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# **Education Occupation Mismatch in Developing countries**

Khan, Bilal Muhammad

University of International Business and Economics

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# Education-Occupation Mismatch in the Developing World

## Abstract

This paper contributes to the literature highlighting the cost of education-occupation mismatch in the labor market. Most of the existing literature analyzing the education-occupation mismatch has been focused on the developed economies. Using the Skill Towards Employment and Productivity (STEP) data, this paper analyzes the loss in income as a result of the education-occupation mismatch in developing countries. The results suggest that vertically mismatched (over-educated as well as under-educated) workers earn significantly less than the "matched" workers, whereas there is no significant penalty for being a horizontally mismatched workers. This paper also found the over-educated and horizontally mismatched workers to be significantly less satisfied with their life as compared to the "matched".

# 1 Introduction

The role of education in economic development of a society has been well-established result in the literature. Since the pioneering work of Schultz, Becker and Mincer, there has been many articles highlighting the returns to education, resulting from improved human capital<sup>1</sup>, schooling quality<sup>2</sup> and highlights the role of experience in partially explaining the gender gap in wages<sup>3</sup>. In the last two decades, the focus has been shifted more towards the heterogeneity in the returns to education as a result of education-occupation mismatch. The mismatch between education and occupation can be classified into two categories i.e. *vertical mismatch* and *horizontal mismatch*. A vertical mismatch is defined as the over-education or under-education of the worker as compared to the occupation's required level. A horizontal mismatch would be defined as a mismatch between the type of skills acquired during the school and the one required by the occupation.

There have been many studies analyzing the implication of vertical mismatch (over-education or under-education) in the labor markets resulting in lost earnings in the developed economies.<sup>4</sup> Most of them found the returns to over-education to be about one-third to two-third less as compared to required level of schooling whereas the cost of under-education to be insignificant or relatively smaller in the developed countries. Recently, the focus has been shifted to the horizontal mismatch in the developed economies<sup>5</sup>. These studies found that the horizontally mismatched workers earn around 5% to 20% less as compared to the matched workers.

There has not been many studies focusing on the developing countries, primarily because of the

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<sup>1</sup>Mincer (1974), Psachoropoulos (1981), Willis (1986), Ashenfelter and Krueger (1994), Ashenfelter and Rouse (1998)

<sup>2</sup>See Behrman and Birdsall (1983) and Card and Krueger (1992).

<sup>3</sup>See Mincer and Polachek (1974)

<sup>4</sup>Sloane, Battu & Seaman (1999), Bourdet & Persson (2008), Dolton & Vignoles (2000), Hartog (2000), McGuinness (2006), Rubb (2003)

<sup>5</sup>see Robst (2007a), Robst (2008), Nordin et al. (2010), Altonji et al. (2015), Lemieux (2014)

lack of availability of the data. Quinn & Rubb (2005) analyzed the vertical mismatch in Mexico and found that the returns for extra schooling for over-educated males were half the returns for males with required education. Mehta et al. (2011) assessed the implications for Philippines, Mexico, India and Thailand and found varying level of evidence of over-education in unskilled jobs in these economies. As many policymakers stress the importance of increasing the literacy rates in developing world, it is important to highlight the implications of resulting education-occupation mismatches in these economies. On one hand, the lower level of literacy rates might suggest that under-education, rather than over-education, might be a critical issue in developing economies. On the other hand, Obiols-Homs and Sanchez-Marcos (2018) have shown that the quality of education is negatively correlated to the over-education in EU-15. Since the quality of education is relatively worse in developing economies, it might lead to severe over-education in low and middle income countries.

Using the data for 11 developing economies around the world, this paper will provide more comprehensive support for existence of vertical and horizontal mismatch in the developing countries. It will also help us to compare the extent and implication of education-occupation mismatch across these countries since STEP survey is a standardized household survey conducted by The World Bank in these economies. The results suggest that over-educated workers (vertical mismatch) earn 8%-15% less whereas horizontal mismatched workers earn less, though not significantly, in income as compared to the workers who are neither vertically nor horizontally mismatched in terms of their education and occupation. The workers who report themselves to be under-educated earn more than their peers, having the same level of education, however, if the premium for an extra level of education is incorporated, there is also a penalty for being under-educated for their job.

This paper also analyzes the relationship between this vertical as well as horizontal mismatch and the life satisfaction of the workers. Since the workers invest a significant amount of money and effort in achieving a certain level of education, but if they cannot utilize it in the labor market, it might lead to not only lost income but also regret/dissatisfaction for life. Using the standard measure for life satisfaction, it has been found that the over-educated workers as well as horizontally mismatched workers are significantly less satisfied, especially having secondary or higher level of education, as compared to the workers who are employed with the required level and type of education. Under-educated workers also report lower level of life satisfaction, however, the results are not significant for these workers.

Rest of the paper will proceed as follows: Section 2 will discuss in detail the STEP data. Section 3 will provide the description of the summary statistics and presents results. Finally, section 4 will conclude.

## **2 Data**

This paper will primarily use the Skill Towards Employment and Productivity (STEP) survey, a series of cross-sectional surveys conducted by World Bank in developing countries (low and middle income countries) to assess the supply and demand of skills in the respective labor markets. STEP includes an Employer survey to assess the demand for skills, and a Household survey to determine the supply of skills in the labor market. The STEP Household survey collects detailed information about the individual including demographics, educational background, type of employment, cognitive skills, job-related skills and personality traits. For some of these countries, it also involves a

literacy test for each individual at the end of the survey<sup>6</sup>.

STEP Household surveys was conducted for 11 countries in first two waves<sup>7</sup>. All the respondents in the survey are between 15 and 64 years of age. STEP survey interview between 2000 and 4000 individuals, from randomly chosen households, in the urban areas of the country, to generate a representative sample of the country. It collects detailed information about the household and the the assets owned by it including the number of cattle, radio, television, size of the house, source of energy etc.

For a randomly chosen adult in the household, it collects detailed information about the level and the field of education (in school or some vocational center), basic information about the individual's health (including the life satisfaction), personality traits and risk preferences as well as family related information. For the employed individuals, it will collect detailed information about the job as well as the tasks performed at work. For this paper, we will restrict the age of workers to be between 20 and 64 years old<sup>8</sup>. This paper will focus on the employed individuals in the STEP survey since it is focused on the implications of education-occupation mismatch in the job market.

### **3 Descriptive Statistics**

Table 1 summarizes the statistics across participating countries. There are 4 countries from Asia, 3 from Eastern Europe, 2 from Africa and 2 from South America. The number of observations(employed individuals) varies across countries with Kenya having the highest number of ob-

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<sup>6</sup>See Pierre et al. (2014) for a detailed description of the skills measures included in the STEP surveys

<sup>7</sup>Ukraine is excluded from the sample as the required variables used in the survey are different from other countries

<sup>8</sup>The results in this paper are robust to the inclusion of all workers i.e. 15 to 64 years old or 20 to 60 years old. We have restricted the starting age to be 20 years as by then, the workers should have atleast completed their secondary school which is the minimum education level for horizontal mismatch in this paper

servations and Georgia having the least<sup>9</sup>. Interestingly, Eastern European countries and Yunnan have relatively lower level of self-employment as compared to other countries<sup>10</sup>. The next column lists the variation in hourly median wage rate across countries which is in accordance with the GDP per capita across these countries. Column (5) and (6) highlights the years and level of educational attainment. It should be noted that more years of education does not always translate into higher level of education.

The last four columns gives information about the level of education-occupation mismatch across these countries. In order to define whether the worker is vertically mismatched, this paper uses the self-reported information considering the presence of bias towards self-reported over-education issue. The STEP survey records the highest level of education completed by the individual. In addition, it also asks the workers to report the minimum level of education, according to their opinion, required to perform their job. This paper classify the education into 9 ISCED levels, comparable across countries<sup>11</sup>. If there is a difference of 2 levels between the individual's own education and the required education for the job, she will be classified as vertically mismatched i.e. an individual will be over-educated (under-educated) if her own education is 2 levels higher (lower) than the one required for her job<sup>12</sup>. The difference of two levels has been chosen as a benchmark in order to correct the worker's bias towards classifying herself as over-educated. Interestingly, contrary to the expectation, most of these developing countries have an issue of over-education which might suggest that the quality of education is relatively lower in these economies. Laos, being the

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<sup>9</sup>These observations only include the employed workers who are earning some positive salary for their work. It does not include the workers who might be employed but do not receive any salary or benefits

<sup>10</sup>Most of these self-employed are in Services and Sales occupation which might suggest that they operate a small shop/store

<sup>11</sup>ISCED level are No Education or Less than Primary, Primary, Basic General, Secondary General, Post-secondary (specialized/vocational, Bachelors (4 years), Masters, Candidate of Science and Doctor of Science.

<sup>12</sup>The results are robust at the difference of 3 levels of education as well

only exception, reporting under-education to be more prevalent as compared to over-education in the labor market. Last two columns record the horizontal mismatch. The STEP survey does not have enough data to directly measure the horizontal mismatch. Though, it does ask the respondent to rate the usefulness of her education for her work. The respondent can respond by choosing, *very useful, moderately useful, somewhat useful* and *not useful at all*. A worker will be considered horizontally mismatched if she has at least secondary level of education and is neither under-educated nor over-educated, but still reports her studies to be not useful for her job. A strong mismatch is a horizontal mismatch where the worker reports that her studies were not useful at all for her job whereas a weak mismatch would be where the education is either not useful at all (strong mismatch) or somewhat useful for work. Table 1 suggests that the proportion of workers reporting a strong horizontal mismatch varies between nearly nothing to 16 percent and correspondingly, relatively higher level of weak mismatch. Laos has the lowest level of literacy but also reports the lowest level of education-occupation mismatch whereas Kenya also has a lower level of education in general but reports very high level of over-education.

Table 2 and 3 record the distribution of workers across major occupations and major industries respectively. Since STEP survey is conducted in the urban areas, there are relatively fewer workers (except Laos) than expected in Skilled Agriculture, Forestry and Fishing among major occupation codes as well as Agriculture, Forestry and Mining among major industry groups despite these economies to be agrarian in nature. Most of the workers are employed in the other services among the major industry group. *Services and Sales workers* employ most of the workers among the major occupation groups. In Eastern European countries, *Professionals* also employ a significant proportion (22% to 35%) of the total workforce.

The distribution of educational level across workers is provided by Table 4. This paper uses the



CSO Standard Educational Classification, jointly introduced by Eurostat and UNESCO, based on International Standard Classification of Education (ISCED 1997). It is also used by STEP survey to record the educational field for the highest level of education completed by the individual. As mentioned earlier, Eastern European countries and Yunnan province have relatively higher level of education among their workforce irrespective of the level of development.

There are also 10 major field of studies (including the others category). Table 5 reports the distribution of workers across field of study having atleast secondary level of education. Most of the earlier reported studies have chosen college and above for analyzing the impact of horizontal mismatch on earnings in developed economies. This paper chose the secondary and above since there exists variation across field of study even at the secondary level as is evident from Table 5. It leaves us with 11,579 observations.

Table 5 highlights that women dominate men in Education, Humanities & Arts, Health & Welfare whereas men are somewhat over-represented in *Engineering, Manufacturing & Construction, Agriculture & Veterinary* and *Services*. Table 5 also records the distribution of fields across different level of education. As expected, more than half of the workers with secondary level of education have degrees in *General Programmes*. However, among the college graduates and workers with the Masters degree, most of the workers have a degree in *Engineering, Manufacturing & Construction*.

Last 4 rows in Table 5 shows the distribution of usefulness of education for each field. It can be seen that nearly one-third of the workers with *General Programmes* degree report their education to be not useful at all or just somewhat useful whereas less than 17 percent of the workers with *Education or Health & Welfare* degree reported similar levels of usefulness of their education.

## 4 Education Occupation Mismatch

In standard human capital models, an individual acquires education to enhance the future earnings. She would choose the level and type of education which would maximize her expected earnings given her risk preferences as well as job characteristics. However, the dispersion in returns to education exists at every level of education, primarily, resulting from the education-occupation mismatch in the labor market as first pointed out by Duncan and Hoffman (1981). Hartog (2000) found the returns to actual years of schooling to be less than the returns to required years of schooling on the job, suggesting a penalty for being over-educated. Similarly, Robst (2007) also found that even if the worker might have the right level of education, there is still significant heterogeneity among the the returns to a specific type (college major) of education. He found the mismatch between the college major and the occupation to be the main source of this heterogeneity in returns to the college majors in U.S. There have been many studies exploring the implications for earnings as well as job satisfaction, as a result of vertical or horizontal mismatch in the developed economies. There has also been few studies highlighting the issue of vertical mismatch in some developing economies<sup>13</sup>. The developing countries, in general, are characterized by lower level of education which might suggest that there might not be an issue of education occupation mismatch, especially over-education, for the workers. On the other hand, Obiols-Homs and Sanchez-Marcos (2018) has shown that the quality of education plays an important role in the over-education in the labor market. Using the data from EU-15, they have shown that the quality of education appears to be negatively correlated with both the over-education of workers at the tasks they perform and the unemployment rate. Hence, it is important to understand the existing level of education-occupation

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<sup>13</sup>see Quinn & Rubb (2006) and Mehta et. al(2011)

mismatch in the developing countries and their implications for earnings, job satisfaction or even migration decisions as suggested by Quinn and Rubb (2006).

This paper explores the issue of education-occupation mismatch among 11 developing countries in detail. We will use the self-reported measures to classify the mismatch in the labor market which might be subjective in nature<sup>14</sup>. Though, it is subjective in nature, Groot and Maassen van den Brink (2000), have shown that among different measures of over-education, only the one based on variation in years of education within occupational groups appears to yield significantly lower-than-average rates of over-education. The main advantage of the self-reported measure is that the individual has the perfect information about her job as well as her own qualification.

Since in the developing countries, there is a higher probability of repeating the grades, so years of education might not be the ideal measure to assess the acquired level of education. This paper uses the level of formal education completed by the individual (irrespective of number of years it took to complete) to measure the educational qualification. In order to control for the bias in self-reported measure, this paper will characterize the mismatch at a difference of more than two levels of education. In the STEP survey, a question asks, "What is the highest level of formal education you have completed?". Another question asks, "What is the minimum level of education you think is required to do this job?". These questions are used to classify the vertical mismatch. The answers to the above question were converted to a standard ISCED classification into 9 categories. If the actual level of education is at least 2 levels above (below) the required level of education, the worker will be classified as over-educated (under-educated). In addition, STEP survey also asks "How useful were your studies for this work?". The respondent can choose one

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<sup>14</sup>For detailed discussion on the methods to calculate education occupation mismatch, see Leuven and Oosterbeek (2014)

of the four options i.e. not useful at all, somewhat useful, moderately useful and very useful. This usefulness variable helps us to define the horizontal mismatch for the individual worker. If the worker is neither over-educated nor under-educated as defined above and still reports her studies to be *not useful at all* or *somewhat useful* for her work and has atleast secondary education, she will be classified as horizontally mismatched. Robst (2007) and Yeun (2010) also uses similar questions from the U.S. National Survey College Graduates and the SLID to look at the impact of relatedness on earnings whereas Lemieux (2014) and Nordin et al. (2010) measures the relatedness at the occupation-field of study level for Canada and Sweden respectively. Nordin et al. (2010) construct their own measure of horizontal mismatch by comparing the occupational and field of studying classifications.

#### 4.1 Education-Occupation Mismatch and Earnings

In order to assess the impact of mismatch on the earnings of the individual, we start with the modified Mincerian wage equation with the corresponding fixed effects.

$$\ln(wage) = \beta_0 + \beta_1 Female + \beta_2 educ + \beta_3 exp + exp^2 + \beta_4 O.E. + \beta_5 U.E. + \beta_6 H.M. + \beta_x X + \epsilon$$

(1)

where *wage* is the hourly wage rate in U.S. dollars, *Female* is the dummy for being a female, *educ* is the ISCED level of education, *exp* and *exp*<sup>2</sup> are the proxy for experience and experience

square for the individual<sup>15</sup>. *O.E.* represents a dummy for being over-educated, *U.E.* is the dummy for being under-educated and *H.M.* being the horizontal mismatch. *X* will be a set of variables which will record the individual's characteristics as well as job characteristics and the industry-occupation-country fixed effects.

Table 6 presents the results for equation (1) with different controls. The mismatch measures have been added incrementally to the regression from column (1) to column (4). Column (1) reports the result for educational categories without controlling for the mismatch. As expected, there is an incremental returns for the level of education completed by the worker in the labor market. There is also a premium for experience in the job. On average, the individual earns 1.4 percent more for an extra year of experience in the labor market. In column (2), only the measure for vertical mismatch has been added. The workers who report themselves to be under-educated for their job earns about 12 percent more as compared to the workers with the same level of education but they report themselves to be adequately matched. It seems like that these workers outperform their peers, in terms of educational level, as they might be working in jobs that require higher level of education and as a result have higher wages. On the other hand, if a worker is over-educated, she earns about 8 percent less as compared to the workers with similar level of education but do not find themselves to be over-educated or under-educated. The coefficient for education at every level increases once we control for the vertical mismatch for the individual. It might suggests that if we do not control for the mismatch in education and occupation, the returns to education might be under-reported (or biased downwards) as highlighted in the earlier literature. In column (3) and column (4), the results also control for the strong and weak horizontal mismatch respectively. There is higher penalty for

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<sup>15</sup>The proxy for experience is the difference between the current age and the age at which the individual completed her education

strong horizontal mismatch as compared to the weak horizontal mismatch, though the coefficients for both are not significant. It might be because of the measurement issue as the definition of horizontal mismatch used here is not as clear as used in earlier literature.

Table 6 also reports that females, on average, earns about 21 percent less as compared to their male counterparts and there is heterogeneity among these countries in the level of unexplained gender wage gap<sup>16</sup>. We can also notice that there is also a positive and significant premium for height. The results for height are in line with Vogl (2014) for Mexico, though, the magnitude is smaller, on average, for STEP countries. Among the big five personality traits, individuals scoring higher on the consciousness, openness and emotional stability earn significantly higher wages. There has been ample evidence in Psychology and Economics literature highlighting the impact of personality traits on educational attainment, occupational choice or even their performance in the workplace<sup>17</sup>. It can also be seen that there is a penalty about 22% for working in the informal sector whereas a reward of about 15 percent for self-employed individuals in STEP countries which is in the range found for other developing countries. Gindling et al. (2016) found a premium of about 25% for self-employed workers and a penalty of about 22% for workers in informal sector in urban areas of low income countries.

In many earlier papers, the authors have tried to control for the endogeneity issue posed by the ability of the workers. It might be possible that the mismatched workers in the market are the ones who might have lower ability and it is the lower ability which might be causing the mismatched workers (over-educated or horizontally mismatched) to earn lower wages as compared to the matched individuals. Given the data available, we have controlled for different proxies for the

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<sup>16</sup>See appendix for country level regression for each of the 11 countries in the data.

<sup>17</sup>see Bowels et al. (2001), Nyhus and Pons (2005) and Groves (2005) for more details

ability difference among the surveyed workers. We have already controlled for height which has been reported to be a predictor of higher cognitive abilities among the workers. Case and Paxon (2008) have shown that the taller individual perform significantly better on cognitive tests as compared to shorter workers. We will also control for the self-reported performance of the worker in the primary or secondary school. The survey asks the respondent "*From what you remember, how did you compare in your school work to your classmates in the highest grade you attended in primary or secondary school?*". The individual response is recorded as *excellent, above average, average, below average*. Davis-Kean (2005) have shown that the parents educational level positively affect the student's achievements through parental education itself, in addition to the higher income level resulting from higher education of the parents. In column (6), we control for self-reported student's performance in school and maximum of the parents education level in addition to the height of the individual. We notice that the coefficient for vertical as well as horizontal mismatch are robust to the inclusion of these variables. In 7 of these 11 countries, STEP survey also conducted the literacy test for each individual surveyed. In column (7), we have also controlled for the literacy score in addition to the other proxies for the ability differential. The magnitude for the vertical mismatch variables increases after controlling for the literacy score of the individuals, but that is primarily because of the change in the sample size as shown by the results in column (8) for these 7 countries without the literacy scores.

Table 7 runs similar regression as Table 6, though only for the workers having secondary or higher level of education. It is important to analyze these workers as many developing countries are characterized by lower level of education. In addition, horizontal mismatch is defined for the workers with secondary or higher level of education. The premium for under-education is relatively low whereas the penalty for over-education or horizontally mismatched workers is relatively higher

for these workers as compared to the aggregate data. However, the coefficient is still insignificant for the horizontal mismatch. The premium for height as well as being self-employed and the penalty for being in the informal sector is also significantly higher for these workers. Column (5) reports the regression results similar to column (4) with the field of study fixed effect. The results for the mismatch variables are robust to controlling for the field of study effects as well as proxies for the ability variable as suggested by column (6), (7) and (8).

Leuven and Osterbeek (2011) have summarized the results for the vertical mismatch from many different studies, mostly focused on developed economies, and have found the returns for over-schooling to be usually half (3%-4%) of the returns to the require level of schooling (7%-9%) whereas a penalty of 2%-5% for every year of under-education. Quinn & Rubb (2006) found similar results for Mexico. Our results are also in line with these numbers as the vertical mismatch is defined at the difference of two ISCED level of education which usually translate into 3 to 6 years of education. It should be noted that the coefficient for under-education is positive, which implies that these under-educated workers earn more than the workers with same level of education. Though, it does not mean that it is a premium for being under-educated. If we compare the earnings of under-educated worker with the worker having the right level of education, it shows that there is also penalty for being under-educated as the premium for extra level of education is bigger than the coefficient of under-education for any given ISCED level. For horizontal mismatch, the penalty for college educated workers in developed economies range from 3% to more than 20%, the variation resulting from the definition of horizontal mismatch, the demographic characteristics of the sample and the country for the data-set<sup>18</sup>. The coefficient in our results are more modest and insignificant in nature. It is possible that there is not a serious issue of horizontal mismatch in these developing

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<sup>18</sup>see Robst (2007), Nordin et al. (2010) and Lemiux (2014)



countries, though, the robustness of the results from developed economies might suggest the reason to be the crude definition of the horizontal mismatch in this paper.

In the next section, we analyze the impact of this mismatch on the utility of the individual, measured by the life satisfaction index.

## 4.2 Education-Occupation Mismatch and Life Satisfaction

For the working adults, job satisfaction is arguably the most important component of their life satisfaction as an individual, on average, spends about a quarter of her time at work. As discussed earlier, human capital models suggest that the individuals carefully choose the level and type of education based on the expected future returns of the education in the labor market. Once the individual enters the market and could not find the "right" job for her level and type of education, it might lead to disappointment/dissatisfaction. In this section, we want to see whether the education-occupation mismatch has any relationship with the life satisfaction of the individual.

In the survey, the respondents are asked "*How satisfied are you at present with your life, all things considered?*" and the respondent can choose from a scale of 1 (completely dissatisfied) to 10 (completely satisfied). We start by regressing this life satisfaction measure with all the variables in Table 6 including the *log(wage)*, *married*, *Have children* and replacing experience with *age and age squared* to control for other socio-economic variables which affect the life satisfaction of the individual<sup>19</sup>. It can be seen that the workers who report themselves to be over-educated or horizontally mismatched have lower life satisfaction, though, the coefficient of horizontal mismatch are not significant. Column (5) controls for the relative asset position of the household within the country as Easterlin (1995) suggests that the relative income level affects the life satisfaction

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<sup>19</sup>see Stutzer and Frey (2006), Clark and Oswald (1996), Deaton (2008) and Angeles (2010) for more details.

rather than the absolute level of income. It can be seen that the coefficient for mismatch are robust to controlling for the social status of the family<sup>20</sup>.

The results for other variables are also in line with the literature. Table 8 suggests that a positive and significant relationship between life satisfaction and being female, married, education, height, self-employed, big 5 personality traits (barring conscientiousness) and negative and significant relationship between being parent, age, suffering from chronic disease and being employed in informal sector of the economy. Other than the results for being parents (i.e. having children), the sign for other variables are as expected from the literature<sup>21</sup>. Women, on average, report higher level of satisfaction as compared to men across the world. Hartog & Osterbeek (1998) has shown that higher schooling affects the life satisfaction through health as well as income channel. More educated workers are likely to get higher paying jobs and are also more careful about their health. Both these variables have positive and significant relationship with life satisfaction. Blanchflower and Oswald (2004) have shown that married individuals have more sex than single, divorced or separated individuals and sexual activity has a strong relationship with the life satisfaction. However, Booth et al. (1985) have argued that the birth of the child have a negative correlation with the marital happiness as having children reduces the probability of divorce among the unhappy couples and it might cause the negative association with the life satisfaction. Height is a predictor for better health as well as cognitive abilities and the taller workers, even in non-cognitive jobs, earn more. This might explain the positive relationship between height and life satisfaction. Lange (2012) have shown that even controlling for socio-economic and personality traits, self-employed workers value their autonomy and procedural freedom and report higher job satisfaction as compared

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<sup>20</sup>Interestingly, the coefficient of most of the education level becomes insignificant once the regression controls for the relative position of the household on the asset index

<sup>21</sup>see Hartog & Osterbeek (1998), Deaton (2008), Andersson (2008)

to the employees. The workers in the informal sector reports lower level of life satisfaction and this relationship is very robust in nature. As the workers in the informal sector are not guaranteed the labor rights by constitution, especially in developing countries, the dismal working conditions might be the prime reason for lower level of satisfaction among these workers.

Table 9 presents the same regression as Table 8 but for the workers with secondary or higher level of education as it is more meaningful to analyze the impact of horizontal mismatch among these workers and compare it with the workers who do not report a mismatch. It can be noticed that the workers reporting horizontal mismatch reports significantly lower level of life satisfaction. The coefficient for under-education is also negative for these workers which might suggest that these under-educated workers might feel their lower level of education as compared to their peers to be an obstacle for promotion/growth. Even after controlling for the relative asset position of the household in the country as in column (5) or for the field of education as in column (6), the coefficient for weak horizontal mismatch is still significant.

It should be highlighted that there is no direct measure for job satisfaction in this survey, however, this robust negative relationship between education-occupation mismatch and the life satisfaction in these developing countries points towards the job dissatisfaction channel. Country-industry-occupation fixed effects control for any systematic variation that might be arising from the differences in these categories and the socio-economic and demographic variables control for the standard determinants of life satisfaction. Despite all these controls, the negative relationship between mismatch variable and life satisfaction is robust. This second degree implications of education-occupation mismatch, after the impact on the earnings, has not been studied in detail, especially for the developing countries. Given the cross-sectional nature of the data-set as well as crude measure for horizontal mismatch, this paper cannot comment on the causal relationship

between education-occupation mismatch and life satisfaction. Though, this paper provides ample evidence to explore this relationship in more detail.

## 5 Conclusion & Discussion

This paper contributes to the expanding list of empirical papers, focused on quantifying the impact of education-occupation mismatch in the labor markets. Much of the earlier literature is focused on the developed or upper-middle income countries. This paper assesses the penalty of vertical as well as horizontal mismatch among the low or middle income countries<sup>22</sup>. The results suggest that over-educated workers (vertical mismatch) earn 8%-15% less whereas horizontal mismatched workers earn 0%-6% less in income as compared to the workers who are not over-educated or horizontally mismatched in terms of their education and occupation, though the coefficient for horizontal mismatch are insignificant. The workers who report themselves to be under-educated for their jobs earn 8%-20% more money as compared to the workers with same education level but do not report a mismatch. Though, once we account for the premium of extra level of education, this under-education is penalized in the labor market. There is also a negative and significant relationship between education-occupation mismatch and the life satisfaction of the worker. This paper is the first to comment on the relationship between education occupation mismatch and the life satisfaction for workers in the developing countries<sup>23</sup>.

Many policymakers stress on increasing the literacy rates in the developing countries. However, this paper highlights the importance of incorporating the implications of education occupation mis-

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<sup>22</sup>STEP countries including Armenia, Bolivia, Colombia, Georgia, Ghana, Kenya, Laos, Macedonia, Sri Lanka, Viet Nam, Yunnan Province in China

<sup>23</sup>This statement is true to the best of my knowledge

match in order to correctly assess the benefits of increasing literacy in developing countries. This paper also highlights that despite the developing countries having lower level of education, there is significant proportion of the workforce that reports themselves to be over-educated or do not find their studies to be useful for work. It is important to explore whether these workers are over-educated or find their studies to be useless because there are not many relevant job opportunities in these areas or is it because the quality of education being provided in these countries is not good enough to match these workers with the "right" jobs in these economies. This paper also suggests an extra cost of these mismatched in terms of lost utility (or satisfaction). Given the limitations of the data, there cannot be any inference on the causal relationship between the mismatch in the labor market and the life satisfaction. Though, it is important to determine the causality in this relationship to correctly estimate the welfare effect of these mismatches.

Table 1: Summary Statistics across Countries

Country	Total	Employed	Self-Employed	Median Wage	Average years of Education	Median ISCED completed	Over-Educated	Under-Educated	Strongly Mis-matched	Weakly Mis-matched
Armenia	2992	963	.1	2.54	14.1	6	.22	.03	.07	.15
Bolivia	2433	1414	.48	2.98	11.4	4	.58	.06	.01	.04
Colombia	2617	1566	.45	2.76	10.2	3	.41	.01	.02	.06
Georgia	2996	887	.14	2.89	15.6	6	.68	.02	.04	.08
Ghana	2987	1925	.62	1.36	8.9	2	.38	.11	.01	.05
Kenya	3894	2159	.41	1.66	9.7	3	.51	.02	.01	.05
Laos	2845	1597	.61	1.7	8.6	2	.16	.19	0	.01
Macedonia	4009	1607	.16	4.46	13.3	3	.33	.14	.16	.23
Sri Lanka	2989	1323	.34	2.42	9.5	3	.26	.01	.01	.06
Vietnam	3405	2121	.39	2.74	11.2	3	.35	.02	.01	.07
Yunnan	2017	1216	.13	2.73	12.8	3	.09	.06	.02	.18

Notes: Table 1 provides summary statistics for the STEP survey across 11 countries. Here, employed individuals are the ones who are 20 years of age or older and have a job/business that have positive earnings. Worker will be classified as over-educated (or under-educated) if she has atleast two ISCED level of education higher (or lower) than the one required for this job. An individual will be classified as strongly mismatched (or weakly mismatched) if she has atleast secondary level of education, is neither classified as over-educated or under-educated and still reports her education to be not useful at all (not useful at all or somewhat useful) for her work.

Table 2: Distribution of Workers across Occupations

Country	Armed Forces	Managers	Professionals	Technicians & Assoc. Profs.	Clerical Support workers	Services and Sales Workers	Skilled Agri., Forest. & Fish.	Craft & Related Trades	Plant & Machinery Operators	Elementary Occupations	Total
Armenia	.02	.06	.35	.11	.09	.16	0	.06	.05	.09	963
Bolivia	0	.06	.13	.11	.05	.27	0	.18	.07	.11	1414
Colombia	0	.04	.08	.06	.09	.29		.16	.09	.19	1566
Georgia	.01	.1	.34	.08	.06	.2	0	.07	.04	.09	887
Ghana		.03	.12	.02	.02	.42	.07	.21	.05	.06	1925
Kenya	0	.02	.11	.06	.06	.46	.01	.12	.04	.12	2159
Laos	.04	.04	.07	.05	.02	.26	.25	.12	.03	.12	1597
Macedonia	.01	.06	.22	.13	.07	.19	.01	.13	.1	.09	1607
Sri Lanka	.01	.07	.14	.04	.06	.13	.05	.21	.08	.22	1323
Vietnam	.01	.04	.18	.06	.06	.34	.01	.15	.06	.09	2121
Yunnan		.06	.15	.07	.18	.28	.02	.07	.07	.11	1216

Notes: Table 2 reports the distribution of employed adult workers across major occupation group. An employed adult worker is defined as atleast 20 years old and have a job/business that generates positive earnings.

Table 3: Distribution of Workers across Industry

Country	Agriculture, Forestry and Mining	Manufacturing and Construction	Commerce	Other Services	Total
Armenia	.09	.12	.1	.7	963
Bolivia	.01	.25	.24	.5	1414
Colombia	.01	.24	.29	.46	1566
Georgia	.02	.12	.13	.73	887
Ghana	.09	.16	.38	.37	1925
Kenya	.01	.16	.28	.55	2159
Laos	.27	.18	.24	.31	1597
Macedonia	.04	.24	.18	.54	1607
Sri Lanka	.13	.3	.17	.4	1323
Vietnam	.03	.25	.25	.47	2121
Yunnan	.03	.16	.2	.61	1216

Notes: Table 3 reports the distribution of employed adult workers across major industry group. An employed adult worker is defined as at least 20 years old and have a job/business that generates positive earnings.

Table 4: Distribution of Workers across level of Education

Country	Less than Primary	Primary School	Middle School	High School	College & above	Total
Armenia	0	0	.04	.26	.68	963
Bolivia	.13	.05	.12	.39	.31	1414
Colombia	.09	.22	.05	.36	.29	1566
Georgia	0	0	.02	.21	.75	887
Ghana	.22	.1	.35	.2	.13	1925
Kenya	.11	.22	.11	.43	.12	2159
Laos	.22	.22	.18	.25	.14	1597
Macedonia	0	.01	.11	.56	.32	1607
Sri Lanka	.08	.11	.29	.43	.1	1323
Vietnam	.05	.15	.2	.29	.32	2121
Yunnan	.01	.07	.28	.3	.34	1216

Notes: Table 4 reports the distribution of employed adult workers across major educational level as defined by ISCED. An employed adult worker is defined as at least 20 years old and have a job/business that generates positive earnings.

Table 5: Distribution of Workers across Field of Study (Excluding the unpaid employees and having less than secondary level of education)

	Field of Study										Total
	General Programmes	Education	Humanities and Arts	Social Science, Business and Law	Science, Maths and Computing	Engineering, Manufacturing and Construction	Agriculture and Veterinary	Health and Welfare	Services	Others	
A. Percentage of Individuals in each field of study											
All	28.1	4.2	3.2	9.2	2.6	16.1	2.1	5.9	8.9	19.7	100
Men	28.8	2.5	1.9	8.9	3.0	18.4	2.6	4.1	10.3	19.5	49.2
Women	27.5	5.8	4.4	9.5	2.3	13.9	1.6	7.5	7.6	19.9	50.8
Secondary	62.9	0.7	0.7	3.8	1.0	13.0	1.3	2.2	3.2	11.2	35.1
Post-secondary	22.8	3.1	2.3	5.3	1.6	11.4	1.2	5.8	8.8	37.7	25.0
Bachelors	0.8	3.4	2.6	11.5	2.7	25.3	3.2	9.1	17.2	24.2	19.9
Masters and Above	0.9	12.4	9.1	21.0	6.7	18.4	3.5	9.2	11.0	7.8	20.0
B. Percentage of individuals assessing the usefulness of education											
Not useful	12.4	8.2	10.9	13.5	15.8	15.0	14.5	8.1	9.8	7.9	11.5
Somewhat useful	26.6	8.5	12.0	11.9	12.5	15.2	11.6	6.6	13.6	19.6	17.8
Moderately useful	23.2	12.2	10.3	18.9	14.1	20.8	19.5	11.8	17.9	23.4	20.1
Very useful	37.8	71.1	66.8	55.7	57.6	49.0	54.4	73.5	58.7	49.1	50.6

Notes: Table 5 highlights the distribution of workers across different educational fields. Here, we have focused on the workers who have atleast secondary level of education, are atleast 20 years or older and have positive earnings from their job/business. In section A, the horizontal rows add upto 100% whereas in section B, the column adds upto 100%.



Table 6: Education-Occupation Mismatch and Earnings

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log (Hourly wages in USD)							
Female	-0.213(0.019)***	-0.209(0.019)***	-0.209(0.019)***	-0.209(0.019)***	-0.219(0.019)***	-0.223(0.024)***	-0.224(0.024)***
Primary Education	-0.002(0.067)	0.018(0.067)	0.018(0.067)	0.018(0.067)	0.026(0.067)	-0.005(0.091)	0.001(0.091)
Basic General	0.113(0.065)*	0.166(0.065)**	0.166(0.065)**	0.166(0.065)**	0.168(0.066)**	0.104(0.087)	0.127(0.087)
Secondary (General)	0.251(0.065)***	0.310(0.066)***	0.313(0.066)***	0.312(0.066)***	0.303(0.067)***	0.336(0.089)***	0.368(0.089)***
Post-secondary (specialized/vocational)	0.284(0.067)***	0.372(0.068)***	0.373(0.068)***	0.372(0.068)***	0.354(0.070)***	0.303(0.091)***	0.350(0.091)***
Bachelors (4 years)	0.458(0.068)***	0.558(0.071)***	0.559(0.071)***	0.559(0.071)***	0.526(0.072)***	0.474(0.094)***	0.521(0.093)***
Masters	0.748(0.073)***	0.858(0.075)***	0.858(0.075)***	0.858(0.075)***	0.806(0.077)***	0.759(0.098)***	0.814(0.097)***
Candidate of Science	0.891(0.086)***	1.039(0.091)***	1.039(0.091)***	1.040(0.091)***	0.977(0.092)***	0.953(0.111)***	1.005(0.110)***
Doctor of Science	1.197(0.179)***	1.349(0.181)***	1.349(0.181)***	1.349(0.181)***	1.286(0.181)***	1.314(0.198)***	1.362(0.197)***
Experience	0.014(0.002)***	0.014(0.002)***	0.014(0.002)***	0.014(0.002)***	0.015(0.002)***	0.014(0.003)***	0.013(0.003)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***
Height (in meters)	0.235(0.090)***	0.236(0.090)***	0.236(0.090)***	0.236(0.090)***	0.213(0.090)**	0.213(0.105)**	0.212(0.105)**
Chronic Illness	-0.035(0.023)	-0.035(0.023)	-0.035(0.023)	-0.035(0.023)	-0.032(0.023)	-0.054(0.029)*	-0.053(0.029)*
Extraversion	0.031(0.013)**	0.031(0.013)**	0.031(0.013)**	0.031(0.013)**	0.029(0.013)**	0.024(0.016)	0.024(0.016)
Conscientiousness	0.046(0.016)***	0.045(0.016)***	0.045(0.016)***	0.045(0.016)***	0.043(0.016)***	0.022(0.020)	0.025(0.020)
Openness	0.048(0.015)***	0.045(0.015)***	0.045(0.015)***	0.045(0.015)***	0.038(0.015)***	0.048(0.019)***	0.051(0.019)***
Agreeableness	0.012(0.014)	0.011(0.014)	0.011(0.014)	0.011(0.014)	0.011(0.014)	-0.026(0.018)	-0.026(0.018)
Emotional Stability	0.037(0.012)***	0.037(0.012)***	0.037(0.012)***	0.037(0.012)***	0.037(0.012)***	0.037(0.015)**	0.037(0.016)**
Risk Loving	0.024(0.006)***	0.024(0.006)***	0.024(0.006)***	0.024(0.006)***	0.023(0.006)***	0.019(0.008)**	0.018(0.008)**
Informal Sector	-0.231(0.020)***	-0.221(0.020)***	-0.221(0.020)***	-0.221(0.020)***	-0.219(0.020)***	-0.246(0.026)***	-0.247(0.026)***
Self-Employed	0.156(0.023)***	0.158(0.023)***	0.158(0.023)***	0.158(0.023)***	0.158(0.023)***	0.200(0.028)***	0.200(0.028)***
Part-time Job	0.839(0.025)***	0.844(0.025)***	0.844(0.025)***	0.844(0.025)***	0.846(0.025)***	0.780(0.030)***	0.779(0.030)***
Under-educated		0.125(0.035)***	0.122(0.035)***	0.125(0.035)***	0.125(0.035)***	0.166(0.059)***	0.168(0.060)***
Over-educated		-0.081(0.019)***	-0.084(0.019)***	-0.082(0.020)***	-0.079(0.020)***	-0.113(0.024)***	-0.114(0.024)***
Weak Horizontal Mismatch				-0.004(0.025)	-0.005(0.025)	-0.001(0.039)	0.001(0.039)
Strong Horizontal Mismatch			-0.040(0.038)				
Literacy score						0.000(0.000)***	
Constant	-0.367(0.177)**	-0.410(0.177)**	-0.408(0.177)**	-0.409(0.177)**	-0.328(0.178)*	-0.250(0.215)	-0.197(0.215)
Observations	14,293	14,293	14,293	14,293	14,274	8,953	8,953
R-squared	0.349	0.351	0.351	0.351	0.353	0.330	0.330
Maximum Parent Education	No	No	No	No	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	No	No	No	No	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Column (1) reports the results for regressing logarithm of hourly wages in U.S. dollars against the above mentioned variables. Column (2) adds the dummy variable for under-educated and over-educated to the regression in column (1). Similarly, column (3) adds the dummy for strong horizontal mismatch whereas column (4) uses the dummy for weak horizontal mismatch instead of strong horizontal mismatch used in column (3). Column (5) adds the proxy for ability measure in the regression in column (4) by adding dummies for the individual performance in primary or secondary school and the maximum of parental education level. Column (6) adds the literacy score to the regression in column (5) but it should be noted that the number of observations are reduced as literacy test was only conducted in 7 of 11 STEP countries. Column (7) provides comparison results of column (5) for those 7 countries. All regressions control for country-industry-occupation fixed effect.

Table 7: Education-Occupation Mismatch and Earnings-Secondary and above

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1	2	3	4	5	6	7
USD log of Hourly earnings							
Female	-0.191(0.022)***	-0.186(0.022)***	-0.186(0.022)***	-0.187(0.022)***	-0.185(0.022)***	-0.209(0.028)***	-0.210(0.028)***
Post-secondary (specialized/vocational)	-0.005(0.027)	0.031(0.027)	0.029(0.027)	0.029(0.027)	0.006(0.032)	-0.126(0.054)**	-0.120(0.055)**
Bachelors (4 years)	0.171(0.030)***	0.223(0.031)***	0.220(0.031)***	0.220(0.031)***	0.173(0.037)***	0.022(0.063)	0.031(0.063)
Masters	0.439(0.039)***	0.505(0.040)***	0.503(0.040)***	0.502(0.040)***	0.438(0.046)***	0.278(0.066)***	0.293(0.066)***
Candidate of Science	0.590(0.059)***	0.712(0.062)***	0.710(0.062)***	0.710(0.062)***	0.647(0.067)***	0.496(0.082)***	0.510(0.082)***
Doctor of Science	0.900(0.172)***	1.026(0.172)***	1.025(0.172)***	1.026(0.172)***	0.974(0.168)***	0.858(0.178)***	0.867(0.178)***
Experience	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.013(0.003)***	0.013(0.003)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***
Height (in meters)	0.341(0.110)***	0.342(0.110)***	0.342(0.110)***	0.341(0.110)***	0.335(0.110)***	0.310(0.128)**	0.311(0.128)**
Chronic Illness	-0.013(0.028)	-0.012(0.027)	-0.011(0.028)	-0.011(0.027)	-0.011(0.027)	-0.019(0.033)	-0.019(0.033)
Extraversion	0.041(0.015)***	0.042(0.014)***	0.042(0.014)***	0.042(0.014)***	0.043(0.015)***	0.034(0.018)*	0.034(0.018)*
Conscientiousness	0.019(0.018)	0.016(0.018)	0.016(0.018)	0.016(0.018)	0.016(0.018)	0.013(0.022)	0.016(0.022)
Openness	0.060(0.017)***	0.057(0.017)***	0.057(0.017)***	0.057(0.017)***	0.056(0.017)***	0.049(0.022)**	0.051(0.022)**
Agreeableness	0.001(0.017)	0.000(0.017)	0.000(0.017)	0.000(0.017)	0.000(0.017)	-0.019(0.021)	-0.018(0.021)
Emotional Stability	0.029(0.014)**	0.030(0.014)**	0.029(0.014)**	0.029(0.014)**	0.030(0.014)**	0.030(0.017)*	0.030(0.017)*
Risk Loving	0.035(0.007)***	0.035(0.007)***	0.035(0.007)***	0.035(0.007)***	0.035(0.009)***	0.036(0.009)***	0.036(0.009)***
Informal Sector	-0.276(0.024)***	-0.263(0.024)***	-0.264(0.024)***	-0.263(0.024)***	-0.261(0.024)***	-0.260(0.030)***	-0.260(0.030)***
Self-Employed	0.219(0.029)***	0.224(0.029)***	0.224(0.029)***	0.224(0.029)***	0.224(0.029)***	0.248(0.034)***	0.248(0.034)***
Part-time Job	0.775(0.029)***	0.780(0.029)***	0.781(0.029)***	0.781(0.029)***	0.782(0.029)***	0.764(0.034)***	0.763(0.034)***
Under-educated	0.111(0.039)***	0.103(0.040)***	0.103(0.040)***	0.103(0.040)***	0.110(0.040)***	0.200(0.074)***	0.202(0.074)***
Over-educated		-0.118(0.022)***	-0.122(0.022)***	-0.125(0.023)***	-0.124(0.023)***	-0.150(0.027)***	-0.152(0.027)***
Weak Horizontal Mismatch				-0.026(0.026)	-0.025(0.026)	-0.021(0.040)	-0.021(0.040)
Strong Horizontal Mismatch			-0.055(0.039)				
Literacy score						0.000(0.000)**	
Constant	-0.141(0.204)	-0.123(0.204)	-0.116(0.204)	-0.110(0.205)	0.007(0.214)	0.203(0.267)	0.291(0.265)
Observations	10,025	10,025	10,025	10,025	10,025	6,868	6,868
R-squared	0.336	0.339	0.339	0.339	0.340	0.324	0.323
Educational Field	No	No	No	No	Yes	Yes	Yes
Maximum Parent Education	No	No	No	No	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	No	No	No	No	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 7 focuses on the workers with secondary or higher level of education. Column (1) reports the results for regressing logarithm of hourly wages in U.S. dollars against the above mentioned variables. Column (2) adds the dummy variable for under-educated and over-educated to the regression in column (1). Similarly, column (3) adds the dummy for strong horizontal mismatch whereas column (4) uses the dummy for weak horizontal mismatch instead of strong horizontal mismatch used in column (3). Column (5) adds the proxy for ability measure in the regression in column (4) by adding dummies for the individual performance in primary or secondary school and the maximum of parental education level as well as educational field fixed effect. Column (6) adds the literacy score to the regression in column (5) but it should be noted that the number of observations are reduced as literacy test was only conducted in 7 of 11 STEP countries. Column (7) provides comparison results of column (5) for those 7 countries. All regressions control for country-industry-occupation fixed effect.

Table 8: Education-Occupation Mismatch and Life Satisfaction

VARIABLES	(1)	(2)	(3)	(4)	(5)
	1	2	3	4	5
Life satisfaction					
USD log of Hourly earnings	0.254(0.020)***	0.252(0.020)***	0.252(0.020)***	0.252(0.020)***	0.210(0.021)***
Female	0.293(0.041)***	0.296(0.041)***	0.296(0.041)***	0.296(0.041)***	0.237(0.042)***
Married	0.375(0.044)***	0.376(0.044)***	0.376(0.044)***	0.376(0.044)***	0.367(0.044)***
Has Children	-0.120(0.044)***	-0.120(0.044)***	-0.120(0.044)***	-0.121(0.044)***	-0.163(0.044)***
Primary Education	0.151(0.110)	0.162(0.110)	0.162(0.110)	0.160(0.110)	0.047(0.121)
Basic General	0.114(0.103)	0.171(0.104)	0.171(0.104)	0.172(0.104)*	-0.030(0.112)
Secondary (General)	0.211(0.104)**	0.278(0.107)***	0.282(0.107)***	0.301(0.108)***	0.008(0.115)
Postsecondary (specialized/vocational)	0.314(0.107)***	0.415(0.113)***	0.418(0.113)***	0.431(0.113)***	0.091(0.120)
Bachelors (4 years)	0.396(0.111)***	0.511(0.117)***	0.513(0.117)***	0.525(0.117)***	0.132(0.124)
Masters	0.776(0.120)***	0.911(0.129)***	0.912(0.129)***	0.925(0.129)***	0.441(0.136)***
Candidate of Science	0.559(0.173)***	0.749(0.185)***	0.750(0.185)***	0.765(0.185)***	0.279(0.190)
Doctor of Science	0.178(0.693)	0.373(0.694)	0.374(0.694)	0.391(0.694)	-0.130(0.679)
Age	-0.084(0.012)***	-0.085(0.012)***	-0.085(0.012)***	-0.084(0.012)***	-0.082(0.012)***
Age squared	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***
Height (in meters)	0.457(0.205)**	0.455(0.205)**	0.456(0.205)**	0.454(0.205)**	0.195(0.209)
Chronic Illness	-0.334(0.051)***	-0.335(0.051)***	-0.334(0.051)***	-0.333(0.051)***	-0.338(0.051)***
Extraversion	0.082(0.029)***	0.081(0.029)***	0.082(0.029)***	0.081(0.029)***	0.055(0.030)*
Conscientiousness	-0.025(0.035)	-0.026(0.035)	-0.026(0.035)	-0.027(0.035)	-0.048(0.036)
Openness	0.071(0.033)**	0.068(0.033)**	0.068(0.033)**	0.068(0.033)**	0.031(0.033)
Agreeableness	0.197(0.031)***	0.196(0.031)***	0.196(0.031)***	0.196(0.031)***	0.192(0.032)***
Emotional Stability	0.264(0.029)***	0.264(0.029)***	0.264(0.029)***	0.264(0.029)***	0.243(0.030)***
Risk Loving	0.032(0.014)**	0.031(0.014)**	0.031(0.014)**	0.031(0.014)**	0.021(0.014)
Informal Sector	-0.239(0.046)***	-0.228(0.047)***	-0.228(0.047)***	-0.228(0.047)***	-0.169(0.048)***
Self-Employed	0.301(0.048)***	0.305(0.048)***	0.305(0.048)***	0.305(0.048)***	0.214(0.049)***
Part-time Job	-0.331(0.048)***	-0.323(0.048)***	-0.323(0.048)***	-0.322(0.048)***	-0.291(0.050)***
Under-educated		0.056(0.082)	0.051(0.083)	0.039(0.083)	0.016(0.084)
Over-educated		-0.121(0.042)***	-0.124(0.042)***	-0.138(0.043)***	-0.104(0.044)**
Weak Horizontal Mismatch				-0.095(0.067)	-0.102(0.068)
Asset Wealth Index					0.339(0.020)***
Strong Horizontal Mismatch			-0.057(0.114)		
Constant	4.927(0.443)***	4.902(0.443)***	4.904(0.443)***	4.913(0.443)***	6.054(0.458)***
Observations	15,600	15,600	15,600	15,600	14,429
R-squared	0.267	0.268	0.268	0.268	0.291
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 8 explores the relationship between the life satisfaction of the individual and the education-occupation mismatch in the labor market. Column (1) regresses the above mentioned variables against the life satisfaction measure recorded between 1 (very unhappy) and 10 (very happy). Column (2) adds the measure for vertical mismatch i.e. dummy for under-educated and over-educated. Column (3) adds the measure of strong horizontal mismatch to column (2). Column (4) replaces strong horizontal mismatch in column (3) with weak horizontal mismatch. Column (5) also controls for the relative asset position of the household in the country. All regressions control for country-industry-occupation fixed effect.

Table 9: Education-Occupation Mismatch and Life Satisfaction-Secondary and above

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	1	2	3	4	5	6
Life satisfaction						
USD log of Hourly earnings	0.285(0.025)***	0.282(0.025)***	0.282(0.025)***	0.225(0.026)***	0.225(0.026)***	0.224(0.026)***
Female	0.338(0.049)***	0.339(0.049)***	0.340(0.049)***	0.269(0.049)***	0.269(0.049)***	0.266(0.049)***
Married	0.410(0.051)***	0.410(0.051)***	0.410(0.051)***	0.408(0.051)***	0.408(0.051)***	0.408(0.051)***
Has Children	-0.132(0.051)***	-0.131(0.051)***	-0.130(0.051)**	-0.150(0.051)***	-0.150(0.051)***	-0.154(0.051)***
Postsecondary (specialized/vocational)	0.068(0.062)	0.093(0.063)	0.090(0.063)	0.023(0.065)	0.023(0.065)	-0.004(0.079)
Bachelors (4 years)	0.156(0.065)**	0.192(0.067)***	0.187(0.067)***	0.078(0.068)	0.078(0.068)	0.065(0.085)
Masters	0.499(0.082)***	0.554(0.087)***	0.550(0.087)***	0.352(0.089)***	0.352(0.089)***	0.340(0.107)***
Candidate of Science	0.294(0.148)**	0.401(0.155)***	0.397(0.155)**	0.199(0.156)	0.199(0.156)	0.200(0.167)
Doctor of Science	-0.045(0.683)	0.066(0.684)	0.064(0.684)	-0.171(0.671)	-0.171(0.671)	-0.203(0.676)
Age	-0.080(0.014)***	-0.081(0.014)***	-0.081(0.014)***	-0.083(0.014)***	-0.083(0.014)***	-0.083(0.014)***
Age squared	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***
Height (in meters)	0.669(0.236)***	0.666(0.236)***	0.666(0.236)***	0.411(0.237)*	0.411(0.237)*	0.419(0.237)*
Chronic Illness	-0.387(0.060)***	-0.386(0.060)***	-0.384(0.060)***	-0.384(0.060)***	-0.384(0.060)***	-0.385(0.060)***
Extraversion	0.076(0.034)**	0.076(0.034)**	0.077(0.034)**	0.062(0.034)*	0.062(0.034)*	0.062(0.034)*
Conscientiousness	-0.044(0.042)	-0.045(0.042)	-0.045(0.042)	-0.055(0.042)	-0.055(0.042)	-0.055(0.042)
Openness	0.108(0.039)***	0.107(0.039)***	0.107(0.039)***	0.081(0.039)**	0.081(0.039)**	0.082(0.039)**
Agreeableness	0.222(0.036)***	0.222(0.036)***	0.222(0.036)***	0.210(0.037)***	0.210(0.037)***	0.210(0.037)***
Emotional Stability	0.261(0.033)***	0.261(0.033)***	0.260(0.033)***	0.253(0.034)***	0.253(0.034)***	0.253(0.034)***
Risk Loving	0.021(0.016)	0.020(0.016)	0.021(0.016)	0.017(0.016)	0.017(0.016)	0.017(0.016)
Informal Sector	-0.207(0.054)***	-0.199(0.054)***	-0.199(0.054)***	-0.162(0.054)***	-0.162(0.054)***	-0.163(0.054)***
Self-Employed	0.219(0.058)***	0.225(0.059)***	0.223(0.058)***	0.175(0.059)***	0.175(0.059)***	0.174(0.059)***
Part-time Job	-0.321(0.057)***	-0.314(0.057)***	-0.313(0.057)***	-0.253(0.059)***	-0.253(0.059)***	-0.246(0.059)***
Under-educated		-0.037(0.099)	-0.055(0.099)	-0.064(0.101)	-0.064(0.101)	-0.062(0.102)
Over-educated		-0.117(0.047)**	-0.128(0.048)***	-0.115(0.050)**	-0.115(0.050)**	-0.120(0.050)**
Weak Horizontal Mismatch				-0.131(0.069)*	-0.131(0.069)*	-0.131(0.069)*
Asset Wealth Index				0.316(0.023)***	0.316(0.023)***	0.316(0.023)***
Strong Horizontal Mismatch			-0.143(0.115)			
Constant	4.621(0.504)***	4.671(0.505)***	4.689(0.505)***	5.523(0.511)***	5.523(0.511)***	5.710(0.532)***
Observations	10,981	10,981	10,981	10,591	10,591	10,591
R-squared	0.262	0.262	0.262	0.278	0.278	0.279
Educational Field	No	No	No	No	No	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 9 explores the relationship between the life satisfaction of the individual and the education-occupation mismatch in the labor market but focuses on the workers having secondary or higher level of education. Column (1) regresses the above mentioned variables against the life satisfaction measure recorded between 1 (very unhappy) and 10 (very happy). Column (2) adds the measure for vertical mismatch i.e. dummy for under-educated and over-educated. Column (3) adds the measure of strong horizontal mismatch to column (2). Column (4) replaces strong horizontal mismatch in column (3) with weak horizontal mismatch. Column (5) also controls for the relative asset position of the household in the country. Column (6) also controls for the educational field fixed effect. All regressions control for country-industry-occupation fixed effect.

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Table 14: Education-Occupation Mismatch and Earnings

VARIABLES	(1) Aggregate	(2) Female	(3) Male	(4) Informal	(5) Formal	(6) Self-employed	(7) Employee
USD log of Hourly earnings							
Female	-0.219(0.019)***						
Primary Education	0.026(0.067)	0.053(0.087)	-0.038(0.109)	0.034(0.072)	0.087(0.201)	0.050(0.092)	0.010(0.091)
Basic General	0.168(0.066)**	0.192(0.087)**	0.096(0.105)	0.200(0.073)***	0.108(0.196)	0.302(0.093)***	0.054(0.091)
Secondary (General)	0.303(0.067)***	0.335(0.089)***	0.241(0.107)**	0.340(0.077)***	0.274(0.196)	0.461(0.099)***	0.178(0.092)*
Postsecondary (specialized/vocational)	0.354(0.070)***	0.394(0.094)***	0.283(0.109)***	0.343(0.082)***	0.385(0.196)**	0.516(0.108)***	0.252(0.094)***
Bachelors (4 years)	0.526(0.072)***	0.577(0.098)***	0.427(0.113)***	0.494(0.089)***	0.572(0.197)***	0.598(0.115)***	0.463(0.096)***
Masters	0.806(0.077)***	0.850(0.106)***	0.732(0.119)***	0.795(0.101)***	0.811(0.199)***	0.944(0.136)***	0.707(0.099)***
Candidate of Science	0.977(0.092)***	0.999(0.123)***	0.877(0.150)***	0.927(0.121)***	1.039(0.211)***	1.339(0.199)***	0.809(0.111)***
Doctor of Science	1.286(0.181)***	1.353(0.200)***	1.017(0.326)***	1.169(0.254)***	1.436(0.283)***	0.775(0.805)	1.298(0.175)***
Height (in meters)	0.213(0.090)**	-0.035(0.128)	0.357(0.130)***	0.185(0.125)	0.292(0.112)***	0.035(0.179)	0.372(0.088)***
Chronic Illness	-0.032(0.023)	-0.037(0.031)	-0.017(0.035)	-0.049(0.034)	-0.023(0.027)	-0.037(0.046)	-0.016(0.023)
Experience	0.015(0.002)***	0.012(0.003)***	0.019(0.003)***	0.016(0.004)***	0.011(0.003)***	0.016(0.005)***	0.012(0.002)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***
Informal Sector	-0.219(0.020)***	-0.268(0.029)***	-0.199(0.028)***			-0.276(0.078)***	-0.215(0.020)***
Self-Employed	0.158(0.023)***	0.170(0.035)***	0.146(0.031)***	0.138(0.026)***	0.253(0.068)***		
Extraversion	0.029(0.013)**	0.048(0.018)**	0.011(0.018)	0.025(0.019)	0.035(0.015)**	0.042(0.027)	0.017(0.013)
Conscientiousness	0.043(0.016)***	0.057(0.023)**	0.023(0.022)	0.072(0.023)***	-0.008(0.018)	0.102(0.034)***	0.003(0.015)
Openness	0.038(0.015)***	0.043(0.021)**	0.041(0.020)**	0.046(0.021)**	0.021(0.018)	0.027(0.030)	0.037(0.014)**
Agreeableness	0.011(0.014)	0.012(0.021)	0.008(0.019)	0.006(0.021)	0.027(0.017)	0.023(0.030)	0.007(0.014)
Emotional Stability	0.037(0.012)***	0.054(0.017)***	0.012(0.017)	0.046(0.019)**	0.027(0.014)*	0.040(0.027)	0.037(0.012)***
Risk Loving	0.023(0.006)***	0.016(0.009)*	0.033(0.008)***	0.019(0.009)*	0.025(0.007)***	0.031(0.014)**	0.016(0.006)***
Part-time Job	0.846(0.025)***	0.859(0.033)***	0.858(0.038)***	0.933(0.031)***	0.601(0.036)***	1.035(0.043)***	0.693(0.028)***
Over-educated	-0.079(0.020)***	-0.096(0.030)***	-0.047(0.027)*	-0.099(0.030)***	-0.046(0.024)*	-0.135(0.042)***	-0.058(0.020)***
Under-educated	0.125(0.035)***	0.157(0.056)***	0.109(0.045)**	0.203(0.067)***	0.086(0.033)***	0.280(0.095)***	0.080(0.030)***
Weak Horizontal Mismatch	-0.005(0.025)	-0.018(0.036)	-0.012(0.035)	0.024(0.050)	-0.013(0.025)	0.065(0.071)	-0.023(0.024)
Constant	-0.328(0.178)*	-0.261(0.238)	-0.416(0.262)	-0.679(0.242)***	-0.207(0.272)	-0.303(0.350)	-0.234(0.189)
Observations	14,274	7,209	7,065	8,152	6,122	5,062	9,212
R-squared	0.353	0.366	0.379	0.315	0.414	0.339	0.431
Maximum Parent Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 14 reports the variation in results across different sub-groups. Column (1) regresses the logarithm of hourly wage in U.S. dollars against the variables stated above, including the mismatch variables, for the aggregate data. Column (2) through column (7) runs the similar regression as column (1) but for Females only, Males only, Workers in the informal sector, workers in the formal sector, self-employed individuals and employees only respectively. All regressions control for the maximum parental education, performance of the individual in primary or secondary school and the country-industry-occupation fixed effects.

Table 15: Education-Occupation Mismatch and Earnings-Secondary and above

VARIABLES	(1) Aggregate	(2) Female	(3) Male	(4) Informal	(5) Formal	(6) Self-employed	(7) Employee
USD log of Hourly earnings							
Female	-0.198(0.022)***			-0.293(0.038)***	-0.135(0.024)***	-0.312(0.054)***	-0.151(0.021)***
Postsecondary (specialized/vocational)	-0.008(0.033)	-0.003(0.047)	-0.028(0.046)	-0.104(0.060)*	0.096(0.035)***	-0.055(0.086)	0.028(0.032)
Bachelors (4 years)	0.146(0.038)***	0.154(0.055)***	0.107(0.054)*	0.020(0.073)	0.267(0.039)***	0.041(0.102)	0.202(0.037)***
Masters	0.395(0.047)***	0.407(0.068)***	0.363(0.068)***	0.270(0.090)***	0.492(0.047)***	0.335(0.131)**	0.430(0.044)***
Candidate of Science	0.592(0.068)***	0.590(0.093)***	0.536(0.111)***	0.448(0.110)***	0.733(0.084)***	0.800(0.190)***	0.540(0.068)***
Doctor of Science	0.915(0.168)***	0.954(0.187)***	0.686(0.309)**	0.638(0.274)**	1.143(0.201)***	0.263(0.815)	1.046(0.151)***
Height (in meters)	0.289(0.110)***	-0.066(0.164)	0.523(0.156)***	0.265(0.175)	0.296(0.122)**	-0.004(0.258)	0.429(0.104)***
Chronic Illness	-0.006(0.027)	-0.018(0.037)	0.010(0.041)	-0.029(0.047)	-0.009(0.030)	-0.008(0.064)	-0.004(0.027)
Experience	0.011(0.003)***	0.008(0.004)**	0.016(0.004)***	0.011(0.005)**	0.012(0.003)***	0.011(0.007)	0.010(0.003)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)*	-0.000(0.000)***	-0.000(0.000)*	-0.000(0.000)***	-0.000(0.000)*	-0.000(0.000)***
Informal Sector	-0.258(0.024)***	-0.297(0.035)***	-0.242(0.033)***			-0.291(0.024)***	-0.237(0.024)***
Self-Employed	0.225(0.029)***	0.239(0.045)***	0.214(0.039)***	0.212(0.035)***	0.264(0.071)***		
Extraversion	0.042(0.014)***	0.057(0.021)***	0.028(0.021)	0.050(0.024)**	0.028(0.016)*	0.075(0.034)**	0.020(0.015)
Conscientiousness	0.016(0.018)	0.032(0.026)	0.002(0.025)	0.047(0.030)	-0.010(0.020)	0.039(0.043)	0.000(0.017)
Openness	0.049(0.017)***	0.047(0.026)*	0.053(0.024)**	0.064(0.029)**	0.019(0.019)	0.043(0.041)	0.036(0.017)**
Agreeableness	0.001(0.017)	-0.002(0.025)	-0.000(0.022)	-0.013(0.028)	0.018(0.018)	0.002(0.040)	0.002(0.017)
Emotional Stability	0.029(0.014)**	0.048(0.019)**	-0.000(0.020)	0.033(0.024)	0.023(0.015)	0.003(0.034)	0.036(0.013)***
Risk Loving	0.034(0.007)***	0.028(0.010)***	0.041(0.010)***	0.038(0.012)***	0.026(0.007)***	0.069(0.017)***	0.018(0.007)***
Part-time Job	0.783(0.029)***	0.777(0.038)***	0.829(0.047)***	0.914(0.041)***	0.572(0.037)***	1.021(0.056)***	0.631(0.032)***
Over-educated	-0.120(0.023)***	-0.158(0.034)***	-0.075(0.031)**	-0.185(0.038)***	-0.053(0.026)**	-0.228(0.053)***	-0.056(0.023)**
Under-educated	0.108(0.040)***	0.096(0.062)	0.123(0.053)**	0.169(0.097)*	0.090(0.037)**	0.248(0.134)*	0.085(0.034)**
Weak Horizontal Mismatch	-0.025(0.026)	-0.052(0.038)	-0.016(0.036)	-0.030(0.053)	-0.017(0.026)	-0.002(0.076)	-0.025(0.025)
Constant	0.131(0.216)	0.550(0.314)*	-0.268(0.299)	0.117(0.354)	0.141(0.245)	1.180(0.509)**	-0.081(0.212)
Observations	10,015	5,042	4,973	4,643	5,372	2,900	7,115
R-squared	0.344	0.363	0.376	0.330	0.396	0.355	0.414
Educational Field	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Parent Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 15 reports the variation in results across different sub-groups. Column (1) regresses the logarithm of hourly wage in U.S. dollars against the variables stated above, including the mismatch variables, for the workers with secondary or higher level of education in the aggregate data. Column (2) through column (7) runs the similar regression as column (1) but for Females only, Males only, Workers in the informal sector, workers in the formal sector, self-employed individuals and employees only respectively. All regressions control for the educational field, maximum parental education, performance of the individual in primary or secondary school and the country-industry-occupation fixed effects.

Table 16: Education-Occupation Mismatch and Life Satisfaction

VARIABLES	(1) Aggregate	(2) Female	(3) Male	(4) Informal	(5) Formal	(6) Self-employed	(7) Employee
Life satisfaction							
USD log of Hourly earnings	0.210(0.021)***	0.216(0.030)***	0.214(0.031)***	0.181(0.025)***	0.280(0.045)***	0.190(0.029)***	0.221(0.034)***
Female	0.237***(0.042)			0.246(0.057)***	0.228(0.065)***	0.197(0.073)***	0.250(0.052)***
Primary Education	0.047(0.121)	-0.001(0.158)	0.096(0.200)	0.076(0.128)	-0.224(0.467)	0.051(0.158)	0.045(0.198)
Basic General	-0.030(0.112)	-0.175(0.148)	0.144(0.183)	0.035(0.121)	-0.266(0.430)	-0.044(0.152)	-0.0667(0.180)
Secondary (General)	0.008(0.115)	-0.189(0.154)	0.233(0.185)	0.069(0.129)	-0.205(0.425)	-0.045(0.162)	0.008(0.181)
Postsecondary (specialized/vocational)	0.091(0.120)	-0.061(0.163)	0.300(0.190)	0.199(0.138)	-0.160(0.427)	0.064(0.174)	0.070(0.186)
Bachelors (4 years)	0.132(0.124)	0.019(0.169)	0.283(0.196)	0.151(0.148)	-0.050(0.428)	0.086(0.181)	0.132(0.191)
Masters	0.441(0.136)***	0.300(0.191)	0.627(0.209)***	0.527(0.168)***	0.204(0.434)	0.299(0.208)	0.502(0.202)***
Candidate of Science	0.279(0.190)	0.139(0.260)	0.500(0.295)*	0.174(0.263)	0.273(0.464)	-0.612(0.431)	0.520(0.247)***
Doctor of Science	-0.130(0.679)	0.699(0.658)	-1.057(1.121)	-0.806(1.217)	0.298(0.844)	-3.202(2.132)	0.310(0.648)
Married	0.367(0.044)***	0.350(0.059)***	0.348(0.073)***	0.324(0.059)***	0.438(0.069)***	0.277(0.076)***	0.429(0.055)***
Has Children	-0.163(0.044)***	-0.202(0.063)***	-0.123(0.066)*	-0.184(0.061)***	-0.118(0.066)*	-0.120(0.078)	-0.189(0.054)***
Height (in meters)	0.195(0.209)	0.315(0.317)	-0.125(0.292)	0.221(0.275)	0.005(0.331)	0.010(0.340)	0.220(0.270)
Chronic Illness	-0.338(0.051)***	-0.297(0.069)***	-0.370(0.080)***	-0.332(0.070)***	-0.341(0.077)***	-0.336(0.086)***	-0.330(0.065)***
Age	-0.082(0.012)***	-0.076(0.017)***	-0.083(0.017)***	-0.068(0.016)***	-0.109(0.018)***	-0.089(0.021)***	-0.075(0.015)***
Age squared	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***
Extraversion	0.055(0.030)*	0.048(0.043)	0.051(0.043)	0.077(0.041)*	0.000(0.045)	0.113(0.051)**	0.026(0.038)
Conscientiousness	-0.048(0.036)	-0.032(0.052)	-0.045(0.051)	-0.076(0.049)	-0.002(0.055)	0.029(0.063)	-0.092(0.045)***
Openness	0.031(0.033)	0.012(0.048)	0.052(0.048)	0.003(0.044)	0.087(0.052)*	-0.016(0.055)	0.061(0.042)
Agreeableness	0.192(0.032)***	0.190(0.047)***	0.188(0.045)***	0.191(0.043)***	0.179(0.047)***	0.139(0.055)**	0.210(0.040)***
Emotional Stability	0.243(0.030)***	0.225(0.043)***	0.284(0.044)***	0.29(0.041)***	0.175(0.044)***	0.269(0.052)***	0.240(0.037)***
Risk Loving	0.021(0.014)	0.014(0.021)	0.027(0.020)	0.022(0.020)	0.015(0.020)	0.060(0.026)**	0.001(0.017)
Informal Sector	-0.169(0.048)***	-0.161(0.072)**	-0.167(0.066)**			-0.333(0.131)**	-0.142(0.053)***
Self-Employed	0.214(0.049)***	0.187(0.078)**	0.240(0.066)***	0.182(0.057)***	0.463(0.119)***		
Part-time Job	-0.291(0.050)***	-0.271(0.069)***	-0.332(0.076)***	-0.248(0.061)***	-0.279(0.091)***	-0.331(0.077)***	-0.228(0.068)***
Asset Wealth Index	0.339(0.020)***	0.341(0.029)***	0.333(0.029)***	0.358(0.028)***	0.299(0.030)***	0.407(0.037)***	0.301(0.024)
Over-educated	-0.104(0.044)**	-0.073(0.065)	-0.148(0.062)**	-0.103(0.060)*	-0.157(0.068)**	0.012(0.076)	-0.182(0.054)***
Under-educated	0.016(0.084)	-0.025(0.128)	0.031(0.115)	0.050(0.130)	-0.063(0.114)	0.097(0.186)	0.003(0.095)
Weak Horizontal Mismatch	-0.102(0.068)	0.003(0.103)	-0.183(0.091)**	-0.103(0.107)	-0.161(0.088)*	-0.103(0.139)	-0.112(0.078)
Constant	6.054(0.458)***	6.352(0.654)***	6.132(0.642)***	5.493(0.591)***	7.156(0.817)***	6.644(0.772)***	6.004(0.595)***
Observations	14,429	7,383	7,046	8,022	6,407	4,917	9,512
R-squared	0.291	0.278	0.334	0.321	0.282	0.323	0.300
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 16 reports the variation in results across different sub-groups. Column (1) regresses the life satisfaction against the variables stated above, including the mismatch variables, for the workers in the aggregate data. Column (2) through column (7) runs the similar regression as column (1) but for Females only, Males only, Workers in the informal sector, workers in the formal sector, self-employed individuals and employees only respectively. All regressions control for the country-industry-occupation fixed effects.

Table 17: Education-Occupation Mismatch and Life Satisfaction-Secondary and above

VARIABLES	(1) Aggregate	(2) Female	(3) Male	(4) Informal	(5) Formal	(6) Self-employed	(7) Employee
Life satisfaction							
USD log of Hourly earnings	0.224(0.026)***	0.202(0.038)***	0.247(0.036)***	0.165(0.033)***	0.302(0.047)***	0.176(0.039)***	0.256(0.038)***
Female	0.266(0.049)***			0.260(0.075)***	0.258(0.070)***	0.224(0.097)**	0.271(0.059)***
Postsecondary (specialized/vocational)	-0.004(0.079)	-0.009(0.119)	0.028(0.111)	-0.112(0.121)	0.075(0.111)	-0.035(0.160)	0.004(0.094)
Bachelors (4 years)	0.065(0.085)	0.091(0.127)	0.034(0.122)	-0.124(0.136)	0.175(0.116)	0.018(0.171)	0.077(0.103)
Masters	0.340(0.107)***	0.316(0.161)*	0.369(0.150)**	0.193(0.166)	0.424(0.146)***	0.183(0.214)	0.414(0.128)***
Candidate of Science	0.200(0.167)	0.216(0.234)	0.231(0.253)	-0.070(0.258)	0.473(0.217)**	-0.668(0.429)	0.450(0.187)**
Doctor of Science	-0.203(0.676)	0.776(0.655)	-1.336(1.110)	-1.052(1.197)	0.537(0.747)	-3.211(2.215)	0.238(0.631)
Married	0.408(0.051)***	0.361(0.070)***	0.425(0.082)***	0.372(0.077)***	0.449(0.072)***	0.307(0.096)***	0.452(0.062)***
Has Children	-0.154(0.051)***	-0.182(0.075)**	-0.143(0.074)*	-0.192(0.079)**	-0.123(0.069)*	-0.146(0.097)	-0.160(0.061)***
Height (in meters)	0.419(0.237)*	0.569(0.371)	0.071(0.328)	0.563(0.338)*	0.128(0.349)	0.723(0.440)	0.155(0.285)
Chronic Illness	-0.385(0.060)***	-0.326(0.082)***	-0.435(0.093)***	-0.457(0.094)***	-0.335(0.081)***	-0.442(0.116)***	-0.360(0.072)***
Age	-0.083(0.014)***	-0.068(0.021)***	-0.090(0.019)***	-0.062(0.020)***	-0.106(0.019)***	-0.070(0.027)***	-0.084(0.016)***
Age squared	0.001(0.000)***	0.001(0.000)**	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)**	0.001(0.000)***
Extraversion	0.062(0.034)*	0.057(0.050)	0.061(0.048)	0.117(0.051)**	-0.002(0.047)	0.180(0.064)***	0.009(0.041)
Conscientiousness	-0.055(0.042)	-0.022(0.062)	-0.080(0.059)	-0.086(0.063)	-0.010(0.058)	0.015(0.081)	-0.080(0.050)
Openness	0.082(0.039)**	0.105(0.058)*	0.057(0.055)	0.050(0.058)	0.116(0.056)**	0.102(0.072)	0.077(0.048)
Agreeableness	0.210(0.037)***	0.197(0.056)***	0.222(0.050)***	0.205(0.056)***	0.196(0.050)***	0.120(0.070)*	0.235(0.045)***
Emotional Stability	0.253(0.034)***	0.206(0.050)***	0.330(0.048)***	0.345(0.051)***	0.164(0.047)***	0.311(0.065)***	0.235(0.040)***
Risk Loving	0.017(0.016)	0.002(0.024)	0.032(0.022)	0.017(0.025)	0.011(0.021)	0.057(0.032)*	0.002(0.019)
Informal Sector	-0.163(0.054)***	-0.185(0.082)**	-0.157(0.075)**			-0.327(0.145)**	-0.135(0.061)**
Self-Employed	0.174(0.059)***	0.168(0.095)*	0.187(0.077)**	0.123(0.073)*	0.394(0.125)***		
Part-time Job	-0.246(0.059)***	-0.195(0.082)**	-0.303(0.089)***	-0.156(0.077)**	-0.269(0.095)***	-0.293(0.099)***	-0.201(0.076)***
Asset Wealth Index	0.316(0.023)***	0.327(0.034)***	0.303(0.033)***	0.332(0.036)***	0.295(0.032)***	0.361(0.048)***	0.299(0.027)***
Over-educated	-0.120(0.050)**	-0.103(0.074)	-0.157(0.070)**	-0.148(0.074)**	-0.142(0.072)**	0.024(0.096)	-0.202(0.060)***
Under-educated	-0.062(0.102)	-0.098(0.161)	-0.034(0.137)	-0.260(0.183)	0.009(0.125)	-0.131(0.285)	-0.022(0.109)
Weak Horizontal Mismatch	-0.131(0.069)*	-0.041(0.107)	-0.216(0.093)**	-0.122(0.112)	-0.171(0.090)*	-0.069(0.147)	-0.149(0.079)*
Constant	5.710(0.532)***	5.733(0.778)***	6.056(0.745)***	5.032(0.757)***	6.689(0.775)***	4.768(1.020)***	6.434(0.643)***
Observations	10,591	5,334	5,257	4,862	5,729	2,967	7,624
R-squared	0.279	0.266	0.332	0.323	0.275	0.336	0.284
Educational Field	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Table 17 reports the variation in results across different sub-groups. Column (1) regresses the life satisfaction against the variables stated above, including the mismatch variables, for the workers with secondary or higher level of education in the aggregate data. Column (2) through column (7) runs the similar regression as column (1) but for Females only, Males only, Workers in the informal sector, workers in the formal sector, self-employed individuals and employees only respectively. All regressions control for the educational field and country-industry-occupation fixed effects.