likelihood of spending in Nigeria; however, they combine educational and healthcare spending because the data they use did not have separate information for these two categories. The study employs household-level data to examine expenditure patterns for rural and urban household using a double-hurdle model. The empirical results show that a household decision to spend on educational and health care services are positively and significantly related to household income, household size, and the level of education of the household head. Moreover, the findings suggest that female-headed households tend to spend more on education and healthcare services compared to male-headed households.

For Tanzania, Ngwilizi (2013) investigates the socio-economic determinants of household educational expenditure. The results show that number of children in the household, household

income, education of household head, and age of children were major determinants of households' investment in human capital. Since they differentiate between urban and rural areas of Tanzania, they find some disparities between these two regions. For instance, in urban households, the age of the household head plays a significant role; in rural areas, this effect is minimal.

In summary, based on this reviewed literature, we can claim that household income, parents' education level, and household size are often considered as the most important determinants of household's expenditure on education. Some studies also mention some uncommon variables such as globalisation, distance of households from national capital, students' ability, family assets ownership, and school location.

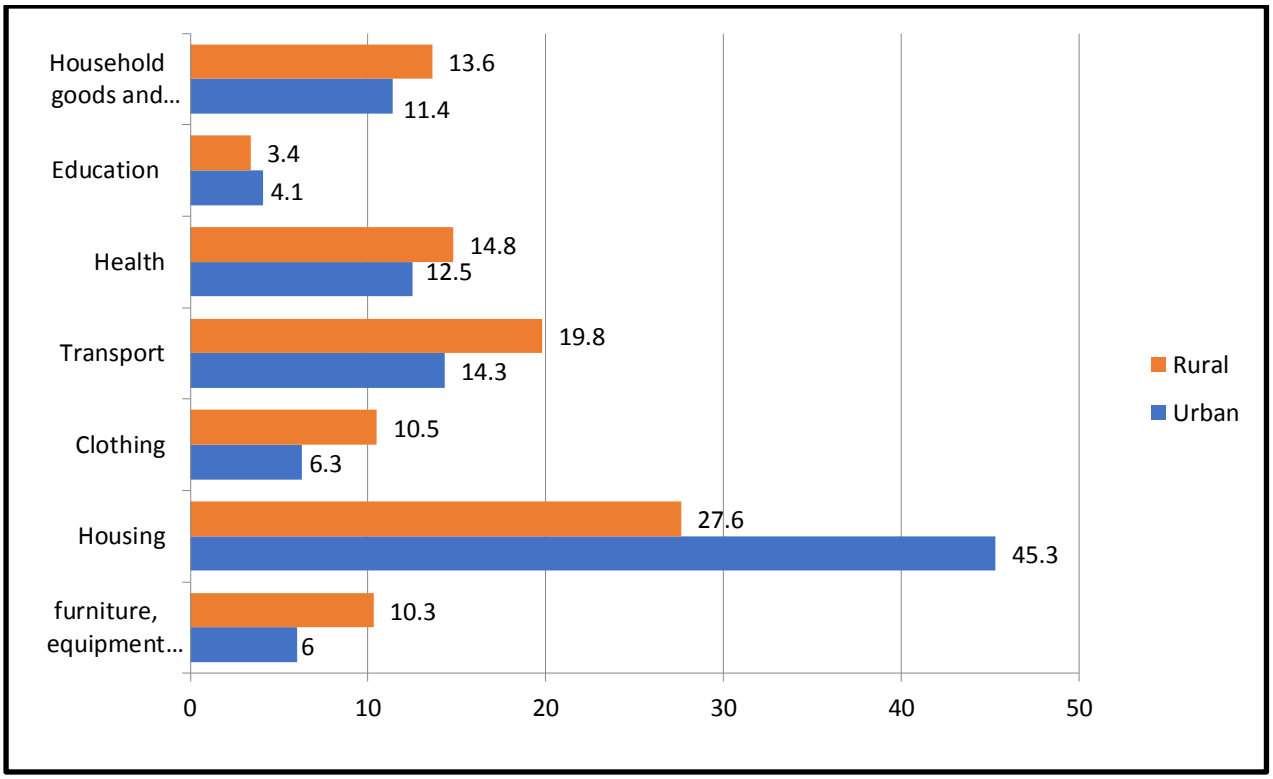
However, the results from the reviewed literature show the uncertain significance of socio-demographic variables. Some studies confirm a significant effect of social-demographic variables on household spending on education, for instance, Tansel (2002), Kambhampati (2008), and Ogundari and Awudu (2014). Nevertheless, Choudhury (2011); Sulaiman et al (2013); and Ngwilizi (2013) argue for the insignificance of some variables. The findings are inconsistent because these studies differ in geographical context; some studies were conducted in urban areas while others in rural areas, which differ in terms of economic development. The studies also use different types of data; some use primary data, while others used secondary data. The studies also have differing designs: some use a cross-sectional study design while others use a longitudinal design. Furthermore, they do not use the same econometric techniques. For instance, most of the studies use OLS, Logit models, Probit models, and Tobit models.

4.2.5 Literature on Iran

While there is a fairly reliable database of public educational expenditures in Iran, information about household expenditures is extremely limited. Serious attention was not given to collecting data on long-run household educational expenditures because these were considered trivial and unnecessary to public expenditure planning. Consequently, there are few empirical studies surveying household expenditures on education on Iran, though 'it is increasingly accepted that that ignoring household investment might prove costly for educational planning in the long run (Tilak, 2002, p.10). This chapter intends to fill the gap in the Iranian literature on the determinants of parental educational expenditure.

A look through the limited research available in Iran suggests that expenditure is very low, especially among the lowest income deciles. According to a report by the Statistical Centre of Iran (2014), in years 2012 to 2013, educational expenditure was the lowest proportion of the household budget compared to other expenses. As Figure 4.1 shows, a typical household spends only 4.1% of their total income on education in urban areas. This is even lower in rural areas, where households spend only 3.4% of their total income on education. The second lowest expenditure for Iranian households is on clothing. This report suggests that despite high educational attainment in Iran, private education expenditure is very low in Iranian families in both urban and rural areas. Hashemkhani (2014) provides a rather descriptive methodology of this report by the Statistical Centre of Iran and claims that 70% of Iranian families spend less than $1 per child per month on education. He then suggests that education is a luxury good for Iranian households (Hashemkhani, 2011).

Figure 4.1: Household non-food Expenditure



Source: Statistical Centre of Iran (2014)

Ansari (2011) examines the effects of family financial resources on child deprivation, and claims that the 5th highest income decile spent 81 times more than families in the lowest deciles did. However, this study was conducted in a small village in east Iran, with a limited number of families; thus, the findings are unlikely to apply to other regions and provinces in Iran. On the other hand, Alitabar (2012) conducts primary research on the impact of family background in one city in Iran and finds that the number of students in the household increases as household income rises. He then points out that, for families in the lowest decile, the average number of students is 1, whilst in the highest decile the average number is 2. Although this study is restricted to a limited number of families, the questionnaire included a question about the importance of returns on education for families with less financial resources, and finds out that parents' expectations about

their children's returns on education are very essential on their decision to spend on education of their children.

Noorbakhsh (2003) also investigates the importance of regional disparities between one of the richest (Tehran) and poorest cities (Sistan Balouchestan) of Iran, and finds that the latter had the lowest educational expenditure in the whole country.Javadi (2012) also examines regional disparities between these two cities and suggests that the differences between these two provinces might be due to differences in their rate of return on education. Using a simple Mincer function, she finds that while in Tehran, one additional year of schooling increased income by 7.5%, in Sistan Balouchestan, it led to a 2.5% increase. However, both of these studies employ primary data collected by themselves, and compare only two cities (Tehran versus Sistan Balouchestan), while we use HIES data, which is a rich and informative data set across Iran, with both urban and rural considerations. Finally, the only study using the same data from the Iranian Household Income and Expenditure Survey (HIES) that we do and focuses on both urban and rural areas is by Kashi (2010), which is in Farsi language. He employs a time-series analysis from 1984 to 2006 and compares the proportion of household educational expenditure for urban and rural households by using t-student distribution. He also examines the elasticity of household expenditures on education to changes in household income. His main finding is that there is a large disparity in terms of educational expenditure of urban and rural households, and that education is a necessity good in Iranian households' budgets. He finds that for urban households, the proportion of educational expenditure increased from 2.6% in 1984 to 4.4% in 2006, while these numbers are 2.4% and 3.1% in rural areas. He suggests that this rise in educational expenditure suggests that the importance of education in households is rising. He then explores the educational expenditure

of various household deciles. For example, among urban households, the proportion of educational expenditure for the first and 10th decile is 2.8 %and 3.9%, respectively, while that for rural households is 2.6% and 3.6%.

Overall, the research examining the determinants of household expenditures on education in Iran is limited, and the topic has not attracted widespread research attention thus far. This lack of detailed knowledge led to incorrect presumptions about the extent, nature, and quality of household-level investments in education. These presumptions contributed to the formulation of inefficient and unsound policies on fees, scholarships, and subsidies in Iran. Our study hopes to contribute to the existing literature by conducting this research.

4.3 Data and Descriptive Statistics

This section briefly introduces the dataset used in this analysis and provides the descriptive statistics of key variables.

4.3.1 HIES data

This chapter uses data from two cohorts of the annual Iranian HIES: 2009/10 and 2011/12.[4] The HIES is an annual survey conducted by the Statistical Centre of Iran designed to monitor households' income and living costs. The survey has been administered in rural areas since 1963 and in urban areas as of 1968. Initially, the survey was limited to gathering data on household expenditures; it was only in 1974 that questions concerning household income were introduced to the survey's questionnaire. According to the Statistical Centre of Iran, the HIES aims to develop

[4]The Iranian year begins in March and each year of data therefore covers two Western calendar years

estimates of the average income and expenditure for urban and rural households at provincial and country levels. It makes it possible to understand household income and expenditure composition and distribution patterns, the household consumption pattern, the weight for each commodity in the household consumption basket, and is also used to calculate the poverty line, and study the imparity in household income and facilities.[5]

The HIES aims to represent the national level each year. The survey uses a three-staged cluster sampling method with strata. At the first stage, the census areas are classified and selected. At the second stage, the urban and rural blocks are selected, whilst the selection of sample households occurs at the third stage. The sample sizes are chosen to estimate the representative average annual income and expenditures. In order to obtain representative estimates for the year, the samples are evenly distributed between the months.

Using the HIES has several advantages. First, it has a large sample size and can be pooled for even larger sizes. Second, the dataset includes a large amount of information on individual characteristics, employment status, educational attainment, earnings, and living costs, in a similar format to standard European Labour Force Surveys. The HIES data is split into both rural and urban data files and we present summary statistics for both. Table 4.1 provides descriptive statistics for those living in urban areas, whilst Table 4.2 provides descriptive statistics for those living in rural areas.

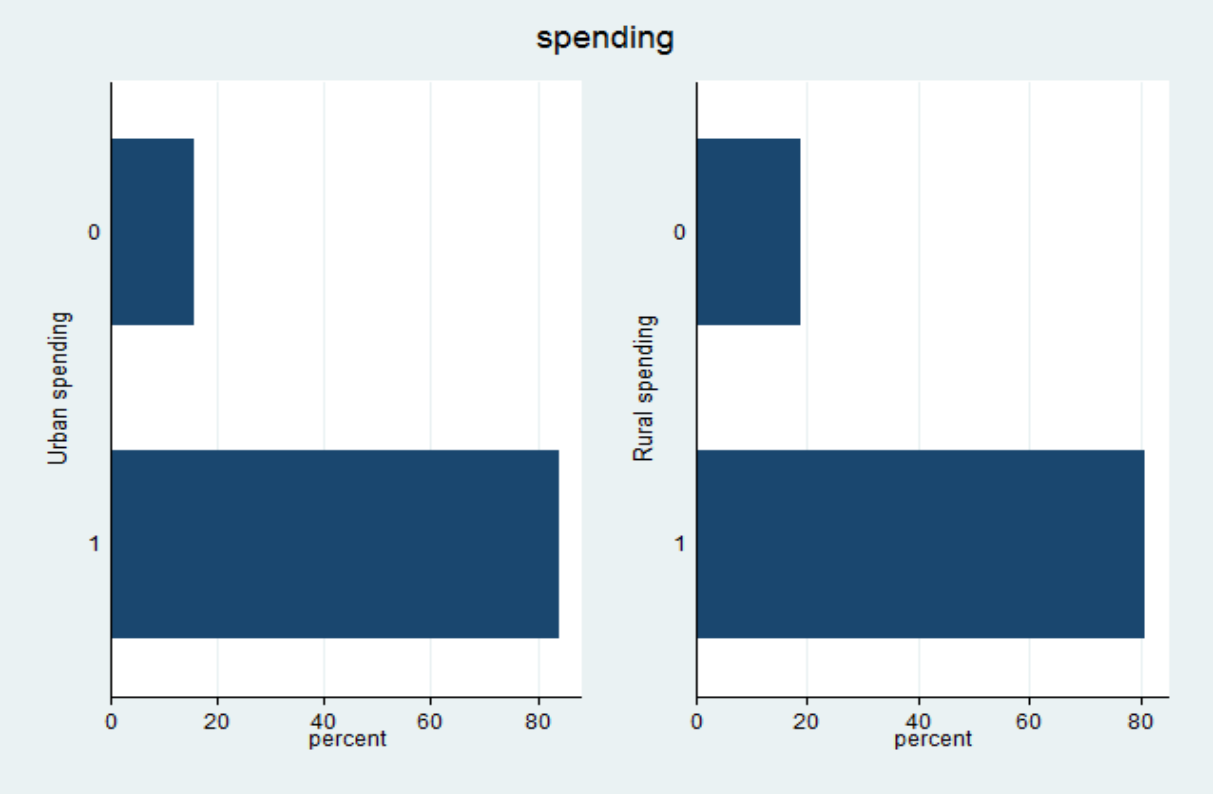
[5]http://amar.org.ir/english/Metadata/Statistical-Survey/Household-Expenditure-and-Income

4.3.2 Summary statistics of dependent variables

We employ three types of dependant variable in our sample of households with children under 22.We restrict the sample to households with at least one child under the age of 22 because our primary concern is the impact of household characteristics on child schooling expenditure, and thus families with no children, or older children, are not of interest. We chose 22 rather than 18 as the maximum age because there some students might have failed certain levels of education, or started going to school later than usual, and we did not want to exclude them from the analysis. The first dependent variable is a binary variable that takes the value of zero or one and describes whether households spend on education or not. The second describes how much households spend on education. The final dependent variable describes the proportion of a household's expenditure that is on education.

As discussed in the previous section, many households in our dataset either have not reported their educational expenses, or listed their expenditure on education as 0. However we are only using those households that have reported their educational expenditure as zero or more. Accordingly figure 4.2 gives a graphical presentation of our first dependant variable (a binary variable that takes the value of zero or one and describes whether households spend on education or not)for urban and rural households in our sample (families with children under 22). It shows that the number of households with zero reported educational expenditure is higher in rural areas than urban areas: 15.88% of urban households reported zero educational expenditure, while this is 19.02% in rural areas. The higher number of non-spenders in rural areas is not a surprise, as in most countries, probability of spending is lower in rural households.

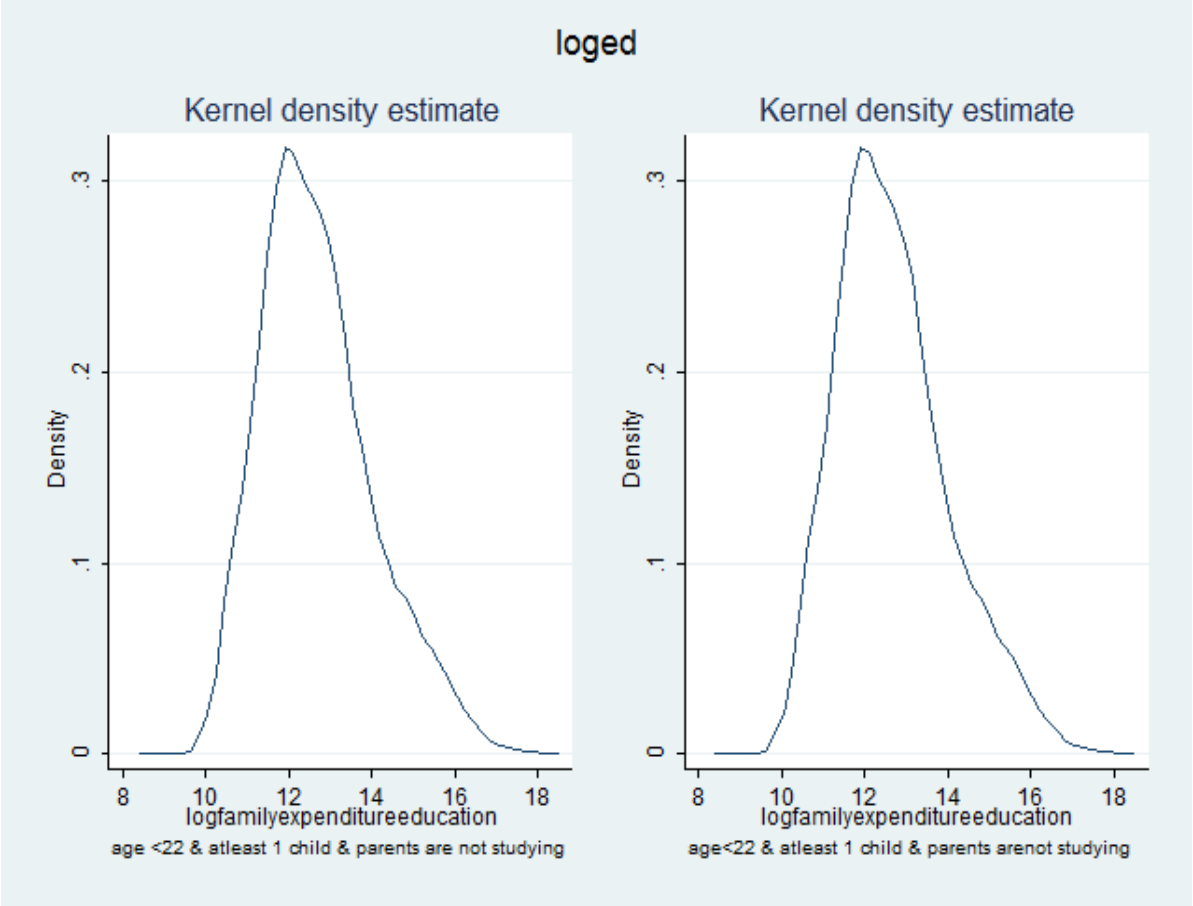
Figure 4.2: Comparison of spending on education in urban and rural areas



Source: HIES 2009/10-2011/12, Own calculation

Figure 4.3 presents a comparison kernel density plot of our second dependent variable, log educational expenditure. The figure shows that educational expenditure in rural areas is lower than in urban areas. On average, urban households' educational expenditure is log 12.68 Rial, whilst for rural households it is log 12.13 Rial. Furthermore, we observe a wider distribution and fatter tails in the urban expenditure distribution, and urban areas have higher maximum expenditure amounts.

Figure 4.3: Comparison of log of Household Education expenditure in urban and rural areas

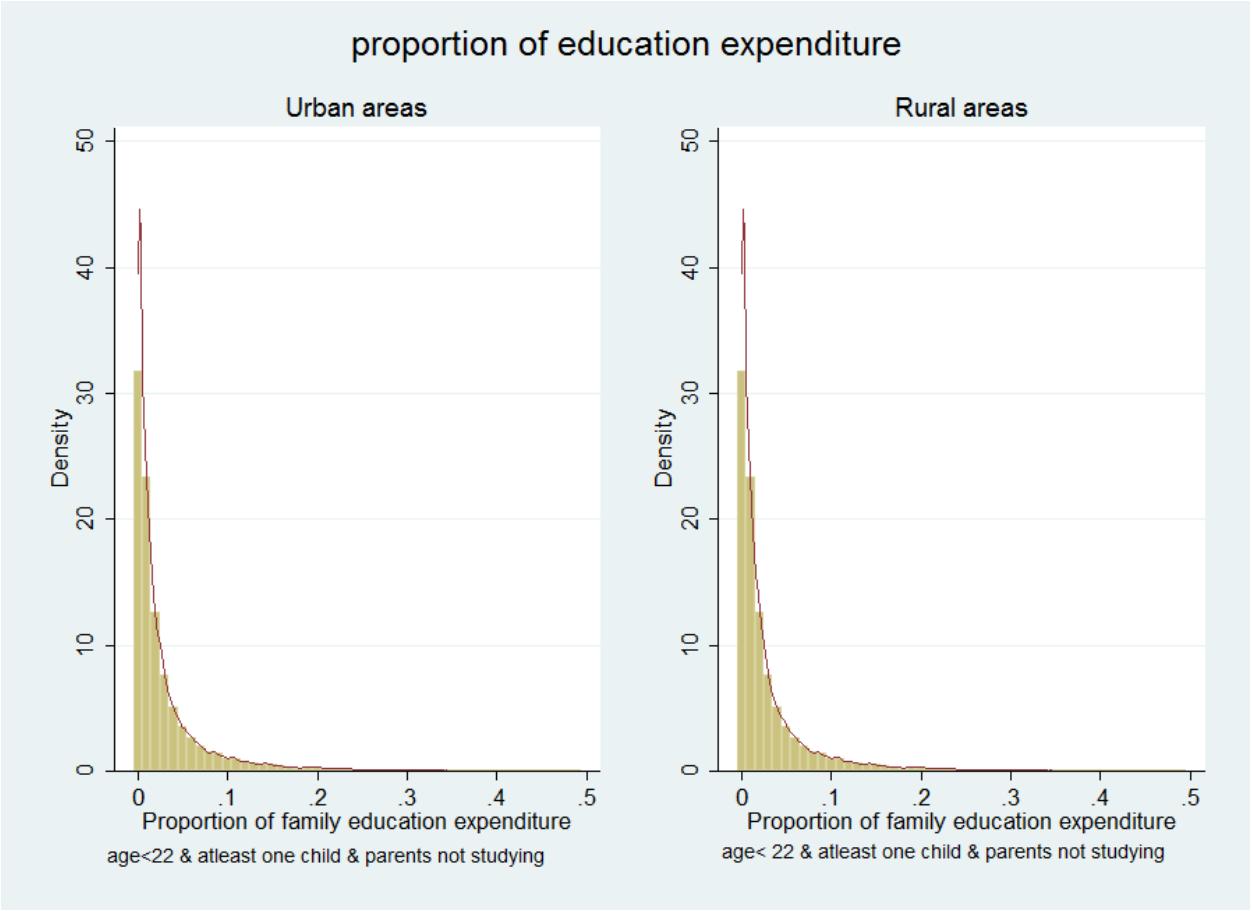


Source: HIES 2009/10-2011/12, Own calculation

Finally, Figure 4.4 presents a comparison histogram and kernel density plots for our final dependent variable, proportion of household expenditure on education for rural and urban areas. We calculate the proportions by dividing educational expenditure by total expenditure. The plot shows high numbers of zero spenders on education in both areas. Figure 4.4 shows that the number of families who do not spend proportionally on education is higher in rural areas compared to urban areas. Interestingly, once you exclude 0 spenders, the averageproportion spent on education is higher in rural areas than urban areas. According to Tables 4.1 and 4.2, the average proportion of expenditure in rural areas is 4.3% of total household expenditure, while in urban

areas, we observe a lower average proportion of household education expenditure at 3.2% of total household expenditure. The number of urban households spending more than 20% of their total expenditure on education is much higher than for rural areas, where the percentage of families spending more than 20% of their total expenditure on education is close to zero.

Figure 4.4: Educational expenditure as a proportion of total expenditure



Source: HIES 2009/10-2011/12, own calculation

4.3.3. Summary statistics for urban areas

Table 4.1 presents the descriptive statistics for both the whole urban sample (211,300) and our restricted sample (70,839), on which we run the multivariate regressions. Since we are interested in parental educational expenditure on children, we dropped parents who are students

themselves, so that household education expenditure should only relate to spending on children. Finally, we focus only on children under 22 who still live with their parents. We exclude older children who no longer live with their parents because the characteristics of their present household are not likely to be those that determine the educational outcomes of interest, and may also be the result of prior schooling decisions. Given the cumulative nature of schooling decisions, the circumstances of the household in which the child was raised are more relevant; for this reason, we focus on children still living in the household of their parent or parents.

Table 4.1 shows that 49.88% are male and 50.12% female in the whole sample, whereas this is 52.34% male and 47.66% female for households with children under 22. In terms of parental characteristics, Table 4.1 shows that in the whole (restricted) sample, the average mother's age is 43.45 (38.91)[6]. It is clear why average mother's age is lower for households with younger children, since mothers with younger children are usually younger as well. The average age of fathers for the whole (restricted) sample is 48.30 (44.21).

The influence of parental human capital formation on children's ability to acquire their own human capital has been extensively studied (see Eckstein and Wolpin, 1999; Keane and Wopin, 1997). To examine this relationship in our dataset, we present two variables on parental education in Table 4.1: parental education levels (fathers and mothers separately), and parental over-education (fathers and mothers separately). We categorise parents' education level in 6 levels: level 1 for parents with primary education; level 2 for secondary level; level 3 for high school level; level 4 is some sort of university degree level (can be first year of university, or last year of masters);

[6]The reference person in each family is defined as the guardian of household; we determine the relationship of other household members is with respect to this person.

level 5 for those with more than 18 years of schooling, which is PhD (or higher) levels; and category 6 for any other type of education. Finally, because there were many missing values for both parents' schooling, we recoded our data to create a category of missing values for educational levels. We also address this in our regression framework by including 'missing' dummy variables.

Table 4.1 shows that in the whole (restricted) sample, 29.81% (30.93%) of fathers have some primary level education, 17.29% (19.60%) have some sort of secondary education, 19.69% (20.30%) have some sort of high school education, 14.97% (15.55%) have university level education, and 0.25% (0.24%) have a PhD or above. Missing values account for 16.94% (12.87%) of fathers. It is important to note that information on parent's education levels is only given where parents are literate; there is no education level of 0 reported. This means a high percentage of missing values might be the result of 0 years schooling, or in other words, illiterate parents. However, we cannot confirm that these missing values are solely due to illiteracy or lack of schooling.

Another category of parental education in Table 4.1 is father's over-education status.[7] According to our descriptive analysis, 9.50% of fathers are undereducated in their occupation, 61.97% are normally educated, and 28.53% are over-educated. In households with children under 22, this is 10.76%, 66.26%, and 22.98%, respectively. This confirms the existence of over education in Iran, which we mentioned in Chapter 1 of this thesis.

Although a father's education level is an important determinant of investment in children's education, many scholars argue that maternal human capital matters more (Kornich, 2012). Table

[7]We compute over-education by taking the average value of years of schooling for each occupational category and treating all individuals who fall within 1 standard deviation of this value as 'normally' educated. Those above or below these thresholds are 'under' or 'over' educated.

4.1 presents mothers' level of education and maternal over-education statistics. It shows that 30.98% of mothers have some sort of primary level education, 14.18% have some sort of secondary education, 18.73% have some sort of high school education, 8.51% have university level education, 0.04% have a PhD or above, and 0.43% have other types of education. Missing values for mother's education account for 27.14% of cases, which is significantly higher than that for fathers. For mothers with children under 22, the figures are 33.96%, 16.39%, 20.34%, 8.48%, 0.03%, 0.22%, and 20.58%, respectively. Table 4.1 suggests that over-education is more prevalent amongst women than men in Iran, as we can observe 4.77% of mothers are undereducated in their occupation and 62.06% are normally educated, while 33.17% are over-educated. Within households with children under 22, the values are 5.37%, 69.07%, and 25.56% (compared to 22.98% for fathers), respectively.

Parental employment status can also relate to expenditures on a child's education. Table 4.1 shows that 66.56% of fathers were working, 2.00% were unemployed and looking for a job, 19.82% were unemployed with income, 0.05% were housekeepers, and 1.42% were in some other category. Occupation status is missing for 10.03% of fathers. In households with children under 22, these figures are 77.06%, 2.13%, 11.21%, 0.02%, 0.95%, and 8.62%, respectively. Haveman et al. (1991) suggest a significant, positive relationship between a mother's employment status, particularly during a child's teenage years, and high school completion. Table 4.1 shows that 7.52% of mothers were working, 0.43% were looking for a job, 8.00% were inactive, 80.55% were housekeepers, and 0.26% were in other categories. Information is missing in 2.45% of cases, which is much lower than for fathers with missing employment information (10.03%). For mothers'

employment status in households with children under 22, the figures are 9.26%, 0.44%, 4.82%, 84.64%, 0.08%, and 0.77%, respectively.

Turning now to child characteristics, Table 4.1 shows the average child age is 16.14 years for the whole sample and 12.61 years for households with children under 22. In terms of the number of children per household, within the whole sample, 24.26% have no children, 24.96% have one child, 28.20% of households have two children, 14.50% of households have three children, 5.27% of households have four children, 2.12% of households have five children, and 0.68% have six or more children. For households with at least one child under 22 years old, these numbers are 20.51% for those with one child, 39.04% with two children, 24.58% with three children, 9.97% with four children, 4.44% with five children, and 1.48% with six and more children. Gender composition can also be an important determinant of household expenditure on education (Lundberg and Rose, 2002); Table 4.1 shows that 23.55% of the whole sample have boys only, 16.12% have girls only, and 60.33% have children with mixed genders. The figures are 25.90%, 21.16%, and 52.94%, respectively, for our sample of households with children under 22 years old.

Table 4.1 also provides information on the spending characteristics of Iranian households. For Information on income, we added the income for wage workers with the self-employed and we included other types of income, for instance, from properties or heritage. According to this table, annual household income was 59,585,198.69 Rials (6,156.44$)[8] for the whole sample, and 60,020,534.97(6,201.42$) Rials for households with children under 22 years old. Our variable on income is gross income, and it excludes taxes. It also has been deflated. In our dataset, the total average household expenditure includes spending on food, housing, clothing, communication,

[8]www.fxtop.com

transport, education, and entertainment. Annual total household expenditure for the whole sample was 32,591,388.57 Rials (3,367.39$), and 32,291,394.12 Rials (3,336.4$) for households with children under 22 years old. Another variable describing household spending behaviours is a binary variable that takes the value of zero or one describing whether families spend on education or not. According to Table 4.1, within the whole sample, 32.20% spend nothing on education, while 67.80% report some sort of expenditure on education. For households with children under 22, 15.88% of households report no educational expenditure at all, while 84.12% report some sort of spending. Clearly, the probability of some sort of educational expenditure rises if households have at least one child. Table 4.1 also provides information on how much families spend annually on education. On average, all families (with or without children) spent 791,954.42($81.83) Rials per year on education, while for households with children under 22, educational expenditure rises to some extent to 855,833.50($88.43). Hence by implication, families without children have lower educational expenditure than families with children. However, comparing the educational expenditure of all families with those with children, suggest that the two figures are very similar, implying that families with children spend similar amounts to families without children. There can be few explanations for this phenomenon. First of all households with no children might be spending money on their own education. For example a young married couple might be still going to university and that is why they are spending money on their education. This is why in our subsample we have dropped those households that father and mother are going to university. For instance, in our whole sample we have couples that are spending money on their university level education, while in our subsample we don't have these families. Secondly in our whole sample we have all families with children hence there are families who are spending money on their children's

university level, while in our subsample we only have those households that are spending money for children under the age of university. Given the fact that university expenses are very high in Iran, and the fact that many parents prefer to send their children to public school and save their money for when they are going to university (REF) this phenomenon can be explained.

Note that education expenditure here is for primary, secondary, and high school levels only and excludes educational expenditure on higher education. We have two reasons to do so. First, we are interested in parental expenditure on their children's education; parents spending on higher education might be spending that on themselves. Second, we are primarily interested in younger children, so an analysis of educational expenditure on higher education is not relevant. Proportionally, educational expenditure accounts for 2.8% of total expenditure in the whole sample and 3.2% for families with children under 22.[9]As mentioned in the literature review, many studies claim that Iranian households spend low proportions of their total expenditure on education. Our sample confirms these findings (Hashemkhani, 2011; Ansari, 2011). Finally, Table4.1 includes t-test results to highlight any significant differences in the means between the full and restricted samples.

[9]We calculate proportions by dividing educational expenditure by total expenditure.

Table 4.1: Summary Statistics Urban Areas

Variable		Urban whole sample			Urban aged less than 22			Difference	
		Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
Continuous									
Famlily income last year (deflated)		211,206	59,585,198.69	64,552,749.42	70,289	60,020,534.97	54,856,011	435,336.28	0.003
Family total expenditure last year (deflated)		211,295	32,591,388.57	43,468,058.19	70,320	32,291,394.12	42948359.41	-299,994.45	0.426
Family educational expenditure last year (deflated)		210,644	791,954.42	2,757,322.39	70,185	855,833.50	2,670,665	63,879.08	0.000
Proportion of family expenditure on education		210,644	0.03	0.056	70,185	0.03	0.05	0.00	0.000
Fathers age		190,115	48.31	13.05	64,256	44.21	9.50	-4.10	0.000
Mothers age		206,118	43.45	12.27	69,773	38.92	8.52	-4.54	0.000
Child age		192,694	16.14	8.79	70,320	12.61	6.10	-3.53	0.000
Categorical									
Sex									
	Male	105,402	49.88		36,803	52.34		2.46	0.000
	Female	105,896	50.12		33,516	47.66		-2.46	0.000
Father education levels									
	Level 1	56,665	29.81		19,877	30.93		1.12	0.000
	Level 2	32,876	17.29		12,593	19.60		2.31	0.000
	Level 3	37,434	19.69		13,047	20.30		0.61	0.000
	Level 4	28,462	14.97		9,992	15.55		0.58	0.000
	Level 5	467	0.25		152	0.24		-0.01	0.000
	Level 6	1,999	1.05		324	0.50		-0.55	0.000
	Missing	32,208	16.94		8,271	12.87		-4.07	0.000
Mother education levels									
	Level 1	63,856	30.98		23,696	33.96		2.98	0.000
	Level 2	29,232	14.18		11,433	16.39		2.21	0.000

Table 4.1(Continues): Summary Statistics Urban Areas

Variable		Urban whole sample			Urban aged less than 22			Difference	
		Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
	Level 3	38,599	18.73		14,191	20.34		1.61	0.000
	Level 4	17,539	8.51		5,920	8.48		-0.03	0.000
	Level 5	78	0.04		20	0.03		-0.01	0.000
	Level 6	888	0.43		154	0.22		-0.21	0.000
	Missing	55,936	27.14		14,363	20.58		-6.56	0.000
Fathers overeducation									
	Undereducated	18,062	9.50		6,913	10.76		1.17	0.000
	Normal educated	117,813	61.97		42,576	66.26		4.69	0.000
	Overeducated	54,240	28.53		14,767	22.98		-5.88	0.000
Mother overeducation									
	Undereducated	9,836	4.77		3,747	5.37		0.5	0.000
	Normal educated	127,921	62.06		48,198	69.07		5.81	0.000
	Overeducated	68,371	33.17		17,832	25.56		-6.31	0.000
Father working status									
	Working	140,646	66.56		54,188	77.06		5.56	0.000
	Looking for job	4,231	2.00		1,501	2.13		0.13	0.000
	Unemployed with income	41,874	19.82		7,881	11.21		-8.64	0.000
	Student	264	0.12		na	na		na	na
	Housewife	100	0.05		17	0.02		-0.03	0.000
	Others	3,000	1.42		669	0.95		-0.48	0.000
	Missing father information	21,185	10.03		6,064	8.62		-1.44	0.000
Mother working status									
	Working	15,892	7.52		6,513	9.26		1.68	0.000
	Looking for job	915	0.43		308	0.44		0.00	0.000
	Unemployed with income	16,894	8.00		3,386	4.82		-3.22	0.000
	Student	306	0.89		na	na		na	na

Table 4.1(Continues): Summary Statistics Urban Areas

Variable	Urban whole sample			Urban aged less than 22			Difference	
	Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
Housewife	170,209	80.55		59,516	84.64		3.48	0.000
Others	557	0.26		54	0.08		-0.18	0.000
Missing Mother information	5,172	2.45		543	0.77		-1.68	0.000
Number of children in household aged less than 22								
0	51,265	24.26		na	na		na	na
1	52,750	24.96		14,422	20.51		-4.33	0.000
2	59,596	28.20		27,450	39.04		10.87	0.000
3	30,633	14.50		17,283	24.58		10	0.000
4	11,125	5.27		7,008	9.97		4.66	0.000
5	4,487	2.12		3,119	4.44		2.28	0.000
6 or more	1,444	0.68		1,038	1.48		0.79	0.000
Child gender composition								
All boys	23,885	23.55		18,215	25.90		2.39	0.000
All girls	16,353	16.12		14,879	21.16		5.09	0.000
Mixed	61,193	60.33		37,225	52.94		-7.48	0.000
Family spends any money on education								
0	67,824	32.20		11,144	15.88		-16.38	0.000
1	142,820	67.80		59,041	84.12		16.38	0.000

Source: HIES 2009/10-2011-12

4.3.4. Summary statistics for rural areas

Table 4.2 provides the same summary statistics for rural areas. We first present a descriptive analysis of the whole rural sample (222,763) and then describe our restricted sample (84,778). To avoid repetition, this section will highlight the differences between rural and urban areas only, and will not describe each statistic separately.

Characteristics such as parents' age, child gender composition, and child age are in the same range for both environments. Two children per household is the most common family size in both types of area, though rural households have a higher proportion of large families than urban households do. For example, in rural areas, 2.95% of households with children under 22 have 6 children or more, while this is 1.48% for urban households.

In terms of parents' education levels, there are interesting differences between rural and urban areas. The number of fathers with the lowest level of education is higher in rural areas (37.29%) compared to urban areas (29.81%). In addition, the percentage of fathers with some sort of higher education is much lower in rural areas (3.79%) compared to urban areas (14.97%). We can observe similar differences in households with children under 22 years old, where the percentage of fathers with the lowest level of education is 41.72% in rural areas and 30.93% in urban areas. The number of missing values for fathers' education is also higher in rural areas (34.76%) compared to urban areas (16.94%). As explained above, this suggests, though does not confirm, that the number of illiterate fathers is higher in rural areas than in urban areas. University level education amongst fathers in households with children under 22 also differs between rural and urban areas, at 4.23% in rural areas compared with 15.55% in urban areas.

Another indicator of paternal education level is fathers' over-education, which also differs between urban and rural areas. Table 4.2 suggests that over-education among rural fathers in the whole sample is much higher in rural areas (47.62%) compared with urban fathers (28.53%). The same trend is also evident in households with children under 22, where over-educated fathers in rural areas make up 36.06% of the sample compared to over educated fathers in urban areas (22.98%).

In terms of maternal education, Table 4.2 shows that rural mothers have lower education levels than urban mothers do. For example, only 1.18% of rural mothers in the whole sample have some sort of university education, while this is 8.51% in urban areas. These numbers are 1.13% (rural) and 8.48% (urban) in households with children under 22. Furthermore, missing values are recorded for 50.41% of mothers in rural areas in the whole sample, compared to 27.14% of missing values for urban mothers. With the caveats above, these values suggest high numbers of illiterate mothers in rural areas. In households with children under 22, the number of missing values is slightly lower, at 41.72% (rural). In terms of maternal over-education, Table 4.2 shows much higher over-education among rural mothers (63.01%) compared to urban mothers (33.17%) in the whole sample, and 56.48% and 25.56% in households with children under 22 years old.

In terms of household income, Table 4.2 highlights interesting differences between rural and urban households. Average annual income for rural households with children under 22 was 32,986,069.19 Rials (3,408.17$), while it was 60,020,534.97(6,201$) Rials in urban households. This suggest that urban households have annual income of was nearly double that of rural households. Rural and urban households also differ in terms of family expenditure. Total annual

expenditure for a rural household with children under 22 was 18,007,172.56(1,860.53$) Rials, while it was 32,291,394.12(3,336.40$) Rials for urban households.

Educational expenditure for rural households with children under 22 was also much lower (429,640.60 Rials/44.39$) compared to urban households (855,833.50 Rials/88.34$). Interestingly, rural households with children under 22 spend proportionally more of their income on education compared to urban households: 4.3% versus 3.2%. These numbers are 3.1% and 2.8%, respectively, for the whole sample.

Overall, a comparison of the summary statistics in Tables 4.1 and 4.2 confirms the existence of education and income inequality between urban and rural areas. Both mothers and fathers in urban areas are better educated than their rural counterparts are. Urban families have higher incomes and spend more money on education than rural families in absolute terms. Interestingly, however, rural families spend a greater proportion of their income on educational goods than urban families do. Finally, missing values (which can be an indicator of illiteracy) are much more common among rural parents. We will explore how these differences influence parents' decisions on educational expenditure in the results section.

Table 4.2: Summary Statistics Rural Areas

		Rural whole sample			Rural aged less than 22			Difference	
Variable		Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
Continuous									0.000
Famlily income last year (deflated)		220,786	32,798,137.10	39,005,192.55	83,773	32,986,069.19	36,824,595	187,932.10	0.086
Family total expenditure last year (deflated)		222,766	18,786,151.74	29,284,104.48	84,953	18,007,172.56	28032383.98	-778,979.178	0.000
Family educational expenditure last year (deflated)		220,441	351,186.14	1,040,732	83,883	429,640.60	1,132,158	78,454.45	0.000
Proportion of educational expenditure		220,441	0.03	0.065	83,883	0.04	0.07	0.01	0.000
Fathers Age		172,001	48.48	14.63	64,923	43.65	10.58	-4.83	0.000
Mothers Age		216,078	43.78	13.16	83,298	38.85	9.19	-4.93	0.000
Child age		202,220	15.31	8.52	84,953	12.19	5.86	-3.12	0.000
Categorical									
Sex									
	Male	105,435	47.33		44,485	52.47		5.14	0.000
	Female	117,327	52.67		40,292	47.53		-5.14	0.000
Father education levels									
	Level 1	64,138	37.29		27,024	41.72		4.43	0.000
	Level 2	24,888	14.47		10,944	16.89		2.42	0.000
	Level 3	14,012	8.15		5,711	8.82		0.67	0.000
	Level 4	6,521	3.79		2,742	4.23		0.44	0.000
	Level 5	29	0.02		10	0.02		0.00	0.000
	Level 6	2,621	1.52		537	0.83		-0.69	0.000
	Missing	59,788	34.76		17,813	27.50		-7.26	0.000
Mother education levels									
	Level 1	73,539	34.04		34,016	40.92		6.88	0.000
	Level 2	18,120	8.39		8,157	9.81		1.42	0.000

Table 4.2 (Continues): Summary Statistics Rural Areas

Variable		Rural whole sample			Rural aged less than 22			Difference	
		Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
	Level 3	12,191	5.64		5,114	6.15		0.51	0.000
	Level 4	2,559	1.18		943	1.13		-0.05	0.000
	Level 5	11	0.01		4	0.00		-0.01	0.000
	Level 6	709	0.33		208	0.25		-0.08	0.000
	Missing	108,924	50.41		34,681	41.72		-8.69	0.000
Fathers overeducation									
	Undereducated	13,968	8.13		6,187	9.55		1.42	0.000
	Normal educated	76,009	44.25		35,234	54.39		10.14	0.000
	Overeducated	81,801	47.62		23,360	36.06		-11.56	0.000
Mother overeducation									
	Undereducated	7,164	3.61		3,362	4.27		0.66	0.000
	Normal educated	66,316	33.39		30,873	39.25		5.86	0.000
	Overeducated	125,152	63.01		44,428	56.48		-6.53	0.000
Father working status									
	Working	139,129	62.46		57,011	67.25		4.79	0.000
	Looking for job	4,470	2.01		1,924	2.27		0.26	0.000
	Unemployed with income	25,013	11.23		5,032	5.94		-5.29	0.000
	Student	47	0.02		na	na		na	na
	Housekeeper	83	0.04		21	0.02		-0.02	0.000
	Other	3,259	1.46		793	0.93		-0.53	0.000
	Missing father information	50,762	22.79		19,997	23.59		0.80	0.000
Mother working status									
	Working	33,167	14.89		13,316	15.71		0.82	0.000
	Looking for job	606	0.27		251	0.30		0.03	0.000
	Unemployed with income	13,771	6.18		3,459	4.08		-2.10	0.000
	Student	439	0.20		na	na			
	Housewife	167,187	75.05		65,974	77.82		77.62	0.000

Table 4.2 (Continues): Summary Statistics Rural Areas

Variable	Rural whole sample			Rural aged less than 22			Difference	
	Frequency	Mean	std. dev.	Frequency	Mean	std. dev.	Value	P-value
Others	893	0.40		123	0.15		-74.90	0.000
Missing Mother information	6,700	3.01		1,655.00	1.95		1.55	0.000
Number of children in household aged less than 22								
0	48,001	21.55		na	na		.	.
1	44,703	20.07		12,680	14.96		-5.11	0.000
2	59,784	26.84		28,226	33.29		6.45	0.000
3	37,472	16.82		21,681	25.57		8.75	0.000
4	18,407	8.26		11,908	14.05		5.79	0.000
5	10,964	4.92		7,775	9.17		4.25	0.000
6 or more	3,432	1.54		2,508	2.95		1.41	0.000
Child gender composition								
All boys	23,460	20.72		19,078	22.50		1.78	0.000
All girls	16,602	14.67		15,236	17.97		3.30	0.000
Mixed	73,143	64.61		50,464	59.52		-5.09	0.000
Family spends any money on education								
0	81,309	36.56		16,110	19.02		-17.54	0.000
1	141,094	63.44		68,603	80.98		17.54	0.000

Source: HIES 2009/10-2011-12

4.4 Methodology

Our goal in this chapter is to investigate the determinants of parents' educational expenditure on children in urban and rural areas of Iran. To do so, we employ three types of dependent variable in our regression analysis: a binary variable for spending, log of educational expenditure, and the proportion of educational expenditure compared to total household expenditure.

Since our three types of dependent variable differ in their construction, we will need to employ a different regression model for each one. For the binary spending variable, we employ a logit model, which will allow us to examine spending at the extensive margin. For the continuous variable of log educational expenditure, we employ an OLS model to examine education spending at the intensive margins. Finally, to examine the proportion of household expenditure on education, we employ a fractional logit model that allows us to estimate a flexible distribution bounded between 0 and 1, where both may appear as outcomes (something not feasible with a traditional Tobit model).

4.4.1. Logit model

Our data is characterised by the presence of a large number of zeros in the response variable, indicating no expenditure on children's education. To model spending decisions at the extensive margin, we first investigate what determines whether households spend resources on education. To ensure that such dependent variables are accommodated correctly in our empirical framework, we estimate the decision to spend non-zero amounts via a standard logit model.

Following Jones (1998), let the probability that educational expenditure for individual i,Y_{1_i} , is positive be determined by two vectors of observable factors (x_i , x_j). Let(ε_i) be the error term distributed as a logistic distribution function with cdf$F(\cdot)$. The probability that the dependent variable, Y_{1_i} , takes the value of 0 or 1 is a function of whether the underlying latent variable $y^*_{1_i}$is higher than a threshold value.

$$Y_{1_{ij}} = x_i'\beta_1 + x_j'\beta_2 + \varepsilon_{ij} \begin{cases} 0\ if y^*_{1_{ij}} =< 0 \\ 1\ if y^*_{1_{ij}} > 0 \end{cases} \quad (4.1)$$

The vectors of observable characteristics are given by individual specific variables, $x_i'\beta_1$, (such as age, gender) and household specific variables, $x_j'\beta_2$, (father's and mother's age, father's and mother's education, household income, etc.). See Tables 4.1 and 4.2 for more information. Because it is possible that multiple children have the same parents, we cluster all standard errors by household.

Finally, we present our results using marginal effects coefficients estimated at the mean of all independent variables for the logit model, as marginal effects are a more powerful interpretive device. According to Wulff (2014), a clear advantage of the marginal effect method is that it provides richer and more meaningful information not available through by interpreting the coefficients, and it provides information about changes in the predicted probabilities due to a change in a predictor.

4.4.2. OLS model

The second model is a standard linear regression model, conditional on the subsample of families that spend a non-zero amount on education. We regress the monetary amount spent,$Y_{2_{ij}}$, on observable covariates x_i and x_j. We log the dependent variable and deflate it

for each year. We also cluster robust standard errors by household as in the previous model. The model we estimate takes the form:

$$log(Y_{2_{ij}}) = \beta_0 + x_i'\beta_1 + x_j'\beta_2 + \varepsilon_{ij} \qquad (4.2)$$

Where $x_i'\beta_1$ is a vector of observable individual characteristics (such as age, gender) and $x_j'\beta_2$ is a vector of family characteristics (such as father's and mother's age, father's and mother's education, household income, etc.). ε_{ij} is a standard normally distributed variable that, for a causal interpretation, we assumed to be uncorrelated with the explanatory variables.

4.4.3. Fractional logit model

We now turn to the proportion of educational expenditures as our dependant variable. An OLS is unworkable for regressions on proportions because two of its tenets are violated. An OLS requires that the response, *y*, be continuous and unlimited between $-\infty < y < +\infty$, and that the error variance be constant everywhere in that range. However, since our dependent variable is a proportion, it is constrained to the unit interval, $0 < p < 1$, and the variance is not constant but depends on $var(\mathrm{p}) = \mathrm{p}(1-\mathrm{p})$. Thus, OLS regressions would produce biased and inconsistent estimates in this situation due to non-normally distributed errors (Blundell & Meghir, 1987; Cragg, 1971; Lamb, 2004).

To correct this estimation problem, we implement a limited-dependent variable model called the fractional logit model (Papke and Wooldridge, 1993). The standard approach to dealing with a censored variable is via a traditional Tobit model that combines the probit likelihood that a zero value will be observed with the linear regression likelihood to explain non-zero values. However, more complex Tobit models are needed when, in addition to a lower bound, an upper bound is present (in this case, at the value one). Even if no upper

bound values are present, the fractional logit model is theoretically consistent, as the Tobit model simply does not apply when theoretical values beyond the censoring point are infeasible.

The fractional logit model is estimated via quasi-maximum likelihood, and the log-likelihood for our dependent variable $Y_{3_{ij}}$is given by:

$$ln\,L = Y_{3_{ij}} log(\Lambda(\boldsymbol{x}'_{ij}\,\beta)) + \beta)) + \left(1 - Y_{3_{ij}}\right) log(1 - \Lambda\left(\boldsymbol{x}'_{ij}\beta\right))(4.3)$$

Where Λ is the logistic CDF and $y_{3_{ij}}$ is bounded between [0,1] (which differs from normal logit models that limit y to a value of either 0 or 1). $Y_{3_{ij}}$ is the proportion of household expenditure on education for each child *I* in household *j*. $\boldsymbol{x}'_{ij}$ is a vector of individual and family characteristics used in the previous models. We can interpret the coefficients using odds ratios or marginal effects. In this case, we present marginal effects calculated at the mean of other independent variables.

4.4.4. Selection models

So far, the previous three models have been estimated independently and take no account of any underlying selection process that may drive our dependent variables. For example, equation (4.2) is only observed when spending on education is above 0. However, when the correlation between the two error terms in (4.1) and (4.2) is non-zero, selection bias will exist, and bias the resulting estimates in equation (4.2). This could occur if an underlying non-observed process is driving both models, such as parental motivation or attitudes towards spending (possibly due to other unobserved family background variables). For this reason, we also explore two selection models that aim to account for potential selection in education expenditure.

The first model is the traditional Heckman selection model (Heckman, 1979), where a regression equation is specified, in this case, our OLS model in equation (4.2):

$$log(Y_{2_{ij}}) = \alpha_i'\beta_0 + x_i'\beta_1 + x_j'\beta_2 + u_{1_{ij}} \quad (4.4)$$

and a selection equation is specified, in this case, our Logit model in equation (4.1):

$$Y_{1_{ij}} = z_i'\beta_1 + z_j'\beta_2 + u_{2_{ij}} \begin{cases} 0 \; if y_{1_{ij}}^* =< 0 \\ 1 \; if y_{1_{ij}}^* > 0 \end{cases} (4.5)$$

The error terms are distributed as follows:

$$u_1 \sim N(0, \sigma)$$

$$u_2 \sim N(0,1)$$

Additionally, there is a correlation between both error terms of $corr(u_1, u_2) = \rho$. We estimate this system via maximum likelihood and achieve identification by including at least one additional variable in (4.5) that strongly affects the chance of observation (i.e., the probability that children experience educational expenditure), whilst not affecting the outcome under study (i.e., the actual educational expenditure). Theoretically, we can run the model without such variables, but in this case, identification will depend on functional form.

We can apply the same selection treatment to equation (4.3) examining the proportion of household expenditure on education. Traditional models used for proportions, such as the fractional logit model mentioned above, assume that proportions are bounded between 0 and 1, but do not actually consist of 0s or 1s. However, as highlighted in Figure 4.2, our data clearly contains a large proportion of 0s. This suggests there might be an underlying process generating the 0s, and equation (4.3) does not consider this explicitly. Equation (4.3) specifically assumes that proportions taking values greater than 0 are determined through

the same process as proportions that take the value 0. Obviously, this may be an incorrect assumption.

We therefore also estimate a zero-inflated beta model that consists of up to three parts: a logit model for whether or not a proportion takes the value 0, a logit model for whether or not a proportion takes the value 1, and a beta model for proportions between 0 and 1. In our case, the absence of 1s means that the model reduces to a two-part model. We do the estimation via maximum likelihood and identification is not only necessary if one believes that the underlying process that determines 0s differs from the process that determines proportions greater than 0 and less than 1.

For both models, we spent a significant amount of time examining the dataset for potential exclusion restrictions that we could use in the first stage of either model. Any potential variable could affect the decision to spend on education, but not affect the *amount* of household expenditure on education. Conceptually, this was challenging, and we could find few theoretically suitable variables in the available data. In addition, as our results show, most variables are either statistically significant in all regressions or statistically insignificant in all regressions. We therefore estimated models without exclusion restrictions in both cases and attached these results in the appendix. We acknowledge that such results are unlikely to be robust, but argue nonetheless that these results might suggest some selection bias. Any apparent selection bias in these models suggests that selection is more of a concern than anticipated, and that our 'base' models should be interpreted with caution. Appendix A presents the results for these models.

4.5 Results

Tables 4.3 and 4.4 present the determinants of family educational expenditure for urban and rural households in Iran measured at both the extensive and intensive margins. Employing both margins allows us to explore both the statistical significance and direction of the relationships. The first section presents the results of the logit model examining whether households spent money on education or not; the second section presents the results of the OLS model examining how much money households spent on education where expenditure was more than zero; and the third section presents the results of the fractional logit model for the proportion of household expenditures allocated to education.

4.5.1 Urban areas

4.5.1.1 Logit model

Table 4.3 reports the results of the logit model for any kind of educational expenditure on children in urban areas. The results indicate that parental over-education, maternal education, and most coefficients regarding parents' working status are not significantly related to the probability that families spent money on education. On the other hand, household annual income, child's gender, number of children, age category of children, father's education, and most coefficients on both parents' age, are significantly related to the probability that the family spent money on children's education.

Table 4.3 shows that household annual income is positively related to the probability that the family would spend money on children's education. The results in this table suggest that a 1 per cent increase in household income increases the *likelihood* of household educational expenditure by 1.2 percentage points. It should also be noted that the relationship between income and the probability of spending on education appears to be

relatively linear since the higher order polynomial terms (not shown) were not significant. In other words, children from the richest family are most likely to experience education-related expenditure, whilst children from the poorest families are least likely. The finding that household income has a significant effect on educational expenditure is consistent with wider results in the literature. For example, Glewwe and Patrinos (1999) find that as household income increases, willingness to spend on education also increases. One possible explanation is that parents with higher incomes perceive investments in education as providing future returns in terms of greater earnings potential and higher quality of life for their children. This suggests that lack of intergenerational income mobility exists in Iran.

Table 4.3 also suggests a positive and significant relationship between a child's gender (being a girl) and the probability of any kind of educational expenditure. According to our results, the probability of any type of educational expenditure rises by 1.3 percentage points for urban households with a girl (although we do not know that the money was actually spent on the girl in mixed gender households). Babaie (2011) claims that one of the reasons parents in Iran spend on their daughters' education is that university education will help them escape low-wage work. On the other hand, Isfahani (2009) investigates the rising marriage age of young Iranians and claims that higher education, especially for women, could increase their chances of marriage. Finally, Salehi-Isfahani (2011) claims that higher educated young women in Iran will be the main educators in the home as future mothers. This interesting argument could also explain why households value educating girls more. Considering the studies mentioned above(Babaie, 2011; Isfahani. 2009) our proposed explanation for a higher likelihood of educational expenditure for girls is that given existing discriminations against women in the Iranian labour market, parents who are aware of these prejudices expect that higher and more productive education for the girls might help compete with their male

counterparts in the labour market, increase their chances of getting married, and become better educators when they have children.

Table 4.3 suggests that a father's age is only significantly related to the probability of spending on education when they are between 20 and 40 years old. Households with fathers between 20 to 30 years old have the highest probability of educational expenditure on children; compared to our reference age (10 to 20), households with fathers between 20 to 30 years old are 4.7 percentage points more likely to spend on education. On the other hand, children whose fathers are between 50 to 60 experienced a lower probability of educational expenditure (1 percentage points) compared to children with fathers between 20 to 30 years old (4.7 percentage points). It should be noted that the sample size becomes small quickly as paternal age increases and this contributes to wider standard errors.

For maternal age, the categories 20 to 30, 30 to 40, and 40 to 50 are significantly related to probability of spending on education. Mothers between the ages of 40 to 50 have the highest probability of educational expenditure on children although the effect remains similar to that of young fathers (approximately 4 percentage points) across the entire maternal age range. This is an interesting difference from results related to fathers. It should be noted that these parental effects are independent of children's ages since we control for these separately.

A father's education level appears to affect the probability of household educational expenditure. Table 4.3 shows that if a father has a university degree or equivalent, the probability of educational expenditure on children in his household rises by 3 percentage points. Furthermore, if a father has a PhD degree or above, the probability of educational spending rises by 6 percentage points. Maternal education, however, is not an important determinant of the probability of expenditure on education. This might be because in a

typical, traditional Iranian household, fathers are the children's guardians and the main decision makers. This finding suggests that any intergenerational transmission of education in Iran is likely to be driven by the father's education as opposed to the mother's education. This is also an interesting result in light of the other finding that girls in a family increase the likelihood of educational expenditure. This may have important implications for future studies on social and intergenerational mobility in Iran.

Finally, in line with expectations, there is a clear positive relationship between the number and age of children and the probability of educational expenditure. The coefficients for number of children are large and significant, and show the importance of household size on the probability of spending on education. It should be noted that because the sample is limited to households with children, the reference category is 1 child. This suggests that larger families (those with 2 children or more) are significantly more likely to spend money on educational goods. Coefficients for all child categories over 1 are approximately 25 percentage points more likely, which is a large probability increase. The largest coefficients in our model, however, are those relating to the age of a household's children. The highest probability of educational expenditure is for households with teenage children aged 10 and 14. All categories show coefficients of approximately 0.5, suggesting a 50 percentage point increase in the probability of spending over children that are younger than 5 years old.

As mentioned before, coefficients such as parental over-education, maternal education, and parents' working status were not significantly related to the probability that households spent money on their children's education, while the primary determinants of whether families spend money on their children's education are the number and age of children in the household, the level of their father's education, and family income level.

4.5.1.2 OLS model

Observing the results for the intensive margins in column (2) of Table 4.3 also provides some interesting insights on the determinants of parental expenditure on children's education in urban areas. Here, the dependent variable is the log of educational expenditure for families who spend money on education; there are 53,171 observations. According to this table, child gender, fathers' age, most coefficients on parents' over-education and employment status are not significantly related to the amount of household educational expenditure. While household income, maternal age, and both parents' education status, child age, and household size is significantly related to the amount of educational expenditure.

There is a clear positive relationship between annual household income and the amount of educational expenditure, where the coefficient is 0.317.The coefficient suggests that educational expenditure is a necessity good. This means that like any normal good, educational expenditure rises as household income risesal though the increase for spending on education is less than proportional to the rise in income. In other words, the proportion of expenditure on education falls as income rises. This finding is in accordance to worldwide literature (for example, Gundersen et al, 2004) for demand on education. However, as Gundersen et al (2004) explain, in most developed countries household can borrow the money they need and invest it on their children's educations whereas in developing countries, 'where credit markets function poorly most investment in education must be funded by households. This makes it very likely that credit-constrained and risk averse lower income households will invest less in education'(Gundersen et al, 2004, p.9). Finally, the magnitude of this coefficient suggests that household income is an important determinant of educational expenditure on children.

Moreover, the maternal age categories suggest that older mothers spend more money on education, and mothers aged 50 to 60 spent the most on children's education. Note

That none of the father's age categories (apart from the missing variable) are significant in the OLS model. Furthermore, Children from families with highly educated parents experienced higher educational expenditure. For father's education level, the results show a similar relationship to the previous model: a father's education is significantly related to the amount of household educational expenditure, and fathers with a PhD or above spent substantially more (coefficient 1.138) on their children's education. Fathers with some type of university degree also spend 40% more on their children's education. Interestingly, unlike the previous models, maternal education also appears significant, and these coefficients suggest, consistent with the existing literature (Harris and Morgan, 1991; Lundberg and Rose, 2002), that the maternal education level has a greater positive effect on educational expenditure than fathers' education level. Table 4.3 suggests that for mothers with a PhD qualification or above the coefficient is 1.811 while for fathers with a qualification with a PhD or above the coefficient is 1.138 with the same level of education. Note that the differential relative to the reference category is larger for women than for men, suggesting there is more variation in spending across education attainment categories of mothers than of fathers.

Finally, our results on child age and household size suggest a positive and significant relationship between these variables and the amount parents spend on their children's education. Table 4.3 shows that as the number of children and their ages rise, the amount of educational expenditure also rises. Children aged 15 to 22 received the highest expenditure compared to other age groups. Thus, students studying for high school, or preparing for university entrance or the labour market, receive the greatest educational expenditure.

4.5.1.3 Fractional logit model

Columns (7), (8), and (9) of Table 4.3 estimate a fractional logit model for the proportion of expenditure allocated to education by urban households. Most coefficients do not appear to directly relate to the proportion of expenditure. The column shows that child's gender, parents' age, parents' schooling, and employment status are not significantly related.

In terms of financial resources, our model suggests a negative relationship between the proportion of expenditure allocated to education and household wealth. This contrasts with models (1) and (2), which suggest a positive relationship between household educational expenditure and family income. The marginal effect of -0.004 is statistically significant at the 0% level, and suggests that richer families proportionally spend approximately 0.4% less on education for each 1% increase in total income. This suggests that in urban areas, as families become wealthier, total expenditure on other consumables rises, but the proportion allocated to education declines. This is an interesting contrast to the 'level' models in columns (1) and (2) that suggest ever increasing expenditure on education items.

In terms of fathers' over/under education, our model indicates some negative effects of educational mismatch on the proportion of expenditure allocated to education. Our previous model suggests no statistically significant effect of parental over-education, so it is interesting to see its influence on this dependent variable. Column (3) in Table 4.3 shows that while under-educated fathers have a negative effect on the proportion of educational expenditure, this effect is positive for children whose fathers are overeducated; in comparison with household whose fathers are normally educated, households with over-educated fathers experience a 0.7% increase in proportional spending. In terms of maternal over-education, we observe a positive significant relationship for over-educated mothers, where the coefficient is 0.008 and translates to a 0.8 per cent increase in household spending

on education proportionally. A possible explanation for higher educational spending of over-educated parents is that although these parents are over-educated and possibly haven't received the appropriate income and employment they initially invested for, they value education beyond an investment but as a precious feature. Hence they spend higher proportion of their income on the education of their children. Another explanation might be related to the intergenerational impact of education, and how parents' experience of educational expenditure by their family shapes their future expenditure on educating their children (Steelmann and Powell, 1991). In other words overeducated parents still spend proportionally more of their income on their children's education because their own parents spent higher proportion of their income on their children's education. The coefficient for mothers who are undereducated, however, is not statistically significantly different from zero, which suggests that this does not play a role in household allocation decisions. Households in which both parents are overeducated experienced approximately 1.5% more expenditure on education proportional to household expenditure. We can also observe that maternal education has a positive and significant impact on the proportion of a household's educational expenditure. For instance, households where the mother has a PhD experience a 3.6% increase in the proportion of household's educational expenditure. As stated before, father's education is not significantly related to the proportion of education expenditure in urban households.

Finally, the results of the fractional logit model suggest a positive and significant relationship between the numbers of children, child's age, and the proportion spent on education. Column (3) of Table 4.3 shows that households with children aged 10 to 15 spent the highest proportion of their expenditures on education, and bigger households with more children spent the greatest proportions.

4.5.1.4 Selection models

We noted previously that our selection models are based on an identification strategy that does not use exclusion restrictions due to the difficulty of finding appropriate variables. We nonetheless argue that we can obtain some insight on possible selection effects by examining and comparing the coefficients of key variables across both model types (non-selective vs selective). We present the results for our selection models in Appendix A.

Examining the Heckman selection model for urban areas suggests that the Mills inverse ratio is statistically significant. This indicates that selection into expenditure may be an issue in our previous models, and that our results should be taken with some caution. When examining the coefficients in detail, however, most variables between the selection and non-selection model display statistically similar coefficients. Only father's age and child's age appear to deviate between the models. This suggests that a possible route into selection may be age-related factors, and these could be explored in more detail. The overall conclusion remains that both sets of models display broadly similar findings, even in the presence of a statistically significant selection term.

The same applies to the fractional logit expenditure proportion model. Evidence from our zero-inflated beta models suggests that including a selection equation does not significantly alter the results of the proportional outcomes. Although the selection term does suggest some selection, the individual coefficients are generally not statistically significantly different. We therefore argue that for both model types, we can accept our standard set of results, with some caution.

Table 4.3: Results on Urban Areas

Variable		Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational expenditure		
		Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Continuous										
Log family income last year (deflated)		0.012	0.002	0.000	0.317	0.015	0.000	-0.004	0.001	0.000
Child gender (female)		0.013	0.002	0.000	-0.020	0.011	0.173	-0.001	0.000	0.059
Categorical										
Father age(reference: 10 to 20)										
	20 to 30	0.047	0.009	0.000	-0.131	0.071	0.165	0.001	0.001	0.524
	30 to 40	0.037	0.011	0.001	0.041	0.075	0.581	0.003	0.002	0.104
	40 to 50	0.022	0.014	0.109	0.079	0.079	0.321	0.003	0.002	0.088
	50 to 60	0.010	0.018	0.558	0.162	0.087	0.064	0.002	0.003	0.397
	Missing	-0.016	0.017	0.209	0.570	0.096	0.000	0.036	0.003	0.000
Mother age(reference: 10 to 20)										
	20 to 30	0.039	0.007	0.000	0.088	0.033	0.007	-0.001	0.001	0.481
	30 to 40	0.043	0.011	0.000	0.139	0.041	0.001	-0.003	0.002	0.126
	40 to 50	0.049	0.012	0.000	0.150	0.052	0.004	-0.005	0.002	0.116
	50 to 60	0.028	0.018	0.113	0.174	0.093	0.062	-0.008	0.003	0.121
	Missing	-0.036	0.046	0.427	-0.339	0.437	0.438	-0.001	0.002	0.471
Father education levels (reference:Level 1)										
	Level 2 (Secondary School)	0.010	0.005	0.037	0.102	0.025	0.000	0.000	0.001	0.841
	Level 3 (High School)	0.013	0.005	0.011	0.269	0.028	0.000	-0.002	0.001	0.134
	Level 4 (Degree)	0.030	0.006	0.000	0.406	0.038	0.000	-0.007	0.001	0.123
	Level 5 (Phd)	0.060	0.016	0.000	1.138	0.219	0.000	0.008	0.009	0.402
	Level 6 (other)	0.024	0.015	0.112	-0.036	0.118	0.759	-0.004	0.005	0.446

Table 4.3(Continues): Results on Urban Areas

Variable	Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational		
	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Missing	-0.031	0.011	0.004	-0.057	0.049	0.249	-0.005	0.002	0.015
Mother education levels(reference:Level 1)									
Level 2 (Secondary School)	0.010	0.004	0.011	0.130	0.026	0.000	0.002	0.001	0.024
Level 3 (High School)	0.005	0.005	0.262	0.299	0.029	0.000	0.007	0.001	0.000
Level 4 (Degree)	0.012	0.010	0.250	0.430	0.067	0.000	0.004	0.002	0.001
Level 5 (Phd)	0.037	0.028	0.182	1.811	0.383	0.000	0.036	0.019	0.005
Level 6 (other)	-0.107	0.059	0.067	-0.432	0.184	0.019	-0.018	0.006	0.005
Missing	-0.029	0.015	0.054	-0.261	0.082	0.001	-0.008	0.003	0.002
Fathers overeducation(reference:Normal)									
Undereducated	0.003	0.005	0.619	-0.014	0.027	0.605	-0.004	0.001	0.000
Overeducated	-0.003	0.006	0.537	0.046	0.037	0.214	0.007	0.001	0.000
Mother overeducation(reference:Normal)									
Undereducated	0.003	0.007	0.651	-0.103	0.038	0.008	0.000	0.002	0.785
Overeducated	-0.023	0.013	0.076	0.130	0.077	0.092	0.008	0.003	0.002
Father working status(reference:Working)									
Working (reference category)									
Looking for job	-0.005	0.011	0.592	-0.085	0.056	0.129	0.003	0.002	0.303
Inactive	0.013	0.004	0.005	0.050	0.029	0.084	0.004	0.001	0.001
Housekeeper	.	.	.	-0.785	0.076	0.000	-0.014	0.003	0.000
Other	-0.019	0.022	0.383	0.048	0.103	0.639	0.001	0.004	0.800

Table 4.3(Continues): Results on Urban Areas

Variable	Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational		
	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Mother working status(reference:Working)									
Looking for job	0.015	0.014	0.230	-0.063	0.152	0.677	-0.007	0.004	0.070
Inactive	0.010	0.013	0.428	-0.035	0.078	0.651	0.001	0.003	0.651
Housekeeper	-0.012	0.008	0.090	0.010	0.042	0.820	-0.003	0.002	0.109
Other	-0.161	0.117	0.174	-0.120	0.436	0.783	0.007	0.019	0.737
Number of children in household aged less than 22(reference: 1)									
2	0.228	0.007	0.000	0.249	0.023	0.000	0.010	0.00	0.000
3	0.274	0.008	0.000	0.503	0.027	0.000	0.015	0.00	0.000
4	0.274	0.009	0.000	0.700	0.037	0.000	0.022	0.00	0.000
5	0.261	0.012	0.000	0.869	0.057	0.000	0.021	0.00	0.000
6 or more	0.266	0.014	0.000	0.953	0.098	0.000	0.030	0.01	0.000
Child age(reference: 0 to 5)									
5 to 9	0.496	0.015	0.000	0.303	0.045	0.000	0.018	0.001	0.000
10 to 14	0.534	0.017	0.000	0.825	0.049	0.000	0.029	0.001	0.000
15 to 22	0.506	0.019	0.000	1.005	0.053	0.000	0.025	0.001	0.000
Missing	0.503	0.019	0.000	1.301	0.063	0.000	0.020	0.002	0.000
Regional controls (22 regions)	included	included	included	included	included	included	included	included	included
N		63025		53171			63027		
R^2/pseudo R^2		0.397		0.288			-		

Source: HIES 2009/10-2011-12. Standard errors clustered on household

4.5.2. Rural areas

4.5.2.1. Comparison of rural and urban areas

Table 4.4 shows the results for rural households in Iran from 2009/10 to 2011/12. To avoid repetition, we will not explain each coefficient individually, but will instead highlight the differences in results between urban and rural areas.

Table 4.4 shows that child's gender, maternal educational levels, parental over-education, and employment status are not statistically significant in rural areas of Iran when the dependent variable is whether children experience educational expenditure or not (logit model). However, we observe the significant importance of family income, parents' age, fathers' education, number of children, and child's age. In rural households, like their urban counterparts, a father holding a university degree increases the probability of spending on education. Furthermore, the coefficient for the effect of a father's university degree is 0.046, which is larger than for urban areas (0.030). Interestingly, maternal education does not appear to be an important determinant of the probability of educational spending in either rural or urban areas.

Turning to the OLS model in Table 4.4, we observe that just like in urban areas, there is a strong and significant relationship between annual household income and the amount spent on education. Table 4.4 shows that children from richer households in rural areas received 15% more educational spending than children from lower-income families. Table4.4 also shows that child's gender (being a girl) is negatively related to the amount of household educational expenditure, and this effect is stronger in rural areas than urban areas. In addition, the strong positive relationship between maternal education level and amount of educational expenditure does not hold in rural households, where all of the coefficients on maternal education are not statistically

significantly different from zero. Just like in urban areas, however, there is a positive relationship between households with a father who completed higher education and the amount spent on education. For instance, household's where the father has a university degree spend 32% more on their children's educational expenditure, which is a similar differntial than urban households (40%). Finally, similar to urban areas, there is a significant positive relationship between the number and, age of children, and the amount of educational expenditure in rural areas. In terms of the proportion of expenditure allocated to education within rural households Table 4.4 shows that wealthier rural households spend a lower proportion of their income on education, which is consistent with our findings for urban households. We can also observe that, father's education level has a different effect in urban and rural areas: Table 4.4 suggests a strong negative and significant relationship between father's education level and the proportion of household expenditure on education. For example, households with fathers with a PhD-level education spend 3.4 percentage points smaller proportion on educational expenditure, while in urban areas, the effect of a father's education level was not statistically significantly different from zero.

4.5.2.2. Selection Models

Appendix B provides the selection model results for rural areas. The Heckman selection model suggests that the Inverse Mills ratio is statistically significant, in that selection regarding expenditure may be an issue in our previous models and that the results should be taken with some caution. When examining the coefficients in detail, however, most variables between the selection and non-selection models display statistically similar coefficients. Only parents' age appeared to deviate between both models. This suggests a possible route into selection may be age-related factors, which could be explored in more detail. The overall conclusion, however,

remains that both sets of models display broadly similar findings, even in the presence of a statistically significant selection term.

The same applies to the third model with the proportion of expenditure allocated to education as an outcome. Evidence from our zero-inflated beta models suggests that including a selection equation does not significantly alter the outcomes. Although the model does suggest some selection, the individual coefficients are generally not statistically significantly different. We therefore argue that for both model types, we can accept our standard set of results, with some caution.

Table 4.4: Results on Rural Areas

	Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational expenditure		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Continuous									
Log family income last year (deflated)	0.015	0.003	0.000	0.154	0.011	0.000	-0.005	0.000	0.000
Child gender (female)	0.000	0.003	0.924	-0.024	0.009	0.006	-0.001	0.000	0.089
Categorical									
Father age(reference: 10 to 20)									
20 to 30	0.092	0.013	0.000	0.011	0.045	0.813	0.003	0.001	0.026
30 to 40	0.065	0.016	0.000	0.125	0.049	0.010	0.002	0.002	0.222
40 to 50	0.063	0.018	0.000	0.178	0.056	0.001	0.003	0.002	0.178
50 to 60	0.050	0.020	0.013	0.147	0.064	0.021	0.001	0.003	0.653
Missing	0.069	0.125	0.580	-0.007	0.233	0.977	-0.014	0.007	0.032
Mother age(reference: 10 to 20)									
20 to 30	0.065	0.009	0.000	0.030	0.025	0.235	-0.001	0.001	0.245
30 to 40	0.066	0.013	0.000	-0.012	0.034	0.718	-0.005	0.002	0.004
40 to 50	0.052	0.015	0.001	-0.025	0.045	0.583	-0.010	0.002	0.000
50 to 60	0.037	0.020	0.071	-0.009	0.079	0.906	-0.016	0.003	0.000
Missing	-0.010	0.048	0.830	-0.065	0.214	0.760	-0.004	0.002	0.018
Father education levels (reference:Level 1)									
Level 2 (Secondary School)	0.003	0.006	0.638	0.032	0.021	0.002	-0.004	0.001	0.000
Level 3 (High School)	0.020	0.009	0.031	0.167	0.044	0.000	-0.011	0.001	0.000
Level 4 (Degree)	0.046	0.009	0.000	0.320	0.051	0.000	-0.013	0.002	0.000
Level 5 (Phd)	0.092	0.015	0.000	-0.275	0.252	0.275	-0.034	0.010	0.001
Level 6 (other)	0.027	0.017	0.109	-0.016	0.095	0.870	-0.005	0.004	0.231
Missing	-0.034	0.015	0.022	-0.041	0.052	0.433	-0.005	0.002	0.008

Table 4.4(Continues): Results on Rural Areas

	Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational expenditure		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Mother education levels(reference:Level 1)									
Level 2 (Secondary School)	0.017	0.005	0.112	0.068	0.024	0.125	-0.001	0.001	0.616
Level 3 (High School)	0.022	0.015	0.157	0.002	0.093	0.982	-0.002	0.002	0.335
Level 4 (Degree)	-0.047	0.027	0.175	0.246	0.116	0.134	0.003	0.003	0.294
Level 5 (Phd)	-0.051	0.022	0.123	0.858	0.532	0.106	-0.002	0.012	0.850
Level 6 (other)	0.049	0.025	0.046	0.039	0.204	0.848	0.013	0.009	0.164
Missing	-0.032	0.021	0.124	-0.215	0.097	0.027	0.002	0.002	0.465
Fathers overeducation(reference:Normal)									
Undereducated	-0.007	0.008	0.364	0.000	0.026	1.000	-0.001	0.001	0.563
Overeducated	-0.018	0.011	0.105	-0.012	0.047	0.797	0.009	0.001	0.000
Mother overeducation(reference:Normal)									
Undereducated	-0.005	0.010	0.615	-0.070	0.035	0.049	-0.002	0.002	0.297
Overeducated	-0.028	0.019	0.129	0.167	0.095	0.079	0.002	0.002	0.331
Father working status(reference:Working)									
Looking for job	0.021	0.010	0.041	-0.020	0.047	0.669	0.001	0.002	0.534
Inactive	0.016	0.006	0.014	0.067	0.033	0.042	0.001	0.001	0.39
Housekeeper	.	.	.	-2.885	0.190	0.000	-0.021	0.009	0.018
Other	-0.032	0.029	0.276	-0.017	0.092	0.854	-0.004	0.004	0.278

Table 4.4(Continues): Results on Rural Areas

	Logit model for any educational expenditure			OLS model of amount spend (Rial)			Fractional logit model of proportion of educational expenditure		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values
Mother working status(reference:Working)									
Looking for job	0.050	0.022	0.020	-0.110	0.113	0.330	0.007	0.007	0.375
Inactive	0.050	0.014	0.000	0.000	0.086	0.999	0.003	0.004	0.472
Housekeeper	0.005	0.007	0.526	0.021	0.027	0.426	0.002	0.001	0.105
Other	-0.013	0.050	0.795	-0.112	0.187	0.547	-0.009	0.004	0.014
Number of children in household aged less than 22(reference: 1)									
2	0.277	0.009	0.000	0.156	0.023	0.000	0.009	0.001	0.000
3	0.350	0.010	0.000	0.410	0.026	0.000	0.017	0.001	0.000
4	0.371	0.011	0.000	0.624	0.030	0.000	0.025	0.001	0.000
5	0.362	0.012	0.000	0.847	0.040	0.000	0.033	0.002	0.000
6 or more	0.340	0.019	0.000	1.025	0.061	0.000	0.037	0.004	0.000
Child age(reference: 0 to 5)									
5 to 10	0.461	0.015	0.000	0.342	0.034	0.000	0.014	0.001	0.000
10 to 15	0.490	0.018	0.000	0.730	0.038	0.000	0.021	0.002	0.000
15 to 22	0.413	0.021	0.000	0.881	0.043	0.000	0.015	0.002	0.000
Missing	0.421	0.022	0.000	1.343	0.059	0.000	0.015	0.002	0.000
Regional controls (22 regions)	induded	induded	induded	induded	induded	induded	induded	induded	induded
N		63135		51455			63170		
R^2/pseudo R^2		0.397		0.288			-		

Source: HIES 2009/10-2011-12. Standard errors clustered on household

4.6 Conclusion

This chapter examined the determinants of household educational expenditure on children, and provided a comparative analysis between urban and rural areas, and gender differences in Iran. As mentioned previously, while studies on household expenditure (such as Fazaeli et al., 2016; Ghiasvand, 2015) have identified the determinants of parental spending on other major household outgoings, the question of education has received little research attention. Despite this, studying household educational expenditure in Iran is important for both policy and research implications. This is because Iranian governments have reportedly announced in their development plans that their main objective is to eliminate gender and regional inequalities in terms of education (Kurd, 2014). This means that understanding factors that determine private/household spending on education is an important first step for Iranian government.

Our results in this section show that in both urban and rural areas a household's annual income, number of children, and age of children were key factors determining the decision to spend on education, the amount spent, and the proportion of household expenditure allocated, which is consistent with existing literature (DesJardin et al.; 1999; Ellwood and Kane,2000). Secondly, we found that household annual income has larger effects (nearly double) in urban areas than rural areas. The positive effects of household income disappear, however, when we observe its effects proportionally, suggesting that while higher income families tend to spend more on their children, they spend the same proportionally. Third, we found that in rural areas, maternal education is not significantly related to decisions regarding spending on education, amount or proportion of educational expenditure, while father's education is significantly related to all these three decisions. This finding suggests that any

intergenerational transmission of education in rural areas of Iran is likely to be driven by the father's education as opposed to the mother's education, which is in contrast with the existing literature that emphasises the important role of a mother's education (Haveman et al., 1991). However, in the context of Iranian society, this result seems comprehensible, as fathers are generally the main decision-makers within Iranian households. These finding highlight the importance of cultural and social effects, and strengthens the argument that studies of parental expenditure on education should go beyond economic regressions to consider more complicated effects and pressures. Finally, our results suggested that, while in both areas, there was a negative relationship between child gender (being a girl), and amount of educational expenditure, this coefficient is only significant in rural areas. This can also be explained by the fact that in rural areas there might not be much demand for educated women, as women are usually working in farms and at homes, where less education is required. Hence rural households don't see it necessary to spend money on their daughter's education.

Overall, our results suggest a common and accepted fact that policy makers should focus on different subjects in urban and rural areas. For instance, it seems that eliminating gender inequality in education might be more challenging in rural areas, while in urban areas, eliminating income inequality between households might be more advisable. In the case of the Iranian government, it appears that it needs to provide cultural lessons to rural households about the important role that women can play, while in urban areas they need to provide more financial access to poorer households, through tax reforms, and various subsidies

Chapter 5. Returns to Education

5.1. Introduction

Investments in education are usually evaluated by rates of return on educational investments, which is the increase in labour market earnings associated with additional education (Borjas, 2012). Becker's (1964) pioneering work on human capital established the notion of evaluating education by its rate of return, and since then extensive research has been conducted on the determinants and effects of returns to schooling around the world (for example Mincer,1974; Spence, 1973; Heckman, 1997, Salehi-Isfahani, 2009, Tansel, 2016).

There are several reasons why our study is important. Firstly, although the existing studies on returns to education are extensive and well established, they largely ignore evidence from the MENA region, particularly Iran (though some researchers do attempt to address this issue, such as Assaad, 1997; El-Hamidi, 2006; Salehi-Isfahani et al., 2009). Second, as mentioned previously, Iranian household expenditure on education is very low, and the government intends to encourage households to invest more in private education. One of the main reasons that households may invest in education is their expectations of future returns to education. Hence, a study on returns to education in Iran is important as it clarifies whether private spending on education has high returns in terms of wages or not. Third, returns to education are usually different in urban and rural areas (Tokila, 2010), where wide differences in their labour market characteristics still exist, and this implies that there might be large variations between returns to education between urban and rural areas, which we investigate in this chapter. Finally, there is some evidence in the literature that returns to education are higher for women than men(Huitfeldt and Kabbani, 2007), if this is also the case in Iran, then

policy makers can improve women's status in the society, by encouraging women's educational attainment.

This chapter intends to make three contributions. First, we extend the previous literature on the returns to education in Iran by using a new high-quality data source. Second by attempting a causal interpretation of years of schooling on wages using instrumental variable (IV) techniques. Finally, our study focuses on rural and urban regions and men and women separately, which was not previously done in any studies of returns to education in Iran.

This chapter has various interrelated objectives. The first is to investigate the average returns to schooling in terms of wages in Iran. Our second goal is to investigate the difference between returns to schooling for men and women separately to determine whether there are any differences between these returns in terms of gender. Our third objective is to examine whether there are any differences in returns to human capital between urban and rural areas of Iran. Our fourth goal is to examine the existence of non-linearities in returns to education in Iran. Our final objective is to investigate the causal returns to education in Iran. To fulfil the first, second, and third objectives, we employ a simple Mincer function, and report the results for urban and rural areas and for men and women separately. In order to examine non-linearity in returns to education in Iran(fourth objective), we employ a quadratic term for schooling in our Mincer function as well as using educational levels instead of years of schooling. Finally, in order to attain objective 5, we employ an IV strategy to examine the causal effects of education on earnings.

This chapter is organised as follows. The next section examines the literature on the determinants of returns to schooling. Section 3 presents the summary statistics of the data

used in this study. Section 4 describes the methodological approach, while the empirical results are presented in Section 5. Section 6 presents the concluding remarks.

5.2. Literature Review

5.2.1 Introduction

Returns to education can be divided into two categories: social returns and private returns. Social returns to education consider the direct costs of schooling incurred by governments and then refer to the large scale benefits from such investments. On the other hand, private returns to education refer to the individual's benefits from investments in education. In this section, we focus on private returns to education and overlook public returns to education (Harman et al, 2000).

We should note that private returns to education are observable in three interrelated aspects: higher wages, greater employment stability, and greater upward mobility in income (Mincer, 1974). Private returns to education in terms of higher wages can be a result of two factors. First, as discussed in the theoretical chapter (Chapter 2), increased human capital results in higher productivity that allows workers to extract higher hourly wages. Second, increased education 'increases labour force participation, decreases the probability of unemployment, and decreases job turnover. This results in highly educated workers who work a greater number of hours annually for higher hourly wages than their less educated labour market competitors' (Hall, 2000, p.5). This chapter examines only the returns to education in terms of higher wages, and overlooks the other two effects of education. Nevertheless, Chapter 6 will look at a different aspect of employment, namely, mismatch in the labour market.

In the next section, we examine the Mincer function and its drawbacks, and then discuss factors that impact returns to education in term of wages. We also examine the related literature on the MENA region countries as well as the case of Iran.

5.2.2 Estimations of returns to education

The Mincer function, which we mentioned in Chapter 2, contributed a lot to labour economics, and addresses many subjects within this area. The Mincer function in its simplest form can be represented as follows:

$$lnw_t = \beta_0 + \beta_1 S + \beta_2 \chi + \beta_3 \chi^2 + \beta_4 Z + \varepsilon \quad (5.1)$$

where lnw_t is the log wage at time t, S is years of schooling, χ denotes years of labour market experience, and Z is a vector of other miscellaneous observed variables. χ is quadratic to allow for any possible decline in post-school human capital formation. Here, β_1 is the marginal effect of schooling in percentage on log wages. However, this specification has several drawbacks:

The first drawback of the original Mincer function is related to the variable of schooling, S. This variable refers to years of schooling; however, some researchers (such as Spence, 1973; Heckman, 1977) argue that returns to education is not the same in every year of schooling, and suggests that the return on a year of schooling might be higher between 11 and 12 years of education (high school credential effect) and between 15 and 16 years of schooling (college credential effect) than for other years of schooling. This is motivated by the evidence that degrees matter over and above years of schooling (the sheepskin effect)[10].Furthermore, Krueger and Lindahl (1998) find that there is an inverted-U patter for returns to education that suggests that there are diminishing returns to education, with the peak effect at 7.5 years. In

[10] More detailed discussion of non-linearity of education is provided in section 5.4.2.

this section of thesis, we will first employ a schooling variable as in the original Mincer function. Furthermore, we will employ a quadratic term for schooling, to investigate the notion of diminishing returns to education (as suggested by Krueger and Lindahl (1998))and thenwe will employ educational levels instead of years of schooling to investigate the sheepskin effect (as suggested by Isfahani, 2009).A second critique of the Mincer function is also related to the schooling variable, and the fact that in the original Mincer function, the schooling variable is treated exogenously, while many researchers stress that education is an endogenous choice variable in human capital theory (Borjas, 2012). However, there is no agreement over the magnitude of this endogeneity bias in the literature. For instance, Angrist and Krueger (1991) suggest a limited impact of endogeneity, while Harmon and Walker (1995) find a rather large effect.

Finally, in the Mincer specification, 'the disturbance term captures unobservable individual effects, which may also influence the schooling decision and induce a correlation between schooling and the error term in the earnings function' (Harman et al, 200, p.5). Usually unobserved ability is being used as an example for this situation. In this context, Murnane et al. (2000) argue that at least 50% of the full return on higher achievement can be attributed to individual ability. However, there is disagreement among researchers on how to deal with the issue of endogenity (Griliches, 1976), and various modifications were employed to find proxies for ability. As Regan, et al. (2006) argue, some scholars (such as Behrman and Birdsall, 1983; Card and Krueger, 1992) employ a variable such as quality of schooling in their earning function to address the unobserved omitted variables, while others (such as Altonji and Dunn, 1996; Ashenfelter and Zimmerman, 1997; Agnarsson and Carlin, 2002) include a variable that captures family background. We should note that although studies use various modifications for unobserved effects, the threshold argument in each is that 'by inclusion of

some proxies for ability the coefficient on education will capture the effect of education alone since ability is controlled for' (Harmon et al., 2000, p. 8).

On the other hand, various studies (Ashenfelter and Krueger, 1994; Rouse, 1999; Behrman and Rosenzweig, 2001) try to address endogeneity by employing research on identical (monozygotic, MZ) twins. According to Trostel (2005), 'it is the prospect that differencing within MZ twin pairs eliminates unobserved endowments that makes twins attractive for researchers. Thus, the extent of ability bias can, in principle, be inferred from comparing the schooling coefficient estimate using data on the fraternal (dizygotic, DZ) twins (or, indeed, any sample of unrelated individuals) with estimates based on MZ pairs of twins' (Trostel, 2005, p. 198). However, various researchers (such as Bound and Solon, 1999; Griliches, 1979) criticise the simplistic assumption of such studies and the fact that all these studies assume that 'the omitted ability is entirely made up of a genetic effect', and argue that there are other factors such as birth weight differences between twins that can affect their ability to obtain schooling later (Bingley et al. 2005, p.4).

Angrist and Krueger (1991) propose a final approach to address endogeneity by introducing IV estimates. They explore season of birth as a suitable instrument, and investigate how this might affect students' school leaving age. Following this methodology, Harmon and Walker (1995) use a change in the compulsory schooling law that raised the minimum schooling age in Britain to generate an exogenous change in education. 'In both of these approaches, the key variable will affect the education decisions of a subset of the population, those who leave school as soon as they can, so one interpretation of these results is that the IV estimates identify the rate of return on the marginal or "treated" group only'(Denny and Harmon, 2000, p.2). In this section, we attempt to address endogeneity by employing the same methodology. To do so, we employ two instruments: parental background and the educational

expansion that occurred in Iran after the Islamic revolution. We provide more details about this approach in the methodology section.

5.2.3 Determinants of Returns to Education

In this section, we discuss various determinants of returns to human capital, namely, ability, gender, and schooling characteristics.

Many researchers (such as Levhari and Weiss, 1974; Altonj, 1996; Card, 1999; Walker, 2000) recognize that one of the most important determinants of individuals' returns to education is their innate ability. As Walker (2000) points out, differences in ability can have two effects. First, individuals with more ability are probably more competent to 'convert' schooling into human capital efficiently. On the other hand, the opportunity cost of schooling is higher for individuals with higher ability because they could earn more money by working in the labour market instead (Walker, 2000). However, despite the existing acknowledgment of the importance of individual ability in the literature on returns to education, it is not easy to examine this factor in datasets (Levhari and Weiss, 1974). Consequently, the issue of individual ability usually leaves its trace in concern over bias in the empirical applications of human capital theory (Altonji, 1996; Heckman and Sedlacek, 1985).

Prior studies also examine the impact of gender on returns to schooling, and whether such returns are higher for women than for men. For instance, in one of the most comprehensive papers in the literature, Dougherty (2005) cites 27 studies on returns to education in the U.S., of which 18 report unambiguously higher returns for women than for men. For Europe, Trostel et al. (2002) report estimates for 28 countries, and find that for 24 of these countries, returns are higher for women. However, we should note that the level at which schooling is responsible for different estimates of returns to schooling by gender is

unclear, and while most studies imply that university education is responsible for higher returns for women, these results have been called into question. For instance, Pekkarinen (2012) argues that 'previous studies fail to account for the top-coding of earnings in the available data and that once this is done, there is no evidence of gender differences in returns to university education' Pekkarinen, 2012, p.8). He then studies the trends of returns to university education for men and women since the 1980s and suggests that this increase in returns occurred for both men and women since the early 1980s. Overall, it seems fair to conclude that although the evidence on gender differences in returns to university education is inconclusive, most of the literature points toward the fact that returns to education are higher for women than for men. However, we should point out that 'women still work less hours over their life cycles than men do at all levels of education; hence, even if there are no large differences in university premiums between men and women, men are still in a better position to reap the full financial benefits of education than women are' (Nordic, 2012, p.176).

Schooling characteristics can also be an important determinant of returns to schooling (Borjas, 2012), and various studies acknowledge the important impact of schooling on returns to education (for example, Card and Kruger, 1992; Betts, 2010; Groger, 1996; Harmon and Walker, 2000; Dearden et al., 2002). For instance, Card and Krueger (1992) analyse the effects of pupil/teacher ratios and annual teachers' pay on returns to education, and find a large, negative, and significant effect of pupil/teacher ratios on the rate of return on education. On the other hand, Hanushek et al. (1996) study the effects of school characteristics on returns to education, and claims that the level at which school quality is aggregated affects the estimation results, and claims that 'aggregation biases upward estimated school quality effects' (Case, 1999, p.19). Replicating the Card and Krueger results in the 1970, 1980, and 1990 censuses, Heckman et al. (1998) clarify the importance of allowing for non-linearity in

the returns to education when estimating the impact of school resources. Implementing non-linearity in the returns to education, they find that school quality is only strong for those who attend college. For the UK, Blundell et al. (1997) find that men who study subjects such as chemistry or biology degrees have lower returns than average, while women graduating with education, economics, accountancy, and law degrees have significantly higher returns compared to other subjects. Overall, the existing evidence on the impact of schooling is rather mixed and inconclusive, the main reason being that there are various dimensions of schooling, and no study can examine all of these factors together.

5.2.4 Returns to education in developed countries

Becker (1964) conducted the first attempt to estimate returns to education by estimating the internal rate of return on college and high school education, finding a rate of return between 13% to 28%. Following Becker's estimation, Solow (1965) argues that these large estimates must be corrected for correlations between education and ability, and addresses the issue of endogeneity of schooling in the human capital model. Generating his famous equation, Mincer (1974) estimates that each additional year of schooling yields a net increase of 11.5% in annual earnings (Psacharopoulos, 1994). Ashenfelter and Krueger (1994) estimate the return on schooling by introducing returns to schooling and wage rates of identical twins with different levels of educational attainment, and suggest that each additional year of schooling generates a wage increase of about 12% to 16%. Rouse (1999) also took a similar approach; however, his estimates were lower than those in the initial twin studies (about 10% per year of schooling). Arias and McMahon (2001) estimate the dynamic and expected rates of return on college and high school in the US, and after correcting for ability, family factors, and measurement errors, suggest that average returns are 13.3% in real terms. Dearden (1999) and Blundell et al. (2005) try to address common issues that usually

cause biased OLS estimates, 'including measurement error, omitted ability bias, composition bias, and the heterogeneity of returns according to observable characteristics' (Cattan, and Crawford,2016.p.8). Both studies estimate returns to educational qualifications by different model specifications and methods (OLS, matching, IV, and control function methods). They estimate that returns to education are between 5% and 19% depending on the methodological approach. In a meta-analysis of the related literature, Ashenfelter et al. (1999) review 96 estimates from 27 studies conducted in 9 different countries and find that the average OLS estimate of the return on schooling is 6.6%, whereas the average IV estimate is 9.3%. In a comprehensive analysis, Montenegro et al. (2013) employ a meta-analysis of data based on 545 observations from 131 economies. They suggest that between 1970 and 2011, the average rate of return on one additional year of schooling is 10.4%. Interestingly, they find that the returns to schooling by world region are highest in Sub-Saharan Africa and lowest in the MENA region. Table 5.1 summarises Montenegro et al. (2013) results.

Table 5.1: Returns to schooling by region[11]

Region	Returns to Schooling (%)
World	5.6
Middle East and North Africa	7.0
South Asia	8.2
High Income Economies	10
East Asia and Pacific	10.3
Latin America and Caribbean	10.3
Sub-Saharan Africa	12.8

Source: Montenegro et al. (2013)

Table 5.2 summarises the empirical findings above with respect to the rate of return on education. As we observe, the overall empirical evidence (for developed countries)

[11]It should be noted that table 5.1 only presents selected regions and not every region in the world.

suggests that the average estimate of the return on an additional year of education ranges from 5% to 15% (Wilson, 2001). We must also mention that according to the World Bank (2013), returns to schooling have been declining significantly, and since the 1980s, the returns have declined by 4.5 percentage points, or 1% per year. Part of the explanation for this trend can be the rise in educational expansion by almost 50% (World Bank, 2017).

Table 5.2: The rate of return to Education

Study	Year	Estimate
Becker	1964	13%-28%
Mincer	1974	11.50%
Ashenfelter and Krueger	1994	12%-16%
Psacharopoulos	1994	5%-15%
Dearden	1998	5.5%-9.3%
Ashenfelter, Harmon, and Oosterbeek	1999	6.6%-9.3%
Arias and McMahon	2001	11.7%-13.3%
Wilson	2001	5%-10%
Montenegro	2013	10.40%

However, all of these studies focus only on private returns to education. Cattan et al. (2013) argue that such an approach could be misleading. They direct attention to an individual's educational spill-over to their firm, city, or country and suggest that 'if these effects are positive but unaccounted for by individuals when making educational decisions, they will lead individuals to under-invest in their education from a social perspective, thus creating an incentive for government subsidization of education. The traditional approach focusing on the individual returns to education obviously ignores this part of the picture and thus could under-estimate the total benefits of education' (Cattan and Crawford, 2013, p. 15).

A final limitation of these studies is that they estimate the private returns to education at one particular age, while there is evidence of life-cycle changes in the impact of education on wages (Heckman et al., 1996; Cattan et al. 2013; Haider and Solon, 2006). In other words,

the returns to education is not constant over the lifecycle, while many of the studies mentioned above use data from different time periods (Dickson, 2015). According to Buscha and Dickson (2015) Bhuller et al. (2011) specifically warn of the danger of lifecycle bias and suggest that estimating returns to educational attainment over a lifecycle can provide more precise estimates of returns at various ages.

5.2.5 Returns to education in the Middle East and Iran

Wahba (2000) investigates the determinants of labour market earnings in Egypt. She assesses the relative importance of individual and regional effects on earnings inequality. The main findings of the paper are: (i) the average rate of return to education is 7.8% for the whole sample. (ii) returns to education increase with rising educational levels; for instance returns to education for university degree are 131%, while for secondary education are 74%, and for those with basic education are 22% (iii) there are substantial variations in returns to education across regions. (iv) estimates point to the importance of sheepskin effects in the Egyptian labour market. However, this study employs only a simple OLS model and does not examine causal returns to education or point to the possibility that returns to education are heterogeneous across individuals and that individuals make educational decisions based on their individual gains. Hence, the OLS estimates used in this study are likely to be biased and should be interpreted with caution. It also does not mention the possibility of strong selection mechanisms into higher education because, if education is not randomly assigned and is instead assigned according to ability, the estimates are not returns to education but to ability as well. As such, the results should be interpreted with caution. El-Hamidi (2006) also studies the Egyptian labour market using the 1998 household survey. However, she focuses on factors that influence an individual's choice between vocational and general education as well as the relative returns between them. Using an ordered logit model, the study finds that parental

education increases the likelihood of an individual choosing general education. Interestingly, the analysis suggests that the presence of young siblings in the household motivates the parents to send their daughters to vocational school, but the study did not observe this impact for sons in families. Finally, after correcting for self-selection, she concludes that in terms of earnings, vocational education offers higher returns than general secondary education for men, while the study did not observe this impact for women. The study also stresses the existence of a sheepskin effect for men that is not evident for women. One of the limitations of the study is that the sample is restricted to urban workers in the private sector, despite the importance of urban/rural differences in the vocational education curriculum and labour force participation rates. In addition, two thirds of this sample are either not working or working in the public sector, and the econometric technique used to correct for this relies on dubious assumptions, such as the exclusion of parental education, lagged household income, and high test scores from the earnings equation.

Tansel (2016) conducted one of the most recent studies on returns to education using the Turkish Household Labor Force Survey to examine causal returns to schooling for men and women in the 1938-2000 birth cohorts. This study uses the exogenous variation in years of schooling due to the education expansion of the early 1960s as the instrument to address the problem of endogeneity. To our knowledge, this is the only study to use an IV estimation for the returns to schooling in the MENA region. Their analysis suggests that naïve estimates on returns to education are 8% for men and 10% for women. Interestingly estimates of returns are smaller for the Two-Stage Least Squares (2SLS) estimates than for the OLS estimates, which is contrary to the existing IV literature. Their IV estimates suggest that returns to education are 4.7% for men, and 1.7% for women, which suggests that returns for women are lower than for men. The methodology in that study (using education expansion as an IV) is similar to our

methodological approach; we also employ this type of IV for estimates of returns to schooling in Iran. However, we also stress the importance of spatial differences in terms of urban and rural areas, as we believe that there are important differences in returns to human capital between these two regions.

Finally, Salehi-Isfahani et al. (2009) conduct the only study on returns to education in Iran; however, even this study does not focus solely on Iran and is a cross-country study that investigates private returns to schooling for urban men in Egypt, Iran, and Turkey. Estimates of returns to education in this study suggest that the returns to one additional year of schooling in Iran are 7.6%. However, these estimates cannot be interpreted as the causal effects of education on wages, as the authors ignore the issue of selectivity and endogeneity of schooling in their model and rely only on the naive results. They find that in Iran, returns to years of schooling are non-linear, which is contrary to the Mincer assumption of linearity on returns to schooling. Supporting the previously mentioned papers, they also suggest that secondary and tertiary degrees have the highest returns. We further examine this latter point (whether there is linearity in returns to schooling in Iran) in this chapter of the thesis, in which we use a non-linear Mincer function and will employ educational levels instead of years of schooling. It is worth noting that while Salehi-Isfahani's (2009) paper studies only urban men in Iran (to maintain comparability with Turkey and Egypt), we look at both men and women in urban and rural areas of Iran.

Many related studies have not been published in a journal but are available to read online. For instance, Dah and Hammami (2002) investigate the rates of return on education for males and females in urban Lebanon. They collect primary data for 6,626 individuals and employ a basic OLS model. Their results suggest that the rate of return on education is high for vocational and university education. They also emphasize that the rate of return is higher

for females than for males at almost all educational levels. For instance, returns to education for those with a tertiary education is 16% for women, and 13% for men, while for vocational education is 18% and 11% respectively. However, this study presents a very basic set of regressions on returns to education without mentioning issues such as selection mechanisms into higher education. As such, the results do not tell us much about what schools are doing to increase individuals' earnings potential.

Huitfeldt and Kabbani (2007) stress the non-linearity of returns to education in Syria and estimate the returns with OLS regressions and address the issue of selection bias using Heckman's two stage model. They include several additional variables in the selection equation, including marital status and the number of children between the ages of 0-5 (pre-school) and 6-14. According to this study, higher education increases both wages and the probability of getting a job in the public sector. One of the important contributions of this study is that it investigates the returns to education for men and women, in the private and the public sector separately. They suggest that women with a university degree that are working in the public sector receive the highest return (135%), while men with primary school qualifications working in the public sector receive the lowest return to education (-11%) . Furthermore, they argue that the additional benefit of obtaining higher education is, declines in 'queuing times for sought-after jobs in the public sector, and increases the opportunities for working abroad' (Huitfeldt and Kabbani, 2007, p. 12). Finally, they point out that since 2001, the Syrian government has stopped guaranteeing jobs to graduates of higher institutes, and hence these graduates have to look for jobs in the private sector, which do not necessarily match the training they received. They predict that future studies on returns to schooling in Syria will find that the rates of return on schooling will be much lower for university graduates. Said and El-Hamidi's (2005) analysis of gender wage premia in Egypt and Morocco supports

Huitfeldt and Kabbani's (2007) argument. Using the Oaxaca-Blinder wages-differential decompositions of sector and gender wage gaps for Egypt and Morocco, they suggest that selectivity-corrected returns to different levels of education indicate that a reduction in the role of the public sector leads to lower returns in the private sector and falling returns over time. Only at the university level are returns higher in the private sector in Egypt, indicating that employers place relatively little value on basic and secondary education (Said and El-Hamidi, 2005, p.14).

In summary, the few studies above on the returns to schooling in the MENA region have some important factors in common. First, the government's role as the main employer of university graduates is evident for high returns to education in these countries. Second, the government's role is fading away and most of these countries are displacing these policies, resulting in a decline in the returns to education in these countries. Finally, it seems that the sheepskin effect is evident in most MENA countries and contrary to Mincer's suggestion of diminishing rate of return on schooling, all of these studies show non-linearity in returns to schooling. Overall, such studies on MENA countries are less frequent than other regions, and specifically, as we are aware, there is only one study on returns to education in Iran by Salehi-Isfahani (2009). Table 5.3 summarizes this literature on returns to schooling in MENA countries.

Table 5.3: Summary of Literature Review on MENA

Study	Year	Country	Average Return (%)
Wahba	2000	Egypt	7.8%
Tansel	2016	Turkey	Naïve: 8-10% Causal:1- 4%
Salehi-Isfahani	2009	Iran	7.6%
Dah and Hammami	2002	Lebonon	6-16%
Huitfeldt and Kabbani	2007	Syria	11-135%

In this chapter, we employ Tansel (2016) and Salehi-Isfahani's (2009) papers as a starting point for our analysis. Salehi-Isfahani (2009) suggests that the returns to education in Iran are about 7% and are non-linear. We adopt the same methodological approach (using a non-linear Mincer function and educational levels instead of years of schooling) to estimate returns to schooling in Iran. However, while their study focuses only on urban men, we employ a gender-specific approach and account for spatial differences by considering urban and rural differences. Furthermore, while Salehi-Isfahani (2009) presents only the naïve results for returns to education, our current study aims to provide further estimates of the causal returns to education in Iran by employing IV estimates. In doing so, we use the same approach as Tansel (2016) to report our IV estimates in terms of the educational expansion that occurred in the 1970s in Iran. Yet again, we contribute to Tansel's study by considering the effects of returns to education in urban and rural areas separately. We expect to provide more accurate estimates of the returns to education in Iran that will be of interest to policymakers and individuals in guiding their decisions to invest in education.

5.3. Data and Descriptive Statistics

In this chapter, we use the same data as in the previous chapter from the various cohorts of the HIES from 2008/09 to 2011/12 that monitors the income and cost living of households in Iran. We discussed the HIES characteristics and benefits in the previous chapter, and hence do not repeat it here.

Tables 5.4 and 5.5 contain summary statistics for our sample. After accounting for non-responses, merging all 5 annual surveys, and limiting our sample size to those aged between 16 to 65, our sample size for urban areas is 211,862 individuals and for rural areas is 227,139. There is no minimum wage for working in Iran; however, most studies in Iran limit their samples to individuals aged 16 to 65 to maintain consistency with ILO regulations. Hence, we

adopt the same age category for our sample. Tables 5.4 and 5.5 describe the general characteristic variables such as age, and marital status, variables for education such as years of schooling and educational levels, and variables for employment status such as annual income, working status, working hours in a day, and working days in a week.

5.3.1 Summary statistics of dependent Variable

Our dependent variable in this section is the natural log of hourly wages. In terms of income, the HIES database provides three types of information: income or wages for those who are employees, income for self-employed, and other types of income, which includes retirement income, rents, benefits, and any other charities. We added two types of income for each individual as total income: income for wage-receivers and income for the self-employed, and excluded other types of income. Unlike in developed countries, there is a high number of self-employed individuals in the Iranian labour market; hence, we include the wages of the self-employed as well as wage workers in our observations of income.In our sample, we have 13,901 observations for wage receivers and 8,909 observations for those who are working and are self-employed. This clarifies that one of the main characteristics of the Iranian economy is the high number of observations of self-employed workers, which we cannot ignore. Thus, we merged the income reports of the self-employed and wage receiving workers.

Our income in the dataset is reported annually. In order to estimate hourly income, first we estimate daily pay by dividing annual income by the number of working days in one year, which was available in our datasets. Second, in order to estimate hourly pay, we divide daily income by average number of working hours, which was reported in our dataset. We deflated income according to the 2010 inflation rate and used the dollar exchange rate for

2010. Table 5.4 shows that while hourly income for men is 3.28$, for women, it is 3.21$, which suggests that men earn slightly more than women in Iran.

5.3.2 Summary statistics of urban areas

Table 5.4 provides descriptive statistics for urban individuals between 16 to 65 years old, which contains 211,863 observations (men and women combined). According to this table, the mean for age is about 34 years for both sexes. There are 107,196 observations for men in this sample and 104,666 observations for women.

On observations for marital status, Table 5.4 suggests that for men, nearly 59% are married, while 40% were never married, and nearly 1% are divorced or widowed. For women, 64% are married, 4.45% are widowed, 1.41% are divorced, and 30.55% are single. From our observations, we can interestingly note a high number of widowed women in urban areas, which indicates an interesting social characteristic of Iran. As we mentioned in Chapter 1, the war between Iran and Iraq between 1980 and 1988 shaped many socioeconomic characteristics of Iran, and one of these impacts was the high number of male casualties, which left many widows.

We have three types of variables as indicators of education: a variable for literacy, a continuous variable for years of schooling, and a categorical variable for educational levels. According to our data, the average years of schooling is approximately 9 years for men and 8 years for women. In Iran, compulsory education ends by the end of the 8th year, which is the end of lower secondary school. Hence, our average years of schooling suggests that most students might discontinue their studies after compulsory education ends.

Table 5.4 also presents highest educational qualifications. Our dataset has information on individuals with qualifications from different levels of schooling. We have seven categories of levels of schooling: those with no qualifications, those with a qualification from primary

school, those with a qualification in lower secondary or high school (our dataset combines secondary and high school qualification), a vocational qualification, a certificate from a university BA degree, a certificate from a university Master's degree, and the highest educational degree, a PhD qualification.

According to Table 5.4, for our male participants nearly 13% have no qualification, while approximately nearly 30% have certificates of completion from primary education, 24.12% from secondary or high school, 9.27% have a vocational qualification, 21.45% have a degree from a BA course, 2.58% have a Master's degree, and 0.63% have a PhD. For women, the sample with no qualifications is much higher for women compared to men; nearly 29% of women in urban areas have no qualification compared to 13% for men. Following this trend, the number of women with a primary qualification is also lower than for men (20% for women versus 30% for men); however, this gender gap is much smaller for higher qualifications, and it seems that for secondary education and above, there are similar trends for men and women. A possible explanation for such a trend might be that as educational expansion occurred in Iran, younger women attained more schooling, and the gaps in lower levels of educations are for older individuals. Finally, we observe that more men have some type of vocational qualifications (10%) compared to women (5%).

For employment status, we have information on working status in six categories: working, looking for job, unemployed with income, student, housekeeper, and others. Statistical information about employment status shows that nearly 61% of male participants are working and 12% are looking for jobs; 8.44% are not working, but have some sort of other income such as benefits, rental income, and so on; nearly 15.46% are students, and less than 3% are housekeepers or in other types of employment status. Interestingly, for women only 8.66% are working, and on the other hand, only 5.38% are unemployed (looking for a job). This

shows that women's labour force participation is very low, even in urban areas. Around 6.23% of women are not working while receiving some sort of income, 16.23% are students, and nearly 61.86% are housekeepers. According to the World Economic Forum, the female labour force participation was 15% in 2015, hence selectivity into the labour market is likely to be a primary concern when examining women, and the correct estimation strategy should account for this process.

Finally, Table 5.4 provides information on working hours/days for men and women. We see that on average, men work 8 hours a day, while women work approximately 6 hours a day, and both sexes work 5 days a week. Women's working days in a week are similar to that for men, which suggests that contrary to the labour market of most developed countries, where women work part-time, urban women work full-time, just as urban men do.

5.3.3 Summary statistics of rural areas

In this section, we observe the summary statistics for rural areas presented in Table 5.5. However, we discuss only some interesting differences between these two areas, and will not repeat all of the descriptive statistics as in the previous section. Observing these differences will help us understand disparities between urban and rural areas and how to model our analysis in the next chapters.

One of the main differences between the urban and rural populations can be observed from educational attainment in each region separately. Comparing Tables 5.4 and 5.5 shows that in general, the number of illiterate men and women is 10% higher in rural areas than in urban areas. Looking at years of schooling, we can also observe that rural areas lag behind urban areas: the years of schooling in rural areas is 6.81 for men and 5.37 for women, compared to urban areas with 9.03 years of schooling for men and 8.35 years of schooling for women. This indicates that on average, urban men have approximately 2 more years of

schooling than rural men do, while urban women have 3 more years of schooling than rural women do. Nevertheless, it is interesting that the gap between years of schooling for men and women in both areas is nearly zero, which indicates that regarding equality in education between men and women, the rural areas is progressing in line with urban areas of Iran.

Looking at educational levels, we observe a much higher number of people with no qualification, especially among women: nearly 35% of men and 61% of women have no qualification. We can also observe a very low number of individuals with university degrees (BA, Masters, or PhD) in rural areas. For instance, only 7.44% of men and 4.62% of women in rural areas have a BA degree compared to urban areas, where these estimates are 21.45% for men and 18.66% for women. There can be many explanations for the lower educational attainment of the rural population; as previously mentioned, compulsory education is 8 years in Iran, and hence the government might not invest in high schools and university as much as they do in primary and secondary schools. Another explanation for the lower years of schooling in rural areas could be that there is not enough demand for employees with higher education. Finally, the low number of individuals with university degrees in rural areas could be explained by a lack of university facilities in these areas. In other words, if a young individual is planning to continue their studies in higher education, they are more likely to move to urban areas. In addition, the number of working hours is approximately 1.5 hours less for women in rural areas whilst the work week is actually longer. For men there is less difference between urban and rural areas which suggests that employment patterns between men and women diverge as we move into more rural areas.

A comparison of Tables 5.4 and 5.5 also provides interesting results in terms of employment status, especially for women. We observe that the number of women working in rural areas is nearly double (16%) that of women in urban areas (8%). This is comprehensible

with the available facts and characteristics of the Iranian economy, as the role of women in Iranian rural sectors as both housekeepers and workers in the agricultural sector has been accepted historically.

Other statistical information about employment status shows that in rural areas, 54.88% of male participants are working, 10% are looking for jobs, nearly 9% are not working but with an income, nearly 22% are students, and 4% are either housekeepers or have another type of unknown occupational status. For women, these numbers are 16.73%, 3.55%, 5.16%, and 10%, respectively, while 63.18% are housekeepers and 1.70% have another type of unknown occupational status.

Observing hourly income, we can also see that rural women's hourly income is lower compared to their male counterparts (1.34$ for women compared to 1.80$ for men). Although the gender wage gap is also evident in urban areas, its magnitude is larger in rural areas. Considering the higher labour participation of rural women, this suggests that a gender wage gap exists in Iran, and especially in rural areas. It is also evident that the rural population earns much less than the urban population: for instance, rural men’s hourly income is 1.80$, while urban men's hourly income is 3.28$. These rates are 1.34$ for rural women and 3.21$ for urban women.

Overall, our descriptive section suggests that while the Iranian government succeeded in expanding educational attainment of the youth, rural areas are still lagging behind the urban areas, especially in terms of literacy rates and higher education. However, it seems that in terms of gender equality in education, both urban and rural areas have very low inequality. For instance, we observe that in both regions, the average years of schooling are similar for both men and women. This is compatible with the current literature and available data that suggests substantial improvements in educational attainment in terms of gender equality.

However, the most striking failure of the Iranian government can be observed in its failure to improve labour market characteristics, which suggests that equality of education has not been transformed into equality of opportunity within the labour market. This is evident in our descriptive section, where we observe very low labour force participation for women, especially in urban areas (around 8%). Our descriptive data suggests that women's labour force participation is much higher in rural areas (16%). Discrimination against women as regard a gender wage gap exists, and is more evident in rural areas.

Table 5.4: Summary Statistics Urban Areas[12]

Variable	Men Frequency	Men Mean	Men std. dev.	Women Frequency	Women Mean	Women std. dev.
Continuous						
Age	107,196	34.32	13.56	104,666	34.48	13.24
Year of Schooling	106,442	9.03	4.31	104,148	8.35	4.96
Working hours a day	68,391	8.05	2.9	9,606	6.16	2.66
Working days a week	68,391	5.50	1.46	9,606	5.17	1.40
Hourly Pay($)	66,530	3.28		8,485	3.21	
Categorical Variables						
Literacy						
Literate	99,758	93.06		88,082	84.16	
Illiterate	7,438	6.94		16,581	15.84	
Education Certificate						
No qualification	7,462	12.61		16,591	28.79	
Primary Education	17,370	29.34		11,401	19.78	
Secondary/highschool Education	14,280	24.12		14,995	26.02	
Vocational Qualification	5,490	9.27		2,785	4.83	
BA Qualification	12,695	21.45		10,752	18.66	
Masters Qualification	1,526	2.58		919	1.59	
PhD	370	0.63		183	0.32	
Working status						
Working	65,576	61.18		9,060	8.66	
Looking for job	12,863	12.00		5,628	5.38	
Unemployed with income	9,047	8.44		6,522	6.23	
student	16,572	15.46		16,984	16.23	
Housekeeper	165	0.15		64,748	61.86	
Others	2,971	2.77		1,722	1.65	
Marital Status						
Marrried	63,123	58.89		66,560	63.59	
Widowed	504	0.47		4,652	4.44	
Divorced	680	0.63		1,479	1.41	
Single	42,889	40.01		31,974	30.55	

Source: HIES 2008-2012. Age 16 to 65. Note: Hourly wages are deflated and has been converted to dollars

[12]The descriptive statistics for the samples the equations are estimated are presented in Appendix C(table c1)

Table 5.5: Summary Statistics Rural Areas[13]

Variable	Men Frequency	Men Mean	Men std. dev.	Women Frequency	Women Mean	Women std. dev.
Continuous						
Age	117,737	34.53	13.85	109,402	34.48	13.68
Year of Schooling	116,382	6.81	4.18	108,900	5.37	4.53
Working hours a day	89,736	7.16	3.09	19,180	4.68	2.64
Working days a week	89,736	5.42	2.11	19,180	5.70	2.51
Hourly Pay($)	82,359	1.80		7,321	1.34	
Categorical Variables						
Literacy						
Literate	98,178	83.39		74,427	68.03	
Illiterate	19,559	16.61		34,974	31.97	
Education Certificate						
No qualification	19,569	34.82		34,981	61.21	
Primary Education	19,839	35.30		10,806	18.91	
Secondary/highschool Education	9,217	16.40		7,302	12.78	
Vocational Qualification	3,043	5.41		1,239	2.17	
BA Qualification	4,183	7.44		2,640	4.62	
Masters Qualification	312	0.56		157	0.27	
PhD	35	0.06		21	0.04	
Working status						
Working	86,356	54.88		18,305	16.73	
Looking for job	11,848	10.39		3,884	3.55	
Unemployed with income	4,224	9.02		5,641	5.16	
student	12,121	22.04		10,605	9.69	
Housekeeper	257	0.26		69,116	63.18	
Others	2,928	3.41		1,849	1.69	
Marital Status						
Marrried	73,575	62.49		69,637	63.65	
Widowed	544	0.46		5,434	4.97	
Divorced	472	0.40		1,089	1.00	
Single	43,142	36.64		33,240	30.38	

Source: HIES 2008-2012. Age 16 to 65. Note: Hourly wages are in real terms, deflated and has been converted to dollars

[13]The descriptive statistics for the samples the equations are estimated are presented in Appendix C(table c2)

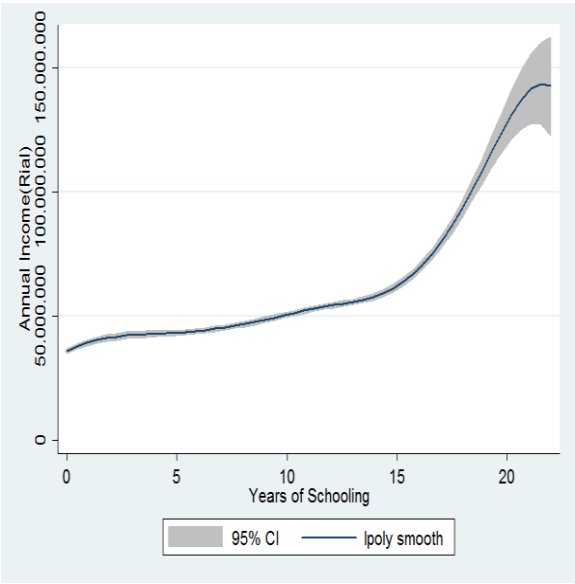
5.3.4 Initial correlation

To examine the impact that schooling might have on wages in Iran, we first examine the basic bivariate relationships between education and earnings. Such results are non-causal, of course, but serve as a useful reference point for later multivariate analysis. To investigate possible issues of non-linearity, we estimate non-parametric smoothers as opposed to basic correlates. This allows us to display the data graphically and observe any particular non-linear effects for possible consideration in later multivariate analyses.

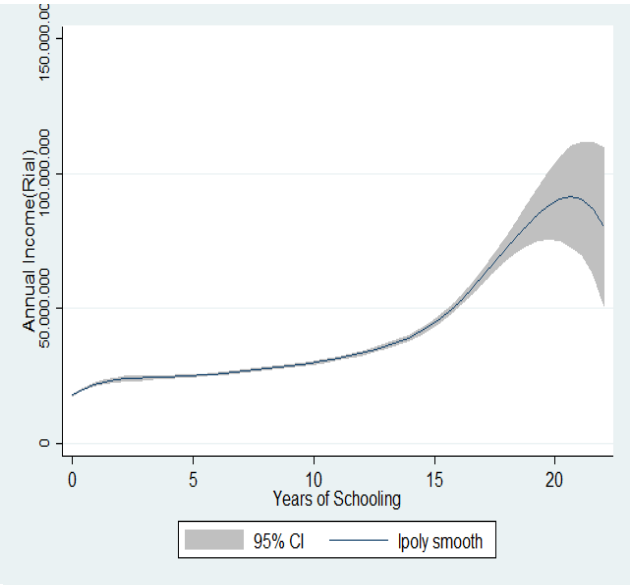
Figure 5.1 shows a nonparametric relationship between earnings and years of schooling in both urban and rural areas. There is a positive relationship between years of schooling and earnings. Both the rural and urban graphs are relatively 'shallow' until 13-15 years of schooling, after which total income accelerates rapidly. After approximately 18 years of schooling, the slope diminishes again and there is some evidence of a negative return beyond 20 years of schooling. This suggests that the returns to education in Iran are possibly non-linear. In particular, there is evidence that higher-level qualifications, such as university degrees, have an important effect on earnings, but that very high qualifications may reduce potential earnings, especially in rural areas. However, it is worth noting that relatively few individuals have more than 18 years of schooling, resulting in a high 95% confidence interval around the estimated relationship.

Figure 5.1: Local polynomial smoother for total income and years of schooling

Urban Areas



Rural Areas



Source: HIES 2008-2012

5.4. Methodology

In this chapter, we use the Mincer earnings function to identify returns to schooling in Iran. We employ several variants of this equation: the standard version with linear years of schooling, and a non-linear version with quadratic years of schooling and levels, instead of years, of schooling. Finally, in order to investigate the issue of endogeneity and causal estimates of returns to education, we employ an IV analysis.

5.4.1 Standard Mincer function

We begin by estimating the conventional human capital earnings function, where the dependent variable is the natural log of hourly wages. We use reports of individuals' annual incomes. In order to calculate the hourly wage, we first calculated daily income by dividing annual income by average working days per year. Then, we divided this by average working hours per day.

The explanatory variables are age, age squared (both as a proxy for experience), years-of-schooling (and later on, educational levels), controls for region (using the 30 standard regions) in order to pick up regional real wage differentials, and finally dummies for marital characteristics. Montenegro (2013) argues that adding many independent variables in studies of returns to education reduces part of the effect of education on earnings.

'Of course, researchers who include other variables, such as occupation dummies, in earnings functions do so because they are interested in modelling earnings, not necessarily in estimating the rate of return on schooling. Obviously, such practices create a problem when others interpret the schooling coefficient as a rate of return'. (Montenegro, 2013, p. 3)

Since we are interested in interpreting the effects of schooling on wages, we employ few independent variables in our models. The Mincer equation (1974) is the basis for economic studies of education and has been estimated using data from a variety of countries and periods. In one equation, Mincer's framework captures two distinct economic concepts: (a) a pricing equation or hedonic wage function revealing how the labour market rewards productive attributes like schooling and work experience, and (b) the rate of return on schooling, which can be compared with the interest rate to determine the optimality of human capital investments. We employ the standard Mincer equation (Mincer, 1974) to examine the rate of returns to education in Iran:

$$logY_i = \alpha + \beta_1 S_I + \beta_2 P_i + \beta_3 {P_i}^2 + \chi_i \gamma + \varepsilon_i \quad (5.2)$$

where Y_i represents individual *i*, $S_i$is an indicator of years of schooling for individual *i*,$P_i$is age as a proxy for experience, ${P_i}^2$ is a quadratic term for age, and $\chi_i$is a vector of control variables including marital, and regional dummies.

$\widehat{\beta 1}$ is the estimated contribution of full-time schooling to earnings, which represents the rate of return on an additional year of schooling, $\widehat{\beta 2}$and$\widehat{\beta 3}$ are the return on experience and generally trace a concave earnings path across the lifecycle of an individual.

5.4.2 Non-Linearity

Although the standard Mincer equation in the previous section is the most commonly used, there are several reasons why a simple linear specification for years of education may be inaccurate. For example, log earnings may be a concave function of years of schooling in a simple human capital investment model in which individuals have different preferences (discount rates), but all face the same concave production function (the return on a year of schooling declines as years of schooling increase). More generally, Mincer (1997) shows that in Becker's (1975) model where individuals are heterogeneous in their preferences and earning opportunities, average log earnings may be either a convex or concave function of years of schooling. Another possibility is that in addition to years of schooling per se, educational credentials also have a direct impact on earnings. Moreover, evidence from our initial correlations (Figure 5.1) suggests the presence of potential increasing returns to education as years of schooling increase.

In order to test for the first type of non-linearity (the notion of diminishing returns to education), in our samples, we relax the linearity assumption and modify equation (2) by adding a quadratic term for years of schooling:

$$logY_i = \alpha + \beta_1 S_I + \beta_2 {S_i}^2 + \beta_3 P_i + \beta_4 {P_i}^2 + \chi_i \gamma + \varepsilon_i \quad (5.3)$$

where $\mathrm{Y_i}$ is hourly wages, $S_i$is an indicator of years of schooling, ${S_i}^2$is the quadratic term for schooling, $P_i$is a proxy for experience, ${P_i}^2$ is age squared, and *Xi* is a vector of control variables including region, and marital status.

However, we can get a more precise idea of the convexity using levels instead of years of schooling. This is also motivated by the evidence that degrees matter over and above years of schooling (the sheepskin effect)(Heckman, 1977). In our regression, we divide schooling levels into seven categories: less than primary (illiterate), primary, lower secondary, upper secondary, tertiary, PhD and above, and other types of educational levels. The omitted category is level 0, which is no qualification.

Our estimated equation for levels is

$$logY_i = \alpha + \beta_1 L_{ij} + \beta_2 P_i + \beta_3 {P_i}^2 + \chi_i \gamma + \varepsilon_i \quad (5.4)$$

where L_{ij} is the dummy variable for the level of education of individual *i*and *j* = 0*, . . . ,* 7.

5.4.3 Endogeneity

Griliches (1977) argues that the OLS estimates of returns to schooling are biased and inconsistent. Nevertheless, researchers still use OLS estimates in studies of returns to education to evaluate signs and amounts of bias. According to Griliches, these results could be both an upward and a downward bias. Some authors argue that upward bias is only true if one analyses the wages of older workers (Blackburn and Neumark, 1993), although the upward bias results are the conventional wisdom (Ehrenberg and Smith, 2016). Calculation by IV and fixed effects gives, instead, a downward bias.

These contrasting empirical results are due to econometric problems: omitted variables and measurement errors could involve opposite distortions without specifying which one prevails. A general framework to describe the problem could be found if we focus on the potential endogeneity of education in the wage function.

To identify the causal effect of education on wages, we follow the standard approach of using IV methods (see for example, Machin*, et al*. 2011). This version constitutes a very useful general framework to understand distortions in returns to schooling and to interpret the IV estimates. In order to do so, we employ two types of instruments: the first is parental education and the second is educational expansion, which happened as a result of the Islamic revolution in 1979.

In this approach, a causal effect of education is estimated by including a variable for parental education (and later on, a dummy variable for educational expansion as a result of the Islamic revolution in 1979) in the first-stage education regression in a 2SLS framework. By arguing that parental education (educational expansion) is an exogenous occurrence that increased levels of education randomly, we can obtain a causal IV estimate as follows:

$$E_i = \alpha_1 + \beta_1 PE_i + \boldsymbol{x_i'}\gamma_1 + \varepsilon_{1i} \qquad (5.5)$$

$$Y_i = \alpha_2 + \beta_2 PE_i + \boldsymbol{x_i'}\gamma_2 + \varepsilon_{2i} \qquad (5.6)$$

where equations (5.4) and (5.5) are the reduced form equations for education E_i and log hourly wages Y_i respectively; β_1 is the estimate of parental education(education expansion) measured in years of schooling, whilst β_2 is the estimated effect of parental education on log hourly wages. $\boldsymbol{x}_i$is a vector of our additional control variables (such as age, age squared, marital status, and regional dummies) with parameter estimates γ. Finally, ε_{1i} and ε_{2i} are two normally distributed error terms with mean zero. The structural form for earnings Y_i is then given by:

$$Y_i = \alpha_3 + \beta_3 E_i + \boldsymbol{x_i'}\gamma_3 + \varepsilon_{3i} \quad (5.7)$$

where the IV estimate of β_3 in (5.6) is given by the ratio of the reduced form coefficients in (5.1) and (5.2), $\beta_3 = \beta_2/\beta_1$.

Below, we introduce our IVs and present the justification for choosing these instruments in our models.

5.4.3.1 Parental education

First, we employ the number of years of schooling for an individual's parent as an instrument by reporting the highest years of schooling of the parent. For instance, if an individual's father has 7 years of schooling and the mother has 20 years of schooling, we appoint 20 years as the parental education. Card's (1992) study implicitly mentions the substantial influence of family background. He claims that parental education influences schooling choices, and therefore incorporates it into his instrument sets. This confirms that family background is significant for an individual's schooling. Furthermore, parental education might be a good indicator to capture and quantify family background.

Maluccio (1998) uses parental education as an IV to examine the return on education in the Bicol region of the Philippines. He argues that incorporating parental education in IVs is important because they serve as a proxy for permanent income, reflect parental preferences, and may affect the education production process.

Another study employing parental education as an instrument was conducted by Arcand et al. (2004). They argue that using parental education as an instrument should meet the orthogonality conditions in countries with communist characteristics, where the intergenerational transmission of wealth and social background is only obtained through educational attainment. Arcand et al. (2004) prove empirically that using parental education as an instrument is feasible in studies of countries with these characteristics. We believe that

this is also the case with Iran, especially for the period we observe. Note that it is only 38 years since the revolution, and many individuals in our sample were affected by revolutionary slogans because they were studying and working at the time. For instance, after the Islamic revolution, the main slogan was that the revolution is for the poor and unprivileged families and ensured policies to attract the vote of the mass population, which is evident in official surveys. For instance, according to the World Bank, immediately following the Revolution, overall inequality fell substantially, by about 10 Gini points, from 0.56 to 0.46 (World Bank indicators, 2017). Hence, for many children, having a wealthy family was mainly a disadvantage. Consequently, many elite families emigrated from the country after the revolution. These pro-poor (or anti-rich) family policies suggest that Iran has characteristics that are close to communist countries. According to Arcand (2004), this feature makes these countries the most plausible for using parental education as an IV.

5.4.3.2 Educational expansion of the 1970s

Our second IV estimator uses an exogenous change in the educational expansion of the early 1980s due to the Islamic revolution in Iran. This type of instrument was used by Duflo (1999) for Indonesia and James (2015) for the UK.

Duflo's (1999) estimation is based on individuals' exposure to a massive education investment program in Indonesia in the early 1970s. Individuals were assigned to the treatment based on their date of birth (pre- and post-reform) and the district they lived in (as investment was a function of a local level needs assessment). James (2015) pursues a similar strategy in an analysis of reforms in the UK in 1980s and 1990s that expanded UK's post compulsory education. The expansion resulted in a rapid increase in education over the whole education distribution. We also follow a similar approach in looking at a fundamental change in the educational system in 1980s Iran, which affected the entire population of school going

individuals, and educational attainment increased rapidly. This allows us to generate IVs that permit consistent estimates of the return on schooling for the whole population.

We believe that one of the most important factors in the growth of education participation after the Islamic revolution in 1979 is the Islamisation of the schools (features of this Islamisation are explained in detail in Chapter 1 of this thesis). One of the most important aims of the revolution was to reshape the educational system and change it according to the rules of Islam. For instance, they introduced separate schools in all levels of education (apart from university). Some social researchers argue that this separation of schools had an important impact on religious parents, as they felt it was safe to send their children to schools that are separate and teach the rules of Islam. This especially had an impact on women and in rural areas of Iran, where more traditional families lived. The available data also suggests that this argument could be correct. For instance, for rural women, the average years of schooling increased from about 40% of their male counterparts for women born in the 1960s to about 90% for those born in the 1970s (Salehi-Isfahani, 2009). Furthermore, the Gini index of inequality in years of schooling for adults born in the 1950s was in excess of 0.60 compared to 0.35 for cohorts born 20 years later, which is a substantial decrease in education inequality in just one generation. Hence, it seems that after the Islamic revolution in 1979, due to the Islamisation of schools, average years of schooling increased substantially because many religious families were now encouraged (or felt it was safe) to send their children to schools.

Hence, we create a dummy variable for those born in 1970, who would attend school after the Islamic revolution. Figures 5.2 and 5.3 show the rapid increase in participation over the period, represented by a significant step change, which provides a justification for using this type of IV.

Figure 5.2: Years of Schooling and Year of Birth for urban areas

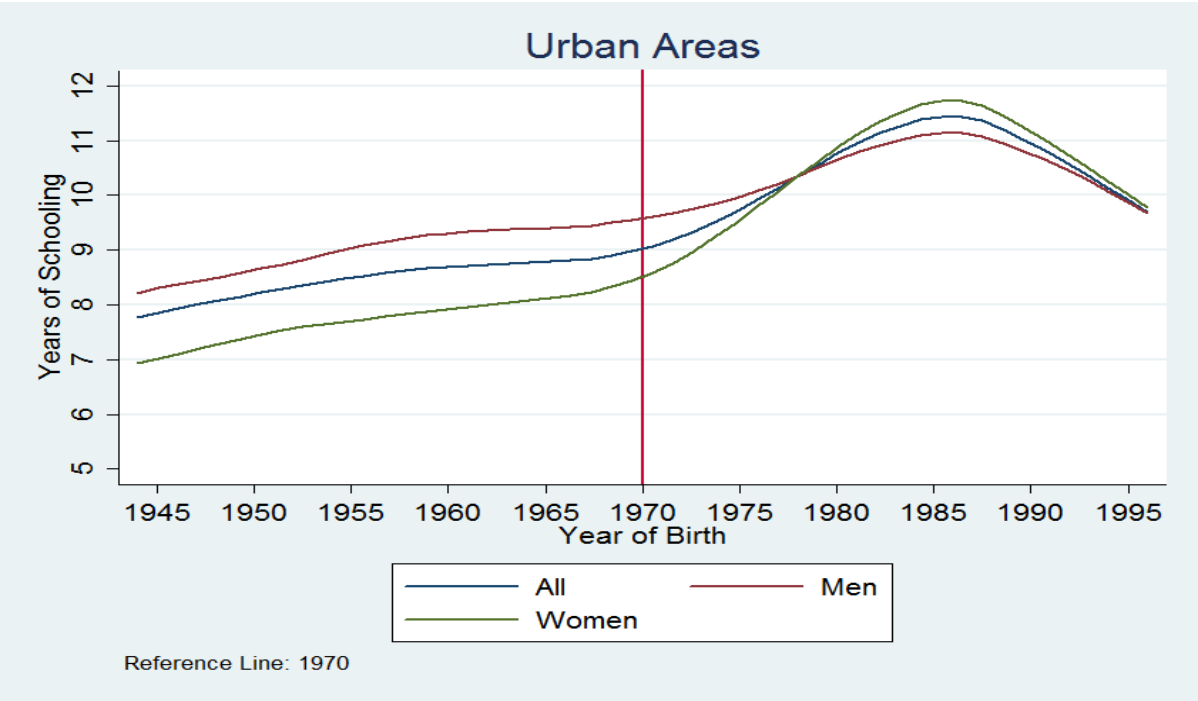
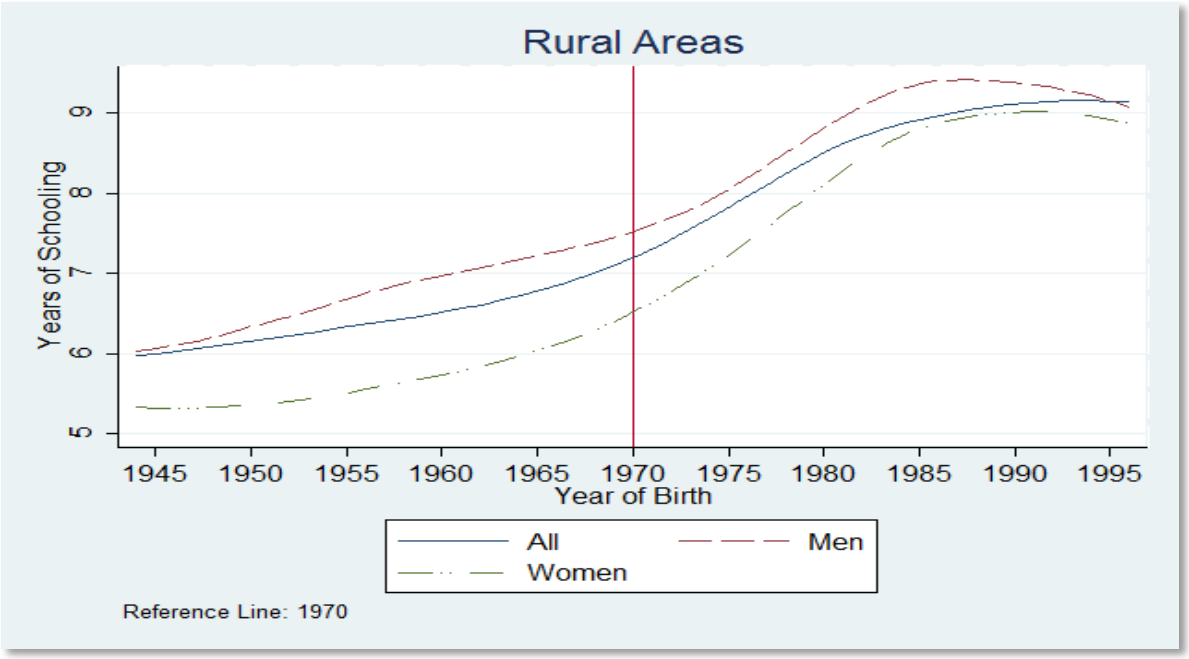


Figure 5.3: Years of Schooling and Year of Birth for Rural areas



5.5. Results

In this section, we report our results for the returns to education with special attention to urban and rural and gender differences. Our dependent variable is log of hourly wages, while our explanatory variables are years of schooling (educational levels), age as a proxy for experience, age squared, marital status, and regional dummies. Most studies on returns to education (for example Salehi-Isfahani et al., 2009; Tansel, 2016) employ a limited number of explanatory variables, and we follow the same route. Furthermore, our sample is individuals between 16 to 65 years of age and is conditioned on people that are working. Two problems of selection bias might appear due to the latter condition. The first is selection bias because individuals, and especially a high number of women, not working create an issue of selectivity in our estimates. Secondly some individuals stated that there are working but do not report their income in the dataset, we address this selectivity issue in our data in Section 5.3 with our causal estimates.

In order to explore returns to education in Iran, we first report the estimates of such returns using an OLS model. Table 5.6 presents the results, where we report returns for men and women in urban and rural areas separately. Second, we test for non-linearity of returns to education in Iran using two models: an OLS model and a quadratic term for schooling. We provide these results in Table 5.7. Additionally, to check further for non-linearity, we use educational levels instead of years of schooling and provide the results in Table 5.8. Finally, in order to test for causal estimates of returns to education on earnings, we employ IV estimate techniques with two IVs: parental education and educational expansion of the 1970s. We present the results of our IV estimates in Tables 5.9, 5.10, 5.11, and 5.12.

5.5.1 OLS model

Table 5.6 displays the OLS estimates of the returns to schooling for those between 16 to 65 years of age in urban and rural areas using a standard Mincer function.

Our OLS results for urban areas show that one additional year of schooling increases log gross annual income by approximately 5.3%. Separating these returns by gender shows that the return for men is approximately 4.5%, whilst for women, the return onan additional year of schooling is 10%. This difference is statistically significant. On the other hand, our results for rural areas suggest that the returns to one additional year of schooling are very similar in urban areas for both sexes. These results are roughly in line with the existing literature, which generally suggests that the coefficient of schooling is between 5% and 15% (Psacharopoulos, 1994). Furthermore, their estimates usually yield returns to education that are higher for women than for men (Van der Sluis et al., 2008). We can also observe that in both urban and rural areas of Iran, women are experiencing higher returns to their wages compared to men. One of the reasons for higher returns to education in both urban and rural areas for women may be explained by the problem of selection bias in Iran. As we discussed previously, women's labour force participation is very low in Iran (16%), and it seems that discrimination against women exists in the Iranian labour market. Because those who are already working in the market might have some characteristics such as higher ability or motivation that affects their wages, we address this selectivity issue in our data in Section 5.3 with our causal estimates. It is also interesting that returns to education are similar in both urban and rural areas of Iran. This is contrary to the existing literature that suggests that such returns are usually higher in urban areas (for example, Dudenhefer, 1993).

We use age as a proxy for the coefficients for the experience variable, where we observe that for both regions that the returns to experience rise with each year of additional

experience, but at a diminishing rate, from the slope coefficients of age squared. The inflection point is approximately 28years after starting age (16 in this case), which suggests a peak earnings age of 44 years. This is consistent with evidence from other countries. We can also detect a similar trend in returns to experience by gender, which suggests that after full-time schooling ends, and both sexes are active in the labour market, no substantial differences in earnings between men and women emerges.

We also include other types of explanatory variables such as marital status and proxies for location. We observe that compared to those who are married, other types of marriage decrease returns to education for both sexes in both regions. The only exception is for rural women, where no marriage category is significantly related to their returns to education, while rural men follow the same trend as their urban counterparts.

Finally, it is important to note that the sample sizes for men and women are significantly different. As noted previously, employment statuses amongst men and women are radically different. Whilst more than 61% of the male population is working, only 16% of women can be classified as working. This is reflected in the sample, with only 8,395 observations for women and 65,730 observations for men in urban areas, and 6,935 observations for women and 79,555 observations for men in rural areas. However, we should also note that the R-squared for women is much higher than for men (0.44 compared to 0.27 in urban areas and 0.28 and 0.18 in rural areas), which suggests that the Mincer function explains a higher proportion of the variation in earnings for women, especially urban women, than for men. This suggests that our explanatory variables, including years of schooling, are one of the key drivers in women's earnings in Iran.

Table 5.6: OLS Results (Urban and Rural Areas)

	Urban			Rural		
	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Continous						
Years of Schooling	0.053***	0.045***	0.102***	0.052***	0.044***	0.100***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)
Age	0.129***	0.129***	0.119**	0.084***	0.088***	0.073**
	(0.006)	(0.005)	(0.016)	(0.004)	(0.003)	(0.012)
Age Squared	-0.001***	-0.001***	-0.001**	-0.001***	-0.001***	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Categorial						
Marital Status(Reference: Married)						
Widowed	-0.257*	-0.185*	0.138**	-0.235**	-0.222*	0.162
	(0.044)	(0.044)	(0.022)	(0.035)	(0.057)	(0.070)
Divorced	-0.301**	-0.374***	0.054	-0.350*	-0.314*	0.026
	(0.033)	(0.020)	(0.048)	(0.075)	(0.098)	(0.033)
Single	-0.296***	-0.329***	-0.111*	-0.285***	-0.279***	-0.094
	(0.010)	(0.012)	(0.027)	(0.017)	(0.019)	(0.050)
Regional dummies(22 regions)	Induded	Induded	Induded	Induded	Induded	Induded
Constant	6.574***	6.718***	5.902**	7.902***	7.899***	7.471***
	(0.255)	(0.232)	(0.523)	(0.221)	(0.211)	(0.410)
N	74,125	65,730	8,395	86,491	79,555	6,936
R2	0.285	0.278	0.445	0.193	0.188	0.283

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

5.5.2 Non-linearity

Most studies on returns to education (Heckman and Polachek, 1974; Card and Krueger, 1992; and Card, 1999) assume that the marginal rate of return is constant over all levels of education, which means each year of schooling has the same value as another. However, some studies find that significant nonlinearities in the rate of return on schoolingexist (Hungerford and Solon, 1987; Belman and Heywood, 1991; and Trostel, 2004). For example, Trostel (2004) examines marginal rates of return on investment in schooling in 12 countries and finds significant nonlinearity in the marginal rate of return. He then suggests that the marginal rate of return is zero for the first several years of schooling, and then increases rapidly until about year 12, after which it declines. Similarly, as mentioned in the literature review section, most studies of returns to education in the MENA region (Elhamidi, 2006; Said, 2016; Salehi-Isfahani et al., 2009) suggest that such returns are non-linear. Of particular interest is Salehi-Isfahani et al. (2009), who compare returns to education in Iran, Turkey, and Egypt for urban men. In order to examine nonlinearity, they relax the linearity assumption in two ways, first by including the quadratic terms for schooling, which deals with the first type of non-linearity; and later by using schooling levels instead of years of schooling, which deals with the second type. They reveal that considerable nonlinearity exist in all three countries, and for Iran, urban men with tertiary education enjoy the highest returns to education, at 102%.

We adopt the same approach as Salehi- Isfahani et al. (2009) to test for nonlinearity. They find considerable non-linearity for urban men where returns to education were -1.7% for the year 2006. Our results in Table 5.7 also show considerable non-linearity in both areas; the coefficients on S^2 is positive and statistically significant for both men and women (except urban women), indicating that the returns to education increase with schooling. The

estimated parameters are difficult to interpret as both the coefficient on years of schooling and years of schooling squared must be taken into account jointly. We present our findings graphically but before we turn to these note that all the results show evidence of convexity, not concavity. The positive terms on years of schooling squared suggest that returns to schooling accelerate in Iran and do not inflect at some point, like a standard age-earnings lifecycle profile. Also noteworthy is the fact that the other estimated coefficients on age, marital status and regions do not appear to have changed much from the linear model presented in Table 5.6.

Table 5.7: Results (Urban and Rural Areas)

	Urban			Rural		
	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Continous						
Years of Schooling	0.035**	0.029**	0.073**	0.034**	0.027*	0.023
	(0.004)	(0.004)	(0.009)	(0.004)	(0.005)	(0.008)
Years of Schooling Squared	0.001**	0.001**	0.002	0.001*	0.001*	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.129***	0.130***	0.120**	0.084***	0.088***	0.070**
	(0.006)	(0.005)	(0.016)	(0.004)	(0.003)	(0.012)
AgeSquared	-0.001***	-0.001***	-0.001**	-0.001***	-0.001***	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Marital Status(Reference: Married)						
Widowed	-0.267**	-0.185*	0.125*	-0.250**	-0.226*	0.146
	(0.043)	(0.044)	(0.023)	(0.036)	(0.056)	(0.070)
Divorced	-0.302**	-0.373***	0.062	-0.352*	-0.312*	0.032
	(0.033)	(0.021)	(0.047)	(0.075)	(0.098)	(0.038)
Single	-0.299***	-0.330***	-0.114*	-0.292***	-0.285***	-0.109
	(0.010)	(0.012)	(0.026)	(0.018)	(0.019)	(0.049)
Regional dummies(30 regions)	Induded	Induded	Induded	Induded	Induded	Induded
Constant	6.635***	6.774***	5.980**	7.955***	7.947***	7.752***
	(0.263)	(0.236)	(0.501)	(0.219)	(0.207)	(0.378)
N	74,125	65,730	8,395	86,491	79,555	6,936
r2	0.286	0.279	0.446	0.193	0.188	0.293

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

Figure 5.4 depicts the effect of years of schooling on log wages using the estimated coefficients in Table 5.7 graphically. We observe that all profiles are convex, showing increasing returns to years of schooling. Interestingly, we observe that non-linearity is more visible for women in both regions. This suggests that women's education results in higher returns as their education increased in rural areas compared to urban areas. Moreover, women with low levels of schooling have lower returns than men, especially in urban areas. A possible explanation for this trend is that since there are more lower educated women than men in Iranian urban areas, therefore less educated women may face additional penalties in the labour market when compared to men.

Figure 5.4: Nonlinearity of Returns to Schooling

Source: Authors own estimation from HIES 2008-2012

While the results in Table 5.7 present strong evidence of non-linear effects of education, one may question whether these returns can be captured by just including a quadratic term. We pursue this further by allowing for an even more flexible specification in Table 5.8. This is motivated by evidence that particular qualifications (such as high school diplomas and/or degrees) matter over and above years of schooling (the sheepskin effect; see, for example, Hungerford and Solon, 1987).

In our regression, we divide schooling levels into seven categories: no qualification, primary school qualifications, secondary or high school qualifications, BA qualification, Master's degree, and the highest degree, a PhD. The omitted category is no qualification.

The results in Table 5.8 confirm the non-linear nature of returns to education in Iran. Note that our sample includes only individuals with qualifications, which reduces it to 48,081 observations for rural areas and 45,162 observations for urban areas. Observing Table 5.8 suggests that, for urban areas, these returns accelerate as individuals gain higher qualifications, and this applies for both men and women; however, women enjoy a much bigger increase. For instance, having a secondary-level certificate increases returns marginally compared to those who have no qualifications (51% for men and 118% for women). Having a BA degree increases returns by approximately 70% for men and 182% for women (compared to no qualification/studies). Having a Master's degree increases the returns by approximately 85% for men and 195% for women, meaning that women with a Master's degree earn 195% more than women with no qualifications, whilst men with a Master's degree earn 85% more than men with no qualification. Finally, urban men and women with PhDs enjoy the highest increase in their hourly wages: 145% for men and 232% for women. In terms of vocational training, we find that the returns are higher compared to those with no qualification, and the effect is higher for women (125%) than for men. These results are also in harmony with Salehi-

Isfahani's et al (2009) findings. For instance, they found out that for 2006 data, returns to wages is 102% for urban men with a tertiary degree, compared to 48% for vocational studies, 57% for upper secondary, and 16% for basic education.

For rural areas, returns to education for primary qualification starts with 38% for men and 60% for women, and increases substantially for each level. The coefficients on secondary and high school certificates are 51% for men and 101% for women. Vocational training also gives very high returns to wages for both men and women, at 53% and 81%, respectively. However, in contrast to urban areas (where women with vocational training had higher returns than women with high school training), women with vocational certificates earn less than those with academic certificates do, while for men, the returns are very similar. Furthermore, we reveal that a university degree increases earnings substantially. For instance, the coefficients for BA certificates are 85% for men and 182% for women.

In summary, results provided in this section suggest strong evidence against the linear Mincer specification that is common in the literature and used in the previous section. Additionally, our results show large sheepskin effects, with the returns to credentials exceeding the returns to years of education. These effects are larger for urban areas than for rural areas are, and for women than for men. Finally, as the tables show, the R squared is higher for women compared to men, suggesting that education is a good predictor of women's earnings in Iran, especially in urban areas where we are able to explain over 40% of the variation in women's hourly wages.

Table 5.8: Regression results using educational levels for urban and rural areas

	Urban			Rural		
	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Education Levels						
Primary	0.477***	0.350***	0.772**	0.513***	0.387***	0.604***
	(0.024)	(0.020)	(0.079)	(0.020)	(0.021)	(0.041)
Secondary/High School	0.603***	0.511***	1.186***	0.629***	0.515***	1.013***
	(0.034)	(0.029)	(0.078)	(0.024)	(0.022)	(0.054)
Vocational	0.671***	0.544***	1.252***	0.665***	0.538***	0.810**
	(0.032)	(0.036)	(0.045)	(0.016)	(0.020)	(0.102)
BA Degree	0.802***	0.702***	1.827***	0.980***	0.854***	1.829***
	(0.039)	(0.034)	(0.071)	(0.045)	(0.052)	(0.030)
Masters Degree	0.959***	0.852***	1.950***	1.282***	1.179***	1.770**
	(0.044)	(0.040)	(0.088)	(0.063)	(0.053)	(0.160)
PhD Degree	1.510***	1.453***	2.325**	1.725***	1.539***	2.719***
	(0.056)	(0.017)	(0.194)	(0.104)	(0.061)	(0.206)
Age	0.131***	0.137***	0.137**	0.084**	0.092***	0.085**
	(0.008)	(0.006)	(0.020)	(0.007)	(0.006)	(0.009)
Age Squared	-0.001***	-0.002***	-0.001*	-0.001***	-0.001***	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Marital Status						
Widowed	-0.578***	-0.212*	0.067	-0.611**	-0.284*	0.109
	(0.036)	(0.058)	(0.029)	(0.048)	(0.087)	(0.064)
Divorced	-0.465***	-0.359**	-0.033	-0.439**	-0.208	0.011
	(0.031)	(0.057)	(0.065)	(0.050)	(0.067)	(0.010)
Single	-0.324***	-0.328***	-0.137*	-0.334***	-0.307***	-0.197*
	(0.018)	(0.017)	(0.038)	(0.022)	(0.022)	(0.036)
Regional controls(30 regio	Induded	Induded	Induded	Induded	Induded	Induded
Constant	14.395***	14.475***	12.928***	15.311***	15.323***	14.380***
	(0.281)	(0.222)	(0.538)	(0.263)	(0.250)	(0.309)
N	48,081	41,471	6,610	45,162	41,005	4,157
R2	0.260	0.265	0.404	0.188	0.173	0.299

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

5.5.3 IV Estimates

In this section, we investigate the causal effect of education on wages using two types of instruments: a non-experimental instrument, which is parental education based on parents' years of schooling, and an experimental instrument based on the educational expansion resulting from the Islamic revolution in Iran. Tables 5.9 (urban) and 5.10 (rural) report the results for parental education, while Tables 5.11 and 5.12 provide the results for educational expansion.

5.5.3.1 Parental education IV results

Tables 5.9 and 5.10 report the casual impact of education on earnings when employing parental education as our IV estimate. It should be noted that our subsample are children older than 16 years that are still living with their parents, as otherwise we would not have access to their parental education. This, of course, leads to a substantially different sample composition when compared to our previous, naïve, results. It is therefore important to investigate this sample in order to contextualise our results appropriately.

Figure 5.6 provides age information about the subsamples used in the regression results. The red line reports our previous, whole, sample, which was all individuals between 16 and 65. On the other hand, the blue line shows the results for the subsample of children older than 16 years old that are living with their parents and are working. It is clearly noticeable that this current sample has a considerably different age distribution with primarily younger individuals aged mid-20 being captured. However, as mentioned, this was necessary to gain access to the parental education information. We therefore complement our IV results with additional OLS results that estimate the return to schooling for this new subsample to help us contextualise our results across all samples.

Figure 5.5: Comparison of the whole sample versus our subsample

Source: Authors own estimation from HIES 2008-2012

5.5.3.1.1 OLS results

The first three columns of these tables report the OLS model for our subsample of children older than 16 years that are living with their parents. Note that in Iran, like in many Middle Eastern countries, it is not odd for children to live with their parents until they are married. This is especially the case in urban areas, where the youth marriage age has been especially delayed. However, in rural areas, the traditional structure of the community is based such that individuals marry at much younger ages, which shows in our subsamples, where the number of children living with their parents in rural areas is much lower than in urban areas. In urban areas, we have 14,395 observations for men and 2,266 observations for

women; while in rural areas, we have 17,364 observations for men and 1,101 observations for women.

Our OLS estimates for our subsample (children older than 16 living with their parents) suggest that in urban areas, education increases the hourly wages of urban men by 1.5% and urban women by 7.3% per year of education. There is also the standard non-linear concave impact of experience for both men and women. Our OLS results for rural men and women of our subsample also suggest a positive effect of schooling and experience for both sexes, though the impact of schooling for rural men is much lower at 0.6%, while for rural women it is very close to that of urban women, of 7.1% and 7.3% respectively. Finally, our estimates of R squared are bigger for women than for men in both areas. In urban areas, we have 0.35 for women compared to 0.28 for men; while in rural areas, we have 0.32 for women compared to 0.21 for men.

5.5.3.1.2 Reduced form results

Columns 5 to 7 of Tables 5.9 and 5.10 reveal our results for our reduced form estimates. Our estimates on parental education are positive in both areas and for both sexes, which suggest that a positive correlation between parental education and child education; the coefficient on parental education is 0.2 for both men and women. Each additional year of parental schooling adds 0.2 years of child schooling. Interestingly, these results suggest that the coefficient for rural women is the biggest, suggesting that the strongest relationship between parental education and child education is for rural women (0.3).

5.5.3.1.3 Restricted estimate results

Observing columns 8 to 10 in Tables 5.9 and 5.10 suggest that our IV estimates are substantially higher than the corresponding OLS estimates. For urban areas, the estimated return on education increases to 6.5% (from 2.3% using OLS). Observing men and women

separately, we predict that for men, the estimated return on education increases to 3.9% (from 1.5% using OLS), while for women, the estimated return on education increases to 20% (from 7.3% using OLS). This suggests significant differences in the rate of return on education between genders, although the IV adjustment results in a common increase of approximately 3 times for both genders.

Observing our IV estimate for parental background in rural areas, we can also detect a higher coefficient for returns to education for both sexes. Here, we observe that one additional year of schooling increases men's hourly income by 0.1% (compared to 0.06% in the OLS model), while women's hourly income increases by 15.7% (compared to 7.1% in the OLS model). Overall, our results here suggest that standard OLS estimates under predict the "true" rate of return to education by a factor of between 2 and 3.

Such results are in line with most studies of the returns to education; for instance Card (1999), Bound and Jaeger (1996), and Ichino and Winter-Ebmer (1999) argue that the returns to schooling are heterogeneously distributed across the population, and this explains the higher coefficients when we employ an IV estimate. There are two explanations for the appearance of this heterogeneity. The first explanation is related to the non-linearity of education and the assumption that returns to education are decreasing with levels of schooling. If parental education has the highest impact on individuals' educational choices at the lower end of the distribution of schooling, then the IV estimates will yield a return that is higher than it should be in the population as a whole. However, this explanation does not apply to our data, since we already find that returns to education are increasing with years of schooling in our dataset. The second explanation is more plausible in our scenario. Educated parents will more easily distinguish the ability levels of their children and hence encourage those with high ability to continue their studies.

We should note that both instruments are statistically significant in the first stage suggesting that parental education as an instrument have a statistically significant impact on the probability to select into more or less education in both areas. The relevant F-statistics for urban and rural areas are 13 and 14 respectively which suggests that parental education as our first IV the instruments are sufficiently strong.

Finally, our sample size decreased substantially because our IV estimates are based on a subsample of children living with their parents, and thus these results should only be seen as indicative results for the larger, population-based sample used in our main analysis. We have 10,528 men and 1,557 women in urban areas and 12,197 men and only 1,101 women for rural areas.

However, these results remain of potential interest because they mirror other studies using this type of instrument Card (1999) and suggest that, as for many countries, OLS estimates may underestimate the true returns to education. If the above results are to be believed, then a conservative estimate of two times our primary OLS coefficients may reflect the true return oneducation in Iran more closely. However, parental education has been criticised in various studies (for example Psacharopoulos and Patrinos, 2004; Trostel et al, 2002, Arcand et al, 2004) as possibly not being an appropriate choice of instrument. This is because parent's education isoften correlated with earnings, as the result these variables don't meet 'the strict validity assumption that is required for IV regressions'(Hoogerheide et al, 2012, p516). We thus attempt to ‘triangulate’ our estimates using a second IV procedure that relies on a period of educational reform in Iran. We discuss this in the next section.

Table 5.9: IV (Parental Education) Results (Urban Areas)

	OLS			***IV Estimate***					
				First Stage			**Second Stage**		
	All	Male	Female	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Parental Years of Schooling	.	.	.	0.235***	0.239***	0.202***	.	.	.
	.	.	.	(0.006)	(0.006)	(0.015)	.	.	.
Years of Schooling	0.023*	0.015*	0.073**	.	.	.	0.065***	0.039***	0.207***
	(0.005)	(0.003)	(0.011)	.	.	.	(0.008)	(0.009)	(0.028)
Age	0.267***	0.292***	0.147***	0.905***	0.849***	1.215***	0.245***	0.277***	0.026
	(0.013)	(0.018)	(0.008)	-0.041	(0.045)	(0.103)	(0.015)	(0.016)	(0.055)
Age Squared	-0.004***	-0.004**	-0.002***	-0.014 ***	-0.013***	-0.019***	-0.003***	-0.003***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Maritial Status(Reference: Married)									
Widowed	-0.311	-0.279	0.074	-0.311	-0.509	-3.353***	-0.332	-0.401	0.599*
	(0.134)	(0.142)	(0.209)	(0.541)	(0.654)	(0.890)	(0.177)	(0.142)	(0.353)
Divorced	-0.228**	-0.209***	0.001	-0.513 *	-0.781**	-1.423**	-0.179 *	-0.155*	0.256
	(0.025)	(0.012)	(0.085)	(0.027)	(0.277)	(0.421)	(0.076)	(0.090)	(0.164)
Single	-0.165**	-0.166**	-0.032	0.615***	0.518***	0.239	-0.198**	-0.184**	-0.090
	(0.017)	(0.014)	(0.092)	(0.068)	(0.070)	(0.076)	(0.023)	(0.023)	(0.080)
Regional controls(22 regions)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded
Constant	5.074***	4.820***	6.045***	-6.334 ***	11.502***	-9.781***	5.089***	4.841***	6.613***
	(0.328)	(0.372)	(0.465)	(0.566)	(0.195)	(0.431)	(0.194)	(0.203)	(0.431)
N	12,085	10,528	1,557	12,085	10,528	1,557	12,085	10,528	1,557
r2	0.277	0.288	0.352	0.363	0.303	0.495	0.2859	0.310	0.267

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

Table 5.10: IV (Parental Education) Results (Rural Areas)

	OLS			***IV Estimate***					
				First Stage			**Second Stage**		
	All	Male	Female	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Parental Years of Schooling	.	.	.	0.222***	0.209***	0.306***	.	.	.
	.	.	.	(0.007)	(0.008)	(0.006)	.	.	.
Years of Schooling	0.016**	0.006	0.071***	.	.	.	0.033**	0.010***	0.157**
	(0.002)	(0.003)	(0.002)	.	.	.	(0.011)	(0.012)	(0.029)
Age	0.172***	0.179***	0.109*	0.761***	0.707***	1.125***	0.183***	0.191***	0.062
	(0.012)	(0.010)	(0.031)	-0.041	(0.045)	(0.127)	(0.015)	(0.016)	(0.051)
Age Squared	-0.002**	-0.002**	-0.001	-0.012 ***	-0.011***	-0.019***	-0.002***	-0.002***	-0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Maritial Status(Reference: Married)									
Widowed	-0.333	-0.265	-0.224	-1.098	-0.947	-1.078	-0.445	-0.470	0.032
	(0.165)	(0.283)	(0.362)	(0.673)	(0.728)	(1.885)	(0.212)	(0.231)	(0.566)
Divorced	-0.269*	-0.282	-0.061	-0.514 *	-0.881**	-0.487	-0.282 *	-0.166*	-0.308
	(0.046)	(0.114)	(0.139)	(0.286)	(0.333)	(0.686)	(0.090)	(0.106)	(0.206)
Single	-0.241**	-0.213**	-0.255	0.615***	0.606***	0.134	-0.230***	-0.198***	-0.255**
	(0.020)	(0.019)	(0.130)	(0.066)	(0.067)	(0.316)	(0.023)	(0.022)	(0.092)
Regional controls(22 regions)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded
Constant	7.076***	6.987***	7.653***	-3.426 ***	-2.825 ***	-5.908 ***	6.801***	6.787***	7.540***
	(0.342)	(0.310)	(0.570)	(0.547)	(0.584)	(1.842)	(0.174)	(0.186)	(0.569)
N	13,298	12,197	1,101	13,298	12,197	1,101	13,298	12,197	1,101
r2	0.213	0.212	0.320	0.167	0.152	0.371	0.211	0.216	0.246

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

5.5.3.2 Educational Expansion IV Results

In this section, we report our results when our IV is educational expansion after the Islamic revolution in 1979. Table 5.11 reports the estimates of our results in urban areas, while Table 5.12 reports the results of our second IV for rural areas. This analysis uses our main sample of all individuals between 16 to 65 years old. Hence, we have 74,125 observations in urban areas and 84,491 observations for rural areas.

5.5.3.2.1 OLS results

The first columns of Tables 5.11 and 5.12 report our OLS estimates, which are similar to our initial OLS estimates in Table 5.6, so we will not describe them in detail. The coefficient for urban areas suggests that one extra year of schooling increases wages by 5.3% in urban areas and 5.2% in rural areas. We observe that returns to education are much higher for women and it nearly double, while they are very similar for urban and rural areas.

5.5.3.2.2 Reduced form results

Columns 4 to 6 of Tables 5.11 and 5.12 report our estimates in the first stage of our model. Here, we observe that the educational expansion had a positive impact on both men and women and in both urban and rural areas of Iran. Interestingly, we also observe that in urban areas, the positive impact of the Islamic revolution is bigger for men than for women (0.55 for men, and 0.30 for women), while in rural areas, the positive impact of educational expansion is much bigger for women than for men (0.22 for men and 1.88 for women). Furthermore, our estimates for age and age squared have the expected signs.

5.3.2.3 Restricted estimate results

We should note that our second instrument is also statistically significant in the first stage suggesting that educational expansion had a statistically significant impact on the

probability to select into more or less education in both areas. The relevant F-statistics for urban and rural areas are 16 and 13 respectively which suggests that our second IV instruments are also sufficiently strong.

According to our second IV, the estimated return on education increases to 22% (from 5.3% using OLS) in urban areas, while this coefficient is 15 % (compared to 5.2%) in rural areas. Observing men and women separately, we find that for men, the estimated return on education increases to 26% (from 4.5% using OLS) in urban areas and 17.6 % (compared to 4.4) in rural areas. For urban women, the estimated return on education increases to 29.7% (from 10.2% using OLS), while for rural women, our coefficient rises to 12.7% (from 10%). These results suggest that when we account for the endogeneity of schooling, the return on an additional year of schooling increases substantially, which is in line with international evidence and suggests that OLS under-estimates the returns to schooling. Note that the highest rise in the coefficient is for men, especially those in urban areas. Moreover, the multiplier on our OLS results is remarkably similar to our previous estimated results using parental education as an instrument. This suggests our 'triangulation' has had some success and produces consistent results.

Overall, our IV estimates are consistent with the existing literature; for instance, existing IV estimates for the UK that examine the effects of 'School Leaving Age Reforms' on wages suggest IV estimates that range between 5% and 20% (for example, see Dickson, 2013 and 2011; Harmon, 1995 and 2000). We also observe that for women, the IV estimates are between 29% (urban) and 12% (rural), whilst for men, they range between 25% (urban) and 12% (rural). We can therefore, with some degree of confidence, argue that our analysis suggests that prior studies on the return to education in Iran (Salehi-Isfahani et al, 2009) underestimates the true return to additional years of schooling, especially for men.

Table 5.11: IV (Educational Expansion) Results (Urban Areas)

	OLS			IV Estimate					
				First Stage			Second Stage		
	All	Male	Female	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Education Policy	.	.	.	0.622***	0.556***	0.303*	.	.	.
	.	.	.	(0.051)	(0.008)	(0.171)	.	.	.
Years of Schooling	0.053***	0.045***	0.102***	.	.	.	0.224**	0.258***	0.297*
	(0.002)	(0.002)	(0.003)	.	.	.	(0.014)	(0.029)	(0.029)
Age	0.129***	0.129***	0.119**	0.375***	0.366***	0.423***	0.065***	0.055***	0.040
	(0.006)	(0.005)	(0.016)	-0.007	(0.045)	(0.127)	(0.015)	(0.016)	(0.051)
Age Squared	-0.001***	-0.001***	-0.001**	-0.005 ***	-0.005***	-0.007***	-0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Maritial Status(Reference: Married)	.	.	.	.	.	.	.	.	.
Widowed	-0.333	-0.265	-0.224	-1.991	-0.947	-1.078	-0.445	-0.470	0.032
	(0.165)	(0.283)	(0.362)	(0.673)	(0.728)	(1.885)	(0.212)	(0.231)	(0.566)
Divorced	-0.269*	-0.282	-0.061	0.016 *	-0.881**	-0.487	-0.282 *	-0.166*	-0.308
	(0.046)	(0.114)	(0.139)	(0.286)	(0.333)	(0.686)	(0.090)	(0.106)	(0.206)
Single	-0.241**	-0.213**	-0.255	1.236***	0.606***	0.134	-0.230***	-0.198***	-0.255**
	(0.020)	(0.019)	(0.130)	(0.066)	(0.067)	(0.316)	(0.023)	(0.022)	(0.092)
Regional controls(22 regions)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded
Constant	7.076***	6.834***	7.653***	3.862 ***	-2.825 ***	-5.908 ***	6.801***	6.787***	7.540***
	(0.342)	(0.310)	(0.570)	(0.547)	(0.584)	(1.842)	(0.174)	(0.186)	(0.569)
N	74,218	65,820	8,395	74,218	65,820	8,395	74,218	65,820	8,395
R2	0.285	0.278	0.445	0.317	0.258	0.527	0.07	0.05	0.106

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

Table 5.12: IV (Educational Expansion) Results (Rural Areas)

	OLS			***IV Estimate***					
				First Stage			**Second Stage**		
	All	Male	Female	All	Male	Female	All	Male	Female
	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay	Log Hourly Pay
Education Policy	.	.	.	0.889***	0.224***	1.882***	.	.	.
	.	.	.	(0.044)	(0.008)	(0.171)	.	.	.
Years of Schooling	0.052***	0.044***	0.100***	.	.	.	0.157**	0.176***	0.127**
	(0.002)	(0.002)	(0.005)	.	.	.	(0.014)	(0.012)	(0.029)
Age	0.084***	0.088***	0.073**	0.216***	0.224***	0.162***	0.065***	0.063***	0.070***
	(0.004)	(0.003)	(0.012)	-0.007	(0.045)	(0.127)	(0.015)	(0.016)	(0.051)
Age Squared	-0.001***	-0.001***	-0.001*	-0.003 ***	-0.004***	-0.003***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Maritial Status(Reference: Married)	.	.	.	.	.	.	.	.	.
Widowed	-0.333	-0.265	-0.224	-1.991	-0.947	-1.078	-0.445	-0.470	0.032
	(0.165)	(0.283)	(0.362)	(0.673)	(0.728)	(1.885)	(0.212)	(0.231)	(0.566)
Divorced	-0.269*	-0.282	-0.061	0.016 *	-0.881**	-0.487	-0.282 *	-0.166*	-0.308
	(0.046)	(0.114)	(0.139)	(0.286)	(0.333)	(0.686)	(0.090)	(0.106)	(0.206)
Single	-0.241**	-0.213**	-0.255	1.236***	0.606***	0.134	-0.230***	-0.198***	-0.255**
	(0.020)	(0.019)	(0.130)	(0.066)	(0.067)	(0.316)	(0.023)	(0.022)	(0.092)
Regional controls(22 regions)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded
Constant	7.076***	6.987***	7.653***	3.862 ***	-2.825 ***	-5.908 ***	6.801***	6.787***	7.540***
	(0.342)	(0.310)	(0.570)	(0.547)	(0.584)	(1.842)	(0.174)	(0.186)	(0.569)
N	86,491	79,555	6,936	86,491	79,555	6,936	86,491	79,555	6,936
R2	0.193	0.188	0.283	0.298	0.286	0.465	0.073	0.061	0.276

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Source: HIES 2008/09 to 2011/12

5.5.3.3 IV Diagnostics

As mentioned in the methodology, for the excluded instrument to be valid, it must be sufficiently correlated with the included endogenous regressor but uncorrelated with the error term. Whilst the correlation with the error term cannot be empirically tested and must be defended on theoretical grounds, the correlation of the instrument with the endogenous regressor can be tested. A significant literature exists that highlights the dangers of using 'weak' instruments in an instrumental variable setting and how they might lead to misleading results (see for example, Cragg and Donald, 1993; Staiger and Stock, 1997; Stock, Wright and Yogo, 2002 and Stock and Yogo, 2005).

To address these concern Table 5.13 and 5.14 presents a series of diagnostic statistics associated with our instrumental variables results in Tables 5.10 to 5.12. It presents the Durbin and Wu-Hausman test that all variables can be treated as exogenous (H_0). It also presents a range of tests on the strength of the instrument in the first stage thereby allowing us inference on whether we should consider any of our instruments weak.

With respect to the tests of endogeneity, for all but one set of regressions the presented test statistics from the Durbin and Wu-Hausman test statistics are significant at the 0.1% level (or less) suggesting that the null-hypothesis that all variables are exogenous can be rejected. Only in the female regression using educational expansion as an instrument is there a suggestion that the variables could be considered as exogenous. Here, for both urban and rural areas the associated Durbin and Wu-Hausman statistics are non-significant suggesting that the included regressors are exogenous. However, we caution against such a formal interpretation as few in the related literature would consider schooling as exogenous.

To test the instrument strength we present a further series of diagnostics. The F-statistic denotes the joint significant of the coefficients on the exogenous regressors and the instrument. Stock, Wright and Yogo (2002) suggest that the F-statistic should exceed 10 when there is one endogenous regressors. All but two regressions exceed this statistics significantly. The first stage regression for women using educational expansion only has an F-statistics of 9.07 in urban areas and 7.94 in rural areas, suggesting the relevant instrument may be weak here. In addition to the F-statistic we also present the adjusted R^2 and partial R^2 both of which can be used as further indicators of instrument strength. A high adjusted R^2 suggests a good model fit whilst the partial R^2 provides evidence on the additional contribution to R^2 that the instrument adds to the first stage. We observe that our regressions with the instrument parental education have higher R^2 and partial R^2 than our regressions using educational expansion, suggesting that parental education is potentially less likely to be a weak instrument. However, parental education appears to work best in urban areas whilst its effect on R^2 diminishes in rural areas. Nonetheless, in both areas parental education appears to have a stronger impact on R^2 than educational expansion. Moreover, the diagnostic evidence suggests that the female regression using educational expansion is particularly weak in both areas with a very low partial R^2 whilst the adjusted R^2 is high, suggesting that the instrument adds little to an already robust model.

Finally, we also present the Stock and Yogo (2005) critical values for a 2-stage least square size of nominal 5% Wald test. This characterisation defines our instrument to be weak if a Wald test at the 5% level can have an actual rejection rate of no more than 10%, 15%, 205% or 25%. In our results the relevant Cragg and Donald (1993) eigenvalue statistic is higher than virtually all our critical threshold suggesting we can reject the null hypothesis of weak instruments. However,

the relevant eigenvalue for females in both urban and rural using educational expansion as an instrument is 9.07 and 7.94 respectively. This is less than the 10% critical threshold of 16.38. This further suggests that the educational expansion acts as a weak instrument in the female regression.

Overall then, we can conclude that the majority of our instruments are strong whilst some caution should be applied to estimates from the female regression using educational expansion as an instrument.

Table 5.13: IV Diagnostics (Urban Areas)

	Instrument = Parental Education			Instrument = Educational Expansion		
	All	Male	Female	All	Male	Female
Tests of endogeneity						
Durbin Chi^2	32.46	10.52	28.02	76.84	103.08	2.41
Wu-Hausman	32.40	10.48	27.53	76.86	103.16	2.40
Tests of Instrument Strength						
F-statistic	1415.01	1271.74	170.29	229.30	166.48	9.07
Adjusted R^2	0.36	0.30	0.48	0.27	0.21	0.41
Partial R^2	0.11	0.11	0.10	0.03	0.03	0.01
Cragg and Donald Minimum Eigenvalue	1415.01	1271.74	170.29	229.30	166.48	9.07
Stock and Yogo 2 SLS Size of nominal 5% Wald Test						
10%	16.38	16.38	16.38	16.38	16.38	16.38
15%	8.96	8.96	8.96	8.96	8.96	8.96
20%	6.66	6.66	6.66	6.66	6.66	6.66
25%	5.53	5.53	5.53	5.53	5.53	5.53

Table 5.14 IV Diagnostics (Rural Areas)

	Instrument = Parental Education			Instrument = Educational Expansion		
	All	Male	Female	All	Male	Female
Tests of endogeneity						
Durbin Chi^2	12.49	13.60	3.45	10.06	15.14	4.62
Wu-Hausman	12.36	13.44	3.09	10.06	15.12	4.55
Tests of Instrument Strength	164.16	111.97	35.19	114.01	87.11	7.94
F-statistic	0.18	0.15	0.39	0.13	0.11	0.31
Adjusted R^2	0.17	0.14	0.32	0.12	0.11	0.30
Partial R^2	0.06	0.04	0.08	0.02	0.02	0.02
Cragg and Donald Minimum Eigenvalue	164.16	111.97	35.19	114.01	87.11	7.94
Stock and Yogo 2 SLS Size of nominal 5% Wald Test						
10%	16.38	16.38	16.38	16.38	16.38	16.38
15%	8.96	8.96	8.96	8.96	8.96	8.96
20%	6.66	6.66	6.66	6.66	6.66	6.66
25%	5.53	5.53	5.53	5.53	5.53	5.53

5.6 Conclusion

In this chapter of the thesis, we have sought to investigate the returns to education in terms of wages in Iran. There is one study conducted on returns to education in Iran by Salehi-Isfahani et al. (2009), however, this study does not differentiate between urban and rural regions/areas, and by gender. On the other hand, as various studies (such as Tokila, 2011) point out, there are differences between rates of return in different regions, and it is important to shed the light to these differences (Tokila, 2010). Furthermore, most of the existing literature (Dougherty ,2005, Trostel et al.,2002) points out that it is important to differentiate between returns to education for men and women, as returns to education are different between them (usually higher for women). This is especially important in developing countries, where cultural and religious factors might overshadow economy, and might affect policymakers' decisions (Huitfeldt and Kabbani, 2007). Hence, our contribution to existing literature on returns to education in Iran comes from differentiating between these two areas, while also examining gender differences. Another contribution of this chapter is that while most of the current studies on return to education in MENA(Assaad,1997; Dah and Hammami, 2002)and the only existing study on Iran(Isfahani et al.,2009) have sought to assess naive estimates of returns to education, we attempt to estimate both the naive and causal returns to education.

Our naïve (OLS) results reveal that the return to an additional year of education (schooling) is approximately 5% for both urban and rural areas. This is consistent with the existing literature on returns to education for most developed countries; for instance, Psacharopoulos (1994) collection of studies on returns to education suggests that in most countries, estimates of

returns to education are between 5% to 15% (Psacharopoulos, 1994). Our naive results also suggest that returns to schooling for Iranian women are higher than for men which is also consistent with the existing literature (Psacharopoulos and Patrinos, 2004). However, our estimates also reveal that returns to education are similar between urban and rural areas, which is in contrast to the existing literature (such as Goetz, 2004; Flink, 2016). In terms of linearity, our results provide strong evidence for non-linearity, which is in contrast with Mincer's assumption of linear returns to education. However, the existence of non-linearity has been proved by many studies of developing countries (for example Elhamidi, 2006; Said, 2016; Salehi-Isfahani, 2009). Finally, our causal (IV) estimates appear significantly higher than our naïve (OLS) estimates; approximately 4 times higher from 5% to around 20%. Many studies (Dickson, 2013; Walker, 2002) have also found that IV estimates that are higher than OLS estimates, although usually only around two to three times as high. Finally, we should note that, while our OLS results suggested that returns to education are similar in urban and rural areas, IV estimates suggest that returns to education in rural areas are lower than urban areas.

Our results provide important policy implications. For instance, existence of high returns to education in terms of wages in Iran justifies both public and private investment in education. This suggests that one way to tackle poverty and inequality in Iran is through public, or/and private investment. Furthermore, the fact that returns to education are non-linear, confirms our findings in the previous chapter regarding possible existence of inequality in education, and consequently existence of intergenerational mobility. Non-linearity in education implies that individuals with higher education earn more money, and since usually children of wealthier and more educated parents receive more education, they then earn more wages in future, while

children of less well-off families usually study until education is complementary (8th grade in case of Iran), which hints that they (especially women) will earn less in future, and this cycle will continue through the life-cycle of individuals. All this suggests that Iranian policy makers need to encourage less wealthier children, and specially girls, to continue their studies into higher education through providing subsidies to these people, or raising the minimum school leaving age.

Chapter 6. Determinants of Under-and-Over Employment

6.1. Introduction

The final chapter of this thesis analyses the determinants of job mismatches in terms of under/over unemployment in Iran. In this thesis, we have conducted a systematic empirical study of the links between private education and the labour market in Iran, with a particular focus on uncovering the potential for different factors to be at work in rural and urban settings. In order to do so, Chapter 4 modelled the determinants of household educational expenditure on children, where we examined various socio-economic factors that determine such decisions. On the other hand, in Chapter 5, we examined returns to human capital in Iran in terms of wages, as we consider such returns as a key motivation for investment in education. Another important impact of investment in human capital is its effects on individuals' employment. Many scholars mention the causes and significance of unemployment in Iran, especially among the educated youth (such as Valadkhani, 2003; Moghaddam, 1995; Amuzegar, 2005; Isfahani, 200), which we discussed in Chapter 1 of this thesis. In fact, one can argue that the topic of unemployment and its costs has received the most attention by Iranian researchers over previous decades. On the other hand, one aspect interrelated with employment and often overlooked, is the potential for under- and over-employment amongst the working population, which is likely to be especially pertinent to the situation of Iran. Since there is an adequate amount of research on unemployment and its consequences in Iran, and no research on the issue of job mismatch, this

chapter focuses on a more specific subject of employment in Iran, namely under/over employment[14].

Scholars of the Iranian economy (such as Sadat, 2016; Harani, 2004) criticise the government as they see under-employment as a way of hiding high rates of unemployment. For instance, in 2014, Iran's Tasnim Newspaper claimed that the government's announced unemployment rates were kept constant compared to previous years due to high rates of under-employment in Iran. These claims can be correct when one examines arguments related to the employment crisis in the Iranian parliament and government committees. For instance, in 2006, one Member of Parliament claimed that the short-term remedy to high unemployment in Iran is that those who are working now should halve their working hours, and instead more unemployed persons would get jobs. On the other hand, in 2012, the Research Centre of the Iranian parliament claimed that in Iran, where the self-employed and unpaid family workers constitute a large portion employed persons, the concept of over-employment might become as important as employment itself. According to this study, the unemployed, and especially unemployed youth, has no choice but to accept jobs that offer hard situations such as more working hours/days than they desire, and this has particular relevance in the agricultural sector. All these findings suggest that job mismatch in Iran should be a central concern to academics, policy makers, and managers alike.

[14]However, we have also modelled returns to education in terms of employability, and provided the results in Appendix D.

This chapter intends to make three contributions; Firstly, as mentioned above, although there are large number of studies of the dynamics and characteristics of employment in Iran such as by Valadkhani (2003), Moghaddam (1995), Amuzegar (2005), and Salehi-Isfahani (2007), to the best of our knowledge, this is the first study that investigates the determinants of under- and over-employment in Iran. The second contribution of this chapter is related to the data that we use in this chapter. The LFS has been available to researchers in recent years (2015), hence, up to our knowledge, no other studies have employed this data to analyse the Iranian labour market, and the author of this thesis is one of the first researchers that have accessed, analysed and studied this rich data source. Finally, while most existing studies of under-and over-employment only model one of these variables, our data provided us the opportunity to observe both under- and -over employment and the exact amount of the existing hours of mismatch, which allows us to investigate all aspects of working hour matches and mismatches of Iranian workers.

The rest of the chapter is organised as follows. In the next section, we provide a literature review of under- and over-employment. Our third section will illustrate our data, which we take from the Iranian Labour Force Survey. The fourth section will provide the methodological and analytical framework. We employ three econometric models to investigate various characteristics of under/over employment in Iran. Section 5 will provide our results, and we finally provide concluding remarks in section 6.

6.2 Literature review

6.2.1 Introduction

In the labour market, the theoretical assumption is that suppliers of labour will naturally match the number of hours they want to the number of working hours offered to them (Golden

and Gebreselassie, 2007). However, in the real economy, various constraints make this equilibrium difficult to achieve. Accordingly, these constraints generate a mismatch between workers' actual working hours and their desired working hours, which results in time-related under- and over-employment (Bonke, 2014). Time-related under-employment happens when workers' wish to work additional hours in return for more wages. On the other hand, 'time-related over-employment reflects a desire for fewer working hours for less pay' (Tam, 2010, p.10). However, we should note that a cyclical pattern of economic growth may also create job mismatch in the labour market (Simic, 2002). For instance, when the economy is growing fast, over-employment may rise and then decrease if economic growth slows down. For under-employment, we would expect the opposite cyclical pattern. Furthermore, under- and over-employment may take other forms; for instance, when there is a mismatch of skills required for the job and the skills possessed by the job-holder. This reflects the existence of under- and over-qualification within the labour market (Tam, 2010). However, this chapter focuses only on job mismatch in terms of time-related under/over employment and overlooks other types of job mismatch, though we acknowledge their importance.

6.2.2 Under-employment

One of the broadest measures of labour utilization is the unemployment rate, however, it does not fully capture the degree of spare capacity (Borjas, 2012). For example, according to the International Labour Organisation (ILO), in many countries (including Iran) individuals working even just one hour during the week would be defined as employed. For this reason, the full capacity of the labour market would be more accurately determined by accounting for under-employment (Simic, 2002). However, there are many operational definitions of under-

employment. For instance, according to Friedland and Price (2003) the Labour Utilisation Framework (LUF) provides a definition of under-employment that is linked to the concept of the social organisation of the economy. According to the LUF, 'under-employment is defined in terms of the adequacy of the exchange within the labour market between the household and the economy, and fairness is the criterion used to determine the adequacy of the exchange. Judgments regarding the adequacy of the exchange are made with the frame of reference being a minimally adequate exchange relative to social norms' (Friedland and Price, 2003, p.33). From this perspective, the exchange can be inadequate in three dimensions; wages received from employment, duration of working hours, and provision of relevant skills (Friedland and Price, 2003). This definition of under-employment suggests that workers may be under-employed in one of three ways: involuntary part-time work, low-income work, and skill mismatch. Mckee (2011) adds to this relatively comprehensive definition provided by the LUF by pointing to social status as one of the most important rewards of the labour market. The importance of social status was first studied by Burris (1983), where he finds that a considerable number of college graduates felt unsatisfied with their job because 'they were denied the high-status positions that their education should have afforded them'(Friedland and Price, 2003, p.35). Friedland and Price (2003) then concludes that 'these workers were concerned about reaping the status rewards their educational and familial backgrounds should afford them as much as they desired adequate hours and wages'. These studies suggest that it is simplifying to assume that workers look only for hours, income, and opportunities for skill use when entering the labour market, because 'jobs also provide people with the opportunity to claim certain statuses in society' (Mckee, 2011, p.967).

Various studies point to under-employment becoming a more prevalent phenomenon in various regions and countries. For the USA, the Bureau of Labour Statistics (2008) reported that 8.8 million workers are forced to work part-time because they are unable to find full-time jobs. While these studies focus on full- versus part-time definitions of under-employment, broader definitions suggest the existence of even higher rates of under-employment. For instance, when the definition is broadened to include workers who are overqualified for the jobs they hold, the US Bureau of Labour Statistics estimates that under-employment ranges from 17% to 22%. Green et al. (2010) point out that under-employment in the USA will rise to about one third of the workforce if we broaden our definition of under-employment, including over 20% who are considered 'highly overqualified'. Vaisey (2006) also focuses on the importance of over-qualification and claims that this observable fact is increasing in the USA in a positive, linear trend, as the average education of workers increases. In line with these arguments, Feldman (2009) also claims that there will be a greater possibility that workers will experience under-employment if the supply of skilled jobs does not increase commensurably. In line with research conducted in the USA Allen and van der Velden's (2001) study on European countries also finds that under-employment is rising in most countries. They claim that half of their sample of higher education or vocational school graduates were either overeducated or employed outside their fields of study (Allen and van der Velden, 2001).

This section suggests that under-employment is a multidimensional and complex concept that can/has been studied from a variety of research perspectives. For instance, management scholars can study under-employment from the organisational view, while economists investigate under-employment by focusing on the under-utilisation of the labour force and its

effects on the labour market. Sociologists study under-employment's impact on society and social structures, while community psychologists might examine the health outcomes and community effects of under-employment. Accordingly, each area has its own way of defining under-employment, and research in each stream tends to follow unique discipline-specific traditions (Heyes et al., 2017).

6.2.3 Over-employment

Employment that involves working excessive hours is another side of inadequate employment situations. According to the ILO, some workers would accept a cut in their wages in exchange for a reduction in their working hours. However, the conventional model usually argues that such a mismatch is a short-term problem and workers and firms will eventually come agree to match the desired and required working hours; otherwise, in the long term, employers will lose their workers to other firms that offer shorter work hours. Nevertheless, most of the existing studies (Rubin and Richardson, 199; Kahn and Lang, 1995) agree that over-employment can persist indefinitely, where 'optimizing employers regularly require longer hours than employees might prefer' (Kahn and Lang, 1995, p.920)

Boulin et al. (2006) point out that the design of the set of survey questions regarding over-employment can affect observant reaction, and thus creating a true measurement of over-employment is rather difficult. For instance, if the survey includes questions that provide an alternative option of obtaining higher income in return for more working hours, the proportion of respondents indicating a preference for fewer hours declines. This report then suggests that 'when presented simultaneously with the alluring more money option, choosing fewer hours may lose its relative appeal, even if such hours are not available at their current job' (Boulin et al.

,2006, p.211). Green (2007) also argues that if the survey asks individuals to specify how many hours they prefer to work (instead of just indicating fewer working hours), then the proportion of over-employed workers will decline. However, he also claims that this kind of question is challenging because it is often unclear how workers would get their 'preferred' number of hours. For example, in the UK, while 12 million respondents indicated a preference for fewer hours, only 3 million pointed out that they would accept less pay in return for fewer working hours (Simic, 2002). Finally, if workers expect a period of high under-employment or unemployment in the near future, they might accept or 'prefer' longer working hours 'as a hedge against anticipated future reduction of income' (Boulin,2006, p.214). These arguments suggest that estimates of over-employment may be biased downward if survey questions 'provoke ascertain implicit assumptions about the current income foregone, and the amount and dimensions of hours reduced and type of gains realised in time off' (Green, 2007, p.217).

We should note that over-employment can also be viewed from a macroeconomic perspective in three distinct types: structural, cyclical, and frictional. 'Structural over-employment occurs because of the presence of structural incentives inherent in labour-market-related institutions or work organisation that lengthen hours demanded per worker. Such work organisation includes the growing use of mandatory (compulsory) overtime practices' (Boulin, 2006, p.216). These institutions include those that intensify the fixed cost associated with employing new workers (e.g., computerisation) (Hubler, 2000), training and hiring costs (Contensou and Vranceanu, 2000), and the cost of 'premiums for employee health benefit coverage' (Glosser and Golden, 2004; p.85). Cyclical over-employment occurs during cyclical booms, when demand is surging and the hours demanded per worker grows more rapidly than

workers' preferred hours (the latter induced by rising wage rates if the substitution effect on labour supply is dominant) (Marcuro et al., 2015). Finally, frictional over-employment exists due to the 'bundling of wages and hours in typical employment contracts and from incomplete markets and information' (Boulin, 2006, p.219). In other words, due to existing barriers in the labour market, employers do not have perfect information about their employees' preferences. Similarly, job applicants do not have perfect information about job requirements and alternative jobs; hence, such information asymmetries lead to mismatches in the labour market.

6.2.4 Consequences of Under/Over Employment

In contrast to the widespread existing literature on the negative effects of unemployment (Dooley et al., 1996), the relationship between under/over employment and well-being has not been studied extensively. In this section, we examine the few existing studies on the consequences of under/over employment, especially in terms of health and well-being.

Most research designs that examine the relationship between under-employment and health employ cross-sectional analysis (Friedland and Price, 2003). However, the findings of such studies are not conclusive, and there is no consistent agreement that under-employment is necessarily harmful for workers' health and well-being. Furthermore, indicators of well-being vary across studies. For instance, Burris (1983) and Khan and Morrow (1991) study the impact of under-employment on job satisfaction, while Beiser et al. (1993) examine its impact on depression. Accordingly, further research employs other factors such as life satisfaction (Feldman and Turnley, 1995), self-esteem (Johnson, 1986), and physical health (Herzog et al., 1991). On the other hand, many studies reject any relationship between under-employment and the same indicators of health and well-being (Burke, 1998; Feldman and Turnley, 1995; Herzoget et al.,

1991). However, as Friedland and Price (2003) suggest, the relationship between under-employment and health may result from three causal conditions: first, as discussed above, 'under-employment might affect health; the second possible scenario is that health affects the probability of under-employment; finally, it is possible that an 'unmeasured third variable' affects both under-employment and health' (Friendland, 2003, p.35).

On the other hand, few longitudinal studies on the relationship between under-employment and well-being have assessed the links between the two. This type of study is more conclusive in its findings, which suggests that skill under-employment affects workers' health and well-being of workers (Friendland and Price, 2003). For instance, Friendland and Price (2003) reveal that skill-under-employed workers experience 'more depressive symptoms, lower life satisfaction, a more external control orientation, and lower perceived competence than do their adequately employed peers' (Friedland and Price, 2003, p.35). Some studies examine underemployment in terms of income and hours. For instance, Prause and Dooley's (1997) study reveals that poor self-esteem was associated with increased odds of hours- or income-under-employment, and reports of alcohol abuse was higher for these workers

Various studies examine the reverse effects of over-employment on workers' well-being (Schor, 1991), although their findings are not conclusive, and they suffer from methodological limitations (Angrave, 2015). This is because studies based on cross-sectional data (e.g., Wilkins, 2007) or longitudinal data 'do not utilize within-person analysis' (e.g. Friedland and Price, 2003) and 'may be biased by failure to account for time invariant individual characteristics' (Angrave, 2015, p.4). According to Angrave (2015), it is necessary to use longitudinal data to capture the causal relationship between over-employment and well-being. However, only two studies

employ this methodology, and they provide contradictory findings. Wooden et al.'s (2009) research on Australia reveals that over-employed individuals reported lower life satisfaction, while evidence from Germanyby, Wunder, and Heineck (2013) finds no relationship between over-employment and life satisfaction.

This literature review highlights several interesting points. First, the relationship between under/over employment and well-being varies by type of under/over employment and indicator of well-being. Second, employing a longitudinal design is the most appropriate methodology in order to minimize the possibility of obtaining spurious relationships. Finally, while the few longitudinal studies on the impacts of under-employment on well-being are more consistent and mostly agree on the negative impacts of under-employment, the few longitudinal studies on the impacts of over-employment are rather inconclusive and contradict each other.

6.2.5 Determinants of Under-employment

In this section, we investigate the various determinant of under/over employment. We divide these indicators into two separate factors: demographic factors such as the role of gender, marital status, number of children, and age; and work status factors such as industrial differences, employer size, trade unions, and temporary work.

Many studies try to examine the impacts of age and gender on the likelihood of under-employment (e.g., Wooden et al., 2009; Kjeldstad and Nymoen, 2012; Bell and Blanchflower, 2011; Cam, 2004). As s McKee-Ryan (2011) state, we usually expect that under-employment is more prevalent among women than men 'because of the disproportionate likelihood of being laid off, career disruptions, re-entry into the workforce after breaks, and the tendency to settle for lower salaries and positions to balance family demands' (Harvey, 2011, p.993). Still, the results

from studies on the relationship between under-employment and gender are rather inconsistent. For instance, while some studies (Jefferson and Preston, 2010; Jensen and Slack, 2003) confirm greater under-employment among women, other studies find non-significant or near-zero relationships between gender and under-employment (e.g., Feldman et al., 2002; Holtom et al., 2002; Johnson and Johnson, 2000a; Ruiz-Quintanilla and Claes, 1996). Some studies even claim that under-employment is higher among men than women (Chambel and Castanheira, 2006; Maynard et al., 2006; Tam, 2010). Just like gender, studies on the relationship between under-employment and age are also inconclusive. Some studies (such as Erdogan and Bauer, 2009) find a positive correlation between age and under-employment, while some find a negative relationship (Maynard et al., 2006). Some studies claim that age is not significantly related to the likelihood of under-employment (e.g., Kraimer et al., 2009). Tam (2010) examines under-employment by age category and claims that under-employment can exist within all age categories; however, his study reveals that under-employment is highest for those within the 18 to 24 age range. Following this research, Harvey (2011) suggests that future research needs to focus on the potentially U-shaped relationship between under-employment and age, where both new entrants and older workers in the labour market are most likely to experience under-employment.

On the other hand, the existing research on the relationship between being a part of a racial minority group and under-employment is consistent and confirms a positive correlation between the two (De Jong and Madamba, 2001; Jensen and Slack, 2003). Mau and Kopischke (2001) reveal that women from minority groups were more likely to desire more working hours compared to their white male counterparts. However, this study also points to the importance

of choice of subject in university, and claims that minorities and women usually select subjects that are associated with lower job market demand.

Finally, among the demographic factors, education can also be related to the desire for more working hours. However, results from studies on this relationship are also mixed and confounding. For example, some studies (such as Weststar, 2009; Holtom et al., 2002; Mason, 1996) suggest that more education is associated with higher levels of under-employment, while Johnson and Johnson (2000) find no significant relationship between the two variables.

Various work-related factors increase the likelihood of under-employment (Feldman, 1996). For instance, Slack and Jensen (2004) examine the probability of under-employment in various industries and find that workers in oil and gas industries are more under-employed in comparison to mining. On the other hand, Feldman (1996) examined the likelihood of under-employment among certain types of employees, and suggested that under-employment is higher among managers (the reference group was non-managers). Abrahamsen (2010) examines variations of under-employment across professions in Norway and finds that professional employees were less likely to be under-employed. However, a review of the literature on the relationship between occupation and under-employment reveals that under-employment affects employees across a wide range of occupations. For example, Feldman et al. (2002) reveal that under-employment exists among executives, while Lee (2005) pointed out that under-employment is prevalent among expatriates. Various studies point out that under-employment might exist among university employees (e.g., for faculty members, Maynard and Joseph (2008); for business school graduates, Feldman and Turnley (1995); and for non-academic university employees Khan and Morrow (1991)). Other studies also point out that under-employment is

prevalent among retail workers (Erdogan and Bauer, 2009), medical and laboratory technicians (Watt and Hargis, 2010), hospital workers (Holtom et al., 2002), and professional and technical workers (Kinicki et al., 2000; McKee-Ryan et al., 2009). Finally, there is evidence that workers who have been laid off or were out of work for some time might experience higher levels of under-employment (Feldman, 1996). Various studies (Hijzen et al., 2010; McKee-Ryan et al., 2009) find that post-layoff jobs are at lower levels in terms of wages and time mismatches.

6.2.6 Determinants of Over-employment

The relationship between over-employment and age has been examined extensively (for example Golden and Gebreselassie, 2007; Angrave and Charlwood, 2015), and there is usually agreement among these studies that over-employment is lower among young workers, but it rises with age. Another demographic variable that might affect over-employment is gender, and most studies agree that women are more likely to be over-employed. SousaPoza and Henneberger (2002) conduct a study of 21 countries and find that in all of them, over-employment is more persistent among women than men. Golden and Gebreselassie (2007) find the same result for the USA and explain that women's greater responsibilities at home explains this result. Additionally, they reveal that persistent gender inequalities within the work place might reduce women's tendency to make labour market work their central priority (Reynolds, 2005).

Various researchers also study the relationship between income and desire to work fewer hours. However it is difficult to examine such effects (Fernandez and Lim, 2016). This is because according to the income effect, 'an increase in income induces an increase in the allocation of time for leisure, which in turn reduces the likelihood of over-employment. On the other hand, an

increase in wages increases the opportunity cost of leisure; therefore, a higher wage may encourage workers to sacrifice leisure for work (due to the substitution effect), thus increasing the likelihood of over-employment' (Fernandez and Lim, 2016, p.40). Reynolds and Aletraris (2007) find that for the USA, high income employees work longer hours than their lower paid peers do, but they have a higher desire to decrease their working hours.

Family characteristics such as the presence of a full-time homemaker and/or childcare duties also determine the desire for longer working hours or vice versa. There is usually agreement among researchers (Jacobs and Gerson, 2001; Kaufman and Uhlenberg, 2000) that being a single parent and/or having dependent children increases the likelihood of over-employment. According to Jacobs and Gerson (2001), workers have to allocate their time between working and their personal lives. Hence, single working parents or dual-earner couples with children are more likely to desire fewer working hours. Following this argument, Kaufman and Uhlenberg (2000) also argue that the head of a household who is the main breadwinner can work more hours because 'they have spouses who perform unpaid domestic work'. Furthermore, 'these men may feel responsible for the economic well-being of their families' (Kaufman and Uhlenberg, 2000, p.934), and this would increase their desire for additional work hours and reduce the likelihood of over-employment. Childcare duties, such as the number of children in the household and age of the youngest child are also important determinants of over-employment. Findings for this relationship are conclusive and reveal that the probability of desiring fewer working hours increases as the number of children rises because both fathers and mothers want to devote more time with their children (Abendroth et al., 2014).

Finally, work-related factors such as hours of work, job satisfaction, and occupation can also contribute to over-employment. According to Sousa-Poza and Henneberger (2002), the percentage of workers who desire fewer hours of work rises as working hours increase. Empirical studies show that over-employment is significantly related to hours of work (Reynolds, 2004; 2005). Golden and Gebreselassie's (2007) study shows that being employed in full-time job increases the likelihood of being over-employed. Some studies also argue that job satisfaction has effects on workers experiencing job mismatches. (Reynolds and Aletraris, 2007). Last, the type of occupation is also related to over-employment, as certain types of jobs require more working hours. Golden and Gebreselassie (2007) suggest that the probability of being over-employed is higher in salaried rather than hourly wages. They also point out that workers in occupations that are not obligated by 'Overtime Laws' are more likely to desire less working hours. Golden (2004) opine that white-collar workers in managerial and professional groups have significantly higher levels of over-employment, while blue-collar workers are less likely to experience over-employment.

6.2.7 Over/Under Employment in Iran

Various studies point to under-employment becoming a more prevalent phenomenon in various regions and countries. For instance, a Gallup (2013) report noted while in most MENA countries, the unemployment rate has decreased slightly during the last decade, the rate of under-employment has increased by 9.7% during the same period. However, in this report, under-employment was simply defined as part-time workers' wish for a full-time job (Jacobe, 2010).Habibi (2015) claims that while both unemployment and under-employment are rising in most countries of the MENA region, this problem is more severe in Iran than in any other Middle

Eastern country. He then describes this problem as 'an unprecedented over-education crisis that is likely to get worse in the coming years'(Habibi,2015, p.10).Harani (2004) suggests that due to the high unemployment in Iran, the government decided that under-employment for young graduates could be a short-term remedy for the country's current crisis. Consequently, part-time jobs are offered to full-time job seekers, or /and those who are looking for more working hours accept fewer working hours out of desperation. Despite these claims no empirical studies on the trends and determinants of under- and over-employment has been conducted in Iran. The issue has only been mentioned briefly in studies of over-education (Habibi, 2015) or unemployment (Valadkhani, 2003). However, as we mention previously, under-employment is even more relevant to less-developed countries like Iran with young university graduates, and the absence of unemployment insurance. Hence, this is the only study on under/over-employment in Iran, particularly as this thesis focuses on gender and urban/rural impacts on under- and over-employment.

6.3. Data and Descriptive Statistics

This section provides a brief introduction to the dataset used in this analysis and provides the descriptive statistics of key variables.

6.3.1 Iranian LFS

The data we analyse in this section are from the Iranian Labour Force Survey (IRLFS) conducted by the Iranian Statistical Centre on a seasonal basis across the nation using sample rotation to provide quarterly and annually estimates of labour force indicators in Iran. As the survey is completed, the outcomes are compared with those of the previous rounds to observe

the possible changes in indicators over seasons at the national, urban, rural, and provincial levels. The survey was first conducted in 2005 and since then occurs regularly in the middle month of every season. Another survey, the Household Employment and Unemployment Characteristics Survey (HEUCS), was implemented before LFS. The HEUCS was first taken in 1994 and repeated annually from 1997 to 2000 from October 23 to November 22. From 2001 to 2003, it was taken on a seasonal basis, in the middle month of every season, while in 2004, it occurred from April 21 to May 21 and October 23 to November 22. To improve the HEUCS quality and its conformance with the international concepts, particularly those of the ILO, the survey plan was revised and became the current Iranian Labour Force Survey[15].

In this section, we use IRLFS data from 2008 to 2014, in which 4,333,492 questionnaires were completed. However, we limit our data to respondents between 16 to 65 years old who are working. We use question 1 in the IRLFS, which asks, 'during the last week, did you work at least one hour to receive wages, salary, profit, and earnings?' This decreases our data to 1,013,693 observations. However, since the nature of our data is seasonal rather than annual, and according to the Iranian Statistical Centre, each individual is surveyed twice each year, then our sample contains around 500,000 working individuals between 16 and 65.

6.3.2 Dependent Variables

In this section, we outline our types of dependent variables. Our first dependent variable is willingness to work more hours, which is one of our indicators for under-employment, while

[15](Iranian Statistical Center: https://www.amar.org.ir/english/Statistics-by-Topic/Labor-force#287788-statistical-survey)

our second dependent variable is the difference between participants' stated desired working hours and actual working hours. The rationale for choosing the second dependent variable is that, first, while the first dependent variable only models under-employment, the second provides information on both under- and over-employment. Hence, this allows us to investigate all aspects of working hour matches and mismatches of Iranian workers. Second, as mentioned in the literature review, the definition of under/over employment is based on respondents' perceptions. While this common critique is applicable to the first dependent variable, it is not applicable to the second dependent variable, as we created this second dependent variable from two questions. This allows us to perform useful robustness and specification checks on the first analysis. Third, our second dependent variable allows us to examine the degree of mismatch in much more detail; specifically, we can identify large and small mismatches. The next sections will examine each dependent variable in detail.

6.3.2.1 Willingness to Work More Hours

Our first dependent variable examines willingness to work more hours during the week, which is provided in LFS question 21. This question asks participants, *'during the last week, did you want to increase your working hours?'.* Hence, it refers to the extra hours participants wish to work during the week. Respondents provide a yes or no answer; hence, a yes response points out that they would like to work more hours, and a no response shows that participants are either happy with their working hours or they want to decrease their working hours during the week.

Table 6.1 presents respondents' answers to the question according to gender. As mentioned in previous sections, female participation is very low in Iran (around 15%), and we have substantially fewer observations for women than for men; however, the large sample size

of the Iranian LFS still makes it feasible to analyse women separately. Consequently, while in Table 6.1 there are 1,000,638 responses from male workers to this question, there are only 206,245 female responses. As we discussed previously, not all of these participants are unique individuals since our data is seasonal and each participant is surveyed twice. According to Table 6.1, 21.53% of male participants are willing to increase their working hours compared to 13.38% of women. This suggests that men are almost twice as likely to wish for increased working hours when compared to women. Hence, this suggests that Iranian women are happier with their working hours than Iranian men are, or at least they do not want to increase their working hours, possibly implying that women are already over-employed and they have the desire to decrease their working hours. Since these participants are already working, a possible explanation for these results is that since women's labour force participation is low, maybe the most educated and skilled women are working and hence already have high working hours. As mentioned in the literature, age, marital status, and number of dependent children are important factors when analysing over/under employment. Hence, another explanation might be that most working women are married. Therefore, their desire to spend more hours with their families and children is stronger than their desire to work more hours. Prior studies report similar findings in the USA (Golden and Gebreselassie, 2007). Furthermore, Tam (2012) finds that in the UK, women between 25 and 34 are twice as likely to be over-employed compared to men, which reflects that childrearing remains a predominantly female role in society. That is, compared to men in the same age range, women of childbearing age reported higher levels of over-employment, perhaps because they experience a greater desire to work fewer hours in order to spend more time with their children and family, as more time spent at work means less time spent at home and with

family. Major (2003) confirms the argument that disruption of work-life balance is a common consequence of over-employment, and is associated with increased work-family conflict and indirectly with psychological distress (Major et al., 2002).

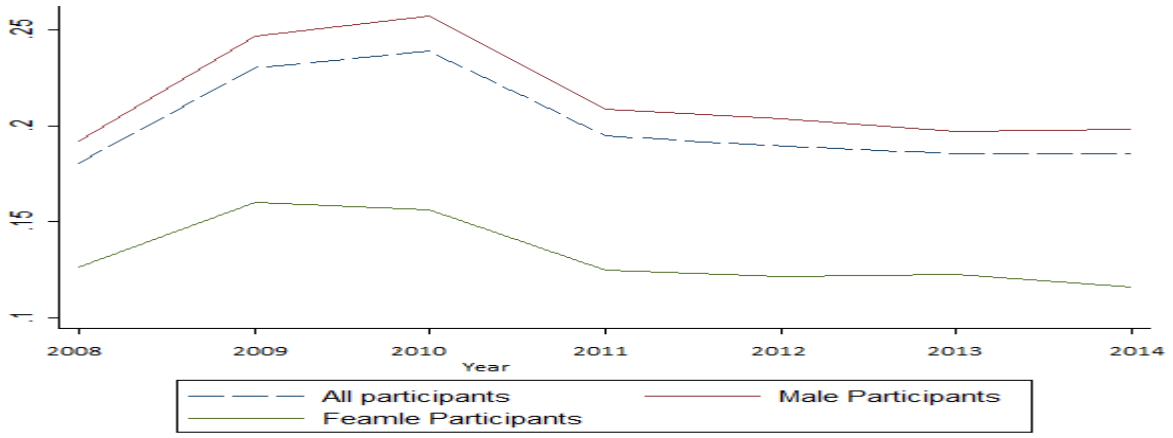
Table 6.1: Willingness to increase working Hours

	Male		Female	
Yes	215,465	21.53%	27,601	13.38%
No	785,173	78.47%	178,644	86.62%
Total	1,000,638	100%	206,245	100%

Source: LFS 2008-2014

Observing under-employment over the period is also an important factor, as macroeconomic shocks and political and social events might have an impact on workers' willingness to work more or less. Figure 6.1 illustrates the willingness to work more hours during 2008-2014. We can observe that 2009 and 2010 have the highest percentage of people who are willing to work more hours (23.21% and 24.04%). After 2010, the proportion of individuals willing to work more hours drops to 20% and remains flat thereafter. If we separate our dependent variable (willingness to work longer hours) by gender, we observe that the willingness to work more is higher among men than for women. The highest willingness to work longer hours for men was in 2010 (25.87%), while for women, it was 16.09% in 2009. However, we can observe no significant difference between both trends, suggesting that macro-economic and time period effects affected both men and women similarly. One possible explanation for workers' highest willingness to work more during this period is that the 2010-2011 international boycotts that included sanctions against the Iranian oil industry happened during this period, which was the peak of the Iranian government crisis with the international community.

Figure 6.1: Willingness to work more hours over years



Source: LFS 2008-2014

6.3.2.2 Amount of Mismatch

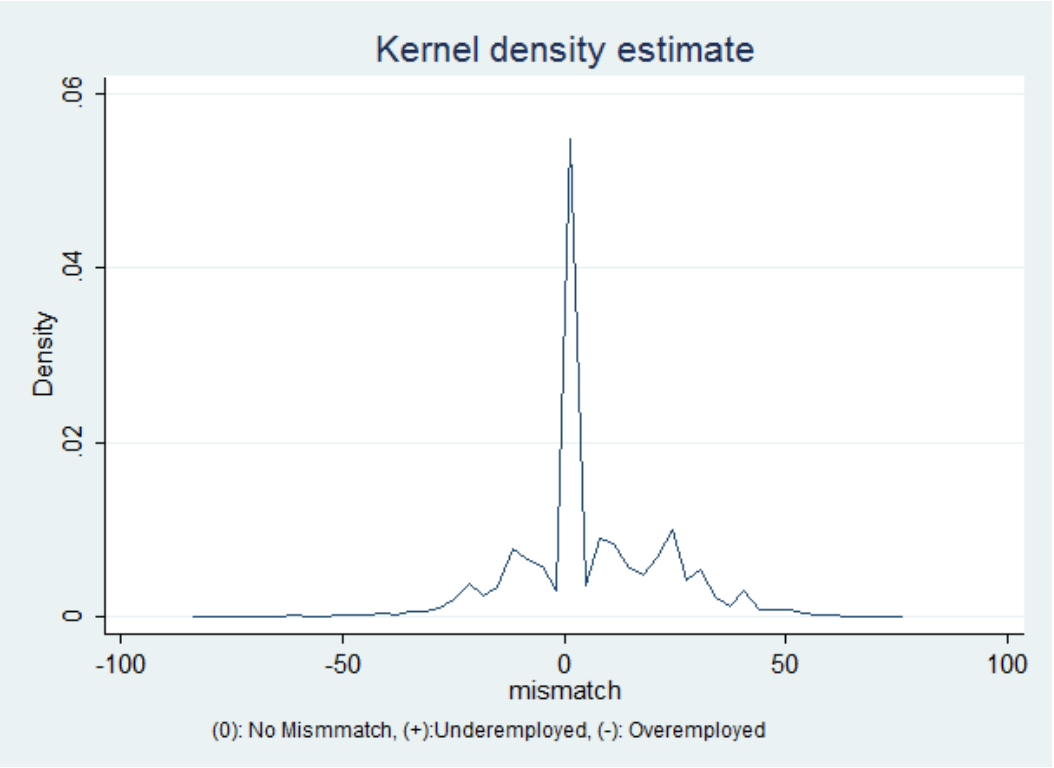
We created our second dependent variable from two separate survey answers: the difference between respondents' stated desired working hours and their actual working hours. A common criticism of studies of under-employment is that they is occasionally use definitions that refer to workers' perceptions (Glyde, 1977; Jensen and Slack, 2003; Bell and Blanchflower, 2011); even so, some additional specifications have been introduced in official definitions. We tried to mitigate this limitation to some extent by creating this dependent variable. The rationale is that with the previous dependent variable, it is not possible to pin down how strongly people want to have extra/fewer hours (Hussmans, 2007) and it does not allows us to examine over-employment. This is particularly important in an economy in which people may adjust their work expectations to tighter job markets (ONS, 2011). The next section explains in detail how we have derived this dependent variable.

6.3.2.2.1 Calculating mismatch

Question 16 in the LFS asks participants, *'on average, how many hours do you work in this season?*' Clearly, this question represents participants' actual working hours. Furthermore, question 27 asks participants, *'how many hours in a week would you like to work in this season?'* Hence, the difference between these two questions is our second dependent variable.

Figure 6.2 presents the distribution of our second dependent variable (difference between desired and actual working hours). According to this figure, the average working hours mismatch is 2.46 hours, suggesting that on average, individuals would like to work more hours per day. The standard deviation is 13.0, suggesting a significant variation around this mean. According to this figure, 67% have no desire to increase/decrease their working hours. In terms of over-employment, we can observe that 1.58% of participants are willing to work 12 hours less per week. Keeping that the Iranian work week has 6 days, this means that 1.58% hope to work 2 hours less per day. For those who are willing to work more, 1.92% of participants are willing to work 24 extra hours per week, which is 4 hours per day on average.

Figure 6.2: Kernel Density estimate of Mismatch Hours



Source: Authors own estimation from LFS 2008-2014

Table 6.2 presents this dependent variable as a categorical variable. Our first dependent variable was based on the simple question, 'do you wish to increase your working hours?'; hence, it only indicated under-employment in the market. However, here we have information on both over- and under-employment and the degree of their mismatch. Table 6.2 suggests that 11.50% of participants desired fewer working hours than what they are actually working, and hence are over-employed. On the other hand, 21.86% of participants desired more working hours than what they actually work, meaning that they are under-employed. Finally, 66.64% are happy with their working hours.

Table 6.2: Dependent variable as a categorical variable

Mismatch Category	Frequency	Percentage
Overemployed	125,559	11.50%
Matched	727,760	66.64%
Underemployed	238,733	21.86%
Total	1,092,052	100%

Source: LFS 2008-2014

In conclusion, we find some interesting insights for further analysis. For instance, the fact that women appear less under-employed than men are in the Iranian labour market. Furthermore, we observe that over-employment is as important as under-employment in looking at the Iranian labour market; hence, if a study looks only at under-employment, it is missesa substantial proportion of workers who are over-employed, and thus their analysis of work mismatch may not be comprehensive enough.

The next section will examine the independent variables we will employ in the methodology section.

6.3.3 Independent Variables

In this section, we provide the summary statistics of our independent variables. Demographic profiles are an important determinant of working hours within the labour market. For demographic characteristics we have individuals' age, marital status, nationality, and educational characteristics. We also have workplace characteristics as our independent variables, including occupational characteristics, employment status, flexible work (i.e., part- versus full-time), and establishment size. Tables 6.3 and 6.4 are providing descriptive analysis for urban and rural areas and for men and women separately. This is because various studies point to a higher

level of involuntariness among women than men (Bell and Blanchflower, 2010; Cam, 2014). As Tables 6.3 and 6.4 show, we have 517 237 observations for urban areas, and 580,127 observations for rural areas.

6.3.3.1 Summary Statistics for Urban Areas

Table 6.3 provides summary statistics of our independent variables for urban areas. We run the multivariate regressions on our restricted sample of respondents between 16 and 65 years old. In Table 6.3, we have information on demographic characteristics such as age, nationality, marital status, and educational characteristics. There are 499,627 observations for men and 80,500 observations for women who are working and are between 16 and 65 years old.

Age categories are important determinants of under/over employment according to evidence from international studies. Ruiz-Quintanilla and Claes (1996), for example, highlight a higher risk of under-employment among younger workers, as Bell and Blanchflower (2011) do in the UK. This can be specifically true in the case of Iran and some Middle Eastern countries, which have a very young population. As Table 6.3 shows, nearly 60% of our working sample is below 40 years old. This highlights the young population pyramid of the Iranian labour force, which is true for both men and women.

We also provide a category for nationality because Iran is a host country for Afghan refugees and it has the biggest refugee camp in the MENA region. According to a report by OECD(2015) ethnicity can have a reverse impact on the likelihood of finding a suitable job, and it is usually accepted that refugees are either under-employed due to discrimination or are over-employed because they work illegally in the host country. In Table 6.3, we can observe that more

than 1% of men and 0.81% of women in our sample are non-Iranian, specifically refugees from Afghanistan.

As another demographic factor, marital status, specifically presence or absence of a spouse and dependent children, are important determinants of over/under employment. For instance, an aggregated analysis of mostly EU and other developed countries stresses that marriage diminishes the likelihood of under-employment (Stier and Lewin-Epstein, 2003). As Table 6.3 shows, nearly 75% men and 68% of women are working and married, while 24% of men and 26% of women are single. We have no evidence on the number of children, as our data is based on individual characteristics.

Finally, education is an important and complex indicator of a person's positions at work (Brown et al., 2011). For example, when involuntary part-time employment rose to 16 million during the economic downturn in the USA in the 1970s, Bednarzik (1980) cites low education and skills as the main reasons. Likewise, aggregated results from developed countries highlight that higher education reduces the likelihood of under-employment (Stier and Lewin-Epstein, 2003). In our sample, we have information about whether individuals are currently studying or not, whether they are literate, their stage of education, or their type of qualification. We categorise educational levels as primary, secondary, high school, pre-university, diploma, bachelor's, master's, PhD, and any other type of education. As mentioned in previous sections and cited by many scholars (Salehi-Isfahani and Eagle, 2009), the education status of young Iranians, and especially young Iranian women, has improved substantially since the Islamic Revolution, where women occupy most of the university seats (60%). Furthermore, the literacy rates among the Iranian population are very high (93%), especially among the younger generations. On the other

hand, researchers (Salehi-Isfahani, 2010) claim that there are some dispersions between rural and urban areas of Iran. We can observe from Table 6.3 that for urban men, nearly 26% of respondents have qualifications from primary school, while nearly 25% have qualification from secondary school, around 33% have education from high school, a pre-university degree, or a diploma degree (pre-university can be obtained in the fourth year of high school, while a diploma can be obtained after third year of high school[16]), and around 13% have university degrees, meaning either a bachelor or a master's degree. Finally, nearly 1.60% of urban men and 2% of urban women have some other types of qualifications. Interestingly, the percentage of women with a university degree is much higher than for men, which confirms previous studies finding a high number of women with higher education in Iran.

Several studies, such as that by Caputo and Cianni (2001), emphasize the importance of workplace characteristics as determinants of over/under employment. In Table 6.3, we include some workplace characteristics such as occupational characteristics, employment status, flexible work (i.e., part- versus full-time), and establishment size. Table 6.3 provides employment characteristics of workers in urban areas of Iran. We divide employment status into four categories: self-employed, entrepreneur, unpaid family workers, and wage and salaried workers. Our data suggests a high percentage of self-employed workers in Iran: nearly33% of men and 23% of women. Apart from the high number of self-employed individuals, 60% of men and 67% of women in urban areas are salaried workers.

Another workplace characteristic in Table 6.3 is number of part-time versus full-time workers. Here, 75% of men are work full-time compared to 24% of men working part-time.

[16] For more information on the Iranian educational system, refer to Chapter 1 of this thesis.

Strikingly, but not surprising, we can observe very high percentages of women who work part-time in Iran: 61% of urban women are working part-time. Although it has been accepted in most countries that the percentages of women working part-time are higher than for men (for example ONS, 2013), the magnitude of this difference in urban areas of Iran is striking.

We also provide information about 3 industries in Table 6.3 for urban men and women: agriculture, industrial, and services. We can observe that nearly 7% of men are working in the agricultural sector, while 21% are in the industrial sector. Interestingly, we can observe very high percentages of men working in the service sector (72%). These numbers are 6%, 29%, and 65% for urban women, respectively. Again, we can observe some interesting and contradictory information. While in most countries, the number of women in the service sector is much higher than for men, we can see the opposite in Iran.

Finally, we provide information on establishment size in five categories: small companies between 1 to 4 workers; medium-sized companies with 5 to 9, 10 to 19, and 20 to 49 workers; and bigger companies with more than 50 workers. We can observe that approximately 77% of men and women are working in small companies, which is consistent with the fact that there are high numbers of self-employed workers in Iran.

Overall, in this section, we point to very interesting descriptive analyses of the workforce in urban areas of Iran. It seems that the Iranian workforce is characterised by a high number of self-employed individuals (similar to salaried workers), which is in contrast to the workforce in most developed countries, with more self-employed men than women. While a high percentage of workers in urban areas are employed in the service sector, interestingly, more men than women work in the service sector, again in contrast to existing evidence in most developed

countries. However, this might be related to cultural factors in Iranian society. Another notable observation is that unlike many MENA countries, the public sector is not the main employer for women; this can be related to the government's religious stance. Finally, the very high number of urban women working part-time is another interesting observation. Although it is widely accepted in most developed countries that a higher percentage of women work part-time, the magnitude of this observation is interesting.

Table 6.3: Summary Statistics Urban Areas

Variable		Men		Women	
		Frequency	Mean	Frequency	Mean
Age category					
	16 to 19	15,412	3.08	2,110	2.62
	20 to 29	130,715	26.16	20,861	25.91
	30 to 39	148,199	29.66	30,519	37.91
	40 to 49	124,868	24.99	20,498	25.46
	50 to 59	66,142	13.24	5,540	6.88
	60 to 65	14,291	2.86	972	1.21
Nationality					
	Iranian	491,280	98.33	79,819	99.15
	Afghan	8,005	1.60	651	0.81
	Others	342	0.07	30	0.04
Education level					
	Primary education	120,245	25.78	10,219	13.68
	Secondary Education	120,542	25.85	7,287	9.75
	High School	4,621	0.99	469	0.63
	Pre-university	121,440	26.04	14,792	19.80
	Diploma	28,625	6.14	10,191	13.64
	Bachelor	52,370	11.23	25,694	34.39
	Masters	10,034	2.15	3,694	4.94
	PhD	948	0.20	291	0.39
	Any Other type of studies	7,519	1.61	2,067	2.77
Marital Status					
	Marrried	393,325	75.24	54,850	68.14
	Widowed	1,319	0.36	2,875	3.57
	Divorced	2,482	0.33	2,019	2.51
	Single	102,501	24.07	20,756	25.78
	Any Other type of studies	7,519	1.61	2,067	2.77
Employment Status					
	Self-employed	168,435	33.71	18,456	22.93
	Entrepreneur	21,039	4.21	820	1.02
	Unpaid family worker	10,003	2.01	7,054	8.76
	Wage and salaried Workers	300,150	60.07	54,170	67.29

Table 6.3 (Continues): Summary Statistics Urban Areas

Variable		Men		Women	
		Frequency	Mean	Frequency	Mean
Occupation Status					
	Part Time	123,105	24.64	49,101	61.00
	Full Time	376,522	75.36	31,399	39.00
Industry					
	Agriculture	34,607	6.93	4,689	5.82
	Industrial	104,738	20.96	23,321	28.97
	Services	360,282	72.11	52,490	65.20
Establishment Size					
	Between 1 to 4	305,019	77.43	34,154	76.09
	5 to 9	36,236	9.20	4,566	10.17
	10 to 19	17,413	4.42	2,514	5.60
	20 to 49	11,877	3.02	1,570	3.50
	50 or more	23,371	5.93	2,085	4.64

Source: LFS, 2008-2014. Age 16 to 65

6.3.3.2 Summary Statistics for Rural Areas

In this section, we observe the summary statistics for rural areas from Table 6.4. However, we discuss only the interesting difference between urban and rural areas, and will not repeat all of the descriptive statistics. Observing these differences will help us to understand whether disparities exist within the labour force in the Iranian economy in terms of urban and rural areas. There are 407,573 and 109,664 rural working men and women, respectively, aged between 16 and 65 in our sample.

Table 6.4 suggests that our rural area sample is also very young, which is similar to urban areas. It also suggests that rural areas have more refugees from Afghanistan compared to urban areas: 1.10% of rural men, though there are fewer female rural refugees than urban women, 0.36% compared to 0.80%.

We can observe a very interesting point from looking at qualifications in rural areas. Fewer rural men have some sort of university degree than urban men do. While in our sample, only 5% of rural men who are working have a university degree, this number is 13% for urban men. For women, this gap is even bigger: 40% of working urban women between 16 to 65 have a university degree, while this is only 5% for rural women.

Table 6.4 also suggests that the number of rural men who are self-employed is much higher than the number of urban self-employed men: 46% compared to 33%, while for women, these numbers are similar, at between 22% to 24%. Another drastic difference can be observed in terms of the number of unpaid family workers, which is much higher in rural areas compared to urban areas: 2% of urban men are unpaid family workers compared to 8% for rural men. This difference is more drastic for women: 8% of urban women are unpaid family workers, while this

is 60% for rural women. Finally, there are also huge differences in the number of salaried workers between urban and rural areas: 60% of urban men are salaried workers, while it is 40% for rural men. Again, this gap is more drastic for women: 67% for urban women compared to 14% for rural women.In terms of working hours, we can observe that similar to urban areas, most rural women are working part-time. However, the percentage of women working part-time is even higher in rural areas than in urban areas, 75% compared to 61%. In terms of industry, we can observe that, not surprisingly, most workers are employed in the agricultural sector, and similar to urban areas, more men work in the service sector than women.

Overall, observing Tables 6.3 and 6.4 suggests that in terms of labour force characteristics, there are drastic differences between urban and rural areas. It seems that working people are more educated in urban areas, and are mostly salaried workers.

Table 6.4: Summary Statistics Rural Areas

Variable	Men		Women	
	Frequency	Mean	Frequency	Mean
Age category				
16 to 19	26,724	6.56	8,274	7.54
20 to 29	109,574	26.88	25,369	23.13
30 to 39	109,321	26.82	28,153	25.67
40 to 49	83,643	20.52	23,766	21.67
50 to 59	58,449	14.34	18,191	16.59
60 to 65	19,862	4.87	5,911	5.39
Nationality				
Iranian	402,895	98.85	109,263	99.63
Afghan	4,497	1.10	393	0.36
Others	180	0.04	8	0.01
Education level				
Primary education	151,659	44.76	34,225	51.99
Secondary Education	95,823	28.28	10,246	15.56
High School	5,236	1.55	747	1.13
Pre-university	52,976	15.63	7,326	11.13
Diploma	7,305	2.16	1,442	2.19
Bachelor	10,777	3.18	3,006	4.57
Masters	1,064	0.31	257	0.39
PhD	59	0.02	8	0.01
Any Other type of studies	13,943	4.11	8,573	13.02
Marital Status				
Marrried	306,676	75.24	76,799	70.03
Widowed	1,458	0.36	4,998	4.56
Divorced	1,335	0.33	999	0.91
Single	98,104	24.07	26,868	24.50
Employment Status				
Self-employed	190,148	46.65	27,274	24.87
Entrepreneur	10,846	2.66	384	0.35
Unpaid family worker	36,092	8.86	65,969	60.16
Wage and salaried Workers	170,487	41.83	16,037	14.62

Table 6.4 (Continues): Summary Statistics Rural Areas

Variable	Men		Women	
	Frequency	Mean	Frequency	Mean
Occupation Status				
Part Time	137,679	33.78	83,265	75.93
Full Time	269,894	66.22	26,399	24.07
Industry				
Agriculture	171,718	42.13	72,327	65.95
Industrial	65,825	16.15	27,408	24.99
Services	170,030	41.72	9,929	9.05
Establishment Size				
Between 1 to 4	329,342	86.54	96,306	91.95
5 to 9	29,100	7.65	6,541	6.25
10 to 19	8,508	2.24	1,109	1.06
20 to 49	5,226	1.37	405	0.39
50 or more	8,381	2.20	376	0.36

Source: LFS, 2008-2014. Age 16 to 65

6.4 Methodology

Our goal in this chapter is to investigate the determinants of under- and over-employment in Iran. To do so, we employ three types of dependent variables in our regression analysis: our first dependent variable is a binary variable for willingness to increase working hours (i.e., under-employment); our second dependent variable is a categorical variable that measures willingness to increase, decrease, or not change hours of work (i.e., under-, over-, and stable employment); and our third dependent variable is a continuous variable that measures the exact hours of mismatch as indicated by actual hours worked versus preferred hours worked.

Since our three types of dependent variable differ in their construction, we need to employ a different regression model for each one. For the binary variable of under-employment, we employ a logit model that allows us to examine under-employment at the extensive margin. This methodology has been used in previous chapters, so we refrain from repeating this here. The continuous variables measuring exact hours of mismatch use an OLS methodology that was also used in previous chapters. Again, we will refrain from elaborating this methodology here. For our categorical variable that measures under-, over-, and stable employment, we employ an ordered probit model, whose methodology is outlined below.

6.4.2 Ordered Probit Model

We are interested in the determinants of both under- and over-employment. We can represent this process by the following equation:

$$y_i = \beta' \boldsymbol{x}_i + \varepsilon_i, \tag{6.1}$$

where y_i is a measure of employment mismatch, $\boldsymbol{x}_i$is a vector of exogenous variables that affect employment mismatch(such as gender, age, qualifications, marital status, industry, establishment size and type of employment), and ε_i **,** is a normally distributed error term. However, we measure employment mismatch,y_i, on an ordinal scale in our dataset, which requires an extension to the previously used binary model in Chapter 4. We extend the previously used binary response model to an ordered response model, the ordered probit model. This model expands the choice set from a binary choice set [0,1] to [0, *J*] ordinal choices where the probability of a given observation is given by:

$$\begin{aligned} p_{ij} = \Pr(y_j = i) &= \Pr(\gamma_{i-1} < \beta'\boldsymbol{x} + \varepsilon < \gamma_i) \\ &= \Phi(\gamma_i - \beta'\boldsymbol{x}) - \Phi(\gamma_{i-1} - \beta'\boldsymbol{x}) \end{aligned}, \quad (6.2)$$

where $\Phi(.)$ is the standard normal cumulative distribution function, and $\gamma_0$is defined as $-\infty$and $\gamma_M$is defined as ∞. Equation (6.2) states that the probability that alternative choice *j* is chosen is the probability that the latent variable $y_i^*$is between two boundaries (cutpoints), $\gamma_{j-1}$and γ_j. Therefore, we can write our specific employment mismatch model as:

$$y_i^* = \beta'\boldsymbol{x}_i + \varepsilon_i \qquad \varepsilon_i \sim \text{NID}(0,1) \qquad (6.3)$$

$y_i = 1, Underemployed$ if $y_i^* \leq \gamma_0$

$y_i = 2, No\ Employment\ Mismatch$ if $\gamma_0 \leq y_i^* \leq \gamma_1$

$y_i = 3, Overemployed$ if $y_i^* \geq \gamma_{j1}$

where γ_0 and γ_1 are associated cutpoints. We base the estimation on maximum likelihood estimation and the log likelihood is given by:

$$\ln L = \sum_{j=1}^{N} \sum_{i=1}^{\gamma} I_i(y_j) \ln p_{ij} \qquad (6.4)$$

Again, we report the marginal effects because the ordered probit model coefficients have no natural interpretation and refer to the underlying latent score. We calculate marginal effects representing changes in $\Pr(y_i = j|\boldsymbol{x_i})$ and hold all other covariates at their mean.

6.4.3 Endogeneity

Our model outlined above is conditional on independent variables being exogenous in nature. However, it is possible that this assumption is violated. Moreover, as discussed in previous chapters, strong selection effects for women are a real phenomenon affecting this data. However, these issues are common in this area and below, we discuss some implications and possible solutions, as well as the issues in applying these.

Certain demographic characteristics such as age and nationality are unlikely to be endogenous because these are predetermined at birth. Individuals thus have little influence on their status in this regard. However, variables such as marital status, educational characteristics, and industry are generally individual choices, which are potentially endogenous. For instance, married women might desire to work less hours, but not because they are married but because there is an unobservable component driving both their decision to marry and to work less. One could also argue, for example, that motivation and ability are positively related to desire to work more hours. Loughrey (2013) also suggests that health status can be an unobserved variable in studies of under-employment.

Without controlling for such an unobserved decision component, we might falsely infer that marriage has a causal, and possibly negative, effect on hours worked. It is thus important that when interpreting potential endogenous variables in our results that, we consider other unobserved effects and not draw a too strict inference with respect to causality. However, even as correlates, the analysis presented in this chapter will offer important insights into the current state of over- and under-employment in Iran.

Whilst it is possible to correct our empirical estimates via more complicated methods such as instrumental variable models and/or sample selection models, we should note that, in practice, such models are often unconvincing because they rely on untestable, and often tenuous, theoretical arguments. We applied such models in prior chapters and noted the caution about interpreting such estimates. In this chapter we refrain from implementing similar models, mainly because of the lack of credible instruments; but argue that the type of data and topical innovation employed nonetheless makes a significant advancement to the related literature – even with a potentially weaker causal interpretation.

6.5. Results

As we discuss in the methodology section, we employ a logit model to observe under-employment, an ordered probit model to observe categorical mismatch, and an OLS model to observe the exact hours magnitude of mismatch. To avoid overloading the results section with numerous tables, we present the results of our logit and OLS models in the appendix to this chapter. The primary results we present in this section are from our ordered probit analysis; however, we discuss all three sets of results. Overall, the results from all three models are very similar and provide a common narrative that we explore below. We divide the results section

into four subsections and discuss the results in terms of our variables. Hence, we first investigate results in terms of the effects of gender and regional (urban and rural) differences. Then, we examine the effects of age and marital on over/under employment, impact of education status on over/under employment, and the effects of work status factors on the likelihood of under/over employment.

6.5.1 Gender and Region

We present our results for the ordered probit model in Tables 6.5, 6.6, and 6.7. Table 6.5 presents the results for both urban and rural areas, while Tables 6.6 and 6.7 demonstrates our results for urban and rural areas, respectively. In these tables, we can observe the magnitude of both under- and over-employment. In terms of under-employment, Table 6.5 shows that women are less likely to be under-employed compared to men; according to our findings, women are 14 percentage points less likely to be situated in the under-employed category compared to men. Conversely, their probability of being overemployed is 10 percentage points higher compared to men. Observing urban and rural areas separately, we reveal that this relationship differs by rural and urban areas. For instance, while in urban areas, women are 10 percentage points less likely than men to be under-employed; in rural areas, they are 17 percentage points less likely to be under-employed. Conversely, women have lower overemployment rates in urban areas when compared to rural areas (8 vs 11 percentage points). These results are also evident in the OLS and logit models presented in the appendix. For instance, our OLS model suggests that women in urban areas want to decrease their working hours by around 6 hours per week, while rural women want to decrease their working hours by 8. Note that gender is significantly related to all three categories (under-employment, over-employment, and no mismatch). Our findings are

consistent with existing results from developed countries. For instance SousaPoza and Henneberger's (2002) research on 21 countries reveals that in all of these countries, over-employment is more persistent among women than among men. Golden and Gebreselassie (2007) explain that women's responsibilities at home is the reason behind their desire to work fewer hours in the labour market.

One of the most important contributions of this thesis is that it recognizes disparities within urban and rural areas and tries to explain such disparities. In this chapter as well, we recognise the importance of urban and rural differences in determining under/over employment. Our results in Table 6.5 suggest that there are gender differences between urban and rural areas: rural men are more likely to be under-employed compared to urban men, while rural women are less likely to be under-employed compared to urban women. For instance, rural men are 0.9 percentage points more likely to be under-employed compared to urban men, whilst rural women are 1.4 percentage points less likely to be under-employed. Again, these results are consistent with the results from our OLS and logit models. In terms of over-employment our ordered probit model results in Table 6.5 suggests the same trend: rural men are 0.7 percentage points less likely to be over-employed compared to urban men. On the other hand, women in rural areas are 0.9 percentage points more likely to be over-employed compared to women in urban areas.

In summary, in examining the relationship between gender and under-employment, we show that men are more likely to be under-employed than women are, which is consistent with studies conducted by SousaPoza and Henneberger (2002). In terms of the relationship between region (urban and rural areas) and under-employment, our results suggest gender differences in

terms of job mismatch in urban and rural areas, and rural men are more likely to be under-employed than urban men are, while rural women are less likely to be under-employed compared to urban women. On the other hand, rural women are more over-employed than urban women, while rural men are less likely to be over-employed than urban men are. However, we should interpret the effects of region (urban and rural areas) with caution. For instance, the fact that rural women are more over-employed than urban women can be explained by differences in the concept of 'reservation hours' in urban and rural areas. In other words, rural women might be more over-employed than urban women are, not due to longer working hours, but because their reservation hours are lower. In other words, cultural differences in these two areas might mean that rural women might not 'expect' or 'desire' more working hours.

6.5.2 Age and Marriage

Another important determinant of job mismatch in the labour market is age, and some existing studies (Erdogan and Bauer, 2009; Holtom et al., 2002; Lee, 2005) suggest that younger workers are more likely to wish for more working hours. Most of these studies explain higher under-employment among the youth by their lack of qualifications, skills, and experience, which prevent this group from obtaining their desired working hours (Barham et al., 2009). Our results in Table 6.5 also reveal that younger workers are more likely to be under-employed, and we can also detect that the youngest age category (individuals aged 20 and 29 years) compared to the reference category (individuals aged 16 to 19) have the highest possibility of under-employment(4 percentage points). Observing men and women separately, we reveal that for men in the 20 to 29, 30 to 39, and 40 to 49 age categories are more likely to be under-employed

(the reference group is 16 to 19), while after the age of 49, men are less likely to be under-employed compared to the reference group. We can also observe that men in the 20 to 29 age category are most likely to be under-employed. We can also observe the relationship between age category and women's under-employment in Table 6.5, which shows that women in the 20 to 29 and 30 to 39 age categories are more likely to be under-employed, and women after the age of 40 are less likely to be under-employed. Furthermore, just like men, women within the 20 to 29 age category have the highest likelihood of under-employment (1.2 percentage points higher than the reference category). Looking at Tables 6.6 and 6.7 reveals that this trend is similar between urban and rural areas; however, for rural women, age is not significantly related to any of our three categories (under-employment, over-employment, and no mismatch). Once again, these results are consistent with our findings from the logit and OLS models reported in the appendix. Tables 6.5 to 6.7 also provide information about the relationship between over-employment and age. Our results suggest that while men in the 50 to 59 and 60 to 65 age categories are more likely to be over-employed, for women, the likelihood of over-employmentstarts earlier: from the 40 to 49 until the 60 to 65 age category. Finally, we can observe that for both men and women, the oldest age category (60 to 65) has the highest likelihood of over-employment. For instance, while men between the ages of 50 and 59 are 2.3 percentage points more likely to be over-employed, men between 60 and 65 are 9 percentage points more likely to be over-employed. Similarly, women between the ages of 40 and 49 are 0.5 percentage points more likely to be over-employed, while this is 3.3 percentage points for women in the 60 to 65 age category. This may be related to changing intertemporal consumption patterns over the lifecycle whereby older individuals place more value on leisure time when

compared to consumption (and hence work) time. Observing urban and rural areas separately, we find the same trend; in both areas, the probability of over-employment rises with the age, although similar to under-employment, age is not significantly related to probability of over-employment for rural women.

The existing literature also suggests that marriage is an important determinant of job mismatch in the labour market. For instance, Stier and Lewin-Epstein (2003) suggest that in most developed countries, marriage diminishes the likelihood of under-employment. Our results for the effect of marriage on under-employment in Table 6.5 have two dimensions. First, it is evident that while marital status is not an important determinant for the probability of under-employment for men, it is significantly related to the under-employment of women. Second, our results suggest that single and divorced/widowed women are more likely to be under-employed compared to married women. For instance, we can observe from Table 6.5 that single women are 3 percentage points more likely to be under-employed compared to married women. We can see the same trend in urban and rural areas. Our logit and OLS results are also consistent with our findings from the ordered probit model. Finally, we should note that a possible explanation of the higher probability of under-employment among single, divorced, and widowed women is the cultural and religious context of Iranian society. We can also observe the relationship between marriage and over-employment from Tables 6.5 to 6.7: similar to under-employment, our results in these tables suggest that marital status is not significantly related to the likelihood of over-employment for men, and this is true for both urban and rural men. On the other hand, for women, we can observe that marital status is an important determinant of women's over-employment in both regions. Furthermore, compared to the married category, the other marital

categories are negatively related to over-employment. The fact that married women are more over-employed is consistent with the existing literature in most developed countries that suggest married women experience a greater desire to work fewer hours because they want to spend more time with their family.

6.5.3 Education Status

Education is another important indicator of job mismatch in the labour market, some studies point out (such as Brown et al., 2011; Stier and Lewin-Epstein, 2003) that in most developed countries, higher education reduces the likelihood of under-employment. Observing the relationship between under-employment and education provides some interesting insights. According to our findings in Table 6.5, education decreases the probability of being under-employed for men. However, for women, as their education rises, the probability of over-employment decrease whilst their probability of under-employment increase – with the magnitude being almost the exact inverse of the men's effect. This suggests that the positive impacts of educational attainment have not been transferred to Iranian women in terms of less under-employment. For instance, women who have a master's degree are 8.5 percentage points more likely than women with primary education to be under-employed. Compare this to men who have a master's degree, who are 5.8 percentage points less likely than men with primary education to be under-employed. If we look at urban and rural areas separately, we can observe the same trend, although it seems that the reverse impact of education for women's under-employment is even bigger in rural areas. For instance, rural women who have a bachelor's degree are 6.3 percentage points more likely than women with primary education are to be under-employed, while urban women with a bachelor's degree are 4.6 percentage points more

likely to be under-employed. Interestingly, in both areas, women with the highest educational qualification (master's degree) have the highest probability of under-employment (note that PhD is not significantly related to the probability of under-employment). A possible explanation for such developments might be that since the educational status of young women is already very high in Iran, educated women have already saturated the Iranian labour market, and there is high competition among educated women. Another probable explanation is the educated women's 'expectation' or reservation time is too high in Iran. Our logit and OLS model results are also consistent with our findings from the ordered probit model. For instance, our OLS model confirms that the negative impacts of under-employment for women are bigger in rural areas and as the level of qualification increases, the gap between urban and rural women also rises. For instance, if we look at urban women, we notice that those with a pre-university degree want to increase their working hours by 1.3 hours, while rural women with a pre-university degree want to increase their working hours by 1.7 hours, a difference of 0.4 hours. However, looking at higher qualifications such as master's degrees, we can observe that urban women with a master's degree want to work 4 extra hours, while rural women with a master's degree want to work 7.5 hours more, a difference of 3.5 hours. This is likely due to the differing nature of demand in the two types of region – women who want to work in high-skilled areas move to the city, and there is more demand for women with higher education in comparison to rural areas, where there is more demand for unskilled labour. Tables 6.5 to 6.7 also present our findings for the relationship between educational status and probability of over-employment. Examining the effects of education status on over-employment also brings some interesting observations: In both urban and rural areas, education status is significantly and positively related to the probability of over-

employment among men, while in both regions, it is significantly and negatively related to the probability of over-employment among women.

6.5.4 Work Status Factors

Various studies examine work-related factors as an important determinant of job mismatch in the labour market (e.g., Feldman, 1996; Slack and Jensen, 2004; Caputo and Cianni, 2001). We examine four work-related factors: employment status, establishment size, economic sector, and working hours (i.e., full time versus part-time).

According to Table 6.5, employment status is significantly related to all of our categories (under-employment, over-employment, no mismatch). Non-salaried workers are all likely to be have a lower probability of being under-employment, and this is true across both urban and rural areas and for both men and women. The only exception is for urban women, where we can observe that being self-employed increases the likelihood of under-employed compared to the reference group of salaried workers. Again, our logit and OLS results also confirm our findings regarding the relationship between under-employment and employment status. In terms of over-employment, Table 6.5 shows that compared to the reference category (salaried workers), all other categories are more likely to be over-employment. Yet again, the only exception is for urban women, where they are 1.4 percentage points less likely to be over-employed compared to the reference category. For instance, while an urban self-employed man is 2.5 percentage points more likely to be over-employed compared to a salaried worker, an unpaid family worker is 5.7 percentage points more likely to be over-employed compared to a salaried worker. However, for women, we can observe that only unpaid family workers are more over-employed compared to salaried workers.

Table 6.5 also provides information on employer size, where again we observe that this variable is significantly related to all of our categories (under-employment, over-employment, no mismatch). We also observe that workers in smaller companies are more likely to be under-employed. These results appear to vary little by either gender or urban/rural region. In terms of over-employment, we can also suggest that compared to the reference group (1 to 4 workers), workers in the other categories are more likely to be over-employed.

Tables 6.5 to 6.7 also provide information on full-time versus part-time work, where we can observe a strong negative relationship between part-time work and probability of under-employment.

Tables 6.5 to 6.7 provide information about the relationship between job mismatch and economic sector, where we observe that workers in the manufacturing and service sectors are more likely to be under-employed compared to those in the agricultural sector. The only exception is for urban women, where we observe that in both categories, they are less likely to be under-employed compared to the reference group. In terms of over-employment, we also observe that that for both men and women in either region, workers in the agricultural sector are mostly affected by over-employment.

Finally, Simic (2002) suggestsa job mismatch may arise due to the cyclical pattern of economic growth. For instance, when the economy is growing fast, over-employment may rise and then decrease if economic growth slows down. For under-employment, we would expect the opposite cyclical pattern. In order to capture such effects, we include a variable for year, where we see that this variable is significantly related to most of our categories. According to Table 6.5, the probability of under-employment rose in 2009 and 2010, for both areas and for both men

and women. However after 2010, workers are less likely to be under-employed. We can see the same trend in over-employment. For 2009 and 2010, workers were less likely to be over-employed; however, after 2010 they are more likely to be over-employed. These results suggest a strong macroeconomic impact on job mismatch during these years.

Table 6.5: Ordered Probit Model Results (Urban and Rural Areas)

	All Men & Women			All Men			All Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Female	0.098***	0.042***	-0.141***	.	.	.	.	.	.
	(0.000)	(0.000)	(0.002)						
Rural	-0.005***	-0.002***	0.008***	-0.007***	-0.002***	0.009***	0.009***	0.005***	-0.014**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)
Age Catgory(Reference:16-19)									
20-29	-0.0.27***	-0.013***	0.040***	-0.038***	-0.013***	0.052***	-0.007**	-0.004***	0.012**
	(0.002)	(0.000)	(0.002)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.002)
30-39	-0.020***	-0.009***	0.029***	-0.031***	-0.010***	0.041***	-0.004*	-0.002*	0.007*
	(0.00)	(0.000)	(0.002)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.003)
40-49	-0.003*	-0.001***	0.004*	-0.012*	-0.002***	0.014***	0.005*	0.003*	-0.008*
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)	(0.004)
50-59	0.028***	0.004***	-0.033***	0.023***	0.001***	-0.025***	0.019***	0.007***	-0.027***
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.004)	(0.001)	(0.005)
60-65	0.088***	-0.002***	-0.085***	0.090***	-0.010***	-0.080***	0.033***	0.010***	-0.044***
	(0.004)	(0.000)	(0.003)	(0.002)	(0.000)	(0.002)	(0.008)	(0.001)	(0.009)
Qualification (Reference:Primary Education)									
Secondary Education	0.003	0.001***	-0.004***	0.005***	0.002***	-0.008***	-0.011***	-0.006***	0.017***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
High School	0.067***	0.010***	-0.077***	0.084***	0.005***	-0.090***	0.001	0.000	-0.002
	(0.003)	(0.000)	(0.002)	(0.003)	(0.000)	(0.002)	(0.006)	(0.001)	(0.009)
Pre University	0.007***	0.003***	-0.011***	0.013***	0.004***	-0.018***	-0.022***	-0.014***	0.037***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.003)
Foghe Diplom	0.021***	0.007***	-0.028***	0.029***	0.008***	-0.038***	-0.021***	-0.014***	0.036***
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.003)	(0.003)	(0.007)
Bachelor	0.016***	0.006***	-0.022***	0.033***	0.008***	-0.042***	-0.027***	-0.020***	0.048***
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.003)	(0.002)	(0.005)

Table 6.5 (Continues): Ordered Probit Model Results (Urban and Rural Areas)

	All Men & Women			All Men			All Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Masters	0.022***	0.008***	-0.031***	0.048***	0.009***	-0.058***	-0.043***	-0.041***	0.085***
	(0.003)	(0.000)	(0.005)	(0.005)	(0.000)	(0.005)	(0.011)	(0.006)	(0.012)
PhD	0.056	0.011***	-0.067***	0.080***	0.006**	-0.087***	-0.006	-0.003	0.010
	(0.012)	(0.000)	(0.012)	(0.017)	(0.000)	(0.012)	(0.016)	(0.009)	(0.025)
Adult Studies	0.003**	0.001***	-0.005**	-0.002	-0.000	0.003	0.000	0.000	-0.000
	(0.017)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.011)	(0.003)
Maritial Status (Reference: Married)									
Widowed	-0.014****	-0.007***	0.022***	0.007	0.002*	-0.009	-0.015***	-0.009**	0.025***
	(0.004)	(0.001)	(0.005)	(0.005)	(0.000)	(0.006)	(0.004)	(0.004)	(0.007)
Divorce	-0.013***	-0.006***	0.019***	0.005	0.001	-0.007	-0.018***	-0.011**	0.029***
	(0.002)	(0.001)	(0.005)	(0.005)	(0.000)	(0.005)	(0.004)	(0.004)	(0.007)
Not Married	-0.008***	-0.004***	0.013***	0.009	0.000*	-0.000	-0.018***	-0.011***	0.030***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
Employment Status (Reference: salaried)									
Self-employed	0.026***	0.013***	-0.040***	0.031***	0.011***	-0.043***	-0.014***	-0.015***	0.029***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)
Employer	0.026***	0.013***	-0.040***	0.027***	0.010***	-0.038***	0.012*	0.009*	-0.022***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.005)	(0.007)	(0.010)
Unpaid Family Worker	0.079***	0.019***	-0.099***	0.053***	0.014***	-0.067***	0.045***	0.020***	-0.065***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.003)	(0.001)	(0.003)
Establishment Size: Reference (1 to 4)									
5 to 9	0.012***	0.005***	-0.017***	0.015***	0.005***	-0.020***	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.001)	(0.002)	(0.001)	(0.003)
10 to 19	0.030***	0.009***	-0.040***	0.036***	0.008***	-0.044***	-0.003	-0.002	0.005
	(0.002)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.005)	(0.002)	(0.006)
20 to 49	0.030***	0.009***	-0.039***	0.032***	0.007***	-0.039***	0.022***	0.009***	-0.032**
	(0.002)	(0.000)	(0.002)	(0.002)	(0.000)	(0.003)	(0.007)	(0.001)	(0.006)

Table 6.5 (Continues): Ordered Probit Model Results (Urban and Rural Areas)

		All Men & Women			All Men			All Women		
		Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
	50 or more	0.018***	0.006**	-0.025***	0.018***	0.005***	-0.023***	0.019***	0.008***	-0.028***
		(0.002)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.006)	(0.001)	(0.005)
Fulltime		0.255***	0.110***	-0.356***	0.279***	0.098***	-0.377***	0.140***	0.085***	-0.226***
		(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.002)
Economic Sector (Reference: Agriculture)										
	Manufacture	-0.013***	-0.003***	0.016***	-0.011***	-0.002***	0.013***	-0.015***	-0.008***	0.023***
		(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.003)
	Services	-0.033***	-0.013***	0.047***	-0.034***	-0.010***	0.044***	-0.022***	-0.013***	0.036***
		(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.004)
Year Controls(7 years)		Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded

Source: LFS 2008-2014

Table 6.6: Ordered Probit Model Results (Urban Areas)

	Urban Men & Women			Urban Men			Urban Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Female	0.078***	0.022***	-0.100***	.	.	.	.	.	.
	(0.000)	(0.000)	(0.002)						
Age Catgory (Reference:16-19)									
20-29	-0.033***	-0.010***	0.044***	-0.038***	-0.008***	0.046***	-0.007**	-0.012**	0.026**
	(0.002)	(0.000)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)	(0.003)	(0.009)
30-39	-0.027***	-0.007***	0.035***	-0.031***	-0.005***	0.037***	-0.004*	-0.008*	0.018**
	(0.00)	(0.000)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)	(0.003)	(0.009)
40-49	-0.009***	-0.001***	0.011***	-0.012*	-0.001***	0.013***	0.005*	0.004*	-0.010
	(0.001)	(0.000)	(0.002)	(0.002)	(0.000)	(0.003)	(0.002)	(0.003)	(0.010)
50-59	0.023***	0.000	-0.023***	0.023***	-0.001***	-0.022***	0.019***	0.010***	-0.031**
	(0.001)	(0.000)	(0.002)	(0.003)	(0.000)	(0.003)	(0.004)	(0.003)	(0.012)
60-65	0.092***	-0.015***	-0.076***	0.098***	-0.022***	-0.075***	0.033***	0.016***	-0.071***
	(0.004)	(0.000)	(0.003)	(0.004)	(0.001)	(0.003)	(0.008)	(0.003)	(0.018)
Qualification(Reference: Primary Education)	.	.	.	.	.	.	.	.	.
Secondary Education	0.007***	0.002***	-0.009***	0.008***	0.002***	-0.011***	-0.011***	-0.009***	0.024***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.005)
High School	0.058***	0.006***	-0.065***	0.070***	0.001*	-0.072***	0.001	-0.008	0.020
	(0.003)	(0.000)	(0.002)	(0.005)	(0.000)	(0.004)	(0.006)	(0.008)	(0.017)
Pre University	0.014***	0.004***	-0.018***	0.017***	0.004***	-0.021***	-0.022***	-0.013***	0.032***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)
Foghe diplom	0.027***	0.006***	-0.034***	0.032***	0.005***	-0.037***	-0.021***	-0.012**	0.029***
	(0.001)	(0.000)	(0.002)	(0.002)	(0.000)	(0.002)	(0.003)	(0.003)	(0.009)
Bachelor	0.025***	0.006***	-0.032***	0.037***	0.005***	-0.043***	-0.027***	-0.020***	0.046***
	(0.001)	(0.000)	(0.002)	(0.002)	(0.000)	(0.002)	(0.003)	(0.002)	(0.007)

Table 6.6 (Continues): Ordered Probit Model Results (Urban Areas)

	Urban Men & Women			Urban Men			Urban Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Masters	0.036***	0.007***	-0.043***	0.055***	0.004***	-0.060***	-0.043***	-0.040***	0.080***
	(0.003)	(0.000)	(0.005)	(0.005)	(0.000)	(0.005)	(0.011)	(0.006)	(0.013)
PhD	0.069	0.004***	-0.074***	0.089***	-0.002	-0.086***	-0.006	-0.007	0.017
	(0.012)	(0.000)	(0.012)	(0.017)	(0.000)	(0.012)	(0.016)	(0.011)	(0.029)
Adult Studies	0.002	0.000	-0.002	-0.005*	-0.002	0.007	0.000	0.004	-0.015
	(0.017)	(0.000)	(0.003)	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.007)
Maritial Status(Reference: Married)									
Widowed	-0.013**	-0.004*	0.018**	-0.001	-0.000	0.001	-0.015***	-0.017**	0.037***
	(0.004)	(0.001)	(0.005)	(0.008)	(0.000)	(0.010)	(0.004)	(0.004)	(0.011)
Divorce	-0.009*	-0.002*	0.012*	0.006	0.001	-0.007	-0.018***	-0.016**	0.036***
	(0.002)	(0.001)	(0.005)	(0.005)	(0.000)	(0.005)	(0.004)	(0.004)	(0.010)
Not Married	-0.007***	-0.002***	0.009***	0.000	0.000	-0.001	-0.018***	-0.019***	0.041***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.004)
Employment Status (Reference:salaried)									
Self-employed	0.022***	0.006***	-0.029***	0.025***	0.005***	-0.030***	-0.014***	-0.029***	0.057***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)
Enterpreneur	0.019***	0.006***	-0.026***	0.020***	0.005***	-0.025***	0.012*	0.003	-0.008
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.005)	(0.007)	(0.005)
Unpaid Family Worker	0.080***	0.004***	-0.085***	0.057***	0.004***	-0.062***	0.045***	0.017***	-0.073***
	(0.001)	(0.000)	(0.001)	(0.003)	(0.000)	(0.003)	(0.003)	(0.001)	(0.005)
Establishment Size: Reference (1 to 4)	.	.	.	.	.	.	.	.	.
5 to 9	0.012***	0.003***	-0.015***	0.014***	0.002***	-0.017***	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.001)	(0.002)	(0.001)	(0.006)
10 to 19	0.023***	0.004***	-0.028***	0.028***	0.003***	-0.032***	-0.003	-0.004	0.010
	(0.002)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.005)	(0.002)	(0.008)
20 to 49	0.020***	0.004***	-0.025***	0.024***	0.003***	-0.027***	0.022***	0.010**	-0.024
	(0.002)	(0.000)	(0.002)	(0.002)	(0.000)	(0.003)	(0.007)	(0.001)	(0.008)

Table 6.6 (Continues): Ordered Probit Model Results (Urban Areas)

	Urban Men & Women			Urban Men			Urban Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
50 or more	0.007***	0.002**	-0.009***	0.010***	0.002***	-0.012***	0.019***	0.004	-0.011
	(0.002)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.006)	(0.001)	(0.007)
Fulltime	0.276***	0.080***	-0.357***	0.298***	0.064***	-0.363***	0.140***	0.119***	-0.266***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.004)
Economic Sector: Reference (Agriculture)									
Manufacture	-0.009***	-0.001***	0.010**	-0.015***	-0.000***	0.016***	-0.015***	0.005	-0.011***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.003)	(0.008)
Services	-0.028***	-0.006***	0.034***	-0.032***	-0.004***	0.036***	-0.022***	0.001	-0.002***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.004)	(0.008)
Year Controls(7 years)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded

Source: LFS 2008-2014

Table 6.7: Ordered Probit Model Results (Rural Areas)

	Rural Men & Women			Rural Men			Rural Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Female	0.109***	0.064***	-0.173***	.	.	.	.	.	.
	(0.001)	(0.000)	(0.002)						
Age Catgory (Reference:14-19)									
20-29	-0.025***	-0.016***	0.042***	-0.038***	-0.020***	0.058***	-0.004	-0.002	0.006
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)	(0.009)
30-39	-0.018	-0.010***	0.029***	-0.030***	-0.015***	0.045***	-0.001	-0.000	0.002
	(0.001)	(0.000)	(0.002)	(0.002)	(0.000)	(0.003)	(0.003)	(0.001)	(0.009)
40-49	-0.001	-0.000	0.001	-0.010***	-0.003***	0.014***	0.004	0.001	-0.006
	(0.001)	(0.000)	(0.003)	(0.002)	(0.000)	(0.003)	(0.003)	(0.001)	(0.010)
50-59	0.031***	0.009***	-0.040***	0.025***	0.005***	-0.030***	0.018	0.005***	-0.024
	(0.002)	(0.000)	(0.003)	(0.002)	(0.000)	(0.003)	(0.005)	(0.002)	(0.012)
60-65	0.084***	0.007***	-0.092***	0.083***	0.002*	-0.085***	0.017	0.005***	-0.023*
	(0.004)	(0.000)	(0.003)	(0.004)	(0.000)	(0.003)	(0.009)	(0.007)	(0.018)
Qualification(Reference :Primary Education)									
Secondary Education	0.001*	0.001*	-0.002*	0.003***	0.002***	-0.005***	-0.006**	-0.002*	0.009*
	(0.002)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.001)	(0.003)
High School	0.077***	0.016***	-0.093***	0.093***	0.014***	-0.108***	0.012	0.003*	-0.016
	(0.005)	(0.000)	(0.004)	(0.005)	(0.000)	(0.004)	(0.009)	(0.001)	(0.010)
Pre University	0.002**	0.001**	-0.004***	0.008***	0.004***	-0.012***	-0.024***	-0.015***	0.039***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.002)	(0.005)
Foghe diplom	0.018***	0.009***	-0.027***	0.030**	0.012***	-0.042***	-0.036***	-0.027**	0.063***
	(0.003)	(0.000)	(0.005)	(0.004)	(0.001)	(0.006)	(0.006)	(0.009)	(0.017)
Bachelor	0.012***	0.006***	-0.019	0.031***	0.012***	-0.043***	-0.035***	-0.027***	0.063***
	(0.003)	(0.001)	(0.004)	(0.003)	(0.000)	(0.005)	(0.005)	(0.006)	(0.007)

Table 6.7(Continues): Ordered Probit Model Results (Rural Areas)

	Rural Men & Women			Rural Men			Rural Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
Masters	0.008	0.004	-0.013	0.034*	0.012***	-0.046**	-0.068***	-0.097*	0.165**
	(0.011)	(0.005)	(0.017)	(0.013)	(0.004)	(0.018)	(0.011)	(0.046)	(0.060)
PhD	0.053	0.016*	-0.070	0.072	0.016***	-0.088	0.038	0.004	-0.042
	(0.094)	(0.006)	(0.139)	(0.133)	(0.004)	(0.128)	(0.147)	(0.014)	(0.132)
Adult Studies	0.000	0.000	-0.000	-0.002	-0.001	0.003	-0.001	-0.000	0.001
	(0.001)	(0.000)	(0.003)	(0.001)	(0.001)	(0.004)	(0.002)	(0.001)	(0.003)
Maritial Status(Reference: Married)									
Widowed	-0.010*	-0.006*	0.016*	0.013	0.006	-0.019	-0.014***	-0.006*	0.021*
	(0.004)	(0.003)	(0.007)	(0.007)	(0.002)	(0.010)	(0.006)	(0.004)	(0.011)
Divorce	-0.011*	-0.006*	0.018*	0.004	0.002	-0.006	-0.021***	-0.011*	0.033**
	(0.002)	(0.003)	(0.008)	(0.006)	(0.003)	(0.010)	(0.007)	(0.005)	(0.012)
Not Married	-0.009***	-0.005***	0.015***	-0.000	-0.000	0.001	-0.017***	-0.008***	0.025***
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.004)
Employment Status(Reference :salaried)									
Self-employed	0.030***	0.022***	-0.052***	0.036***	0.021***	-0.057***	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)
Enterprenur	0.036***	0.025***	-0.062***	0.038***	0.021***	-0.060***	0.011	0.011	-0.023
	(0.002)	(0.000)	(0.001)	(0.002)	(0.000)	(0.003)	(0.013)	(0.010)	(0.023)
Unpaid Family Worker	0.069***	0.034***	-0.104***	0.053***	0.025***	-0.079***	0.047***	0.025***	-0.073***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)	(0.003)	(0.002)	(0.005)
Establishment Size (Reference :1 to 4)									
5 to 9	0.012***	0.007***	-0.019***	0.016***	0.007***	-0.024***	-0.000	-0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)	(0.006)
10 to 19	0.042***	0.016***	-0.059***	0.047***	0.015***	-0.063***	-0.010	-0.005	0.016
	(0.002)	(0.000)	(0.002)	(0.003)	(0.000)	(0.002)	(0.007)	(0.004)	(0.012)
20 to 49	0.047***	0.016***	-0.064***	0.047***	0.015***	-0.062***	0.013	0.004**	-0.017
	(0.003)	(0.000)	(0.002)	(0.003)	(0.000)	(0.003)	(0.012)	(0.003)	(0.016)

Table 6.7(Continues): Ordered Probit Model Results (Rural Areas)

	Rural Men & Women			Rural Men			Rural Women		
	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed	Overemployed	No mismatch	Underemployed
50 or more	0.041***	0.015**	-0.056***	0.036***	0.013***	-0.050***	0.033	0.006***	-0.039
	(0.002)	(0.000)	(0.002)	(0.002)	(0.000)	(0.002)	(0.014)	(0.000)	(0.014)
Fulltime	0.235***	0.137***	-0.373***	0.257***	0.133***	-0.391***	0.134***	0.061***	-0.196***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)	(0.001)	(0.004)
Economic Sector(Reference :Agriculture)									
Manufacture	-0.009***	-0.004***	0.014**	-0.002*	-0.000***	0.003*	-0.017***	-0.008***	0.026***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.003)
Services	-0.034***	-0.021***	0.055***	-0.033***	-0.018***	0.051***	-0.038***	-0.026***	0.064***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.003)	(0.006)
Year Controls(7 years)	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded	Induded

Source: LFS 2008-2014

6. 6 Conclusion

In this final empirical chapter of the thesis, we investigated the determinants of over- and under-employment in Iran, with special attention to urban/rural and gender differences. As mentioned previously, although unemployment and its consequences have received much attention from scholars of Iranian economy (such as Valadkhani, 2003; Moghaddam, 1995; Amuzegar, 2005), issues related to job mismatch have been largely ignored. Despite this, there is evidence of widespread under- and over-employment within the Iranian labour market; for example, evidence from our data suggests that over 32% of employed Iranians are either under- or over-employed. This proportion is significantly higher compared to other countries such as the UK, where under- and over-employment rates are approximately 19% (ONS, 2017). Therefore, studying determinants of under/over employment in Iran is important for both Iranian scholars and policy makers. Following this the contribution of this chapter is that it's the first study that has been implemented on the determinants of over/under employment in Iran.

Some of our findings in the result section were consistent with the existing literature, while some were contradicting previous studies. For instance, in line with existing literature (Wooden et al., 2009 for the USA; Reynolds and Aletraris, 2010 for Norway) we found that women are more likely to be overemployed, and the magnitude of women's over-employment is larger in rural areas. We also found out that, consistent with the existing literature (Ruiz-Quintanilla and Claes 1996) younger individuals are more likely to be underemployed. Finally, our results on the impact of working status (such as establishment size, type of employment, etc.) were also consistent with existing studies (such as Cam, 2012). For instance, we found out that

workers in smaller companies are more likely to be underemployed which is consistent with findings of the Bell and Blanchflower (2011). We also found out that and unpaid family workers, and those in agricultural sector are more likely to be overemployed, which is also consistent with findings of existing studies (such as Caputo and Cianni, 2001).

On the other hand, some of our findings (marriage and education) are in contradiction with the findings of existing studies in the literature. For example, in terms of marriage, we found out that the effect of marriage in terms of job mismatch is different for men and women, and being married is significantly related to the probability of job-mismatch for women, while it is not a significant determinant of men's job-mismatch. These results are in contrast with most studies (for example Stier & Lewin-Epstein, 2003) that point out that marriage is significantly related to the probability of job mismatch for both men and women. Furthermore, we found that the likelihood of being underemployed rises for single and widowed/divorced women. We explained that this could be related to social and cultural aspects of Iranian society, where there is still discrimination against women who are not married. A further line of result which is in inconsistent with the existing findings (Bell and Blanchflower, 2011) is the different impact of educational status on the likelihood of being under/over employed for men and women. We found out that the probability of being underemployed increases for women (especially rural women) as their educational status rise, while for men the opposite is correct. This suggests that returns to human capital, in terms of less underemployment only exist for men.

The findings of this chapter provide important policy implications. For instance, the magnitude of the existing job mismatch (32%) implies that policy makers need to take job mismatch in the Iranian labour market more seriously, otherwise its negative effects in terms of

health, job-satisfaction etc. (which was mentioned in the literature review) will affect workers in the long-term. Furthermore, significant effect of marital status, which was only for women, might suggest that women in the labour market might be judged by employers by their personal characteristics and not by their suitability to the job. Finally, the fact that more educated women are more likely to be underemployed, confirms findings of previous chapters, of the existence of possible discrimination. All these factors might be related to cultural, and traditional status of Iranian society that needs to be addressed by policy makers by appropriate enforcement laws that require gender equality at work.

Chapter 7. Conclusion

7.1 Overview

The importance of education in economic and social development has been emphasized by many international conventions, including the Universal Declaration of Human Rights and the Programme of Action of the 1994 International Conference on Population and Development (United Nations, 1996). For this thesis, we have conducted a systematic empirical study of the links between private education and the labour market in Iran, with a particular focus on uncovering the potential for different factors to function in rural and urban settings. The first empirical chapter sets out those factors that determine household/parental education expenditure on children's education; the second stage of our investigation considers how the earnings returns to these educational investments manifest in urban and rural settings; and finally, we consider the extent to which those in employment can be considered under-, or over-, employed – with our urban/rural distinction highlighting some particularly valuable policy insights.

To some extent, these stages of our investigation overlap, and the factors at work are interrelated. For instance, parents might spend less/more on education for their children as a result of lower/higher perceived returns on education. For example, Tansel (2002a) for Turkey and Kamhampati (2008) for India suggest that due to higher returns on education for girls, parents are willing to spend more money to educate their daughters. On the other hand, high educational attainment is usually associated with better job opportunities (such as lower under/overemployment). In analysing each of the aforementioned factors, we have attempted to focus on different outcomes of education in urban and rural areas, as there seem to be varying

implications for the role of gender in these two geographical settings. This has been mentioned by both Iranian policymakers (Ministry of Education, Iran, 2014) and scholars (such as Iravani, 2011), who recognise that there are still important disparities, both in terms of gender disparities and urban and rural inequalities, in the Iranian education system. For instance, a report on the Iranian education system by the World Education Forum suggests that one of the most important interventions that needs to be conducted in Iran is 'Planning to develop rural and less advantaged areas in order to promote educational indicators and eliminate disparities' (World Education Forum, 2015, p.34). The same report also suggests that one of the main obstacles in reforming the Iranian educational system is the prevalence of cultural viewpoints especially in rural communities which favour prevention of continuing girls' education in junior high and high schools. This suggests that despite great achievements in girls' schooling and considerable advancement towards regional equality in Iranian education (discussed in chapter 1), the battle is not yet over. This thesis has shown that both urban/rural and gender differences have significant effects on various factors that determine human capital investment in Iran, but the interaction between these is complicated. However, to date, the evidence for these matters in Iran has been sparse, and this thesis has sought to make a major contribution to filling that gap. The implications of each empirical chapter will now be further explained below.

7.2 Determinants of Household Educational Expenditure

In Chapter 4 of this thesis, we undertook the analysis of the determinants of parental/household educational expenditure on children, with a particular focus on urban/rural and gender implications. We used data from the Household Income and Expenditure Survey (HIES) for 2009/10 and 2011/12, which provide a rich and up-to-date view of the factors affecting

households' expenditure in Iran. A study of private/household educational expenditure in Iran is important for both its policy and research implications because the role of the government as the main educational spender has decreased sharply over the past 30 years. For instance, the share for education in the government budget within the GDP dropped to 2.9% in 2011 from 4.6% in 2000 (World Education Forum, 2015). Furthermore, since 2000, all Iranian development plans have stated eliminating regional and gender disparities in education as main objectives of the government. Hence, understanding what determines private/household spending on education will have important implications for policy makers (Kurd, 2014). This is because, according to the human capital theory, household characteristics are an important determinant of children's educational attainment, which is also true about Iran. For instance, a field study was jointly conducted by the Ministry of Education and UNICEF in areas of Tehran that have the highest gender gap in education. The study proposed that the most frequently stated issues that caused girls to drop out of school were as follows: cultural factors (traditional thinking that girls' education is useless; prioritizing boys' education over girls'); economic factors (financial poverty; mothers' need for girls' help with housework; families' need for girls' income-generating activities); and educational factors (absence of female teachers and co-educational schools).

The results we report in this chapter suggest that in both urban and rural areas, a household's annual income, number of children, and children's ages were key factors determining the decision to spend for education, the amount spent, and the proportion of household expenditure allocated. Further, we observe that in both areas, household annual income, and the gender, number, and age category of children, and most coefficients of both parents' age were significantly related to the probability that the family spent money on the

children's education, while the father's education level was only significantly related to the probability of spending for those who have a university degree or above. The only difference between the two types of areas (in terms of the probability of education spending) was that in rural areas, child gender was not significantly related to the probability of spending. For our second dependent variable (the amount of household educational expenditure), our results suggest that for urban areas, household income, maternal age, both parents' education status, child age, and household size were significantly related to the amount of educational expenditure. As regards the amount of educational expenditure on children in rural areas, we observed three interesting differences. First, maternal education was no longer significantly related to the amount of expenditure. Only father's education was significantly related to the amount of spending on children's education. For instance, although in urban areas the mother's university degree increases the amount of educational expenditure by 43%, in rural areas the increase is 24% and non-significant. Second, although in both areas there was a negative relationship between child's gender (being a girl) and the amount of educational expenditure, this coefficient is only significant in rural areas. Third, although there was a strong positive relationship between household income and educational expenditure, this relationship was stronger in urban areas. For instance, in urban areas richer households spend 31% more on their children's education, while richer rural household spends 15% more. Finally, our model for the proportion of household educational expenditure suggested that in both areas there was a negative relationship between the proportion of expenditure allocated to education and household wealth.

The results of this empirical chapter suggest two possible shortcomings in observing household investment in children's education in Iran: first, the possible lack of intergenerational social mobility in both urban and rural areas (more predominantly in urban areas), and second, the possible existence of gender discrimination against girls in rural areas. According to our findings, wealthier parents, especially those in urban areas, spend more money on their children's education, which suggests that their children are more likely to achieve higher educational attainment (Acemoglu and Pishke, 2001) and earn more money in the future. This creates a continuous cycle, where inequality in urban areas diverges from that in rural areas. Further, our findings suggest that in rural areas, maternal education is not significantly related to the decision to spend on education, the amount spent, and the proportion of household expenditure allocated. This is a particularly interesting finding, and there can be many explanations for it. One reason could be related to traditional household structures that have remained more dominant in rural areas, where men are still the breadwinners and have the final decision regarding their children's access to education. In this context, rural women have less authority in how resources are invested, including investment in their children's education. Therefore, their own education level is less relevant in influencing their children's educational pursuits. However, in urban areas, the number of working mothers also contributing to their household income is higher, and so is their authority in determining their household's educational spending on children. Another reason could be that education and its effect are perceived differently in urban and rural areas. For instance, Isfahani (2016) argues that parents in Iran invest in a daughter's education not for its returns in terms of wages and employability but because they are aware that a highly educated woman has a higher chance of marrying well

and raising more intelligent children. In this way, they are contributing to society by raising more educated and engaged citizens. Another finding that suggests discrimination against women (especially in rural areas) is the significantly negative amount of educational expenditure for girls, which implies that in rural areas families spend less for their daughter's education. This might be related to rural households' traditional thinking, in which daughters' education is less important. Alternatively, it may be related to the labour market structure of rural areas, where there is not much demand for women with high levels of education. These results suggest the possible existence of a cycle in rural areas, where girls suffer from educational underinvestment and mothers do not affect the decision regarding the schooling of their children; this is reflected in the probability of educational spending, amount of expenditure, or proportion of educational expenditure. This means that even the most able and educated girls, who then become mothers themselves, do not (or cannot) invest in their children's education.

Our findings suggest that policymakers need to address different challenges in urban and rural areas of Iran: the lack of intergenerational mobility in urban areas and the discrimination against women in rural areas. To address intergenerational mobility, public policy, such as providing easier access to schooling for less privileged households could be effective for example, redistributive policies, such as tax and transfer schemes (Reforms, 2010). Another possible solution is to provide subsidy schemes and scholarships for higher levels of education—which exist in most developed countries—especially for children from poor families. An alternative plan could be to provide a subsidy for private schools to accept more pupils from poorer households. However, our finding regarding gender discrimination in rural areas of Iran might have its roots in the cultural, religious, and political characteristics of the Iranian society, and, considering the

government's Islamic ideology, we are not sure it could be easily addressed, as it is the government itself that is not willing to encourage women's role in the society. However, both policymakers and activists can address these problems by educating households about the importance of parents' investment in their daughters' education, and the important role that women can play in the society.

Finally, it is worth noting that the study conducted for this section is a first step at assessing a complex topic. However, there is room for further research in this subject. First, since our results suggest that household income is an important determinant of educational expenditure, the next step would be to examine the intergenerational effects of income inequality for both rural and urban areas, and for men and women. Secondly, since the Iranian economy has experienced a variety of shocks over the last thirty years, it would be interesting to add data from previous years, to see whether household behaviour has changed during that time. Finally, our results confirm the findings of studies that emphasise the low levels of educational expenditure by households in Iran; a similar study might investigate why these levels are so low. Is it because of the dominant role of the government in education, or are there other factors, such as low returns to education, that discourage Iranian households from investing heavily in it. The latter factor is investigated in the next chapter of this thesis (Chapter 5), where we examine returns to education, in terms of wages, for both men and women in urban and rural areas.

7.3 Returns to Education

Chapter 5 focused on returns to education, in terms of wages, for those aged between 16 and 65, by differentiating between urban/rural and individuals' gender. There is one study conducted on returns to education in Iran by Isfahani et al. (2009), which estimates returns to

average years of schooling for urban men. Here, a key contribution comes from differentiating between returns to education in urban/rural areas, while also examining gender differences. Another contribution of this chapter is that although most of the current studies on returns to education in the MENA region (Assaad, 1997; Dah and Hammami, 2002)—and the only existing study on Iran (Isfahani et al., 2009)—have sought to assess naive estimates of returns to education, we estimate both the naive and causal returns to education.

In this chapter, we employ various methodological approaches to determine returns to education. First, we investigate the average returns to schooling in terms of wages by employing a Mincer function. Second, we examine the existence of non-linearity in returns to education by using educational levels instead of years of schooling. Finally, we investigate causal returns to education by employing two types of instruments: parental education, and educational expansion as a result of the Islamic revolution in 1979.Like the previous chapter, the results in this chapter were also obtained using data from HIES.

Our naive results revealed that returns to education is similar for both urban and rural areas, and its higher for women (10%) than for men (5%). This is consistent with the existing literature on returns to education for most developed countries (e.g. Psacharopoulos, 1994). On the other hand, our IV estimates are higher than OLS estimates, and lie between 1% to 29%. Many studies (Dickson, 2013, 2011; Walker, 1995, 2002) have also found IV estimates that are higher than OLS estimates. We should note that while our OLS results suggested that returns to education are similar in urban and rural areas, IV estimates suggest that returns to education in rural areas are lower than those in urban areas. Finally, we found evidence of a strong

nonlinearity in the rate of return on schooling, which is also consistent with most studies of returns to education in the MENA region (Elhamidi, 2006; Said, 2016; Salehi-Isfahani et al., 2009).

This chapter's findings suggest several interesting avenues for policymakers to intervene. In terms of regional differences, our OLS and IV results provide two different insights for returns to education in Iran. First, our OLS estimates suggest that returns to education in urban and rural areas of Iran are very similar, and there is equal opportunity (in terms of returns to wages) for those who continue their studies, regardless of their being a resident of rural vs. urban areas. This finding suggests that if the government wants to promote income equality in urban and rural areas, they could promote more rural inhabitants to continue their studies, via investing more on schooling facilities. On the other hand, our IV estimates reveal that returns to education in terms of wages are much higher in urban than in rural areas. These differences in terms of regional returns to wages can explain the mass rural to urban migration that occurred in Iran since the Islamic revolution in 1979,and has been mentioned by both researchers and policymakers as one of the most important challenges of the Iranian economy (Taleb and Anbari, 2005;Mahmoudian, 2016). This suggests that raising returns to education in ruralareas can be used as a tool for reducing rural-to-urban migration. Regarding gender equality, the findings in this section suggest that returns to education are much higher for women than for men. There can be several explanations for these results; for instance, they might be related to characteristics of the Iranian labour market, and that it is segregated, with some jobs perceived as for women and some for men. Subsequently, a smaller supply of women into the labour market means that they are scarce, compared to the number of jobs perceived as being 'for women'. Another explanation could be related to selection bias and the fact that women who enter the labour

market are taken from the top-end of the female ability distribution, whereas the men are from across their ability distribution. This suggests that if policymakers aim to improve women's status in the society, they could do so by pursuing women's educational attainment. Lastly, the fact that returns to education are not linear in Iran has several policy implications. First, the higher-returns-to-higher-education argument has often been used to justify allocating funds to expand primary education, as it implies that the forms of education accessed the most by the poorest (i.e. primary and lower secondary) bring the smallest rewards in the labour market. According to a report by UNICEF (2016), 'this is a common pattern in countries with highly selective school systems and rigid labour markets'. Second, non-linearity has implications in the form of an increase in education inequality; if private returns to schooling increase with higher education, poorer families who educate their children to only primary level will face lower returns, whereas wealthier families who educate their children to higher levels will reap higher returns. Consequently, the education and earnings differentials may widen across families. One important policy could be to provide funding for higher education for those from poorer households. This funding can be paid either to students themselves or directly to their Higher Education provider, on students' behalf (e.g. in the case of tuition fee loans). Similar schemes, such as 'student support funding' and 'block grant funding' exist in the UK, which cover poorer students' tuition fees and costs associated with higher education attendance.

Finally, there is room for further research on this subject. For instance, in this section, we have not discussed returns to education in terms of a life cycle, whereas there is evidence of life-cycle changes in the impact of education on wages (Heckman, Lochner, and Taber, 1996; Cattan et al., 2013; Haider and Solon, 2006). However, the limitations of our data source render this type of

analysis unfeasible, as the current data source is not panel data and does not follow individuals/households through their life cycle. In recent years, the Iranian Statistical Centre has improved its data quality and made most of the data available online (Salehi-Isfahani, 2014); subsequently, the next step for the Centre is to assemble panel data that will enable researchers to follow individuals/households through their life-cycle. Another important recommendation for the Iranian Statistical Centre is to create a data source on education and schooling, to enable scholars of education economics to conduct research on various school-related topics (such as school quality, teacher-to-student ratio, and distance from home to school). Finally, in this chapter, we have only explored returns to education in terms of wages (although we have presented estimates regarding returns to education in terms of employability in Appendix D); the next step would be to examine other types of returns to education, such as employment, job mismatch, and probability of marrying. In the next chapter of this thesis (Chapter 6), we will examine determinants of job mismatch in terms of over/underemployment.

7.4 Determinants of Under/Overemployment

In the final empirical chapter of this thesis, we examine determinants of job mismatch in the form of under/overemployment by differentiating between both urban/rural and gender issues. We think that this topic is especially pertinent to the situation in Iran, as the government sees underemployment as a way of hiding the high rates of unemployment. On the other hand, in 2012, the Research Centre of the Iranian parliament highlighted the possible existence of overemployment among the self-employed and unpaid family workers, and according to our knowledge, no other studies have been conducted on the determinants of under-and

overemployment in Iran, hence our main contribution being the first study on such an important topic. Furthermore, the data analysed in this section of the thesis were from the Iranian Labour Force Survey (IRLFS) (2008–2014), which have only been available to researchers since 2015.

In the study underlying this chapter, we employed several models to capture both under- and overemployment: a model to examine determinants of underemployment, a model to investigate the magnitude of existing over/underemployment, and a model to capture likelihood of being both under- and overemployed. Our dependent variables were desire to work more hours, and the difference between actual and desired working hours.

In our results section, we reported that women, especially rural women, are more likely to be overemployed, whereas younger individuals are more likely to be underemployed. We also found out that workers in smaller companies are more likely to be underemployed whereas unpaid family workers, and those in the agricultural sector are more likely to be overemployed. All these findings were consistent with the findings in previous studies. We also reported the different effects of marriage for men and for women and that the likelihood of being underemployed rises for single and widowed/divorced women, whereas it is not significantly related to men's status in the labour market. For instance, single women are 3 percentage points more likely to be underemployed compared to married women; the coefficients for divorced and widowed women are also very similar (2.9 and 2.5 percentage points for divorced and widowed women, respectively), whereas single men are 0 percentage points less likely to be underemployed compared to married men. Nevertheless, none of the marriage coefficients for men were significantly related to the probability of over- and underemployment. We hypothesised that this relation might suggest possible discrimination against non-married

women within the Iranian labour market. However, the most interesting finding stated in this section was the impact of educational status on the likelihood of being under/overemployed, and that it differs between men and women. We reported that the probability of being underemployed declines for men as their educational status rises, whereas as women's educational level rise, their likelihood of being underemployed increases. For instance, compared to the reference group, men with a Bachelor's degree are 4.2 percentage points less likely to be underemployed, whereas women with the same type of degree are 4.8 percentage points more likely to be underemployed. We observed the same trend in both urban and rural areas, albeit the stronger effects in rural areas. For instance, rural men with a Bachelor's degree are 4.3 percentage points less likely to be underemployed, whereas rural women with the same type of degree are 6.3 percentage points more likely to be underemployed. This suggests that returns to human capital, in terms of less underemployment only exist for men. We also reported the same opposite effects of education for men and women in terms of overemployment, where for men the probability of being overemployed rises with higher qualifications; for instance, men with a bachelor's degree are 3.3 percentage points more likely to be overemployed, whereas women with the same degree are 2.7 percentage points less likely to be overemployed. Combining this evidence with our findings from the previous chapter, we can speculate that there are fewer opportunities for well-educated women in the labour market relative to the supply. This implies that although women seem to secure better wage returns than men, their higher level of education is often wasted, because they are not utilised by employers to their full productivity potential. One possible explanation for this phenomenon might be that women who pursue education are career-oriented; they have high expectations for their employability and ability to

secure high wages, as they are selected from the population of women of all working ages. However, they are disappointed by the opportunities available to them when they do secure work, and hence tend to feel underemployed.

This chapter's findings suggest several interesting areas for policymakers to intervene. Our results suggest that gender has the largest effect on the probability of job mismatch in the Iranian labour market (where the coefficient for overemployment is 0.098, and for underemployment is -0.141). The next largest effect comes from age, and education, while all other factors are significantly smaller than those three variables. Two of the three factors (gender and age) cannot be influenced by individuals so governments may have to intervene. For instance, our results suggest that there might be discrimination against non-married women, as they are more likely to be underemployed. This suggests that cultural and religious prejudice against women's marital status is still persistent in Iran. Considering the high rates of divorce (especially in urban areas of Iran), which has been mentioned by many sociologists (e.g. Afshar, 2005), this could be an alarming point for policymakers, especially since the number of families with single mothers has been increasing substantially (Iranian Census, 2016). This means that discrimination against non-married women is not only going to directly affect them, but will also affect their children, and hence future generations. A second area for concern by policymakers is also related to the status of women and the fact that being more educated does not decrease the likelihood of being underemployed. This means that returns to education, in terms of less underemployment, have not been transferred to women. Thirdly, findings in this chapter suggest that education is a significant strong factor in explaining employment mismatch and should thus be seen as another positive educational outcome, on top of additional monetary returns. These

findings suggest that Iranian policymakers need to move beyond a simple 'jobs counting' assessment of unemployment and focus their efforts on also capturing the underemployment phenomenon. As Gallup rightly highlights, 'The Arab Spring uprisings in Tunisia and Egypt proved that a sole focus on classic economic measures such as GDP missed a crucial component of the social cohesion dynamic in each country, so too is the case with underemployment' (Gallup, 2013, p. 14). As of now, the issue of underemployment has been ignored (intentionally or unintentionally) by policymakers in Iran; however, the fact that young people are facing a particularly acute underemployment challenge highlights the urgency of changing this approach.

Finally, there is room for further research in this subject. First, we have not examined the causal relationship between job mismatch and our variables; hence, there is room for improvement in terms of the methodological approach. Second, since our findings suggest the possible existence of discrimination against women in the labour market, further research is required to investigate why there such discrimination exists. Is it because of the inelasticity of the labour market? Alternatively, is it because of employers' discrimination against women?

As a final note, we propose that the findings of this thesis confirm the systematic existence of gender discrimination in both the Iranian education system and its labour market; according to the findings reported in Chapter 4, Iranian girls receive less educational expenditure from their parents (despite high returns to education in terms of wages). This situation is even worse in rural areas, where even if they receive education, they still cannot influence their household's decision regarding the educational expenditure for their children (most likely because the father is the main breadwinner and hence has the final word in the household's decisions). In chapter 5 we found that women generally experience higher wage returns to

schooling than men but when such results were further dissected we found that poorly educated women– in both urban and rural areas – actually have lower returns than men. The high return thus only accrues to girls who gain appropriately high levels of education. On the other hand, the findings from Chapter 6 suggested that more educated women are more likely to be underemployed, in both urban and rural areas. All these factors suggest that policymakers and activists need to be alarmed, as it seems that any investment in women's education may not fulfil its full potential. Another alarming point is the potential existence of low, or worsening, intergenerational mobility in Iran; for instance, Chapter 4 confirmed that wealthier parents spend much more on their children's education, whereas Chapter 5 confirmed the non-linearity of returns to education. This suggests that policymakers need to provide financial support to less well-off families and encourage their children to continue their education through 'student support funding' and 'block grant funding', which cover students' tuition fees and costs associated with higher education attendance.

Bibliography

Abadi, R., Zamanian, Z.,Rezvan,M., Musavi, A.,2015. The conceptual evolution of labour law in Iran with the emphasis on flexicurity in labour

Abbasi, Mohammad Jalal, et al. "Revolution, war and modernization: Population policy and fertility change in Iran." *Journal of Population Research* 19.1 (2002): 25-46.

Abendroth, A., Pausch, S. and Böhm, S., 2014. German fathers and their preference to reduce working hours to care for their children.

Abrahamsen, B. 2010. Employment status and commitment to work in professions. Economic and Industrial Democracy, 31: 93-115

Acemoglu, D. and Pischke, J.S., 2001. Changes in the wage structure, family income, and children's education. *European Economic Review*, *45*(4), pp.890-904.

Agnarsson, S. and Carlin, P.S., 2002. Family background and the estimated return to schooling: Swedish evidence. *Journal of Human Resources*, pp.680-692.

Ahlburg, D.A., Assaad, R. and McCall, B.P., 2004. Educational attainment in Egypt: the impact of delayed entry to school. *Unpublished manuscript*.

Ahmadi,Sh., Teher,M.,Meidani, N., Meibodi,J.,2010. Bond Test Convergence Method, Interaction Between Human Capital and Total Factor Productivity in Iran. *Economic Growth and Development Research:* Winter 2010 , Volume 1 , Issue 1 (1)

Akbarian, R.,Kav, M.,2010. The Relationship between Income Inequality, Educational Expenditures and Economic Growth. *Economic Growth and Development.* Winter 2010, Volume 1 , Issue 1 (1)

Akerhielm, K., 1995. Does class size matter?. *Economics of education Review*, *14*(3), pp.229-241.

Alitabar. A. 2012. [Online] (In Persian). Available at: http://www.iscanews.ir/news/560236 [Accessed 2016]

Allen, J. and Van der Velden, R., 2001. Educational mismatches versus skill mismatches: effects on wages, job satisfaction, and on- the- job search. *Oxford economic papers*, *53*(3), pp.434-452.

Al-Qudsi, S.S., 2003. Family background, school enrollments and wastage: evidence from Arab countries. *Economics of Education review*, *22*(6), pp.567-580.

Altonji, J.G. and Dunn, T.A., 1996. The effects of family characteristics on the return to education. *The Review of Economics and Statistics*, pp.692-704.

Al-Samarrai, S. and Peasgood, T., 1998. Educational attainments and household characteristics in Tanzania. *Economics of Education Review*, *17*(4), pp.395-417.

Álvarez, B. and Ramos Palencia, F., 2016. *The Role of human capital in pre-industrial societies: skills and earnings in eighteenth-century Castile (Spain)*(No. 16.03).

Ameri, R, .2017. Why the youth are so eager for university education? Evidence from Iran's labor market. *Journal of Economic Studies*.

Amuzegar, J. 2005. *Iran's Third Development Plan: An appraisal. Middle East Policy* 12 (3), 46–64.

Angrave, D. and Charlwood, A., 2015. What is the relationship between long working hours, over-employment, under-employment and the subjective well-being of workers? Longitudinal evidence from the UK. *Human relations*, *68*(9), pp.1491-1515.

Angrist, J.D. and Keueger, A.B., 1991. Does compulsory school attendance affect schooling and earnings?. *The Quarterly Journal of Economics*, *106*(4), pp.979-1014.

Ansari, A. 2011. [Online](In Persian) Available at:http://tamin24.ir/fa/news/8057
[Accessed 2015]

Arani, A.M., Kakia, M.L. and Karimi, M.V., 2012. Assessment in education in Iran. *Assessment*.

Arani, A.M., Kakia, L. and Taghavi, T., 2015. Privatization of education in the Islamic Republic of Iran: One step forward, one step back. *Cogent Education*, *2*(1), p.1029709.

Arcand, J.L., d'Hombres, B. and Gyselinck, P., 2004. Instrument choice and the returns to education: New evidence from Vietnam. *Unpublished Paper*.

Arias, O. and McMahon, W.W., 2001. Dynamic rates of return to education in the US. *Economics of Education Review*, *20*(2), pp.121-138.

Ashenfelter, O. & Krueger, A. B., 1994. Estimates of the economic return to schooling from a new sample of twins,American Economic Review,84(5), pp. 1157–1173.

Ashenfelter, O. and Zimmerman, D.J., 1997. Estimates of the returns to schooling from sibling data: Fathers, sons, and brothers. *The Review of Economics and Statistics*, *79*(1), pp.1-9.

Ashenfelter, O. and Rouse, C., 1998. Income, schooling, and ability: Evidence from a new sample of identical twins. *The Quarterly Journal of Economics*, *113*(1), pp.253-284.

Ashenfelter, O., Harmon, C. and Oosterbeek, H., 1999. A review of estimates of the schooling/earnings relationship, with tests for publication bias. *Labour economics*, *6*(4), pp.453-470.

Assaad, R., 1997. The effects of public sector hiring and compensation policies on the Egyptian labor market. *The World Bank Economic Review*, *11*(1), pp.85-118.

Assaad, R., 2013. Making sense of Arab labor markets: the enduring legacy of dualism. *IZA Journal of Labor & Development*, *3*(1), p.6.

Assaad, R., Salehi-Isfahani, D. and Hendy, R., 2014, May. Inequality of opportunity in educational attainment in Middle East and North Africa: Evidence from household surveys. In *Economic Research Forum Working Paper Series No* (Vol. 834).

Astone, N.M., and McLanahan, S.S., 1991. Family structure, parental practices, and high school completion. *American Sociological Review*, 56 (3), pp.309–320.

Averett, S.L. and Burton, M.L., 1996. College attendance and the college wage premium: Differences by gender. *Economics of Education Review*, *15*(1), pp.37-49.

Azadeh, A., Davarzani, S., Arjmand, A. and Khakestani, M., 2016. Improved prediction of household expenditure by living standard measures via a unique neural network: the case of Iran. *International Journal of Productivity and Quality Management*, *17*(2), pp.142-182.

Babaei, H., Zomorrodian, A.H., Gill, S.S., Ahmad, N. and Falahati, L., 2011. Social Capital and Human Development: A Meta-Analysis in Iran. *Journal of American Science*, *7*(6), pp.194-197.

Badr, M., Morrissey, O. and Appleton, S., 2012. *Determinants of educational attainment in MENA* (No. 12/03). CREDIT Research Paper.

Baker, D.P. and Jones, D.P., 1999. Creating gender equality: Cross-national gender stratification and mathematical performance. *Sociology of Education*, pp.91-103.

Baker DP, Goesling B, LeTendre GK. 1999. *Social class, school quality, and nationaleconomic development: a cross-nationalanalysis of the "Heyneman-Loxley" effect*. Presented at Annu. Meet. Am. Sociol. Assoc.,94th, Chicago

Bacolod, M.P. and Ranjan, P., 2008. Why children work, attend school, or stay idle: the roles of ability and household wealth. *Economic Development and Cultural Change*, *56*(4), pp.791-828.

Bakhshoodeh, M 2008, Determinants of poor accessibility to microcredits in rural Iran.

Barham, C., Walling, A., Clancy, G., Hicks, S. and Conn, S., 2009. Young people and the labour market. *Economic & Labour Market Review*, *3*(4), pp.17-29

Barro, R.J., 2001. Education and economic growth. *The contribution of human and social capital to sustained economic growth and well-being*, pp.13-41.

Becker, G., 1964. Human Capital: a Theoretical and Empirical Analysis with Special Reference to Education University of Chicago: Chicago (2nd.

Becker, G.S. and Tomes, N., 1979. An equilibrium theory of the distribution of income and intergenerational mobility. *Journal of political Economy*, *87*(6), pp.1153-1189.

Becker, G.S. and Tomes, N., 1986. Human capital and the rise and fall of families. *Journal of labor economics*, *4*(3, Part 2), pp.S1-S39.

Becker, G.S., Murphy, K.M. and Tamura, R., 1990. Human capital, fertility, and economic growth. *Journal of political economy*, *98*(5, Part 2), pp.S12-S37.

Bednarzik, R.W., 1980. Worksharing in the US: its prevalence and duration. *Monthly Lab. Rev.*, *103*, p.3.

Behkish,M., 1381. [Iranian economy to its route to globalisation] Eghtesade Iran dar bastare jahani shodan. *Nashre Nei* (In Persian).

Behrman, J. and Rosenzweig, M.R., 2001. Does increasing women's schooling raise the schooling of the next generation?.

Behrman, J.R. and Wolfe, B.L., 1987. How does mother's schooling affect family health, nutrition, medical care usage, and household sanitation?. *Journal of econometrics*, *36*(1-2), pp.185-204.

Behrman JR, Birdsall N. 1983. The quality of schooling: quantity alone is misleading. *American Economic Review.* 73:928–46

Beiser, M., Johnson, P.J. and Turner, R.J., 1993. Unemployment, underemployment and depressive affect among Southeast Asian refugees. *Psychological medicine*, *23*(3), pp.731-743.

Bell, B.D., 1997. The performance of immigrants in the United Kingdom: evidence from the GHS. *The Economic Journal*, *107*(441), pp.333-344.

Bell, D. and Blanchflower, D.G., 2010, October. Young people and recession: A lost generation?. In *Fifty-Second Panel Meeting on Economic Policy, Einaudi Institute for Economics and Finance, October* (pp. 22-23).

Bell, L. and Freeman, R., 1994. *Why do Americans and Germans work different hours?* (No. w4808). National Bureau of Economic Research.

Beller M, Gafni N. 1996. The 1991 international assessment of educational progress in mathematics and sciences: the gender differences perspective. *Journal of Education. Psychology*.88 (2):365–77

Belman, D. and Heywood, J.S., 1991. Sheepskin effects in the returns to education: An examination of women and minorities. *The Review of Economics and Statistics*, pp.720-724.

Betts, J.R., 2010. School quality and earnings. *International Encyclopedia of Education*, *2*, pp.313-320.

Biblarz, T.J. and Raftery, A.E., 1999. Family structure, educational attainment, and socioeconomic success: Rethinking the" pathology of matriarchy". *American Journal of Sociology*, *105*(2), pp.321-365.

Bingley, P., Christensen, K. and Walker, I., 2005. Twin-based estimates of the returns to education: Evidence from the population of Danish twins. *Aarhus, Denmark: Aarhus Business School*.

Birdsall, N., 1985. Public inputs and child schooling in Brazil. *Journal of development Economics*, *18*(1), pp.67-86.

Blackburn, M.L. and Neumark, D., 1993. Omitted-ability bias and the increase in the return to schooling. *Journal of labor economics*, *11*(3), pp.521-544.

Blackwell, D.L. and McLaughlin, D.K., 1999. Do Rural Youth Attain Their Educational Goals?. *Rural Development Perspectives* 13(3), pp. 37-44

Blanden, J., Goodman, A., Gregg, P. and Machin, S., 2004. Changes in intergenerational mobility in Britain. *Generational income mobility in North America and Europe*, pp.122-46.

Blanden, J., Gregg, P. and Macmillan, L., 2007. Accounting for intergenerational income persistence: noncognitive skills, ability and education. *The Economic Journal*, *117*(519).

Blundell, R. and Meghir, C., 1987. Bivariate alternatives to the Tobit model. *Journal of Econometrics*, *34*(1-2), pp.179-200.

Blundell, R., Dearden, L., Goodman, A. and Reed, H., 1997. Higher Education. *Employment and Earnings in Britain, Institute for Fiscal Studies, London*.

Blundell, R., Dearden, L. and Sianesi, B., 2005. Evaluating the effect of education on earnings: models, methods and results from the National Child Development Survey. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *168*(3), pp.473-512.

Bluestone, B. and Rose, S., 1997. Overworked and underemployed: unraveling an economic enigma. *American Prospect*, (31), pp.58-64+.

Boggess, S., 1998. Family structure, economic status, and educational attainment. *Journal of Population Economics*, *11*(2), pp.205-222.

Bonke, J. and Schultz-Nielsen, M.L., 2014. Are working hour preferences satisfied?. *Nationaløkonomisk Tidsskrift*, *1*, p.1.

Borjas, George J., Labor economics, 6th ed., International ed. New York: McGraw-Hill/Irwin, 2012.

Boulin, J.Y. ed., 2006. *Decent working time: New trends, new issues*. International Labour Organization.

Bound, J., Jaeger, D.A. and Baker, R.M., 1996. Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American statistical association*, *90*(430), pp.443-450.

Bound, J. and Solon, G., 1999. Double trouble: on the value of twins-based estimation of the return to schooling. *Economics of Education Review*, *18*(2), pp.169-182.

Bradley, S., Crouchley, R., Millington, J. and Taylor, J., 2000. Testing for quasi- market forces in secondary education. *Oxford Bulletin of Economics and Statistics*, *62*(3), pp.357-390.

Bradley, S. and Taylor, J., 2004. Ethnicity, educational attainment and the transition from school. *The Manchester School*, *72*(3), pp.317-346.

Bradley, S. and Taylor, J., 2002. The Effect of the Quasi–market on the Efficiency–equity Trade–off in the Secondary School Sector. *Bulletin of Economic Research*, *54*(3), pp.295-314.

Breen, R. and Goldthorpe, J.H., 1997. Explaining educational differentials: Towards a formal rational action theory. *Rationality and society*, *9*(3), pp.275-305.

Brooks-Gunn, J., Guo, G., and Furstenberg, F.F., Jr. Who drops out of and who continues beyond high school?: A 20-year study of black youth. *Journal of Research in Adolescence* (1993)37,3:271–94.

Brown, P., Lauder, H. and Ashton, D., 2011. The global auction: The promise of education, jobs, and income.

Buchmann, C. and Brakewood, D., 2000. Labor structures and school enrollments in developing societies: Thailand and Kenya compared. *Comparative Education Review*, *44*(2), pp.175-204.

Buchmann, C. and Hannum, E., 2001. Education and stratification in developing countries: A review of theories and research. *Annual review of sociology*, *27*(1), pp.77-102.

Bhuller, Manudeep, Magne Mogstad, and Kjell G. Salvanes. 2011. Life-cycle bias and the returns to schooling in current and lifetime earnings. Discussion Paper no. 5788, IZA, Bonn.

Burke, R.J. 1997. Correlates of under-employment among recent business school graduates. *International Journal of Manpowe*r, 18: 627-635.

Burke, R.J. and Cooper, C.L. eds., 2008. *The long work hours culture: Causes, consequences and choices*. Emerald Group Publishing.

Bureau of Labor Statistics, United States Department of Labor. 2010. Employment situation summary [Online].Available at: http://www.bls.gov/news.release/empsit.nr0.htm
[Accessed December 2016]

Burris, B.H., 1983. The human effects of underemployment. *Social Problems*, *31*(1), pp.96-110.

Buscha, F. and Dickson, M., 2015. The Wage Returns to Education over the Life-Cycle: Heterogeneity and the Role of Experience.

Cam, S., 2014. The underemployed: evidence from the UK labour force survey for a conditionally gendered top-down model. *Journal of Social Science Studies*, *1*(2), p.47.

Cameron, S. and Taber, C., 1999. *Borrowing constraints and the returns to schooling* (No. w7761). National bureau of economic research.

Cameron, S.V. and Heckman, J.J., 2001. The dynamics of educational attainment for black, hispanic, and white males. *Journal of political Economy*, *109*(3), pp.455-499.

Caputo, R.K. and Cianni, M., 2001. Correlates of Voluntary vs. Involuntary Part- time Employment among US Women. *Gender, Work & Organization*, *8*(3), pp.311-325.

Card, D. and Krueger, A.B., 1992. Does school quality matter? Returns to education and the characteristics of public schools in the United States. *Journal of political Economy*, *100*(1), pp.1-40.

Card, D., 1999. The causal effect of education on earnings. *Handbook of labor economics*, *3*, pp.1801-1863.

Card, D. and Lemieux, T., 2001. Can falling supply explain the rising return to college for younger men? A cohort-based analysis. *The Quarterly Journal of Economics*, *116*(2), pp.705-746.

Case, A. and Yogo, M., 1999. *Does school quality matter? Returns to education and the characteristics of schools in South Africa* (No. w7399). National bureau of economic research.

Cattan, S., Crawford, C. and Dearden, L., 2013. *The economic effects of pre-school education and quality* (No. R99). IFS Reports, Institute for Fiscal Studies.

Chambel, M.J., & Castanheira, F. 2006. Different temporary work status, different behaviors in organization. Journal of Business and Psychology, 20: 351-367.

Chase-Lansdale, P.L., Gordon, R.A., Brooks-Gunn, J. and Klebanov, P.K., 1997. Neighborhood and family influences on the intellectual and behavioral competence of preschool and early school-age children. *Neighborhood poverty*, *1*, pp.79-118.

Chevalier A. and G. Lanot, 2002, The relative effect of family characteristics and financial situation on educational achievement, Education Economics, 10, 165-182.

Choudhury, P.K., 2011. Patterns and Determinants of Household Expenditure on Engineering Education in Delhi. *Rethinking Development in an Age of Scarcity and Uncertainty, New Values, Vocies and Alliances for Increased Resilience*.

Clarkberg, M. and Moen, P., 2001. Understanding the time-squeeze: Married couples' preferred and actual work-hour strategies. *American Behavioral Scientist*, *44*(7), pp.1115-1136.

Clogg, C.C., 1979Measuring Underemployment: Demo-graphic Indicators for the United States.

Cohn E, Rossmiller RA. 1987. Research on effective schools: implications for less developed countries. *Comp. Educ. Rev.* 31:377–99

Contensou, F. and Vranceanu, R., 2000. Working time. *Books*.

Currie, J. and Thomas, D., 1999. *Early test scores, socioeconomic status and future outcomes* (No. w6943). National bureau of economic research.

Cragg, J.G., 1971. Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica: Journal of the Econometric Society*, pp.829-844.

Cragg, J. G., and S. G. Donald. 1993. Testing identifiability and specification in instrumental variable models.Econometric Theory 9: 222–240.

Dah, A. and Hammami, S., 2002. Returns to education in Lebanon. In *Conference paper, Economic Research Forum*.

De Jong, G.F., & Madamba, A.B. 2001. A double disadvantage? Minority group, immigrant status, and underemployment in the United States. Social Science Quarterly, 82: 117-130.

Dearden, L., Machin, S. and Reed, H., 1997. Intergenerational mobility in Britain. *The Economic Journal*, pp.47-66.

Dearden, L., Emmerson, C., Frayne, C. and Meghir, C., 2005. *Education subsidies and school drop-out rates* (No. 05/11). IFS Working Papers, Institute for Fiscal Studies (IFS).

Dee, T.S., 2005. A teacher like me: Does race, ethnicity, or gender matter?. *The American economic review*, *95*(2), pp.158-165.

Denny, K. and Harmon, C., 2000. Education policy reform and the return to schooling from instrumental variables.

DesJardins, S.L., Dundar, H. and Hendel, D.D., 1999. Modeling the college application decision process in a land-grant university. *Economics of Education Review*, *18*(1), pp.117-132.

Dickson, M., 2013. The causal effect of education on wages revisited. *Oxford Bulletin of Economics and Statistics*, *75*(4), pp.477-498.

DiPrete TA, Buchmann C. 2006. Gender-specific trends in the values of education and the emerging gender gap in college completion.Demography43 (1):1–24

Dolton, P.J., Greenaway, D. and Vignoles, A., 1997. 'Whither Higher Education?'An Economic Perspective for the Dearing Committee of Inquiry. *The Economic Journal*, *107*(442), pp.710-726.

Dalton, P., 1999. *Making the Grade: The Labour Market and Young People*. Joseph Rowntree Foundation.

Dooley, D., Fielding, J. and Levi, L., 1996. Health and unemployment. *Annual review of public health*, *17*(1), pp.449-465.

Dougherty, C., 2005. Why are the returns to schooling higher for women than for men?.*Journal of Human Resources*, *40*(4), pp.969-988.

Downey DB. When bigger is not better: Family size, parental resources, and children's educational performance. American Sociological Review. 1995;60:746–761.

Drajeaa, A.J. and O'Sullivan, C., 2014. The Influence of Parental Education and Family Income on Children's Education in Rural Uganda. *Global Education Review*, *1*(3).

Donkoh, S.A. and Amikuzuno, J.A., 2011. The determinants of household education expenditure in Ghana. *Educational Research and Reviews*, *6*(8), p.570.

Dustmann, C., 2004. Parental background, secondary school track choice, and wages. *Oxford Economic Papers*, *56*(2), pp.209-230.

Duflo, E., 2000. *Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment* (No. w7860). National Bureau of Economic Research.

Duong, V.T., 2004. Family, community-based social capital and educational attainment during the doi moi process in Viet Nam.

Eckstein, Z., Wolpin, K.,1999. Why youths drop out of high school: the impact of preferences, opportunities, and abilities. Econometrica 67 (6),1295–1339.

Edington, E.D. and Martellaro, H.C., 1984. Variables affecting academic achievement in New Mexico schools. Las Cruces: New Mexico Center for Rural Education. (Eric Document Reproduction Service No. 271 267)

Ehrenberg, R.G. and Smith, R.S., 2016. *Modern labor economics: Theory and public policy*. Routledge.

Elbadawy, A., 2009. *Three Essays on Education in Egypt* (Doctoral dissertation).

El-Hamidi, F. 2006. General or vocational? Evidence on school choice, returns, and sheep skin effects from Egypt 1998. Journal of Policy Reform. 9 (2): 157-176.

Ellwood, D.T. and Kane, T.J., 2000. Who is getting into college? Family background and the growing gaps in enrollment. *Securing the Future', Russell Sage, New York*.

Emadzadeh, M., 1384. [Economy of Education] Eghtesade amoozesh va parvaresh (in Persian).

Entwisle DR, Alexander KL, Olson LS. 2007. Early schooling: the handicap of being poor and male.Sociol. Education.80 (2):114–38

Engelmann, D., Fischbacher, U., 2002. Indirect reciprocity and strategic reputation building in an experimental helping game. Working Paper No. 132, University of Zurich.

Ehrlich, P., 2000. Human Natures: Genes, Cultures, and the Human Prospect. Island Press, Washington, DC

Erdogan, B., & Bauer, T.N. 2009. Perceived overqualification and its outcomes: The moderating role of empowerment. Journal of Applied Psychology, 94: 557-565.

Ermisch, J. and Francesconi, M., 2000. Educational choice, families, and young people's earnings. *Journal of Human Resources*, pp.143-176.

Esping-Andersen, G. 2004, Unequal opportunities and the mechanisms of social inheritance, Chapter 12 in M. Corak, ed., Generational Income Mobility in North America and Europe, Cambridge University Press.

Evans, A.W., 1990. The assumption of equilibrium in the analysis of migration and interregional differences: a review of some recent research. *Journal of Regional Science*, *30*(4), pp.515-531.

Evans, A.W., 1993. Interregional equilibrium: a transatlantic view. *Journal of regional science*, *33*(1), pp.89-97.

Erikson, R. and Goldthorpe, J.H., 1992. *The constant flux: A study of class mobility in industrial societies*. Oxford University Press, USA.

Fan, J.X. and Lewis, J.K., 1999. Budget allocation patterns of African Americans. *Journal of Consumer Affairs*, *33*(1), pp.134-164.

Fazaeli, A.A., Hadian, M., Rezapour, A. and Fazaeli, A.A., 2016. Assessing the Distribution of Household Financial Contribution to Health System: A Case Study of Iran. *Global journal of health science*, *8*(10), p.233.

Feinstein, L. and Symons, J., 1999. Attainment in secondary school. *Oxford Economic Papers*, *51*(2), pp.300-321.

Feinstein, L., Duckworth, K. and Sabates, R., 2008. *A Model of the Inter-generational Transmission of Educational Success [Wider Benefits of Learning Research Report No. 10]*. Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London.

Feldman, D.C. and Turnley, W.H., 1995. Underemployment among recent business college graduates. *Journal of Organizational Behavior*, *16*(S1), pp.691-706.

Feldman, D.C., 1996. The nature, antecedents and consequences of underemployment. *Journal of Management*, *22*(3), pp.385-407.

Feldman, D.C., Doerpinghaus, H.I. and Turnley, W.H., 1997. Managing temporary workers: A permanent HRM challenge. *Organizational dynamics*, *23*(2), pp.49-63.

Feldman, D.C., Leana, C.R., & Bolino, M.C. 2002. Underemployment and relative deprivation among re-employed executives. Journal of Occupational and Organizational Psychology , 75: 453-471.

Feldman, D.C., & Turnley, W.H. 2004. Contingent employment in academic careers: Relative deprivation among adjunct faculty. Journal of Vocational Behavior, 64: 284-307.

Feldman, D.C. and Vogel, R.M., 2009. The aging process and person-environment fit. *Research in careers*, *1*, pp.1-25.

Fernandez, J.L. and Lim, E.S., 2016, November. The Prevalence of Overemployment in Penang: A Preliminary Analysis. In *Proceedings of Second International Conference on Contemporary Economic Issues* (p. 39).

Fergany, N., 1993. On the Distribution of Social Position in Egypt With Particular Reference to Gender Differentials: Preliminary Results.

Filmer, D. and Pritchett, L., 1999. *Educational enrollment and attainment in India: Household wealth, gender, village, and state effects*. Washington, DC: World Bank.

Fink, G. and Peet, E., 2016. *Returns to Education in Low and Middle-Income Countries: Evidence from the Living Standards and Measurement Surveys* (No. 12014). Program on the Global Demography of Aging.

Friedland, D.S. and Price, R.H., 2003. Underemployment: Consequences for the Health and Well-Being of Workers. *American journal of community psychology*, *32*(1-2), pp.33-45.

Fuller B, Snyder CW. 1991. Vocal teachers, silent pupils? Life in Botswana classrooms. *Comp. Educ. Rev.* 35:274–94

Fuller B, Clarke P. 1994. Raising school effects while ignoring culture? *Rev. Educ. Res.* 64:119–57

Garner, C.L. and Raudenbush, S.W., 1991. Neighborhood effects on educational attainment: A multilevel analysis. *Sociology of education*, pp.251-262.

Gallagher AM, Kaufman JC, ed. 2005.Gender Differences in Mathematics: An IntegrativePsychological Approach. Cambridge, UK: Cambridge Univ. Press

Gallup. 2013. Underemployment in the MENA region. [Online] Available At: at:http://www.silatech.org/docs/default-source/publications-documents/silatech-index-brief-underemployment-in-the-mena-region.pdf?sfvrsn=6
[Accessed 2015]

Gundersen, C. and Ziliak, J.P., 2004. Poverty and macroeconomic performance across space, race, and family structure. *Demography*, *41*(1), pp.61-86.

Ghiasvand, H., Naghdi, S., Abolhassani, N., Shaarbafchizadeh, N. and Moghri, J., 2015. Iranian Households' Payments on Food and Health Out-of-Pocket Expenditures: Evidence of Inequality. *Iranian journal of public health*, *44*(8), p.1103.

Gibbons, S., 2002. *Neighbourhood effects on educational achievement*. Centre for the Economics of Education, London School of Economics and Political Science.

Ginther, D.K., and Pollak, R.A., 2004. Family structure and children's educational outcomes: Blended families, stylized facts, and descriptive regressions. Demography, 41 (4), pp.671–696.

Glewwe, P. and Patrinos, H.A., 1999. The role of the private sector in education in Vietnam: Evidence from the Vietnam Living Standards Survey. *World Development*, *27*(5), pp.887-902.

Glewwe, P., 2002. Schooling and skills in developing countries: education policies ans socioeconomic outcomes. *Journal of econmic literatue VolXL, pp436-483.*

Global Gender Gap Report.2015. [Online]Iran. Available at:http://reports.weforum.org/global-gender-gap-report-2015/economies/#economy=IRN
[Accessed July 2017]

Glosser, S. and Golden, L., 2004. The changing nature of hours and employment adjustment in US manufacturing: A contributing cause of the jobless recovery?.*International Journal of Manpower*, *25*(7), pp.618-642.

Glyde, G.P., 1977. Underemployment: Definition and causes. *Journal of Economic Issues*, *11*(2), pp.245-260.
Goetz, S.J. and Rupasingha, A., 2004. The returns to education in rural areas. *The Review of Regional Studies*, *34*(3), p.245.

Golden, L. and Gebreselassie, T., 2007. Overemployment mismatches: the preference for fewer work hours. *Monthly Lab. Rev.*, *130*, p.18.

Golden, L. and Wiens-Tuers, B., 2008. Overtime work and wellbeing at home. *Review of Social Economy*, *66*(1), pp.25-49.

Green, F. and McIntosh, S., 2007. Is there a genuine under-utilization of skills amongst the over-qualified?. *Applied Economics*, *39*(4), pp.427-439.

Green, F. and Zhu, Y., 2010. Overqualification, job dissatisfaction, and increasing dispersion in the returns to graduate education. *Oxford Economic Papers*, *62*(4), pp.740-763.

Gregg, P. and Machin, S., 2000. The relationship between childhood experiences, subsequent educational attainment and adult labour market performance. *Child well being in modern nations: what do we know*.

Griliches, Z., 1976. Wages of very young men. *Journal of Political Economy*, *84*(4, Part 2), pp.S69-S85

Grogger, J., 1996. School expenditures and post-schooling earnings: evidence from high school and beyond. *The Review of Economics and Statistics*, pp.628-637.

Habibi, N., 2017. Higher education policies and overeducation in Turkey. *European Journal of Higher Education*, pp.1-10.

Haftlang, K., Lang, K., & Rajabi, Ā. 2003. *The book of Iran: a survey of the geography of Iran*,Volume 1. Alhoda UK.

Haider, S. and Solon, G., 2006. Life-Cycle Variation in the Association between Current and Lifetime Earnings, forthcoming in American Economic Review.

Hall, Joshua. 2000. Investment in Education: Private and Public Returns. Washington DC: Joint Economic Committee

Hannaway, J. and Talbert, J.E., 1993. Bringing context into effective school research: Urban-suburban differences. Educational Administration Quarterly 29, pp. 164–186.

Hannum E. 2000. *Opportunity lost: rural children and educational opportunity in reformera China*. Harvard Univ., Mimeo

Hanushek, E.A., 1992. The trade-off between child quantity and quality. *Journal of political economy*, *100*(1), pp.84-117.

Hanushek, E.A., Rivkin, S.G. and Taylor, L.L., 1996. *Aggregation and the estimated effects of school resources* (No. w5548). National bureau of economic research.

Hanushek, E.A. and Kimko, D.D., 2000. Schooling, labor-force quality, and the growth of nations. *American economic review*, pp.1184-1208.

Hanushek, E.A., Lavy, V. and Hitomi, K., 2008. Do students care about school quality? Determinants of dropout behavior in developing countries. *Journal of Human Capital*, *2*(1), pp.69-105.

Ham, J.C., 1982. Estimation of a labour supply model with censoring due to unemployment and underemployment. *The Review of Economic Studies*, *49*(3), pp.335-354.

Harmon, C. and Walker, I., 1995. Estimates of the economic return to schooling for the United Kingdom. *The American Economic Review*, *85*(5), pp.1278-1286.

Harmon, C. and Walker, I., 2000. The returns to the quantity and quality of education: evidence for men in England and Wales. *Economica*, *67*(265), pp.19-35

Harmon, C., Oosterbeek, H. and Walker, I., 2000. *The returns to education: a review of evidence, issues and deficiencies in the literature*. Centre for the Economics of Education, London School of Economics and Political Science.

Harris, K.M. and Morgan, S.P., 1991. Fathers, sons, and daughters: Differential paternal involvement in parenting. *Journal of Marriage and the Family*, pp.531-544.

Hao, L. and Yu, X., 2015. Rural-Urban Migration and Children's Access to Education: China in Comparative Perspective. *Paper commissioned for the EFA Global Monitoring Report*, pp.2000-2015.

Harani,F,. 2004. Decent Work and its display in Iran**.** *The Journal of Planning and Budgeting*. 2004; 9 (3): 37-66

Harper, E., Bevilacqua, C. and Tatulashvili, N., 2014. Legal Research Series.

Harvey, E., 1999. Short-term and long-term effects of early parental employment on children of the National Longitudinal Survey of Youth. *Developmental psychology*, *35*(2), p.445.

Hashemkhani,M.,2013. Hadafmandie yaraneha be samte koodakan va nojavanan bar asase tarkib and toose va edlate amoozeshi[Online]. (In Persian) Available at:http://conference.imps.ac.ir [Accessed 2016]

Hauser, P.M., 1974. *The measurement of labour utilization*. East-West Center.

Haveman, R., Wolfe, B. and Spaulding, J., 1991. Childhood events and circumstances influencing high school completion. *Demography*, *28*(1), pp.133-157.
Haveman, R. and Wolfe, B., 1994. *Succeeding generations: On the effects of investments in children*. Russell Sage Foundation.

Haveman, R. and Wolfe, B., 1995. The determinants of children's attainments: A review of methods and findings. *Journal of economic literature*, *33*(4), pp.1829-1878.

Heckman, J. and Polachek, S., 1974. Empirical evidence on the functional form of the earnings-schooling relationship. *Journal of the American Statistical Association*, *69*(346), pp.350-354.

Heckman, J.J., 1977. Sample selection bias as a specification error (with an application to the estimation of labor supply functions).

Heckman, J.J. and Sedlacek, G., 1985. Heterogeneity, aggregation, and market wage functions: an empirical model of self-selection in the labor market. *Journal of political Economy*, *93*(6), pp.1077-1125.

Heckman, J. and Vytlacil, E., 1998. Instrumental variables methods for the correlated random coefficient model: Estimating the average rate of return to schooling when the return is correlated with schooling. *Journal of Human Resources*, pp.974-987.

Hedayat, M., Kahn, S.M. and Hanafi, J., 2013. Factors affecting the unemployment (rate) of female art graduates in Iran. *Educational Research and Reviews*, *8*(9), p.546.

Herzog, A., House, J.S. and Morgan, J.N., 1991. Relation of work and retirement to health and well-being in older age. *Psychology and aging*, *6*(2), p.202.

Heyes, J., Tomlinson, M. and Whitworth, A., 2017. Underemployment and well-being in the UK before and after the Great Recession. *Work, employment and society*, *31*(1), pp.71-89.

Heyneman SP, Jamison DT. 1980. Student learning in Uganda: textbook availability and other factors. *Comp. Educ. Rev.* 24:206–20

Heyneman SP, LoxleyWA. 1983. The effect of primary school quality on academic achievement across twenty-nine high- and low income countries. *Am. J. Sociol.* 88:1162–94

Hinshaw SP. 1992. Externalizing behavior problems and academic underachievement in childhoodand adolescence: causal relationships and underlying mechanisms.Psychol. Bull.111(1):127–55

Hijzen, A., Upward, R., & Wright, P.W. 2010. The income losses of displaced workers. Journal of Human Resources, 45: 243-269.

Hobcraft, J., 1998. Intergenerational and Life-Course Transmission of Social Exclusion: Influences of Child Poverty, Family Disruption, and Contact with the Police CASEpaper 15, London School of Economics: ESRC Centre for the Analysis of Social Exclusion.

Holtom, B.C., Lee, T.W., & Tidd, S.T., 2002. The relationship between work status congruence and work-related attitudes and behaviors. Journal of Applied Psychology, 87: 903-915.

Hubbard, W.H., 2011. The phantom gender difference in the college wage premium. *Journal of Human Resources*, *46*(3), pp.568-586.

Hübler, O., 2000. All goes faster but lasts longer: Computer use and overtime work. *IFO Studien*, *46*(2), pp.49-271.

Human Rights and Equal Opportunity Commission, Sydney (Australia)., 2000. *Emerging Themes: National Inquiry In to Rural and Remote Education*. ERIC Clearinghouse.

Huitfeldt, H. and Kabbani, N., 2007. *Returns to Education and the Transition from School to Work in Syria*. American University of Beirut.

Hungerford, T. and Solon, G., 1987. Sheepskin effects in the returns to education. *The review of economics and statistics*, pp.175-177.

Hussmanns, R., 2007. Measurement of employment, unemployment and underemployment–Current international standards and issues in their application. *Bulletin of Labour Statistics*, *1*, pp.2007-2001.

Huy, V.Q., 2012. Determinants of educational expenditure in Vietnam. *International Journal of Applied Economics*, *9*(1), pp.59-72.

Iravani, M.R., 2011. Brain drain problem: A review. *International Journal of Business and Social Science*, *2*(15).

Iacovou, M., 2002. Class size in the early years: Is smaller really better?.*Education Economics*, *10*(3), pp.261-290.

Ichino, A. and Winter-Ebmer, R., 1999. Lower and upper bounds of returns to schooling: An exercise in IV estimation with different instruments. *European Economic Review*, *43*(4), pp.889-901.

ILO, Iran.2005. An employment strategy for the Islamic Republic of Iran[Online]. Available at:http://www.ilo.org/newdelhi/whatwedo/publications/WCMS_124326/lang--en/index.htm [Accessed January 2014]

Iranian Census. 2016[Online]. Available at:http://irandataportal.syr.edu/census
[Accessed July 2017]

Iran Economist. 2014[Online]. 58000 Surplus Personnel in the Educational system. Available at: http://www.iraneconomist.com/fa/news/49902/آموزشي-سيستم-در-مازاد-نيروي-هزار-۵۸
[Accessed May 2016]

Iranian Education Ministry report.Education for All 2014 National Review [Online]. Available at: http://unesdoc.unesco.org/images/0022/002297/229715E.pdf
[Accesses December 2016]

Iranian Ministry of Science, Research and Technology [Online]. (In Persian).Available at: http://www.msrt.ir/en
[Accessed May 2016]

Jacobs, J.A. and Gerson, K., 2004. *The time divide: Work, family, and gender inequality*. Harvard University Press.

James, J. and Vujić, S., 2016. From high school to the high chair: Education and fertility timing.

Javadi, M., 2012 (Online). Available at: http://www.isna.ir/news/8608
[Accessed May 2016]

Jefferson, T. and Preston, A., 2010. Labour markets and wages in Australia in 2009. *Journal of Industrial Relations*, *52*(3), pp.335-354.

Jensen, L., & Slack, T. 2003. Underemployment in America: Measurement and evidence. American Journal of Community Psychology, 32: 21-31.

Joshi, H. and G. Verropoulou.2000., Maternal employment and child outcomes. Smith Institute Report.

Johnson, G.J., 1986. The effects of underemployment and being underpaid on psychological functioning among working men (Doctoral dissertation, University of Michigan, 1986). *Dissertation Abstracts International*, *47*(6-A), p.2339.

Jacobe, D., 2010. No improvement in Gallup's underemployment rate in May. *Gallup Poll Briefing, June, 25*.

Jayachandran, U., 2002. *Socio-economic determinants of school attendance in India* (No. 103).

Jensen, L., & Slack, T. 2003. Underemployment in America: Measurement and evidence. American Journal of Community Psychology, 32: 21-31.

Jensen, R., 2010. The (perceived) returns to education and the demand for schooling. *The Quarterly Journal of Economics*, *125*(2), pp.515-548.

Johnes, G., 1998. Human capital versus sorting: new data and a new test. *Applied Economics Letters*, *5*(10), pp.665-667.

Johnson, G.J., & Johnson, W.R. 2000a. Perceived overqualification and dimensions and job satisfaction: A longitudinal analysis. Journal of Psychology, 134: 537-555.

Johnson, G.J., & Johnson, W.R. 2000b. Perceived overqualification, positive and negative affectivity, and satisfaction with work. Journal of Social Behavior and Personality, 15: 167-184.

Kahn, S.B. and Lang, K., 1995. The causes of hours constraints: Evidence from Canada. *Canadian Journal of Economics*, pp.914-928.

Kane, T.J., 1994. College entry by blacks since 1970: The role of college costs, family background, and the returns to education. *Journal of political Economy*, *102*(5), pp.878-911.

Kalleberg, A. L.2007.The Mismatched Worker. New York: WW Norton & Company.

Kanellopoulos, C. and Psacharopoulos, G., 1997. Private education expenditure in a 'free education'country: the case of Greece. *International Journal of Educational Development*, *17*(1), pp.73-81.

Kambhampati, U.S., 2008. Does household expenditure on education in India depend upon the returns to education?.*Henley Business School University Whiteknights Reading RG6 6AA United Kingdom*.

Kamyab, S., 2008. An overview of the education system of Islamic Republic of Iran.

Kamyab, S., 2015. The university entrance exam crisis in Iran. *International Higher Education*, (51).

Kashi, F., Heidari, K., 2010. [Investigation of educational status in Iranian household's budget]. barrasi jaigahe amoozesh dar sabade masrafie khanevar Irani (In Persian)

Kaufman, G. and Uhlenberg, P., 2000. The influence of parenthood on the work effort of married men and women. *Social forces*, *78*(3), pp.931-947.

Keane, M.P. and Wolpin, K.I., 1997. The career decisions of young men. *Journal of political Economy*, *105*(3), pp.473-522.

Kelley, A.C., 1996. The consequences of rapid population growth on human resource development: The case of education. In *The impact of population growth on well-being in developing countries* (pp. 67-137). Springer Berlin Heidelberg.

Khan, L.J. and Morrow, P.C., 1991. Objective and subjective underemployment relationships to job satisfaction. *Journal of business research*, *22*(3), pp.211-218.

Khoury, D.R., 2013. *Iraq in Wartime: Soldiering, Martyrdom, and Remembrance*. Cambridge University Press.

Kjeldstad, R., & Nymoen, H. (2012). Underemployment in a gender-segregated labour market. *Economic and Industrial Democracy*, *33*(2), 207-24.

King, E.M., Bellew, R.T. and Mundial, B., 1989. The effects of Peru's push to improve education.

Kingdon, G.G., 1998. Does the labour market explain lower female schooling in India?.*The Journal of Development Studies*, *35*(1), pp.39-65.

Kinicki, A.J., Prussia, G.E., & McKee-Ryan, F. 2000. A panel study of coping with involuntary job loss. Academy of Management Journal, 43: 90-100.

Kleinfeld, J.S., McDiarmid, G.W. and Hagstrom, D., 1985. Alaska's small rural high schools: Are they working? ISER Report Series No. 57, Alaska: University of Alaska.

Knight, J. and Shi, L., 1996. Educational Attainment and the Rural- Urban Divide in China. *Oxford Bulletin of Economics and Statistics*, *58*(1), pp.83-117.

Kornrich, S. and Furstenberg, F., 2012. Investing in children: Changes in parental spending on children, 1972–2007. *Demography*, *50*(1), pp.1-23.

Kohli, M., Kunemund, H., 2003. Intergenerational transfers in the family: What motivates giving?. In: Bengtson, V., Lowenstein, A. (Eds.), Global Aging and Challenges to Families. Aldine de Gruyter, New York, pp. 123–142.

Koolaee, E., 2014. The Impact of Iraq-Iran War on Social Roles of Iranian Women. *Middle East Critique*, *23*(3), pp.277-291.

Kraimer, M.L., Shaffer, M.A., & Bolino, M.C. 2009. The influence of expatriate and repatriate experiences on career advancement and repatriate retention. *Human Resource Management*, 48: 27-47.

Kremer, M., 1997. How much does sorting increase inequality?.*The Quarterly Journal of Economics*, *112*(1), pp.115-139.

Krueger, A.B., 2003. Economic considerations and class size. *The Economic Journal*, *113*(485).

Kurd, M., 2014. (Online). [*Eight and half percent of students studying in private schools]*. Borna News Agency. (In Persian). Available At:http://www.bornanews.ir/Pages/News-197759.aspx [Accessed 20 June 2015]

Kutty, N.K., 2008. A Household Production Function Model of the Production of Child Health and Education-The Role of Housing-Related Inputs.

Lamb, M.E. ed., 2004. *The role of the father in child development.* John Wiley & Sons.

Lakshmanasamy, T., 2006. Demand for Higher Education and Willingness to Pay: An Econometric Analysis using Contingent Valuation Method. *Manpower Journal*, Vol. 4, pages: 97-120

Lareau, A., 2003. *Unequal childhoods: Class, race, and family life*. University of California Press.

Leana, C.R., & Feldman, D.C. 1995. Finding new jobs after a plant closing: Antecedents and outcomes of the occurrence and quality of reemployment. Human Relations, 48: 1381-1401.

Lee, C.H. 2005. A study of underemployment among self-initiated expatriates . Journal of World Business, 40: 172-187.

Levhari, D. and Weiss, Y., 1974. The effect of risk on the investment in human capital. *The American Economic Review*, *64*(6), pp.950-963.

Lino, M.,1995. *E*xpenditures on children by families, 1994 Annual Report.

Lloyd, C.B. and Gage-Brandon, A.J., 1994. High fertility and children's schooling in Ghana: Sex differences in parental contributions and educational outcomes. *Population Studies*, *48*(2), pp.293-306.

Lloyd, C.B., 1994. Investing in the next generation: the implications of high fertility at the level of the family.

Lloyd, C.B. and Blanc, A.K., 1996. Children's schooling in sub-Saharan Africa: The role of fathers, mothers, and others. *Population and development review*, pp.265-298.

Lloyd CB, Mensch BS, Clark WH. 2000. The effects of primary school quality on school dropout among Kenyan girls and boys. *Comparative. Education. Review.* 44:113–47

Lockheed ME, Longford NT. 1991. School effects on mathematics achievement gain in Thailand. In *Schools, Classrooms andPupils: International Studies of Schooling From a Multi-level Perspective*, ed. SW Raudenbush,JDWillms, pp. 131–48. San Diego: Academic

Lundberg, S. and Rose, E., 2002. The effects of sons and daughters on men's labor supply and wages. *The Review of Economics and Statistics*, *84*(2), pp.251-268.

LFS. 2000, 2007/8 & 2012. *Iranian Data Archive Labour Force Survey*, Autumn Quarters. Retrieved from http://www.esds.ac.uk/findingData/snDescription.asp?sn=6413

Maccoby EE, Jacklin CN. 1974.The Psychology of Sex Differences. Palo Alto, CA: Stanford Univ.Press

Machin, S., Marie, O. and Vujić, S., 2011. The crime reducing effect of education. *The Economic Journal*, *121*(552), pp.463-484.

Mahmoudian, H.2016.Internal Migration and Urbanization in Iran: Status, Challenges and Policy Guidelines. [Accessed 20 My 2014]

Mauldin, T., Mimura, Y. and Lino, M., 2001. Parental expenditures on children's education. *Journal of Family and Economic Issues*, *22*(3), pp.221-241.

Maynard, D.C., Joseph, T.A., & Maynard, A.M. 2006. Underemployment, job attitudes, and turnover intentions . Journal of Organizational Behavior, 27: 509-536.

Maynard, D.C., & Joseph, T.A. 2008. Are all part-time faculty underemployed? The influence of faculty status preference on satisfaction and commitment. Higher Education, 55: 139-154.

Maluccio, J., 1998. Endogeneity of schooling in the wage function: Evidence from the rural Philippines. *Food Consumption and Nutrition Division Discussion Paper*, *54*.

Manski, C.F., Sandefur, G.D., McLanahan, S. and Powers, D., 1999. Alternative estimates of the effect of family structure during adolescence on high school graduation. *Journal of the American Statistical Association*, *87*(417), pp.25-37.

Marks GN. 2007. Accounting for the gender gap in reading and mathematics: evidence from 31 countries.Oxford Rev. Educ.34(1):1–21

Mau, W.C., & Kopischke, A. 2001. Job search methods, job search outcomes, and job satisfaction of college graduates: A comparison of race and sex. Journal of Employment Counseling, 38: 141-149.

McCulloch, A. and Joshi, H.E., 2000. Neighbourhood and family influences on the cognitive ability of children in the British National Child Development Study. *Social science & medicine*, *53*(5), pp.579-591.

McKee-Ryan, F., Virick, M., Prussia, G.E., Harvey, J., & Lilly, J.D. 2009. Life after the layoff: Getting a job worth keeping. Journal of Organizational Behavior, 30: 561-580

McKee-Ryan, F.M. and Harvey, J., 2011. “I have a job, but...”: A review of underemployment. *Journal of Management*, *37*(4), pp.962-996.

McLanahan, S. and G. Sandefur. 1994.Growing Up with a Single Parent: What Hurts, What Helps. Cambridge: Harvard University Press.

McLaughlin, D.K., Gardner, E.L. and Lichter, D.T., 1999. Economic Restructuring and Changing Prevalence of Female- headed Families in America. *Rural Sociology, 64*(3), pp.394-416.

McMahon, W.W., 1984. *Why families invest in education*. College of Commerce and Business Administration, Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign.

Mehrdad D., 2015. [The Spread of Violence Against Women in Iran] [Online] Gostaresh - e Kooshoonat Aleye Zanan dar Iran . Gooya News , 26 November 2015. (In Persian) Available at:http://news.gooya.com/politics/archives/2 014/11/189365.php/
[Accessed 28 February 2015]

Mehryar, A.H. and Ahmad-Nia, S., 2004. Age-structural transition in Iran: short and long-term consequences of drastic fertility swings during the final decades of twentieth century. *Age-Structural Transitions: Population Waves, Disordered Cohort Flows and the Demographic Bonus"*

Mincer, J., 1974. Schooling, Experience, and Earnings. Human Behavior & Social Institutions No. 2.

Ministry of Education. 1988. *Tarh-e Kolliyat-e Nezam-e AmuzeshvaParvaresh-e Jomhuri-ye Islami Iran* [The General Plan of the System of Education in the Islamic Republic of Iran]. Tehran: Council of Fundamental Transformation in the System of Education.

Ministry of Education. 1995. *Gozaresh-e Natayej-e Tahqiq* [Report on the Research Findings]. Tehran: Ministry of Education (Joint Girls' Education Project of the Ministry of Education and UNICEF-Tehran).

Ministry of Education. 2001. *Amar-e AmuzeshvaParvaresh, Sal-e Tahsili 1380-1381*[Education Statistics, 2001-2002 Academic Year]. Tehran: Bureau of Information Technology.

Ministry of Education. 2002. *Amuzesh-e Herfehva Fan* [Technical-Vocational Training]. Guidance Cycle, Third Year. Tehran: Educational Research and Planning Organization.

Ministry of Education. 2014.National EFA report of Islamic Republic of Iran 2000-2014 Available at: http://unesdoc.unesco.org/images/0022/002297/229715E.pdf [Accessed May 2017]

Ministry of Education.Bureau of International and Scientific Cooperation.*Education For All 2000 Assessment: country report of the Islamic Republic of Iran*. (Under the co-ordination of G. Karimi).Tehran, 1999.

Ministry of Education.Bureau of International and Scientific Cooperation.*National report on the development of education in the Islamic Republic of Iran*. International Conference on Education, 46th session, Geneva, 2001.

Ministry of Education,.2003 *Education in the Islamic Republic of Iran.*Tehran.

Ministry of Education.Bureau of International and Scientific Cooperation. 2004. *National report on the development of education in the Islamic Republic of Iran*. International Conference on Education, 47th session, Geneva.

Moghadam, V.M., 1995. Gender Aspects of Employment and Unemployment in a Global Perspective. *Global Employment: An Investigation into the Future of Work. Publié sous la direction de*.

Mohamadzadeh, M., G. Pezeshkirad and M. Chizari, "Employment Status and Professional Success of University Graduates with Degrees in Agricultural Sciences" (In Persian), PajuheshvaBarnamehrizidarAmuzeshAali, 2006, Vol. 12 (1), pages 79-98.

Mohseni, M. and Jouzaryan, F., 2016. Examining the Effects of Inflation and Unemployment on Economic Growth in Iran (1996-2012). *Procedia Economics and Finance*, *36*, pp.381-389.

Montenegro, C.E. and Patrinos, H.A., 2013. Returns to Schooling around the World. *Background Paper for the World Development Report*.

Muller C. 1998. Gender differences in parental involvement and adolescents' mathematics achievement.Sociol. Education.71(3):336–56

Murnane, R.J., Willett, J.B., Duhaldeborde, Y. and Tyler, J.H., 2000. How important are the cognitive skills of teenagers in predicting subsequent earnings?.*Journal of Policy Analysis and Management*, pp.547-568.

Namoro, S. and Roushdy, R., 2008. Intrahousehold resource allocation in Egypt: women empowerment and investment in children. *Middle East Development Journal*, *1*(01), pp.105-121.

Nemati, S.M., 2011. [Crisis in higher Education]. amoozeshe awli dar bohran.(In Persian). Available At:
http://www.sokhaneashena.ir/fa/pages/?cid=910

Nguyen, A.N. and Taylor, J., 2003. Post-high school choices: New evidence from a multinomial logit model. *Journal of Population Economics*, *16*(2), pp.287-306.

Ngwilizi, D. N., 2013. Socio-Economic Determinant of Household's education expenditure onTanzania. Institute of Rural development planning, lake zone centre-Mwanza.

Noorbakhsh, F., 2003. The dynamics of spatial inequality and polarisation in Iran.

Nordic Council of Ministers. 2012. Nordic Economic Policy Review: Economics of Education

Nowell A, Hedges LV. 1998. Trends in gender differences in academic achievement from 1960 to1994: an analysis of differences in mean, variance, and extreme scores.Sex Roles39 (1–2):21–43

nuffic.2010 .The Iranian education system described and compared with the Dutch system. Available at:https://www.nuffic.nl/en/home/copyright [Accessed July 2014]
[Accessed, June, 2015]

O'Brien, G.E. and Feather, N.T., 1990. The relative effects of unemployment and quality of employment on the affect, work values and personal control of adolescents. *Journal of Occupational and Organizational Psychology, 63*(2), pp.151-165.

OECD.2013. what makes urban schools different? [Online]Available at:
https://www.oecd.org/pisa/pisaproducts/pisainfocus/pisa%20in%20focus%20n28%20(eng)--FINAL.pdf
[Accessed, June, 2015]

OECD.2015. Indicators of Immigrant Integration. [Online]Available at:
http://www.oecd.org/els/mig/Indicators-of-Immigrant-Integration-2015.pdf
[Accessed, June, 2016]

Ogundari, K. and Abdulai, A., 2014. Determinants of household's education and healthcare spending in Nigeria: Evidence from survey data. *African Development Review, 26*(1), pp.1-14.

ONS, Office for National Statistics. 2011. *Labour Force Survey User Guide* [Online]. Available at:http://www.esds.ac.uk/findingData/snDescription.asp?sn=6404 [Accessed, June, 2015]
[Accessed, May, 2015]

ONS, Office for National Statistics. 2013. *Full report - Women in the labour market*[Online]. Available at:
http://webarchive.nationalarchives.gov.uk/20160108012507/http://www.ons.gov.uk/ons/dcp171776_328352.pdf
[Accessed, May, 2016]

Overman, H.G., 2000. Neighbourhood effects in large and small neighbourhoods. *Urban Studies, 39*(1), pp.117-130.

Papke, L.E. and Wooldridge, J., 1993. Econometric methods for fractional response variables with an application to 401 (k) plan participation rates.

Paivandi, S., 2012. Education in the Islamic Republic of Iran and Perspectives on democratic Reforms. *Dubai: Legatum Institute*.

Patrinos HA, Psacharopoulos G. 1996. Socioeconomic and ethnic determinants of age grade distortion in Bolivian and Guatemalan primary schools. *Int. J. Educ. Dev.* 16:3–14

Pekkarinen, T., 2012. Gender differences in education. *Nordic Economic Policy Review, 1*, pp.165-195.

Penrose, P., 1998. Cost Sharing in Education-Public Finance, School and Household Perspectives-Education Research Paper No. 27, 1998, 141 p.

Perna LW. 2003. The private benefits of higher education: an examination of the earnings premium.Res. Higher Education.44 (4):451–72

Polachek, S.W. and Siebert, W.S., 1993. *The economics of earnings*. Cambridge University Press.

Prause, J. and Dooley, D., 1997. Effect of underemployment on school-leavers' self-esteem. *Journal of adolescence*, *20*(3), pp.243-260.

Psacharopoulos, G., 1994. Returns to investment in education: A global update. *World development*, *22*(9), pp.1325-1343.
Psacharopoulos, G. and Patrinos*, H.A., 2004. Returns to investment in education: a further update. *Education economics*, *12*(2), pp.111-134.

Qian, J.X. and Smyth, R., 2011. Educational expenditure in urban China: income effects, family characteristics and the demand for domestic and overseas education. *Applied Economics*, *43*(24), pp.3379-3394.

Rammohan, A. and Dancer, D., 2008. Gender differences in intrahousehold schooling outcomes: the role of sibling characteristics and birth- order effects. *Education Economics*, *16*(2), pp.111-126.

Ramos, R., Duque, J.C. and Nieto, S., 2012. Decomposing the rural-urban differential in student achievement in Colombia using PISA microdata.a.

Reforms, E.P., 2010. A Family Affair: Intergenerational Social Mobility across OECD Countries.

Regan, T.L., Oaxaca, R.L. and Burghardt, G., 2007. A human capital model of the effects of ability and family background on optimal schooling levels. *Economic Inquiry*, *45*(4), pp.721-738.

Research Center of the Islamic Republic of Iran Parliament. A research on Education Coverage and Ending Illiteracy [Online]. Available at: <http://rc.majlis.ir/fa/report/show/800839>
[Accessed, May, 2015]

Research Center of Iranian Parliament, 2012[Online]. Available at:https://www.amar.org.ir/Portals/0/Files/abstract/1394/ch_ntank_94-2.pdf
[Accessed, May, 2016]

Reynolds, J., 2004, March. When too much is not enough: Actual and preferred work hours in the United States and abroad. In *Sociological Forum* (Vol. 19, No. 1, pp. 89-120). Kluwer Academic Publishers-Plenum Publishers.

Reynolds, J., 2005. In the face of conflict: Work- life conflict and desired work hour adjustments. *Journal of Marriage and Family*, *67*(5), pp.1313-1331.

Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., Lopez-Garcia, P. and Chin, N., 2005. Global entrepreneurship monitor: Data collection design and implementation 1998–2003. *Small business economics*, *24*(3), pp.205-231.

Reynolds, J. and Aletraris, L., 2007. Pursuing preferences: The creation and resolution of work hour mismatches. *American Sociological Review*, *71*(4), pp.618-638.

Reynolds, J. and Aletraris, L., 2010. Mostly mismatched with a chance of settling: Tracking work hour mismatches in the United States. *Work and Occupations*, *37*(4), pp.476-511.

Ribar, D.C., 1993. A multinomial logit analysis of teenage fertility and high school completion. *Economics of Education Review*, *12*(2), pp.153-164.

Riddell AR. 1989. An alternative approach tothe study of school effectiveness in third world countries. *Comp. Educ. Rev.* 33:481–97

Rouse, C.E., 1994. What to do after high school: The two-year versus four-year college enrollment decision. *Choices and consequences: Contemporary policy issues in education*, pp.59-88.

Rouse, C.E., 1999. Further estimates of the economic return to schooling from a new sample of twins. *Economics of Education Review*, *18*(2), pp.149-157

Robertson, D. and Symons, J., 2003. Do peer groups matter? Peer group versus schooling effects on academic attainment. *Economica*, *70*(277), pp.31-53.

Rodríguez-Pose, A. and Sánchez-Reaza, J., 2005. Economic polarization through trade: Trade liberalization and regional growth in Mexico. *Spatial inequality and development*, pp.237-259.

Rubin, M. and Richardson, R., 1997. *The microeconomics of the shorter working week*. Ashgate Publishing.

Ruiz-Quintanilla, S.A. and Claes, R., 1996. Determinants of underemployment of young adults: A multi-country study. *ILR Review*, *49*(3), pp.424-438.

Rumberger, R.W. and Thomas, S.L., 1993. The economic returns to college major, quality and performance: A multilevel analysis of recent graduates. *Economics of Education Review*, *12*(1), pp.1-19.

Sadat, F., 2016.[Work an hour a week to be considered a worker / tsunami that the authorities will take]. Aya agar dar toole hafte yek saat kar konid shaghel mahsoob mishavid[Online]? (In Persian) Available at:http://www.yjc.ir/fa/news/6040182/
[Accessed, May, 2015]

Sadker M, Sadker D. 1994.Failing at Fairness: How America's Schools Cheat Girls. New York: Maxwell Macmillan

Sadr, 2017. Review of Regulations regarding Employee-Employer Relations in Iran

Safi, 2000. [The organization and the laws of the Iranian education system]. sazman va ghavanin amouzesh va parvaresh iran (In Persian).

Saha LJ. 1983. Social structure and teacher effects on academic achievement: a comparative analysis. *Comp. Educ. Rev.* 27:69–88

El-Hamidi, F. and Said, M., 2005. Wage inequality by education and gender in MENA: Contrasting the Egyptian and Moroccan experiences in the 1990s.

Said, M. 2007. The Fall and Rise of Earnings and Inequality in Egypt: New Evidence From the ELMPS,ERF Working Paper, No. WP0708.

Saidi-Rezvani, M. Mohammadhoseinzadeh M, Baghgoli H., [Employment status of graduates with degrees from college of education and psychology sciences at Ferdowsi University] *Motaleaat Tarbiati va Ravanshenasi*, 2007, Vol. 11 (2), pages 57-86 (In Persian).

Salehi-Isfahani, D., 2005. Human resources in Iran: potentials and challenges. *Iranian Studies*, *38*(1), pp.117-147.

Salehi-Isfahani, D. and Egel, D., 2007. Youth exclusion in Iran: The state of education, employment and family formation.

Salehi-Isfahani, D., 2008. Are Iranian Women Overeducated?.*Brookings Institution Newsletter*.

Salehi-Isfahani, D., Tunali, I. and Assaad, R., 2009. A comparative study of returns to education of urban men in Egypt, Iran, and Turkey. *Middle East Development Journal*, *1*(2), pp.145-187.

Salehi-Isfahani, D., 2011. Iranian youth in times of economic crisis. *Iranian Studies*, *44*(6), pp.789-806.

Salehi-Isfahani, D., 2012. Education, jobs, and equity in the Middle East and North Africa. *Comparative Economic Studies*, *54*(4), pp.843-861.

Salehi-Isfahani, D. 2014. Micro data for analysis of Iran's economy .Available at:https://djavadsalehi.com/2014/07/03/micro-data-for-analysis-of-irans-economy/#more-2417 [Accessed, January, 2015]

Salehi, E., 2006. Employment Status of Female Graduates: A Case Study. *Quarterly Journal of Research and Planning in Higher Education*, *12*(1), pp.41-60.

Sánchez, M.V. and Sbrana, G., 2009. Determinants of education attainment and development goals in Yemen. *Prepared for the Project Assessing Development Strategies to achieve the Millennium Development Goals in the Arab Region, UNDP-RBAS, UN-DESA and World Bank* .

Sander, W. and Krautmann, A.C., 1995. Catholic schools, dropout rates and educational attainment. *Economic inquiry*, *33*(2), pp.217-233.

Sathar Z, Lloyd C. 1993. Who gets primary schooling in Pakistan: inequalities among and within families. *Popul. Council Work. Pap.* 52:1–40

Sen, P., 1999. Enhancing women's choices in responding to domestic violence in Calcutta: a comparison of employment and education. *The European Journal of Development Research*, *11*(2), pp.65-86.

Najeeb Shafiq, M., 2007. Household rates of return to education in rural Bangladesh: Accounting for direct costs, child labour, and option value. *Education Economics*, *15*(3), pp.343-358.

Schor, J.B., 1991. The Overworked American: the Unexpected Decline of Leisure BasicBooks. *New York*.

Shipler, D.K., 2004. The Working Poor: Invisible in America (Alfred A. Knopf: New York).

Simic, M., 2002. Underemployment and Over Employment in the UK. *Labour Market trends*, pp.399-414.

Slack, T. and Jensen, L., 2002. Race, Ethnicity, and Underemployment in Nonmetropolitan America: A 30- Year Profile. *Rural Sociology*, *67*(2), pp.208-233.

Smits, J.P.J.M., 2007. Family background and context effects on educational participation in five Arab countries.

Smith, A,. (1776). The Wealth of Nations. 1937 edition. New York: Random House. Strumilin 1929

Sokal L, Katz H, Chaszewski L, Wojick C. 2007. Good-bye, Mr. Chips: male teacher shortages and boys' reading achievement.Sex Roles56(9–10):651–59

Solow, R.M., 1956. A contribution to the theory of economic growth. *The quarterly journal of economics*, *70*(1), pp.65-94.

Sommers CH. 2000.The War against Boys: How Misguided Feminism Is Harming our Young Men.New York: Touchstone

Sousa-Poza, A. and Henneberger, F., 2002. An empirical analysis of working-hours constraints in twenty-one countries. *Review of social economy*, *60*(2), pp.209-242.

Spence, M., 1973. Job market signaling. *The quarterly journal of Economics*, *87*(3), pp.355-374.
Spencer, S.J., Steele, C.M. and Quinn, D.M., 1999. Stereotype threat and women's math performance. *Journal of experimental social psychology*, *35*(1), pp.4-28.

Staiger, Douglas, and James H. Stock. “Instrumental Variables Regression with Weak Instruments.” *Econometrica*, vol. 65, no. 3, 1997, pp. 557–586. Available at: *JSTOR*, JSTOR, www.jstor.org/stable/2171753.
[Accessed January 2018]

Statistical Centre of Iran. 2014. Summary Results of the Iranian Urban and Rural Household Income and Expenditure Survey-The Year 1392[Online].Available at: https://www.amar.org.ir/Portals/1/releases/s_heis_ur_1392.pdf
[Accessed December 2015]

Statistical Centre of Iran. 2017. Statistical Yearbook 2017 (In persian5).

Statistical Center of Iran. 2007. School to Work Transition Survey for Islamic Republic of Iran technical report, Statistical Center of Iran: Technical designs and Statistical Methods Research Group, Statistical Research Center.

Stash S, Hannum E. 2001. Who goes to school? Educational stratification by gender, caste and ethnicity in Nepal. *Comparative. Education. Review.*

Steele CM. 1997. A threat in the air: how stereotypes shape intellectual identity and performance.Am. Psychology.52 (6):613–29

Steelman, L.C. and Powell, B., 1991. Sponsoring the next generation: Parental willingness to pay for higher education. *American Journal of Sociology*, *96*(6), pp.1505-1529.

Stevenson DL, Baker DP. 1987. The family-school relation and the child’s school performance. *Child Development*.58 (5):1348–57

Stewart, M.B. and Swaffield, J.K., 1997. Constraints on the desired hours of work of British men. *The Economic Journal*, *107*(441), pp.520-535.

Stier, H. and Lewin-Epstein, N., 2003. Time to work: A comparative analysis of preferences for working hours. *Work and Occupations*, *30*(3), pp.302-326.

Stock, J. H., J. H. Wright, and M. Yogo. 2002. A survey of weak instruments and weak identification in generalizedmethod of moments. Journal of Business and Economic Statistics 20: 518–529.

Stock, J. H., and M. Yogo. 2005. Testing for weak instruments in linear IV regression. In Identification and Inferencefor Econometric Models: Essays in Honor of Thomas Rothenberg, ed. D. W. K. Andrews and J. H. Stock, 80–108.New York: Cambridge University Press.

Sullivan, T.A., 1978. *Marginal workers, marginal jobs: The underutilization of American workers*. University of Texas Press.

Sulaiman, N., Ismail, R., Othman, N. and Tin, P.B., 2012. The determinants of demand for education among households in Malaysia. *International Business Management*, *6*(5), pp.558-567.

Sulaiman, N., Ismail, R., Othman, N. and Tin, P.B., 2012. The determinants of demand for education among households in Malaysia. *International Business Management*, *6*(5), pp.558-567.

Suryadarma, D., Suryahadi, A. and Sumarto, S., 2010. *Causes of low secondary school enrollment in Indonesia*. Jakarta: SMERU Research Institute.

Tabar, F.J., Najafi, Z. and Badooei, Y.S., 2017. The impact of educational expenditures of government on economic growth of iran/el impacto del gasto público en educación en el crecimiento económico de irán. *AD-minister*, (30), p.217.

Taleb, M. and Anbari, M., 2005. Rural Sociology: Aspect of development and changes of Iranian rural. *Tehran University, Tehran*.

Tam H., 2010. Characteristics of the underemployed and the overemployed in the UK', *Economic & Labour Market Review*, July 2010, vol 4, no 7, pp 36–44

Tansel, A., 1994. Wage employment, earnings and returns to schooling for men and womenin Turkey. *Economics of Education Review*, 13(4): 305–320.

Tansel, A., 1998, April. Self employment wage employment choice and returns to education for urban men and women in Turkey. *Economic Research Forum Working Papers* (No. 9804).

Tansel, A., 2001. Self-employment, Wage-employment, and Returns to Schooling by Gender in Turkey. *Labor and Human Capital in the Middle East: Studies of markets and household behavior*, pp.337-367.

Tansel, A., 2002a. Determinants of school attainment of boys and girls in Turkey. E*conomics of Education Review*, 21(5): 455–470.

Tansel, A., 2002b. General versus vocational high schools and labor market outcomes in Turkey.

Tansel, A., 2005. Public-private employment choice, wage differentials and gender inTurkey.*Economic Development and Cultural Change*, 53(2): 453–477.

Tansel, A., 2008. Changing returns to education for men and women in a developing country: Turkey, 1994-2005. In *ESPE 2008 conference*.

Tansel, A. and Bodur, F.B., 2011. Wage inequality and returns to education in Turkey: A quantile regression analysis. *Review of Development Economics*, *16*(1), pp.107-121.

Tansel, A., 2016. Returns to education in turkey: IV estimates from a developing country

Tasnim Newspaper, .2013[Online]. Available at:http://ayaronline.ir/1393/07/87987.html

[Accessed May 2015]

Tilak, J.B., 2002. *Determinants of household expenditure on education in rural India* (No. 88). New Delhi: National Council of Applied Economic Research.

TIMSS, National Study Center for TIMSS & PIRLS, 2015. [Online]. Available at:http://timssandpirls.bc.edu/timss2015/encyclopedia/countries/iran-islamic-rep-of/
[Accessed May 2015]

Tokila, A. and Tervo, H., 2011. Regional differences in returns to education for entrepreneurs versus wage earners. *The Annals of Regional Science*, *47*(3), pp.689-710.

Trostel, P., Walker, I. and Woolley, P., 2002. Estimates of the economic return to schooling for 28 countries. *Labour economics*, *9*(1), pp.1-16.

Trostel, P. A., 2005. Nonlinearity in the return to education. *Journal of Applied Economics*, 8(1): 191–202.

Tyler, J.H., Murnane, R.J. and Willett, J.B., 2000. Estimating the labor market signaling value of the GED. *The Quarterly Journal of Economics*, *115*(2), pp.431-468.

UNESCO Institute for Statistics. 2017[Online]. Adult and Youth Literacy. Available at: http://www.uis.unesco.org/literacy/Documents/fs32-2015-literacy.pdf.
[Accessed June 2017].

UNESCO. 2002. *Education for All: Is the world on track?*Paris: UNESCO.

UNESCO.2016 [Online]. *Available at:* http://data.worldbank.org/indicator/NY.GNP.PCAP.CD
[Accessed May 2017]

UNICEF 2016. Equity, Educational Access and Learning Outcomes in the Middle East and North Africa.

Vaisey, S, .2006. Education and its discontents: Overqualification in America, 1972–2002. *Social Forces*, 85(2), 835–864.

Valadkhani, A., 2003. The causes of unemployment in Iran: An empirical investigation.

Van der Sluis, J., Van Praag, M. and Vijverberg, W., 2008. Education and entrepreneurship selection and performance: A review of the empirical literature. *Journal of economic surveys*, *22*(5), pp.795-841.

Van der Lippe, T., 2001. The effect of individual and institutional constraints on hours of paid work of women. *Women's employment in a comparative perspective. New York: Aldine de Gruyter. S*, pp.221-243.

Walker, I. and Zhu, Y., 2000. The returns to education: Evidence from the Labour Force Surveys.

Watt, J.D., & Hargis, M.B. 2010. Boredom proneness: Its relationship with subjective underemployment, perceived organizational support, and job performance. Journal of Business Psychology, 25: 163-174.

WENR, 2017, Education in Iran [Online]. Available at: http://wenr.wes.org/2017/02/education-in-iran
[Accessed June 2017]

Weststar, J. 2009. Worker control as a facilitator in the match between education and job skill. British Journal of Industrial Relations, 47: 723-470.

Wilkins, R., 2007. The consequences of underemployment for the underemployed. *Journal of Industrial Relations*, *49*(2), pp.247-275.

Willingham WW, Cole SE. 1997.Gender and Fair Assessment. Mahwah, NJ: LawrenceErlbaum

Wilson, William Julius. 1987. The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. Chicago: University of Chicago Press

Wilson, D. and Reuss, A. eds., 2001. *Prison (er) Education: stories of change and transformation*. Waterside Press.

Wooden, M., Warren, D., & Drago, R. 2009. Working Time Mismatch and Subjective Well-being. *British Journal of Industrial Relations, 47*(1), 147-79.

World Bank. 2004a.Gender and Development in the Middle East and North Africa:Women in the Public Sphere. Washington D.C.: World Bank.

World Bank. 2004b.Unlocking the Employment Potential in the Middle East and North Africa: Toward a New Social Contract. Washington D.C.: World Bank.

World Bank. 2007. The Road Not Traveled: Education Reform in the MENA Region.Washington, DC: World Bank.

World Bank, World Development Indicators 2017[Online]. Available at: http://data.worldbank.org/indicator/NY.GNP.PCAP.CD
[Accessed May, 2017]

World Economic Forum

Wulff, J.N., 2014. Interpreting results from the multinomial logit model: Demonstrated by foreign market entry. *Organizational Research Methods*, *18*(2), pp.300-325.

Wunder, C. and Heineck, G., 2013. Working time preferences, hours mismatch and well-being of couples: Are there spillovers?.*Labour Economics*, *24*, pp.244-252

Zare, H., Trujillo, A.J., Driessen, J., Ghasemi, M. and Gallego, G., 2014. Health inequalities and development plans in Iran; an analysis of the past three decades (1984–2010). *International journal for equity in health*, *13*(1), p.42

Appendix A:

Table A1:

	Heckman selection model urban areas						Zero inflate beta model (selection model)					
	Heckman 2nd stage			Heckamn 1st stage			Proportion			Zeroinflate		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effe	andard Err	P-values
Continuous												
Log family income last year (deflated)	0.341	0.009	0.000	0.014	0.002	0.000	-0.004	0.000	0.000	-0.012	0.002	0.000
Child gender	0.004	0.011	0.694	0.015	0.002	0.000	0.000	0.000	0.913	-0.013	0.002	0.000
Categorical												
Father age												
10 to 20 (reference category)	-	-	-	-	-	-	-	-	-			
20 to 30	0.154	0.051	0.002	0.062	0.008	0.000	-0.003	0.001	0.033	-0.047	0.007	0.000
30 to 40	0.295	0.053	0.000	0.048	0.009	0.000	-0.002	0.001	0.115	-0.037	0.008	0.000
40 to 50	0.317	0.055	0.000	0.033	0.010	0.001	-0.002	0.001	0.252	-0.022	0.009	0.011
50 to 60	0.361	0.060	0.000	0.019	0.012	0.106	-0.002	0.001	0.297	-0.010	0.010	0.298
Missing	1.368	1.266	0.280	0.128	0.009	0.000	0.042	0.050	0.402	-0.107	0.008	0.000
Mother age												
10 to 20 (reference category)	-	-	-	-	-	-	-	-	-			
20 to 30	0.183	0.023	0.000	0.048	0.005	0.000	0.001	0.001	0.303	-0.039	0.004	0.000
30 to 40	0.242	0.028	0.000	0.052	0.007	0.000	0.000	0.001	0.817	-0.043	0.006	0.000
40 to 50	0.252	0.036	0.000	0.058	0.008	0.000	-0.001	0.001	0.308	-0.049	0.007	0.000
50 to 60	0.136	0.067	0.043	0.028	0.013	0.028	-0.002	0.001	0.190	-0.028	0.010	0.006
Missing	-0.522	0.214	0.015	-0.043	0.039	0.261	-0.010	0.004	0.016	0.037	0.035	0.297
Father education levels												
Level 1 (reference category)												
Level 2	0.116	0.016	0.000	0.011	0.004	0.002	-0.001	0.000	0.178	-0.010	0.003	0.002
Level 3	0.284	0.018	0.000	0.014	0.004	0.001	-0.002	0.000	0.000	-0.013	0.003	0.000
Level 4	0.446	0.023	0.000	0.036	0.005	0.000	-0.005	0.000	0.000	-0.030	0.004	0.000
Level 5	1.207	0.109	0.000	0.064	0.013	0.000	0.004	0.003	0.128	-0.060	0.010	0.000
Level 6	0.006	0.082	0.000	0.028	0.013	0.032	-0.003	0.002	0.092	-0.024	0.010	0.019
Missing	-0.140	0.030	0.944	-0.038	0.008	0.000	-0.004	0.001	0.000	0.031	0.007	0.000
Mother education levels												
Level 1 (Primary School)	-	-	-	-	-	-	-	-	-			
Level 2	0.152	0.017	0.000	0.015	0.004	0.000	0.001	0.000	0.000	-0.011	0.003	0.000
Level 3	0.315	0.018	0.000	0.009	0.004	0.014	0.003	0.000	0.000	-0.005	0.003	0.110
Level 4	0.440	0.039	0.000	0.017	0.009	0.053	0.002	0.001	0.013	-0.012	0.007	0.113
Level 5	1.874	0.315	0.000	0.052	0.040	0.196	0.043	0.013	0.001	-0.037	0.033	0.264
Level 6	-0.646	0.124	0.000	-0.118	0.039	0.002	-0.010	0.002	0.000	0.107	0.037	0.004
Missing	-0.333	0.046	0.000	-0.032	0.013	0.013	-0.004	0.001	0.000	0.029	0.011	0.009
Fathers overeducation												
Normal (reference category)												
Undereducated	-0.008	0.018	0.673	0.004	0.004	0.353	-0.003	0.000	0.000	-0.003	0.003	0.451
Overeducated	0.054	0.022	0.014	-0.004	0.005	0.470	0.005	0.001	0.000	0.003	0.004	0.419

Table A1 continues

	Heckman selection model urban araes						Zero inflate beta model (selection model)					
	Heckman 2nd stage			Heckamn 1st stage			Proportion			Zeroinflate		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effe	andard Err	P-values
Mother overeducation												
Normal (reference category)												
Undereducated	-0.100	0.024	0.000	0.005	0.006	0.403	0.001	0.001	0.113	-0.003	0.005	0.488
Overeducated	0.107	0.042	0.000	-0.027	0.011	0.015	0.003	0.001	0.009	0.023	0.010	0.018
Father working status												
Working (reference category)												
Looking for job	-0.085	0.040	0.033	-0.006	0.009	0.472	0.000	0.001	0.758	0.006	0.007	0.445
Inactive	0.073	0.018	0.000	0.014	0.003	0.000	0.002	0.000	0.000	-0.012	0.003	0.000
Housekeeper	-0.269	1.265	0.832	0.083	0.002	0.000	-0.012	0.019	0.509	-0.074	0.002	0.000
Other	0.005	0.076	0.948	-0.021	0.016	0.182	0.002	0.002	0.307	0.019	0.013	0.147
Mother working status												
Working (reference category)												
Looking for job	-0.028	0.090	0.757	0.021	0.012	0.091	-0.004	0.002	0.043	-0.016	0.010	0.112
Inactive	0.006	0.052	0.911	0.008	0.010	0.401	0.002	0.001	0.105	-0.010	0.008	0.228
Housekeeper	-0.015	0.025	0.539	-0.015	0.005	0.005	-0.002	0.001	0.007	0.012	0.004	0.005
Other	-0.372	0.221	0.092	-0.181	0.071	0.011	-0.011	0.004	0.010	0.161	0.070	0.022
Number of children in household aged less than 22												
1 (reference category)	-	-	-	-	-	-	-	-	-			
2	0.591	0.028	0.000	0.236	0.006	0.000	0.010	0.000	0.000	-0.23	0.01	0.000
3	0.930	0.033	0.000	0.285	0.006	0.000	0.015	0.000	0.000	-0.27	0.01	0.000
4	1.145	0.037	0.000	0.288	0.006	0.000	0.020	0.001	0.000	-0.27	0.01	0.000
5	1.296	0.042	0.000	0.275	0.007	0.000	0.022	0.001	0.000	-0.26	0.01	0.000
6 or more	1.401	0.055	0.000	0.281	0.008	0.000	0.026	0.001	0.000	-0.27	0.01	0.000
Child age												
0 to 5(refernce category)	-	-	-	-	-	-	-	-	-			
5 to 10	1.111	0.058	0.000	0.506	0.009	0.000	0.018	0.000	0.000	-0.496	0.011	0.000
10 to 15	1.685	0.062	0.000	0.543	0.010	0.000	0.026	0.000	0.000	-0.534	0.012	0.000
15 to 22	1.825	0.061	0.000	0.514	0.011	0.000	0.024	0.001	0.000	-0.505	0.013	0.000
Missing	2.094	0.065	0.000	0.510	0.012	0.000	0.023	0.001	0.000	-0.503	0.013	0.000
Regional controls (22 regions)	included	included	included	included	included	included	included	included	included	included	included	included
N			63027						63027			
Mills Ratio/ln_phi	1.128	0.070	0.000					3.047	0.007	0.000		
R^2			-						-			

Source: HIES 2009/10-2011/12. Standard errors clustered on household.

Table A2:

	Heckman selection model rural araes						Zero inflate beta model (selection model)					
	Heckman 2nd stage			Heckamn 1st stage			Proportion			Zeroinflate		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effe	andard Err	P-values	Marginal Effe	andard Err	P-values
Continuous												
Log family income last year (deflated)	0.173	0.006	0.000	169,711.000	0.002	0.000	-0.004	0.000	0.000	-0.015	0.002	0.000
Child gender	-0.024	0.008	0.004	0.000	0.003	0.889	0.000	0.000	0.226	0.000	0.002	0.912
Categorical												
Father age												
10 to 20 (reference category)	-	-	-	-	-	-	-	-	-			
20 to 30	0.204	0.034	0.000	0.107	0.009	0.000	-0.001	0.001	0.180	-0.092	0.008	0.000
30 to 40	0.287	0.035	0.000	0.076	0.011	0.000	-0.003	0.001	0.015	-0.065	0.010	0.000
40 to 50	0.342	0.037	0.000	0.074	0.012	0.000	-0.002	0.001	0.048	-0.063	0.011	0.000
50 to 60	0.271	0.041	0.000	0.058	0.013	0.000	-0.003	0.001	0.005	-0.050	0.012	0.000
Missing	0.032	0.807	0.969	0.082	0.123	0.502	-0.015	0.018	0.415	-0.069	0.107	0.518
Mother age												
10 to 20 (reference category)	-	-	-	-	-	-	-	-	-			
20 to 30	0.091	0.016	0.000	0.072	0.006	0.000	0.001	0.000	0.004	-0.065	0.006	0.000
30 to 40	0.058	0.020	0.005	0.074	0.008	0.000	-0.001	0.001	0.071	-0.066	0.007	0.000
40 to 50	0.001	0.027	0.985	0.058	0.009	0.000	-0.003	0.001	0.000	-0.052	0.009	0.000
50 to 60	-0.069	0.049	0.154	0.035	0.014	0.011	-0.004	0.001	0.001	-0.037	0.012	0.006
Missing	-0.183	0.142	0.196	-0.011	0.033	0.747	-0.009	0.003	0.005	0.010	0.031	0.746
Father education levels												
Level 1 (reference category)	-	-	-	-	-		-	-	-	-	-	-
Level 2	0.034	0.013	0.009	0.004	0.004	0.400	-0.003	0.000	0.000	-0.003	0.004	0.466
Level 3	0.187	0.024	0.000	0.025	0.007	0.001	-0.008	0.001	0.000	-0.020	0.006	0.002
Level 4	0.357	0.026	0.000	0.053	0.007	0.000	-0.010	0.001	0.000	-0.046	0.006	0.000
Level 5	-0.123	0.326	0.707	0.107	0.009	0.000	-0.015	0.006	0.013	-0.092	0.012	0.000
Level 6	0.018	0.054	0.734	0.032	0.013	0.015	-0.004	0.001	0.003	-0.027	0.011	0.016
Missing	-0.093	0.028	0.001	-0.037	0.011	0.000	-0.005	0.001	0.000	0.034	0.010	0.000
Mother education levels												
Level 1 (reference category)	-	-	-	-	-	-	-	-	-	-	-	-
Level 2	0.092	0.015	0.000	0.021	0.005	0.000	-0.001	0.000	0.156	-0.017	0.004	0.000
Level 3	0.053	0.048	0.271	0.029	0.012	0.018	-0.006	0.001	0.000	-0.022	0.010	0.034
Level 4	0.224	0.050	0.000	-0.045	0.018	0.014	-0.004	0.002	0.003	0.047	0.017	0.005
Level 5	1.204	0.497	0.015	0.105	0.007	0.000	-0.006	0.013	0.633	-0.095	0.006	0.000
Level 6	0.111	0.098	0.257	0.059	0.020	0.003	0.004	0.003	0.200	-0.049	0.017	0.005
Missing	-0.244	0.049	0.000	-0.037	0.016	0.021	-0.004	0.002	0.008	0.032	0.014	0.022
Fathers overeducation												
Normal (reference category)	-	-	-	-	-	-	-	-	-	-	-	-
Undereducated	-0.009	0.015	0.560	-0.010	0.005	0.065	-0.001	0.000	0.080	0.007	0.005	0.117
Overeducated	-0.021	0.025	0.383	-0.021	0.009	0.020	0.007	0.001	0.000	0.018	0.008	0.020

Table A2 continues

	Heckman selection model rural areas						Zero inflate beta model (selection model)					
	Heckman 2nd stage			Heckamn 1st stage			Proportion			Zeroinflate		
Variable	Marginal Effects	Standard Error	P-values	Marginal Effects	Standard Error	P-values	Marginal Effe	andard Err	P-values	Marginal Effe	andard Err	P-values
Mother overeducation												
Normal (reference category)	-	-	-	-	-	-	-	-	-	-	-	-
Undereducated	-0.078	0.021	0.000	-0.004	0.007	0.605	0.000	0.001	0.424	0.005	0.006	0.411
Overeducated	0.127	0.048	0.008	-0.032	0.015	0.031	0.004	0.001	0.003	0.028	0.013	0.026
Father working status												
Working (reference category)	-	-	-	-	-	-	-	-	-			
Looking for job	0.009	0.028	0.758	0.027	0.008	0.000	0.002	0.001	0.015	-0.021	0.007	0.002
Inactive	0.088	0.018	0.000	0.018	0.005	0.000	0.001	0.000	0.039	-0.016	0.004	0.000
Housekeeper	-2.381	0.990	0.016	0.115	0.002	0.000	-0.017	0.015	0.255	-0.105	0.003	0.000
Other	-0.051	0.057	0.365	-0.034	0.019	0.075	-0.002	0.002	0.172	0.032	0.017	0.067
Mother working status												
Working (reference category)	-	-	-	-	-	-	-	-	-			
Looking for job	-0.041	0.083	0.623	0.061	0.018	0.001	0.002	0.002	0.314	-0.050	0.015	0.001
Inactive	0.090	0.053	0.093	0.065	0.012	0.000	0.000	0.001	0.995	-0.050	0.010	0.000
Housekeeper	0.030	0.015	0.048	0.007	0.005	0.182	0.001	0.000	0.046	-0.005	0.004	0.296
Other	-0.136	0.132	0.302	-0.010	0.037	0.792	-0.001	0.003	0.731	0.013	0.032	0.69
Number of children in household aged less than 22												
1 (reference category)	-	-	-	-	-	-	-	-	-			
2	0.460	0.028	0.000	0.28	0.01	0.000	0.010	0.000	0.000	-0.28	0.01	0.000
3	0.799	0.033	0.000	0.36	0.01	0.000	0.017	0.000	0.000	-0.35	0.01	0.000
4	1.042	0.036	0.000	0.38	0.01	0.000	0.023	0.001	0.000	-0.37	0.01	0.000
5	1.263	0.037	0.000	0.38	0.01	0.000	0.026	0.001	0.000	-0.36	0.01	0.000
6 or more	1.419	0.041	0.000	0.36	0.01	0.000	0.029	0.001	0.000	-0.34	0.01	0.000
Child age												
0 to 5(refernce category)	-	-	-	-	-	-	-	-	-			
5 to 10	0.860	0.042	0.000	0.471	0.009	0.000	0.019	0.000	0.000	-0.461	0.011	0.000
10 to 15	1.273	0.045	0.000	0.496	0.010	0.000	0.025	0.001	0.000	-0.489	0.012	0.000
15 to 22	1.331	0.040	0.000	0.417	0.011	0.000	0.019	0.001	0.000	-0.413	0.013	0.000
Missing	1.759	0.046	0.000	0.421	0.013	0.000	0.021	0.001	0.000	-0.421	0.014	0.000
Regional controls (22 regions)	included	included	included	included	included	included	included	included	included	included	included	included
N			63170						63170			
Mills Ratio/ln_phi	0.788	0.056	0.000				3.21	0.006	0.000			
R^2			-						-			

Source: HIES 2009/10-2011/12. Standard errors clustered on household.

Appendix B:

Table B1: Converting educational codes into years of schooling in the Iranian Household and Expenditure Survey.

210	primary school	more than5yrs
211	1st primary-not studying	6
212	2nd primary-studying	7
213	3rd primary-studying	8
214	finish primary	8
215	7th year, secondory school(6 year system)	10/old system
215	8th year, secondary school(6 year system)	9/old system
215	second grade of secondary school	8 old system
215	first grade of secondary school	7-old system
216	First cycle of secondary school	8
216	Third grade of secondary school	11-old system
216	9th year	9-old system
221	second grade, introductary technical and vo	9-old system
221	1st/Agricultural training	9-old system
221	2nd/Agricultural training	9-old system
222	3rd/agricultural training	9-old system
300	High school	more than 8yrs
301	High school	11
302	High school	11
303	High school	11
311	1st high school/not studying	9
312	2nd high school/studying	10
312	3rd high school/studying	11
313	Diploma of high school	11
314	pre-university/studying	12
315	pre-university/studying	12
316	1st vilage teacher training	9
317	high school diploma	11
318	first grade of introductory teachers collge s	10
318	6 year secondary school	10 and 11
318	class 10/mathematics and litrature	10
318	class 10/mathematics and litrature and scier	11
319	Diploma	11
319	Introductory teachers collge diploma	12
31A	1st high school	9
31C	2nd high school	10
31D	3rd high school/	11
31G	high school	more than 8
321	2nd vocational and training courses	10

Table B1 Continues:

Standard Code	Description	years of schooling
314	pre-university/studying	12
315	pre-university/studying	12
316	1st vilage teacher training	9
317	high school diploma	11
318		
318		10 and 11
318	class 10/mathematics and litrature	10
318	class 10/mathematics and litrature and scier	11
319	Diploma	11
319		12
31A	1st high school	9
31C	2nd high school	10
31D	3rd high school/	11
31G	high school	more than 8
321	2nd vocational and training courses	10
321	3rd vocational and training courses11	
322	Diploma for vocational and training course	11
323	High school	10
323	High school	11
324	High school	11
325	High school	9
326	Diploma	11
327		10
327		11
328	diploma	11
328		12
32A	high school	more than 8
32A	high school	more than 8
32C	high school	9
32C	high school	9
32C	high school	9
32C	high school	9
32C	high school	9
32C	high school	9
32D	high school	10
32D	high school	10
32D	high school	10
32D	high school	10
32D	high school	10
32D	high school	10
32G	high school	more than 8
32G	high school	more than 8

Table B1 Continues:

Standard Code	Description	years of schooling
511	1st year uni	13
511	4th year uni	16
511	University	14
511	University	15
511	University	13
511	University	16
511	University	14
511	University	15
512	university degree	16
512	university degree	16
512	university degree	16
512	university degree	16
512	university degree	16
512	university degree	16
513	masters/1st yr	17
513	masters/1st yr	17
513	masters/1st yr	17
513	masters/1st yr	18
513	masters degree	18
513	masters degree	18
514	masters degree	18
514	masters degree	18
514	masters degree	masters degree
516	phd	19
517	phd	19
517	phd	19
521	pre/uni	12
521	pre-university/studying	12
521	university degree	2nd yr uni
521	university degree	1st yr uni
521	university degree	1st yr uni
521	university degree	2nd yr uni
521	university degree	2nd yr uni
521	university degree	1st yr uni
522	university degree	13
522	uni degree	uni degree
522	pre-university/studying	12
522	graduated from uni	uni graduated
600	level 6	
601	phd	19
601	phd	19
602	phd	19
603	above phd	20
604	above phd	20
604	above phd	20

Appendix C:

Table C1: Summary Statistics Urban Areas for the samples the equations are estimated

	Men			Women		
Variable	Frequency	Mean	std. dev.	Frequency	Mean	std. dev.
Continuous						
Age	65,577	37.69	11.48	9,060	36.05	9.64
Year of Schooling	65,175	8.69	4.376539	9,028	11.12	5.35
Experience	65,577	21.11	11.81	9,060	16.48	9.91
Hourly Pay($)	65,577	3.11	.	7,936	3.09	.
Categorical Variables						
Education Levels						
No qualification	*5,296*	*12.84*		910	13.11	
Primary	12,935	31.35		628	9.05	
Secondary/High School	9,981	24.19		1,166	16.80	
Vocational	3,341	8.10		216	3.11	
BA Degree	8,452	20.49		3,625	52.24	
Masters Degree	984	2.39		322	4.64	
PhD Degree	267	0.65		72	1.04	
Marital Status						
Marrried	51,706	78.85		5,747	62.37	
Widowed	183	0.28		439	3.16	
Divorced	380	0.58		346	3.75	
Single	13,308	20.29		2,528	30.73	

Conditional on working

Table C2: Summary Statistics rural Areas for the samples the equations are estimated

	Men			Women		
Variable	Frequency	Mean	std. dev.	Frequency	Mean	std. dev.
Continuous						
Age	86,356	37.74	12.74	18,305	39.08	12.86
Year of Schooling	85,217	6.14	3.98	18,213	4.08	4.32
Experience	86,356	19.75	12.76	18,305	18.71	11.59
Hourly Pay($)	79,038	23,824.10	.	6,534	17,976.44	.
Categorical Variables						
Education Levels						
No qualification	*16,231*	*36.94*		7,873	73.69	
Primary	15,889	36.16		1,299	12.16	
Secondary/High School	6,701	15.25		717	6.71	
Vocational	2,055	4.68		122	1.14	
BA Degree	2,861	6.51		636	5.95	
Masters Degree	180	0.41		26	0.24	
PhD Degree	23	0.05		11	0.10	
Marital Status						
Marrried	66,842	77.40		12,995	70.99	
Widowed	282	0.33		1,244	6.80	
Divorced	316	0.37		203	1.11	
Single	18,916	21.90		3,863	21.10	

Conditional on working

Appendix D: Results of Logit model

	All regions			Urban			Rural		
	For ALL	*Men*	*Women*	*For ALL*	*Men*	*Women*	*For ALL*	*Men*	*Women*
	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours	desire to increse working hours
Female	-0.181***	.	.	-0.126***	.	.	-0.227***	.	.
	(0.002)			(0.002)			(0.002)		
Rural	0.012***	0.017***	-0.027***	.	.	.	.	.	.
	(0.001)	(0.001)	(0.003)						
Age Catgory: Reference:(14-19)	.	.	.	.	.	.	.	.	.
20-29	0.059***	0.077***	0.012**	0.062***	0.071***	0.013	0.062***	0.085***	0.008
	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.010)	(0.003)	(0.003)	(0.004)
30-39	0.040***	0.057***	0.008	0.042***	0.050***	-0.004	0.045***	0.067***	0.009
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.010)	(0.003)	(0.004)	(0.005)
40-49	-0.003	0.010***	-0.016**	-0.000	0.006	-0.038***	0.004	0.020***	-0.014*
	(0.002)	(0.003)	(0.005)	(0.004)	(0.004)	(0.011)	(0.003)	(0.004)	(0.006)
50-59	-0.063***	-0.055***	-0.050***	-0.055***	-0.051***	-0.078***	-0.063***	-0.055***	-0.046***
	(0.002)	(0.003)	(0.006)	(0.004)	(0.004)	(0.012)	(0.003)	(0.004)	(0.007)
60-65	-0.118***	-0.114***	-0.081***	-0.109***	-0.105***	-0.121***	-0.120***	-0.120***	-0.067***
	(0.002)	(0.003)	(0.009)	(0.004)	(0.004)	(0.015)	(0.003)	(0.004)	(0.011)
Qualification: Reference(Primary Education)	.	.	.	.	.	.	.	.	.
Secondary Education	-0.011***	-0.017***	0.020***	-0.021***	-0.024***	0.012*	-0.005**	-0.009***	0.015***
	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.002)	(0.002)	(0.004)
High School	-0.089***	-0.108***	0.001	-0.080***	-0.091***	0.002	-0.100***	-0.121***	-0.012
	(0.003)	(0.003)	(0.009)	(0.005)	(0.005)	(0.018)	(0.004)	(0.004)	(0.010)
Pre University	-0.019***	-0.030***	0.040***	-0.035***	-0.040***	0.018***	0.003	-0.008***	0.045***
	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)	(0.005)
Foghe diplom	-0.051***	-0.064***	0.026***	-0.062***	-0.066***	-0.001	-0.032***	-0.053***	0.063***
	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)	(0.009)	(0.006)	(0.007)	(0.017)
Bachelor	-0.047***	-0.071***	0.045***	-0.065***	-0.077***	0.026***	-0.014**	-0.041***	0.065***
	(0.002)	(0.003)	(0.006)	(0.003)	(0.003)	(0.008)	(0.005)	(0.006)	(0.012)
Masters	-0.062***	-0.108***	0.111***	-0.080***	-0.112***	0.099***	-0.002	-0.049*	0.159**
	(0.006)	(0.005)	(0.014)	(0.005)	(0.005)	(0.016)	(0.021)	(0.021)	(0.057)
PhD	-0.135***	-0.149***	-0.063**	-0.143***	-0.146***	-0.094***	0.007	-0.023	0.052
	(0.011)	(0.012)	(0.023)	(0.010)	(0.011)	(0.026)	(0.145)	(0.178)	(0.154)
Adult Studies	-0.001	0.014***	-0.000	0.010*	0.023***	-0.003	-0.000	0.010*	0.001
	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.009)	(0.003)	(0.004)	(0.004)

Table D1: Results of Logit model Continues

	All regions			Urban			Rural		
	For ALL desire to increse working hours	*Men* desire to increse working hours	*Women* desire to increse working hours	*For ALL* desire to increse working hours	*Men* desire to increse working hours	*Women* desire to increse working hours	*For ALL* desire to increse working hours	*Men* desire to increse working hours	*Women* desire to increse working hours
Maritial Status Reference(Married	.	.	.	.	.	.	.	.	.
Widowed	0.025***	-0.022*	0.042***	0.014	-0.011	0.046***	0.026*	-0.036	0.042***
	(0.007)	(0.010)	(0.008)	(0.009)	(0.013)	(0.012)	(0.011)	(0.015)	(0.011)
Divorce	0.020**	-0.018*	0.062***	0.013	-0.018	0.079***	0.022*	-0.013	0.053***
	(0.006)	(0.007)	(0.009)	(0.007)	(0.008)	(0.013)	(0.011)	(0.013)	(0.013)
Not Married	0.003*	-0.011***	0.032***	-0.004*	-0.015	0.047***	0.009***	-0.007	0.027***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)	(0.003)
Employment Status:	.	.	.	.	.	.	.	.	.
Self-employed	-0.050***	-0.061***	0.036***	-0.038***	-0.046***	0.067***	-0.063***	-0.076***	0.006
	(0.001)	(0.001)	(0.004)	(0.001)	(0.002)	(0.006)	(0.002)	(0.002)	(0.006)
Enterprenur	-0.068***	-0.071***	-0.054***	-0.052***	-0.054***	-0.049***	-0.082***	-0.089***	-0.040
	(0.003)	(0.003)	(0.011)	(0.003)	(0.003)	(0.013)	(0.005)	(0.005)	(0.023)
Unpaid Family Worker	-0.120***	-0.091***	-0.089***	-0.103***	-0.082***	-0.090***	-0.129***	-0.107***	-0.094***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)	(0.005)	(0.002)	(0.003)	(0.006)
Establishment Size: Reference(1-4)	.	.	.	.	.	.	.	.	.
5 to 9	-0.012***	-0.014***	0.001	-0.016***	-0.017***	-0.007	-0.005*	-0.009**	0.008
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.007)	(0.003)	(0.003)	(0.005)
10 to 19	-0.051***	-0.059***	0.004	-0.043***	-0.048***	0.001	-0.057***	-0.069***	0.028
	(0.002)	(0.003)	(0.007)	(0.003)	(0.003)	(0.009)	(0.004)	(0.005)	(0.012)
20 to 49	-0.064***	-0.066***	-0.038***	-0.048***	-0.048***	-0.044***	-0.085***	-0.094***	-0.014
	(0.003)	(0.003)	(0.007)	(0.004)	(0.004)	(0.010)	(0.005)	(0.006)	(0.016)
50 or more	-0.059***	-0.059***	-0.047***	-0.039***	-0.039***	-0.045***	-0.091***	-0.095***	-0.050***
	(0.002)	(0.003)	(0.007)	(0.003)	(0.003)	(0.010)	(0.004)	(0.005)	(0.013)
Full-time	-0.356***	-0.372***	-0.195***	-0.343***	-0.349***	-0.256***	-0.364***	-0.397***	-0.152***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.005)	(0.001)	(0.002)	(0.004)
Economic Sector: Reference (Agriculture)	.	.	.	.	.	.	.	.	.
Manufacture	0.002	-0.009***	0.020***	-0.006*	-0.008**	-0.039***	0.004	-0.011***	0.015***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)	(0.010)	(0.002)	(0.002)	(0.004)
Services	0.054***	0.053***	0.037***	0.037***	0.039***	-0.024*	0.071***	0.074***	0.048***
	(0.001)	(0.001)	(0.004)	(0.002)	(0.002)	(0.011)	(0.002)	(0.002)	(0.006)
N	787,613	687,182	100,431	407,366	368,096	39,270	380,247	319,086	61,161
	Standard errors in parentheses			Standard errors in parentheses			Standard errors in parentheses		
	="* p<0.05	** p<0.01	*** p<0.001"	="* p<0.05	** p<0.01	*** p<0.001"	="* p<0.05	** p<0.01	*** p<0.001"

Table D2: Results of OLS model

	All Areas			*Urban Areas*			*Rural Areas*		
	For ALL Missmatch	Men Missmatch	Women Missmatch	For ALL Missmatch	Men Missmatch	Women Missmatch	For ALL Missmatch	Men Missmatch	Women Missmatch
Female	-6.579***	.	.	-4.691***	.	.	-8.043***	.	.
	(0.050)			(0.068)			(0.068)		
Rural	0.329***	0.377***	-0.461***	.	.	.	.	.	.
	(0.030)	(0.031)	(0.098)						
Age Catgory (Reference:14-20)	.	.	.	.	.	.	.	.	.
20-29	1.716***	2.247***	0.636***	1.958***	2.072***	1.354***	1.692***	2.398***	0.310*
	(0.062)	(0.070)	(0.134)	(0.096)	(0.101)	(0.298)	(0.078)	(0.092)	(0.145)
30-39	1.441***	1.988***	0.454**	1.705***	1.833***	0.898**	1.417***	2.118***	0.275
	(0.069)	(0.078)	(0.144)	(0.103)	(0.109)	(0.307)	(0.090)	(0.107)	(0.160)
40-49	0.605***	1.044***	-0.097	0.897***	0.995***	-0.055	0.507***	1.041***	-0.036
	(0.073)	(0.082)	(0.163)	(0.107)	(0.113)	(0.328)	(0.098)	(0.114)	(0.184)
50-59	-1.075***	-0.810***	-0.749***	-0.635***	-0.683***	-0.717	-1.390***	-1.070***	-0.713**
	(0.081)	(0.089)	(0.200)	(0.115)	(0.121)	(0.380)	(0.112)	(0.128)	(0.231)
60-65	-3.866***	-3.838***	-1.227***	-3.484***	-3.691***	-2.091***	-4.172***	-4.081***	-0.532
	(0.110)	(0.118)	(0.338)	(0.150)	(0.156)	(0.570)	(0.154)	(0.170)	(0.411)
Qualification: Reference(Primary Education)	.	.	.	.	.	.	.	.	.
Secondary Education	-0.172***	-0.329***	0.718***	-0.382***	-0.477***	0.966***	-0.091	-0.218***	0.438***
	(0.033)	(0.035)	(0.107)	(0.044)	(0.045)	(0.184)	(0.047)	(0.050)	(0.125)
High School	-3.544***	-4.310***	-0.197	-2.921***	-3.311***	0.044	-4.300***	-5.143***	-0.430
	(0.121)	(0.132)	(0.315)	(0.180)	(0.191)	(0.566)	(0.160)	(0.176)	(0.371)
Pre University	-0.379***	-0.701***	1.602***	-0.719***	-0.886***	1.358***	-0.105	-0.473***	1.750***
	(0.038)	(0.039)	(0.118)	(0.046)	(0.047)	(0.170)	(0.060)	(0.064)	(0.161)
Foghe diplom	-1.182***	-1.738***	1.671***	-1.476***	-1.777***	1.361***	-1.143***	-1.888***	2.598***
	(0.084)	(0.088)	(0.252)	(0.091)	(0.096)	(0.284)	(0.188)	(0.198)	(0.587)
Bachelor	-0.711***	-1.835***	2.169***	-1.243***	-1.935***	2.000***	-0.594***	-1.817***	2.815***
	(0.072)	(0.080)	(0.180)	(0.078)	(0.085)	(0.216)	(0.164)	(0.180)	(0.395)
Masters	-0.772***	-2.496***	4.402***	-1.433***	-2.656***	4.086***	-0.249	-2.126**	7.592***
	(0.200)	(0.213)	(0.463)	(0.197)	(0.214)	(0.454)	(0.746)	(0.748)	(2.295)
PhD	-2.689***	-3.963***	1.151	-3.287***	-4.172***	1.308	-2.353	-4.171	-0.044
	(0.512)	(0.584)	(0.898)	(0.493)	(0.559)	(0.934)	(2.645)	(3.492)	(3.154)
Adult Studies	-0.436***	-0.034	-0.115	-0.290*	0.195	-0.582*	-0.242**	-0.013	-0.064
	(0.070)	(0.087)	(0.113)	(0.123)	(0.137)	(0.263)	(0.083)	(0.109)	(0.121)

Table D2: Results of OLS model Continues

	All Areas			*Urban Areas*			*Rural Areas*		
	For ALL Missmatch	Men Missmatch	Women Missmatch	For ALL Missmatch	Men Missmatch	Women Missmatch	For ALL Missmatch	Men Missmatch	Women Missmatch
Widowed	0.950***	-0.220	0.992***	0.524*	-0.086	1.257***	0.972***	-0.314	1.011**
	(0.180)	(0.273)	(0.235)	(0.244)	(0.377)	(0.318)	(0.265)	(0.396)	(0.349)
Divorce	0.975***	-0.337	1.478***	0.506**	-0.499	1.615***	1.108***	-0.002	1.818***
	(0.162)	(0.205)	(0.255)	(0.195)	(0.247)	(0.313)	(0.286)	(0.366)	(0.442)
Not Married	0.695***	0.084*	1.440***	0.545***	0.039	1.851***	0.764***	0.160	1.298***
	(0.037)	(0.041)	(0.088)	(0.049)	(0.052)	(0.150)	(0.056)	(0.065)	(0.108)
Employment Status: Reference(Salaried Workers)	.	.	.	.	.	.	.	.	.
Self-employed	-1.109***	-1.219***	1.053***	-0.993***	-1.024***	1.938***	-1.247***	-1.396***	0.097
	(0.032)	(0.033)	(0.114)	(0.042)	(0.043)	(0.164)	(0.049)	(0.051)	(0.163)
Employer	-1.436***	-1.353***	-1.555***	-1.076***	-1.059***	-0.699	-2.024***	-1.933***	-2.715**
	(0.065)	(0.067)	(0.342)	(0.076)	(0.078)	(0.364)	(0.126)	(0.128)	(0.913)
Unpaid Family	-3.621***	-2.008***	-2.241***	-3.276***	-1.998***	-2.415***	-3.316***	-2.197***	-2.519***
Establishment Size:Reference(0 to 4)	.	.	.	.	.	.	.	.	.
5 to 9	-0.621***	-0.771***	-0.181	-0.601***	-0.703***	-0.060	-0.646***	-0.834***	-0.160
	(0.046)	(0.048)	(0.128)	(0.060)	(0.062)	(0.201)	(0.070)	(0.076)	(0.167)
10 to 19	-1.307***	-1.534***	0.192	-1.060***	-1.297***	0.334	-1.756***	-1.956***	0.707
	(0.064)	(0.066)	(0.207)	(0.077)	(0.080)	(0.247)	(0.116)	(0.119)	(0.393)
20 to 49	-1.318***	-1.459***	-0.830***	-0.979***	-1.205***	-0.494	-1.992***	-1.970***	0.063
	(0.074)	(0.077)	(0.246)	(0.089)	(0.093)	(0.284)	(0.135)	(0.138)	(0.520)
50 or more	-0.955***	-0.992***	-0.768***	-0.465***	-0.696***	-0.089	-1.954***	-1.747***	-1.066*
	(0.058)	(0.060)	(0.204)	(0.068)	(0.071)	(0.233)	(0.108)	(0.111)	(0.523)
Full-time	-15.571***	-16.661***	-8.276***	-15.562***	-16.441***	-9.377***	-15.538***	-16.855***	-7.436***
	(0.034)	(0.037)	(0.080)	(0.049)	(0.054)	(0.122)	(0.047)	(0.051)	(0.106)
Economic Sector: Reference (Agriculture)	.	.	.	.	.	.	.	.	.
Manufacture	0.286***	0.310***	0.376***	-0.034	0.365***	-0.551*	0.391***	0.130	0.376***
	(0.044)	(0.050)	(0.100)	(0.082)	(0.087)	(0.256)	(0.058)	(0.068)	(0.113)
Services	1.275***	1.223***	1.368***	0.992***	1.078***	0.311	1.360***	1.285***	2.265***
	(0.040)	(0.042)	(0.138)	(0.077)	(0.081)	(0.267)	(0.050)	(0.052)	(0.216)
Constant	21.118***	15.194***	4.363***	19.012***	15.040***	4.836***	23.284***	15.878***	4.269***
	(0.105)	(0.097)	(0.222)	(0.159)	(0.144)	(0.441)	(0.141)	(0.130)	(0.249)
N	745520	646745	98775	385917	347403	38514	359603	299342	60261
r2	0.314	0.348	0.133	0.315	0.341	0.165	0.312	0.349	0.109
Standard errors in parentheses									
="* p<0.05	** p<0.01	*** p<0.001"		** p<0.01	*** p<0.001"		** p<0.01	*** p<0.001"	

Appendix E:

Table E1: probability of finding a job in urban areas according to years of schooling

	Probability of working Urban Areas		
	All	**Men**	**Women**
	Probability of working	Probability of working	Probability of working
Years of Schooling	0.076***	-0.042***	0.308***
	(0.005)	(0.006)	(0.009)
Experience	0.189***	0.307***	0.227***
	(0.004)	(0.006)	(0.008)
Experience Squared	-0.004***	-0.006***	-0.005***
	(0.000)	(0.000)	(0.000)
Constant	-2.966***	-1.402***	-7.414***
	(0.060)	(0.081)	(0.190)
N	172,748	89,703	83,044
McFadden's R2	0.082	0.231	0.020

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table E2: probability of finding a job in urban areas according education levels

	All	**Men**	**Women**
	Probability of working	Probability of working	Probability of working
Education Level	.	.	.
Primary	-1.512***	-0.527***	-3.792***
	(0.110)	(0.119)	(0.186)
High School	-1.791***	-0.655***	-3.283***
	(0.088)	(0.127)	(0.142)
Vocational	-1.116***	-0.606***	-2.879***
	(0.128)	(0.134)	(0.213)
University	-0.896***	-0.626***	-1.040***
	(0.054)	(0.132)	(0.140)
Maters	-0.701***	-0.676***	-0.681***
	(0.043)	(0.075)	(0.153)
Experience	0.210***	0.317***	0.254***
	(0.008)	(0.010)	(0.008)
Experience Squared	-0.005***	-0.007***	-0.006***
	(0.000)	(0.000)	(0.000)
Constant	-0.553***	-0.867***	-1.257***
	(0.091)	(0.157)	(0.197)
N	88,988	48,491	40,496
McFadden's R2	0.082	0.231	0.020

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table E3: probability of finding a job in rural areas according to years of schooling

	All	**Men**	**Women**
	Probability of working	Probability of working	Probability of working
Years of Schooling	0.070***	-0.004	0.027***
	(0.004)	(0.005)	(0.006)
Experience	0.153***	0.302***	0.098***
	(0.003)	(0.005)	(0.004)
Experience Squared	-0.002***	-0.005***	-0.002***
	(0.000)	(0.000)	(0.000)
Constant	-2.459***	-1.584***	-3.131***
	(0.045)	(0.056)	(0.134)
N	143,828	73,337	70,491
McFadden's R2	0.091	0.261	0.030

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"

Table E4: probability of finding a job in rural areas according education levels

	All Probability of working	**Men** Probability of working	**Women** Probability of working
Education Level			
Primary	-2.179***	-0.638	-4.974***
	(0.474)	(0.625)	(0.764)
High School	-2.386***	-0.728	-5.038***
	(0.461)	(0.586)	(0.795)
Vocational	-1.774***	-0.547	-4.671***
	(0.477)	(0.608)	(0.784)
University	-1.803***	-0.662	-3.617***
	(0.431)	(0.584)	(0.784)
Maters	-1.956***	-1.039*	-3.869***
	(0.326)	(0.500)	(0.941)
Experience	0.170***	0.292***	0.128***
	(0.005)	(0.005)	(0.007)
Experience Squared	-0.003***	-0.006***	-0.003***
	(0.000)	(0.000)	(0.000)
Constant	0.614	-0.478	1.721*
	(0.482)	(0.635)	(0.834)
N	51,362	29,695	21,667
McFadden's R2	0.082	0.231	0.020

Standard errors in parentheses
="* p<0.05 ** p<0.01 *** p<0.001"