# THE RETURNS TO VOCATIONAL HIGH SCHOOL EDUCATION IN TURKEY BY DISCIPLINES

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**THESIS TITLE**

The returns to vocational high school education in Turkey by disciplines

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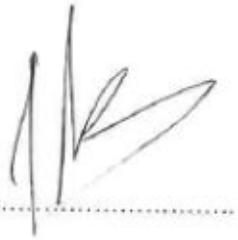

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## ABSTRACT

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Keywords: Returns to education, vocational education, vocational high school disciplines, education economics

Recently Turkey is actively engaging in reforming the vocational education, so that it could serve as a valid alternative to general education. However, only limited number of studies in Turkey scrutinize labor market conditions faced by the general and vocational high school graduates. The review of labor force surveys shows while vocational high school graduates certainly face higher returns in terms of labor force participation and average wage premium compared to high school graduates, these returns do vary across the vocations. The graduates of engineering, science/mathematics/computing majors have the best perspectives for being employed and participate in the labor force, while education and services graduates face adverse labor market conditions. Using standard ordinary least squares method, I estimate that the vocational high school graduates on average earn 1.9% over general high school graduates. The wage returns within vocations, however, are considerably unequal. The science/math/computing major receives the largest 18% markup over education discipline, followed by services, engineering, health and social sciences/business/law graduates enjoying returns in the range of 10.5%-12.5%. The lowest premium is received by arts/humanities - 4.6% and education majors. These findings could assist policymakers in evaluating current and future educational policies. Moreover, they might be helpful in ensuring that the disciplines with the lowest returns are reoriented towards market needs.

# ÖZET


TÜRKİYE'DE MESLEK YÜKSEK OKULU EĞİTİMİNİN ALANLARA GÖRE GETİRİLERİ

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Kamu Politikalari Yükseklisans Programı Tezi, 2015

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Anahtar Sözcükler: Egitimin getirileri, mesleki eğitim, meslek yüksekokulu alanları, eğitim ekonomileri

Türkiye son dönemlerde mesleki egitim reformuna aktif şekilde yönelerek genel lise egitimi karşısında geçerli bir alternatif oluşturmayı hedeflemektedir. Ancak Türkiye'de yalnızca kısıtlı sayıdaki calışmada genel lise ve meslek lisesi mezunlarının karşılaştıkları piyasa koşulları incelenmektedir. İş gücü anketleri değerlendirildiginde, meslek yüksekokulu mezunları iş gücüne katılım ve ortalama ücret açısından genel lise mezunlarına göre şüphesiz daha yüksek bir getiriye sahip olup, bu getiri meslekler arasında değişim göstermektedir. Mühendislik, fen bilimleri/matematik/bilgisayar alanlarından mezun olan ögrenciler istihdam edilme ve iş gücüne katılım açısından en iyi koşullara sahip iken, eğitim ve hizmet alanlarından mezun olanlar olumsuz iş piyasası koşullarından etkilenmektedir. Standart sıradan en küçük kareler yöntemi kullanıldığında, meslek lisesi mezunlarının ortalama kazancının genel lise mezunlarından %1,9 fazla olduğu ölçülmektedir. Ancak meslekler arasındaki ücret getirileri dikkate değer farklılıklar göstermektedir. Fen bilimleri/matematik/bilgisayar alanları %18'lik en yüksek maaş farkına sahipken, bunları %10,5-12,5 aralığında farkla ücret alan hizmet, mühendislik, sağlık ve sosyal bilimler/işletme/hukuk mezunları izlemektedir. En düşük ücret farkı ise %4,6 ile sanat/ beşeri bilimler ve eğitim alanlarından mezun olanlar arasındadır. Bu bulgular, mevcut ve gelecekteki eğitim politikalarının değerlendirilmesinde politika yapıcılara yardımcı olabilecek niteliktedir. Bu bulgular aynı zamanda en düşük getiriye sahip eğitim alanlarının piyasa ihtiyaçları doğrultusunda yeniden şekillendirilmesine de destek olabilir.

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| | |
|---|---|
| EQF | European Qualifications Framework |
| FOET | Fields of Education and Training |
| GDP | Gross Domestic Product |
| HNC/HND | Higher National Certificate/Diploma |
| ISCED | International Standard Classification of Education |
| ISCO | International Standard Classification of Occupations |
| LFS | Household Labor Force Survey |
| NVQS | National Vocational Qualification System |
| NEET | Not in Education, Employment or Training |
| OECD | Organization for Economic Co-operation and Development |
| OLS | Ordinary Least Squares |
| ONC/OND | Ordinary National Certificate/Diploma |
| PISA | Programme for International Student Assessment |
| SBS | Level Placement Exam |
| SVET | European Union Project on Strengthening Vocational Education and Training |
| TEOG | Transition from Primary to Secondary Education Exam |
| UNESCO | The United Nations Educational, Scientific and Cultural Organization |
| VQA | Vocational Qualification Authority |

# Chapter 1

## INTRODUCTION

In recent years Turkey puts great emphasis on reforming the vocational education through developing training standards aligned to ISCED 1997 and reducing educational - occupational mismatch by introducing national vocational qualification system (NVQS). Thus, the efforts are made to design the vocational education as valid alternative to general education. Across the world, the comparative returns to vocational and general qualifications yield mixed results. Mane (1998), Sakellariou (2006), and Moenjak and Worswick (2001) found overall higher payoffs to the vocational education. The results of this study opposed the assumptions of the report issued by the National Commission on Excellence in Education in 1984, which emphasized the significance of the academic curriculum over the vocational courses. In contrast, several other studies estimated that the private returns of the graduates of the general education are higher than those of the vocational education graduates (Psacharopoulos (1994), Horowitz and Schenzler (1999), Dearden et.al. (2002), Kahyarara and Teal (2008), Arrazola and De Hevia (2006)). Thus, the debate continues on who labor market values more – the employee already trained in the occupation at the vocational high school or general high school graduate with the academic training that supposedly enables her to learn more easily at the workplace.

In general, compared to the general high school program, the vocational education is considered to bring various advantages. One perceived benefit of vocational high school education is that it reduces youth unemployment among those individuals who do not have abilities or willingness to pursue academic study at the universities (Eichhorst et al. 2012). This benefit is critical for Turkey, as the percentage of 15-29 year olds not in education, employment or training (NEET) constitute 35% of this age group, which is more than double the average for the OECD countries (OECD 2013).

Moreover, as the vocational education trains in a specific occupation, it enables graduates to start working life earlier and reduces the burden on the limited capacity of tertiary education in Turkey (ERI 2008). However, the vocational education may not bring suggested benefits due to several problems, including lack of labor market relevance of the curriculum, absence of horizontal and vertical mobility between the vocational and academic tracks, and stigmatization as a second-choice education (Eichhorst et al. 2012). Moreover, the vocational education expenditure per student is two times that of general high school program (ERI 2008). The effective allocation of the resources between the vocational and general programs is essential considering budgeting constraint in Turkey – i.e. the spending per capita at the secondary level is $2,736, which is 3 times lower than the average OECD level (OECD 2014). Therefore, the question arises on what are labor market conditions faced by the vocational high school graduates in Turkey, especially in comparison to general high school graduates.

The review of 2004-2011 LFS data shows that vocational and general high school graduates face unequal labor market conditions. Vocational high school graduates tend to have higher employment and labor force participation rates, as well as more likely to be wage earners and occupy "Associate" and "Worker" levels. The average wages for the vocational high school graduates occupying these levels is also higher.

Previous studies on returns in Turkey found higher wage premium for vocational high school graduates (Isfahani et.al. 2009, Tansel 2010). Indeed, the 2004-2011 LFS data demonstrates that the vocational high school wage premium is positive although it is declining. One probable reason behind this is the increasing relative ratio of vocational and general high school graduates. While there were also fluctuations in the professional level composition, its resulting impact on the premium is ambiguous. The closer look at the wage premium by the age groups, shows that younger graduates had the largest premium during the period. By the end of the period, the premium of all three groups is declining and converging, demonstrating similar returns. The declining return for younger group might indicate that the regulation enacted recently to match vocational curriculum with the labor market needs did not have significant impact yet. A probable explanation is that the graduates potentially affected by the regulation constitute only small portion of my sample.

Previous studies in Turkey did not address the returns to the vocational disciplines. Inclusion of observations on the discipline studied for vocational high school graduates into LFS in 2009, allowed to demonstrate that the labor market returns considerably vary across the vocations during the period of 2009-2011. The graduates of engineering, science/mathematics/computing majors have the best perspectives for being employed, and the lowest percentage of the graduates not in the labor force. On the other hand, the lowest employment and the labor force participation are present among education and services graduates. When the employment status by disciplines is considered, the Health graduates have highest wage earners percentage and the graduates of the social sciences/business/law, services are on average more likely to be employers. Moreover, significant percentages of arts, education graduates are self - employed. The distribution by professional level further proves the unequal labor market returns in terms of leadership. The most striking result was that 46% of education and 37% of arts graduates are employed as workers. Expectedly, more than half of the engineering graduates occupy worker level and 59% share of the social sciences/business/law graduates are occupying the clerk positions.

Using standard OLS method, I estimate that on average the vocational high school graduates earn 1.9 % over general high school graduates. However, within the vocational high school education, the returns received by the graduates of different disciplines are unequal. The science/mathematics/computing major receives the largest 18% markup over education discipline, followed by 12.5% for Services and 11.2% for engineering graduates. The health and social sciences/business/law graduates enjoy similar returns - 10.9% and 10.6%, respectively. The lowest premium is received by arts/humanities - 4.6% and education majors. The estimated return to agriculture/veterinary discipline is not significant, probably due to the small size of the full employment sample for this discipline.

These findings could assist policymakers in optimizing funding into the vocational high school education and evaluating current and new policies. Moreover, they might be helpful in ensuring that the disciplines with the lowest returns are revised and reoriented towards market needs. The findings could also guide the individuals in their choice of the educational investment.

The thesis organized as follows. Two next chapters include the overview of the Turkish National Education System and previous literature. Data, Methodology and Results are discussed in Chapters 4-6, while the last section concludes.

## Chapter 2

## TURKISH NATIONAL EDUCATION SYSTEM

The duration of compulsory education was set at five years of primary school since the foundation of the Turkish Republic (Dulger 2004). Law No. 4306 dated 18.08.1997 extended compulsory education to include 8 years of the primary school in 1997-98 academic year (UNESCO 2012). Primary school graduates may continue with non-compulsory secondary education provided in general or vocational and technical high schools. Starting from 2005-2006 academic year, the duration of secondary education was extended from three to four years (UNESCO 2012). The last reform to the educational system was made in 2012-13 academic year with adoption of Law No. 6287 dated 30.03.2012, also known as "4+4+4" law (Gün and Baskan 2014). The law established twelve years of compulsory education, provided through primary school, lower and upper secondary schools, where each of the schools is attended for four years. [1]

Secondary education is provided by both public and private sectors (Ministry of National Education 2014). No tuition fees are foreseen for the publicly provided schooling (UNESCO 2012). The public high schools such as Anatolian high schools, Science high schools, Anatolian Teacher Training high schools, Social sciences high schools, and private schools are considered to be of a high quality.[2] These schools accept students based on the results of the Level Placement Exam (SBS).[3] The

[1]Household Labor Force Survey (LFS) used for the analysis contains data up to 2011. Therefore, all of the observed graduates were educated before the introduction of the "4+4+4" reform.

[2]The duration of studies is longer by one year in the Anatolian and Social sciences high schools, where the medium of instruction is a foreign language.

[3]Starting from the 2013-2014 academic year the SBS exam was substituted by the Transition from Primary to Secondary Education (TEOG) exam (Today's Zaman 2015).

enrollment to the Anatolian Vocational high schools and Anatolian Technical high schools is also based on the results of SBS (Eurydice 2010).The placement to the public high schools or vocational and technical high schools is not subject to the entrance exam (Tansel 2013). [4] There is a large variety of public vocational and technical schools, including Vocational School for Industry, Anatolian Technical High School, and Vocational High School for girls. Some other types of the vocational and technical schools are listed in the Appendix A (Ministry of National Education 2014). [5]

The 9 th grade has the same curriculum both in general and vocational high schools (UNESCO 2012). In the 10 th grade, the students of the general high school choose from sciences, foreign languages, arts, and sports tracks (UNESCO 2012). The Ministry of Education report (2010) notes two parts of the vocational high school education - i.e. theoretical (school training) in the 10-11 th grades and practical (in-company training) in the 12 th grade. The vocational high school students choose from broad job families in the 10 th grade. In the 11th grade the students select from more narrow occupational branches. The development of vocational training standards by Ministry of National Education started in 1993. Within the framework of the EU Strengthening Vocational Education and Training (SVET) Project that started in 2002, 17 job families and 64 branches were developed and tested in 105 pilot schools. Overall, 42 job families and 192 branches in accordance with the International Standard Classification of Education (ISCED) 1997 were implemented in 2006-2007 academic year [6] (Ministry of National Education 2010). In the 12$^{th}$ grade the practical component is introduced. The students spend 2 days in the classroom and 3 days in the enterprises in order to obtain practical skills (UNESCO 2012, Appendix B).

The importance of matching the curriculum of the vocational education and skills needed by the labor market is recognized in Turkey. In fact, the Law No. 4702 adopted in 2001 outlines the need for a close collaboration of the vocational education with the private sector. The employers also participate in the design, implementation, and

[4]Recently, many of the public high schools were converted into the Anatolian high schools (Aydagul 2014).

[5]The current work concentrates only on the returns of formal vocational education provided in high schools. For the detailed description of non-formal vocational education, including short courses, apprenticeship training and distance learning, please see the report of Ministry of National Education 2010.

[6]LFS used for the data analysis classifies vocational high school and college graduates by 21 educational fields in accordance with the ISCED'97 (details are provided in Chapter 4). Job families and branches of vocational high schools were not aligned to ISCED classification before 2002. While ISCED educational fields are quite broad and it should be fairly easy to assign individuals graduated prior to 2002 to the right category, I assume that some measurement error may still take place.

assessment of the vocational education programs through the Vocational Education Council and its provincial branches. The input is also made by other members of the Council, including ministries, trade union/chambers, civil society organizations and tertiary level institutions (UNESCO 2012). Another measure to decrease the educational- occupational mismatch is the development of the vocational qualification system (NVQS) by the Vocational Qualification Authority (VQA), a regulatory body established in 2006 (Cedefop 2013). NVQS standardizes the requirements of what individuals need to know and able to do to receive particular vocational qualification. It also specifies the evaluation, grading and certification criteria for the graduates of both formal and informal vocational education. These requirements are based on the needs of the labor market, thus, the NVQS helps to design matching curriculum at the vocational schools. Moreover, the NVQS is aligned to the European Qualifications Framework (EQF). EQF classifies learning outcomes (knowledge, skills and competences) into 8 levels, where Level 1 and Level 8 correspond to basic and advanced outcomes, respectively. Therefore, harmonization of NVQS with EQF will enable to compare the qualifications obtained in Turkey with those awarded in European countries (UYEP 2013, European Commission 2014).

The Turkish educational system also has a higher education component, which encompasses such institutions as universities, faculties, institutions, colleges, conservatories, vocational colleges, centers for practice and research. Various four-year undergraduate programs, two-year master and four-year doctoral level programs are offered to the prospective students (Ministry of National Education 2014). Universities also offer vocational two-year programs at the Higher Vocational Schools, which grant the associate degree. Following adoption of the Law No. 4702 in 2001, the graduates of vocational/technical high schools are enrolled in these two-year programs without required admissions exam (UNESCO 2012).[7] [8]

[7]The schooling ratio at both secondary and higher education level increased after the introduction of the legislation. It is likely that more students started choosing secondary vocational education and continue the training at the tertiary level (Cavusoglu et al.2011).

[8]In this study I only consider the returns to the vocational education at the secondary level. In the LFS data we do not separately observe the vocational high school graduates who continued to the tertiary level. The proportion of these individuals may be high in our sample for 2009-2011 years. As a result, if these individuals systematically differ in some unobserved characteristics (for instance, ability) relative to the graduates who did not go beyond the secondary level, our estimates may not be representing accurate average wage returns for all individuals who obtained secondary vocational education.

## Chapter 3

## LITERATURE REVIEW

There is a large volume of studies around the world estimating the returns to schooling, including to the vocational and technical education. Some of these works compare the wage premiums, obtained by vocational and general high school graduates. This focus might be explained by the existing debate on who labor market values more – the employee already trained in the occupation at the vocational high school or general high school graduate with the academic training that supposedly enables her to learn more easily at the workplace.

The research made provided mixed results. Mane (1998) found overall higher payoffs to the vocational courses taken by US non-college bound graduates of 1972, 1980 and 1992. For males vocational courses were beneficial to the two out of three examined cohorts, while all females had better labor market outcomes as a result of the vocational concentration. The results of this study opposed the assumptions of the report issued by the National Commission on Excellence in Education in 1984, which emphasized the significance of the academic curriculum over the vocational courses.

Similarly, Sakellariou (2006) found higher returns for the female vocational graduates in Singapore. Moenjak and Worswick (2001) also estimated higher wage premiums for the vocational school graduates in Thailand. [9] In contrast, several other studies estimated that the private returns of the graduates of the general education are higher than those of the vocational education graduates (Psacharopoulos (1994) summarizes world trends, Horowitz and Schenzler (1999) in Suriname, Dearden et.al.

[9]The results were based on the restricted sample, as the authors used the observations of the high school graduates with information on the parental education and occupational status. These variables were considered by authors as important determinants of the schooling decision. This data was available only for the children of the household heads living with their parents at the time of survey. Therefore, the resulting estimates may be biased due to the selection problem, if the graduates living separately from their parents consistently differ from the observations of the surveyed sample.

(2002) in UK, Kahyarara and Teal (2008) in Tanzania, Arrazola and De Hevia (2006) study in Spain). [10]

Overall, the relative returns of vocational and general education may reflect which skills are more required by the employers in the country – general or vocational. This demand from employers to some extent might be shaped by the quality of the vocational education graduates (through education system design, for instance) and labor market policies in the country. Indeed, World Bank report (2012) suggests that the returns for vocational education differ depending on at which level of schooling it is provided. Thus, if we suggest that the general skills (numeracy, literacy) are important to obtain vocational skills, then early introduction of a vocational track may result in less skilled graduates and consequently lower returns.

Existing labor market policies might also influence the tastes of the employers. World Bank report (2012) summarizes research that if labor policies (employment and unions' practices) are flexible, then the firms are willing to invest into the on- the-job training to retain workers. Thus, they do not necessarily require already trained graduates, but are more interested in the graduates with advanced general skills who could learn easily at the workplace. Alternatively, it could be suggested that if the labor policies are stringent, then the employers lose incentives to invest and will demand employees already possessing the vocational skills. In this case, the returns of vocational graduates might be higher for these countries.

The designs of education systems of the countries reviewed above are different, including the years of compulsory education and the levels at which vocational education is offered – secondary in Suriname and Tanzania, post- secondary level in UK and Spain (Classbase online education database 2015, KisaProject 2015,GOV.UK 2012, Study in Spain 2015). Existing labor market policies are also diverse – regulated in Suriname and Spain, and flexible in UK and Tanzania (Kandil et al. 2014, Jaumotte 2011, Lucifora 1998, Hussein 2011). Thus, the countries have different context but exhibit similar tendency of higher returns for general education compared to the vocational qualifications. Therefore, I believe that while the differences are not reason

[10]While the majority of studies compare the actual wage returns of the vocational and academic education graduates, Meer (2006) employs a different approach. The author compares returns of one individual to the track that she actually studied (actual track) to the expected returns of the same person if she have chosen another track (alternative track). The general, academic, and two vocational (i.e.business and technical) tracks of US high school are considered. Interestingly, the results suggest that the graduates of the academic and technical tracks would be worse off had they chosen any other track. In contrast, the business track graduates would receive higher wage premium if they had selected general track.

for concern, but they should be taken into the account when analyzing the relative returns across countries, as they might reduce comparability of the magnitudes of the returns by influencing the demand for the vocational education.

There are fewer studies that considered the returns to various disciplines within vocational secondary education. Dearden et.al. (2002) found that wage premiums are different for the various vocational qualifications in UK. Moreover, the premium to the same qualification differed for males and females. The qualifications with the highest premium for males included ONC/OND, HNC/HND and higher levels of City and Guilds, at around 7-16%. ONC/OND is the "Ordinary" National Certificate/Diploma, which encompasses the qualifications in office skills, building techniques, hairdressing and catering. "Higher" National Certificate/Diploma (HNC/HND) envisages the qualifications in engineering, accounting, and business (Dearden et.al. 2002). City and Guilds offer craft, technician, finance and accounting qualifications (City and Guilds Centre for Skills Development 2014). In contrast, males with the lower levels of the NVQ qualifications do not receive any wage premium. On the other hand, the females received the highest benefits of obtaining teaching and nursing qualifications, 17-23% and 32%, respectively. No wage premium was estimated for the females with the higher levels of City and Guilds qualification. This study controlled for the age, ethnicity, region, and employer characteristics. The richness of one of the dataset allowed authors also to control for the ability bias by including the test scores and a number of school and family background variables. [11] The upward ability bias was particularly noticeable for the vocational qualifications. At the same time, the authors estimated that the measurement error [12] has a downward pull and offsets the ability bias. Thus, the authors suggested that the estimates of the ordinary OLS with no controls of the ability bias and measurement error provide reasonable estimates. This finding was used by Mcintosh (2006) in a more recent UK study, where he employed ordinary OLS estimation[13] and obtained similar wage returns to the vocational qualifications using 1996-2002 data. Additionally, the author found that the vocational qualifications provide similar returns

[11]School and family background variables used in the study are type of school, parents' involvement in child's education, parents' education and father's social class.

[12]The authors use the general question in the 1991 survey about the highest qualification received as an instrument for the detailed questions in the 1981 and 1991 on the received education and training.

[13]The author used age and age$^2$, ethnicity and region as controls in the estimation.

during the lifetime of the individual, while the returns to the general qualifications initially increase and stabilize after person reaches middle age.

Whereas no research was made of returns to various disciplines within vocational secondary education in Turkey, there are a number of studies that estimated returns to years of schooling and schooling levels. Salehi-Isfahani et al. (2009) found 12.4% private wage return per year of schooling in Turkey, using standard Mincer equation with 2003 Household Budget Survey,1994 Household Income and Consumption Expenditures Survey, 1988 Household Labor Force Survey data. When the assumption of linear annual returns to schooling was dropped, the wage returns proved to be increasing with schooling levels, which is in contrast with the world trends of falling returns captured by Psacharopoulos and Patrinos (2004). [14] Salehi-Isfahani et al. (2009) also estimated the wage returns to the schooling levels, including 95.8% and 86.1% for the vocational and general secondary education[15] by adding a dummy variable for the levels to the Mincer equation. The reference category included the individuals with less than primary education level. This study does not control for ability. The sample utilized in the Salehi-Isfahani et al. (2009) study consisted of urban males aged 20-54, who were engaged in full-time wage employment. In Turkey, males have higher rates of labor force participation compared to females. Therefore, the authors suggested that limiting sample to males reduces selection into wage employment bias in the estimation. [16] Restricting the observations to the full-time workers was aimed to control for the measurement error in reporting actual working hours, which leads to inaccurate hourly wages used as a dependent variable. [17] In general, the random measurement error in the

[14]This is expected if the return to a later schooling year is higher if the individual also uses knowledge gained during earlier years. However, the authors also suggest that increasing returns may reflect the rigid public sector pay structure in Turkey that assigns wage levels in accordance with the schooling degrees. General government employees in Turkey constitute more than 10% of labor force and the size of public wage bill is 8% of GDP (World Bank 2014). In this particular characteristic it is similar to a transitional country, where the public sector is also large. In fact, Pastore and Verashchagina (2004) also suggest for the transitional Belarus, increasing returns for schooling may be explained by the fact that state establishes wage rates based on the obtained degree/diploma, rather than based on the productivity.

[15]Large magnitudes of the estimates are possibly due to the simplicity of the standard Mincer equation used. The equation did not include any controls for the region, firm size, public ownership and sector characteristics.

[16]The authors further restricted the sample to urban workers to compare estimations for Turkey with two other countries reviewed in the study (Iran and Egypt).

[17]Hourly wages are calculated by dividing monthly or weekly wages by working hours reported by the individual. If working hours are understated, the resulting hourly wages are overestimated. The best example is teachers, who erroneously may report only class hours. The alternative is to use monthly wages as a dependent variable. However, one should be careful for the "labor supply" effect. It arises when the monthly earnings of one individual may vary merely because she worked more hours during the month (Moenjak and Worswick 2001). Previous studies utilized both hourly (Salehi- Isfahani et al. 2009, Tansel 2010, Oosterbeek and Webbink 2006, El-

dependent variable is not a major concern as it does not bias the estimates. It only increases the unexplained part of the regression, i.e. error term. The resulting estimates will become less precise, as standard errors will increase. However, it is likely that for the particular disciplines of vocational high school, the measurement errors of hours worked may be non-random. For instance, for education and arts discipline, the graduates may only report the hours spent in the kindergarten class or art studio, but do not include the hours spent preparing for the lesson or working at home. In this case the measurement error is not random and is correlated with the discipline, thus, potentially biasing the estimated return.

Similarly, Tansel (2010) estimated the wage premiums per schooling year and schooling levels, but her study also covers female wage earners in Turkey. One more distinction of the study is that it provided estimates corrected for selection into wage earners by using Heckman two-step selection model. The selection bias may arise if surveyed sub-sample differs in some unobservable way from other observations in the random sample. Vella (1998) describes selection bias as caused by when decision to work is influenced by the unobservable characteristics, which also affect the wages. Therefore, the working sub-sample is not characterized by the same average unobservable characteristics as not working sample. As a result, estimates obtained based on this non-random sample are not applicable for the entire population. The selection bias is particularly relevant to females due to their low labor participation. Schultz (1993) summarizes several studies, which provide mixed results on the direction of selection bias. Thus, Griffin (1987) estimated that the returns to education are higher for females after the selection bias is addressed for data in Philippines. The study by King (1990) found that the female returns to secondary school decrease from 8 % to 7.8% in Peru, while Khandker (1989) obtained opposite results using the same data. In case of Turkey, Tansel (2010) found that the estimates for returns per schooling year using Heckman two-step method are higher relative to the OLS estimates, especially for females. This difference is the most evident for females in 1994 (48% vs. 18%), while in 2005 the distinction is much smaller but still present (16% vs. 12%). For males the Heckman two-step and OLS estimates are very similar (10.27% vs. 10.07% in 2005). Similarly to Isfahani et.al. (2009), this study also found increasing returns to the

Hamidi 1998, Glockher and Storck 2012, Mcintosh 2006, Sakellariou 2006, Arrazola and De Hevia) and monthly earnings (Kahyarara and Teal 2008, Pastore and Verashchagina 2004, Pastore 2010) as a dependent variable.

schooling levels in Turkey [18] with the returns of the vocational high school exceeding those of general high school. For female high school graduates Heckman and OLS estimates are 25 % - 21% compared to 50 % -41% for vocational high school graduates.

Tansel and Bircan (2010) went further and estimated returns to education at the different points of the wage distribution for male wage earners at all schooling levels. Indeed, the authors found that while OLS estimate for vocational high school graduates was around 57 % in 2002, the lowest quintile received 50% and the highest q90 quintile earned 80%. Therefore, the q90-q10 differential was equal to 30, showing that OLS estimate conceals significant wage inequality among the vocational high school graduates. The authors deferred the investigation of the reasons behind the wage heterogeneity for the future studies. [19]

[18]The highest returns were estimated at the university level. As the entrance to the universities in Turkey is very competitive, the author suggests that the returns reflect ability bias, which was not controlled for in this study.

[19]For the university level explanations proposed by the authors include diverse returns to the majors and increased number of lower ability graduates. Labor market mismatches, varied school quality, over education are suggested reasons for the wage inequality for other schooling levels.

## Chapter 4

## DATA AND DESCRIPTIVE STATISTICS

### 4.1. Data

The data for this study is taken from the Household Labor Force Surveys (LFS), conducted by Turkish Statistical Institute. The LFS data contains a number of variables, including education level, age, gender, employment status and wage. I use the data for 2004-2011, which gives 1,925,834 of all individuals, aged 25-64. The LFS data contains variable on the highest level of education successfully completed. Out of 299,515 high school graduates, where 135,630 are vocational high school graduates (65% males and 35% females) and 163,885 are general high school graduates (59% males and 41% females). The observations in the data are classified by the labor force participation status into "employed", "unemployed" and "not in labor force" categories. Employed individuals are further categorized as "wage earner", "employer", "self employed", and "unpaid family worker". The employed individuals are also assigned to 9 major groups in accordance with the International Standard Classification of Occupations (ISCO-88). I rearrange them into 4 groups by merging some of the categories. "Professional" level includes chief executive, operations or finance managers of enterprises and professionals such as engineers, doctors, teachers and accountants. "Associate" level is comprised of engineering technicians, medical assistants, estate and travel agents. Secretaries, finance and sales clerks, child care and restaurant services workers make up "Sales/clerical" level. "Worker" level includes skilled agricultural (crop growers, livestock producers), craft (builders, electrical mechanics), machine operators and elementary occupations (street vendors, cleaners).

Starting from 2009, the respondents with the vocational high school and college were also asked to indicate the discipline studied. Overall, the LFS classifies the disciplines into 21 groups, which correspond to the two-digit narrow fields under Fields of Education and Training (FOET) (Andersson and Olsson 1999). For the purpose of the current study, I rearrange them into 8 groups in accordance with the broad FOET categories[20](Table 1). This division results in large sub-samples (except for "Agriculture and Veterinary").

**Table 1:** Mapping of FOET broad fields and LFS classification of disciplines

| **Broad fields under FOET classification** | **Educational fields in the LFS** | **Total number** |
|---|---|---|
| 1- Education (Ed) | 1-Teacher training and education science | 1.948 |
| 2- Humanities and Arts (Arts) | 2-Arts, 3-Humanities | 10.251 |
| 3- Social sciences, Business and Law (SBL) | 4-Social and behavioural science;<br>5-Journalism and information;<br>6-Business and administration;<br>7-Law | 13.716 |
| 4- Science, Mathematics and Computing (SMC) | 8-Life science;<br>9-Physical science;<br>10-Mathematics and statistics;<br>11-Computing | 702 |
| 5- Engineering, Manufacturing and Construction (Eng) | 12-Engineering and engineering trades;<br>13-Manufacturing and processing;<br>14-Architecture and building | 25.346 |
| 6- Agriculture and Veterinary (Ag_Vet) | 15-Agriculture, forestry and fishery;<br>16-Veterinary | 315 |
| 7- Health and Welfare (Health) | 17-Health;<br>18-Social services | 3.786 |
| 8 – Services | 19-Personal services;<br>20-Transport services and environmental protection;<br>21-Security services | 1.817 |
| **Total** | | **57.881** |

Overall sample of vocational high school graduates is further restricted prior the estimation of the wage premium for the particular discipline. First, the sample consists of employed wage earners for whom the LFS has observations on monthly earnings and excludes employers and self-employed individuals. As a result of this restriction, the resulting estimates will be biased if the excluded individuals vary in some unobservable way from the wage earners. The hourly wage is obtained by dividing monthly salary by

[20]Overall, the FOET classification has 25 two-digit narrow fields, which are assigned into 9 broad categories. The FOET narrow fields are identical to two-digit fields of education under ISCED 97. The LFS excludes 3 narrow fields under the "General Programmes" broad field, which encompass general secondary education programs, literacy/numeracy courses for illiterate adults, and personal skills trainings.

4.3 and regular hours worked per week. The hourly wage is further deflated using annual aggregate price index. Second, only full time employment sample is considered, which includes individuals, who reported positive earnings and working 34-85 hours per week in non-agriculture sectors. This is done to remove the effect of possible measurement error due to the underreporting or overreporting of the regular working hours by the surveyed individuals.[21] The resulting sample consists of 25,285 observations.

## 4.2. Labor Market Characteristics in 2004-2011

When the comparison of labor market characteristics of high school graduates and the graduates at other educational levels is made we could see that on average high school graduates are the youngest (Table 2).This may point to the fact that the enrollment to the secondary high schools increased only in recent years in Turkey. [22]Same tendency is observed when the working sample is considered separately. The gender proportion at the high school level is close to college and primary levels when entire sample is considered. At the same time, high school level has higher proportion of males compared to lower education levels (except for primary). This shows that large portion of females do not obtain formal education or do not proceed further than junior primary school. When the working sample is examined even higher proportion of high school graduates are males (83%), which is much higher compared to all other educational levels except for the primary high school graduates (89%). This fact proves that accounting for selection bias is particularly important when estimating the returns at the high school level. When whole sample is examined, the high school graduates are more likely to live in the urban areas (84%) compared to other educational levels except for the college level. Interestingly, this difference between the high school and lower education levels is much more drastic for the employed sample. Therefore, it means that while both working and not working high school graduates are mostly urban, the

[21]Generally,we could suggest that the measurement error tends to take place among individuals, reporting less than 35 working hours per week. Analysis of LFS data shows that while average of 4% of vocational high school graduates report less than 35 working hours, the percentage is higher for Ed (8%), Arts (7%), Services (7%) and Health (6%) disciplines, suggesting possible nonrandom nature of the error for these disciplines. Reducing the sample to control for this error will not result in large decrease of the number of observations, as the percentage of general and vocational high school graduates reporting less than 35 hours constitute 6% and 5 %, respectively.

[22]Net enrollment rate for secondary education in Turkey increased from 57% in 1999 to 76 % in 2009, and to 85% in 2011 ( World Bank 2015).

**Table 2:** Descriptive statistics by earned latest degree

| Education level | ALL | | | | | |
|---|---|---|---|---|---|---|
| | Sample size (%) | Age (mean) | Male % | Female % | Marital status (mean) | Location (mean urban=1) |
| Less than junior primary | 16 | 47,60 | 20 | 80 | 0,83 | 0,56 |
| Junior primary | 49 | 42,04 | 48 | 52 | 0,91 | 0,66 |
| Primary | 9 | 39,44 | 66 | 34 | 0,86 | 0,77 |
| Highschool | 16 | 37,54 | 62 | 38 | 0,80 | 0,84 |
| College | 10 | 38,70 | 61 | 39 | 0,74 | 0,89 |
| | Not working = unemployed+not in LF | | | | | |
| Less than junior primary | 23 | 47,56 | 12 | 88 | 0,81 | 0,66 |
| Junior primary | 52 | 42,87 | 25 | 75 | 0,89 | 0,75 |
| Primary | 8 | 41,51 | 37 | 63 | 0,84 | 0,84 |
| Highschool | 12 | 39.43 | 31 | 69 | 0,79 | 0,88 |
| College | 5 | 42.71 | 44 | 56 | 0,69 | 0,91 |
| | Working | | | | | |
| Less than junior primary | 9 | 47,70 | 40 | 60 | 0,89 | 0,32 |
| Junior primary | 46 | 41,07 | 75 | 25 | 0,92 | 0,55 |
| Primary | 11 | 37,88 | 89 | 11 | 0,87 | 0,72 |
| Highschool | 19 | 36,28 | 83 | 17 | 0,81 | 0,81 |
| College | 15 | 37,33 | 67 | 33 | 0,75 | 0,89 |

employed graduates at lower education levels are much less likely to reside in urban areas. It might be the case that urban job market requires skills of primary school and higher.

**Table 3:** Labor force participation by earned latest degree[23]

| Education level | All (%) | | | Males (%) | | | Females (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| | empl | unempl | not LF | empl | unempl | not LF | empl | unempl | not LF |
| Less than j.primary | 28 | 7 | 70 | 56 | 13 | 36 | 21 | 3 | 79 |
| Junior primary | 46 | 9 | 49 | 72 | 10 | 20 | 22 | 7 | 76 |
| Primary | 57 | 10 | 37 | 76 | 9 | 16 | 19 | 16 | 77 |
| Highschool | 60 | 10 | 34 | 80 | 8 | 13 | 27 | 18 | 67 |
| College | 75 | 7 | 20 | 82 | 6 | 13 | 63 | 10 | 30 |

[23] In this and consequent tables, the percentages of observations that are employed, unemployed and not in labor force add up to the figure higher than 100%. The reason is that different denominators were used in the formulas. The unemployed percentage was calculated using Labor Force= Employed+Unemployed as a denominator. At the same time, Working Age Population = Employed +Unemployed+ Not in Labor Force was utilized as a denominator for calculation of employed and not in LF shares.

Table 3 illustrates that being a high school graduate gives better perspectives in terms of being employed and labor force participation compared to lower education levels. For the less than junior primary high school and junior primary school levels, this could be explained by higher proportions of females, who have lower labor force participation. When male sample is considered independently, the same tendency is observed but the differences between the levels are much lower, thus, this trend is mainly caused by females in the sample. When only female sample is reviewed, the employment and labor force participation is lower compared to males, and the employment and labor force participation of high school graduates is similar to the lower levels. Moreover, for females the difference between the high school and college graduates is quite large (for instance, percentage employed - 27% vs. 63%). This shows that college education significantly increases the chances of female to be employed and participate in the labor force.

**Table 4:** Employment status by earned latest degree

| | All (%) | | | | Males (%) | | | | Females (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Education level** | **Wage earn** | **Empl** | **Self empl** | **Unp. Fam. w** | **Wage earn** | **Empl** | **Self empl** | **Unp. Fam. w** | **Wage earn** | **Empl** | **Self empl** | **Unp. Fam. w** |
| Less than j.primary | 23 | 1 | 36 | 40 | 38 | 2 | 57 | 3 | 13 | 0 | 22 | 65 |
| Junior primary | 46 | 5 | 33 | 15 | 51 | 7 | 39 | 3 | 28 | 1 | 18 | 53 |
| Primary | 62 | 9 | 24 | 6 | 63 | 9 | 25 | 3 | 58 | 3 | 16 | 23 |
| Highschool | 73 | 8 | 15 | 4 | 71 | 9 | 17 | 3 | 79 | 3 | 8 | 10 |
| College | 86 | 7 | 6 | 1 | 82 | 10 | 7 | 1 | 93 | 3 | 3 | 1 |

For the entire sample, high school graduate has lower probability of being unpaid family worker and self-employed and higher chance of being wage earner (Table 4). This tendency is even more profound for the female sample, where 79% of female high school graduates are wage earners and 8% are self-employed. Therefore, it might be important to account for selection into wage earner when estimating the returns to high school education.

Table 5 illustrates that for wage earners sample, high school graduates have a higher proportion occupying “Professional”, “Associate” and “Sales/clerk” positions compared to lower educational levels. For the “Professional” level, the percentage is however more than 6 times lower than that for the college graduates. At the same time,

while the large proportion of high school graduates are occupied at "Worker" level, this proportion is considerably lower than preceding educational levels. Therefore, it could

**Table 5:** Occupational classification by earned latest degree (wage earners).

| Education level | All (%) | | | | Males (%) | | | | Females (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prof | Assoc | Sales/clerk | Worker | Prof | Assoc | Sales/clerk | Worker | Prof | Assoc | Sales/clerk | Worker |
| Less than j.primary | 1 | 1 | 13 | 85 | 1 | 1 | 13 | 85 | 0,2 | 0,9 | 13 | 86 |
| Junior primary | 2 | 3 | 16 | 79 | 2 | 3 | 15 | 80 | 0,5 | 3 | 22 | 75 |
| Primary | 3 | 6 | 26 | 65 | 3 | 6 | 25 | 66 | 2 | 7 | 36 | 55 |
| Highschool | 9 | 16 | 39 | 36 | 9 | 15 | 36 | 40 | 7 | 23 | 53 | 17 |
| College | 60 | 17 | 20 | 4 | 60 | 15 | 20 | 5 | 60 | 20 | 19 | 1 |

be inferred that high school provides knowledge and skills, which enable graduates to be employed at higher than "Worker" level. Whereas the females exhibit similar trend, they seem to benefit even more from high school education compared to males, as the percentage at "Worker" level is two times lower and majority are occupied at "Sales/clerk" and "Associate" levels.

**Table 6:** Average real log wages by occupational classification and earned latest degree (wage earners).

| Education level | All (%) | | | | |
|---|---|---|---|---|---|
| | Prof | Assoc | Sales/clerk | Worker | Total |
| Less than j. primary | 0,54 | 0,87 | 0,60 | 0,56 | 0,56 |
| Junior primary | 0,74 | 1,12 | 0,80 | 0,87 | 0,86 |
| Primary | 1,16 | 1,27 | 1,03 | 1,04 | 1,06 |
| Highschool | 1,60 | 1,54 | 1,26 | 1,16 | 1,30 |
| College | 2,13 | 1,84 | 1,67 | 1,35 | 1,96 |

Expectedly, the average wage for the given occupational level tends to rise with the educational degrees, reflecting the returns to additional years of education (Table 6). Thus, the high school graduate at all occupational positions receive higher average wage than the junior primary or primary school graduate. Moreover, within the high school educational level, the average wage is the highest for the "Professional" and the lowest for the "Worker" positions. Interestingly, this is not the case for the two lowest educational levels (less than junior primary and junior primary), as the average wage for

"Professional" level is the lowest compared to all other occupations. Also, primary education graduates at "Professional" level seem to receive average wage, which is lower than that of the "Associate" level.

**Table 7:** Average real log wages by occupational classification and earned latest degree, by gender (wage earners)

| | Males (%) | | | | | Females (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Education level** | **Prof** | **Assoc** | **Sales/ clerk** | **Worker** | **Total** | **Prof** | **Assoc** | **Sales/ clerk** | **Worker** | **Total** |
| Less than j. primary | 0,49 | 1,05 | 0,63 | 0,63 | 0,63 | 1,14 | 0,64 | 0,53 | 0,39 | 0,41 |
| Junior primary | 0,73 | 1,17 | 0,83 | 0,91 | 0,90 | 0,94 | 0,88 | 0,68 | 0,62 | 0,65 |
| Primary | 1,15 | 1,30 | 1,06 | 1,07 | 1,08 | 1,27 | 1,07 | 0,89 | 0,80 | 0,86 |
| Highschool | 1,62 | 1,55 | 1,28 | 1,18 | 1,31 | 1,47 | 1,52 | 1,19 | 0,88 | 1,23 |
| College | 2,15 | 1,84 | 1,72 | 1,37 | 1,98 | 2,10 | 1,84 | 1,58 | 1,16 | 1,94 |

From Table 7, it is evident that this rather surprising result obtained above is due to male wage earners. A possible explanation is that the percentage of graduates occupying "Professional" level is rather small at the two lowest educational levels -1 and 2% respectively, which might led to some degree of measurement error.

**Table 8:** Descriptive statistics for high school graduates.

| **Education level** | **ALL** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Sample size** | **Age (mean)** | **Male %** | **Female %** | **Potential experience** | **Marital status (mean)** | **Location (mean urban= 1)** |
| General high school | 163.885 | 37,62 | 59 | 41 | 20,62 | 0,79 | 0,83 |
| Vocational high school | 135.630 | 37,45 | 65 | 35 | 20,45 | 0,83 | 0,84 |
| | **Not working = unemployed+not in LF** | | | | | | |
| General high school | 70.286 | 38,87 | 29 | 71 | 21,87 | 0,77 | 0,87 |
| Vocational high school | 50.082 | 40,20 | 33 | 67 | 23,2 | 0,83 | 0,89 |
| | **Working** | | | | | | |
| General high school | 93.599 | 36,68 | 82 | 18 | 19,68 | 0,80 | 0,81 |
| Vocational high school | 85.548 | 35,84 | 84 | 16 | 18,84 | 0,83 | 0,81 |

Table 8 shows that on average the vocational high school graduates are younger, which is also true for the working sample. The potential experience exhibits similar trends, as it was calculated by subtracting years of schooling and 6 (primary school starting age in Turkey) from the age of the individual. Thus, the fact that in a working

sample the vocational high school graduates tend to be younger and subsequently less experienced might be a sign that recent vocational high school graduates are more demanded and tend to be employed despite possessing lower experience. The vocational high school graduates on average are more likely to be married, and this tendency is also true for not working sample. It is likely that despite being younger on average vocational high school graduates are willing to be married and accept additional responsibilities because of feeling more secure regarding employment opportunities. Both vocational and high school graduates tend to reside in the urban areas.

**Table 9**: Labor force participation for high school graduates

| Education level | % empl (ALL) | % unempl (ALL) | % not LF (ALL) | % empl (males) | % unempl (males) | % not LF (males) | % empl (females) | % unempl (females) | % not LF (females) |
|---|---|---|---|---|---|---|---|---|---|
| General high school | 57 | 10 | 36 | 79 | 8 | 14 | 26 | 19 | 69 |
| Vocat. high school | 63 | 9 | 31 | 81 | 7 | 13 | 29 | 17 | 65 |

Table 9 illustrates that vocational high school graduates tend to have higher employment and labor force participation rates compared to the high school graduates. This may be in part due to the higher proportion of males that are in general more likely to be employed and participate in the labor force in Turkey. However, when we review only male samples of general and vocational high school graduates, the vocational high school graduates still have better perspectives in terms of employment and labor force participation. Thus, the comparative advantage of vocational high school graduates over general ones is not solely due to the different proportions of gender within these educational levels.

**Table 10:** Employment status for high school graduates

| | All (%) | | | | Males (%) | | | | Females (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Education level | Wage earn | Empl | Self empl | Unp. Fam. w | Wage earn | Empl | Self empl | Unp. Fam. w | Wage earn | Empl | Self empl | Unp. Fam. w |
| General high school | 70 | 9 | 16 | 5 | 68 | 10 | 18 | 3 | 77 | 3 | 8 | 12 |
| Vocational high school | 76 | 7 | 14 | 4 | 75 | 8 | 15 | 3 | 81 | 2 | 8 | 9 |

Moreover, the vocational high school graduates are more likely to be wage earners, and less likely employers, self-employed compared to high school graduates,

thus, it might important to account for the selection into wage employment (Table 10). For the female sample, the vocational high school graduates are more likely to be wage earners and less likely to be unpaid family workers.

For the entire wage earner sample, on average vocational high school graduates are more likely employed at the "Associate" and "Worker" levels, and less likely at "Sales/clerk" levels compared to the general high school graduates (Table 11). It may partially be due to the fact that "Sales/clerk" levels require more general skills, while the other two levels require vocational ones. However, female vocational high school graduates are slightly less likely to be employed at "Worker" level. A probable explanation is that due to higher unemployment among female general high school graduates, they are more likely to accept "Worker" position. [24]

**Table 11:** Occupational classification for high school graduates (wage earners)

| | All (%) | | | | Males (%) | | | | Females (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Education level** | **Prof** | **Assoc** | **Sales/ clerk** | **Worker** | **Prof** | **Assoc** | **Sales/ clerk** | **Worker** | **Prof** | **Assoc** | **Sales/ clerk** | **Worker** |
| General high school | 9 | 13 | 47 | 32 | 9 | 12 | 43 | 35 | 7 | 15 | 61 | 18 |
| Vocat. high school | 9 | 20 | 31 | 40 | 9 | 17 | 29 | 45 | 7 | 33 | 44 | 16 |

**Table 12:** Average real log wages for high school graduates (wage earners)

| | All | | | | |
|---|---|---|---|---|---|
| **Education level** | **Prof** | **Assoc** | **Sales/clerk** | **Worker** | **Total** |
| General high school | 1.61 | 1.46 | 1.27 | 1.09 | 1.27 |
| Vocational high school | 1.58 | 1.60 | 1.24 | 1.20 | 1.33 |

Interestingly, for the wage earners sample, vocational high school graduates at the "Associate" and "Worker" levels are better off in terms of average wages than the general high school graduates occupying similar positions (Table 12).This may be an additional confirmation of the previous suggestion that these positions require vocational skills, thus, the individuals with suitable skills that are rewarded at a higher

[24]More specifically, it is probable that they were to a greater extent willing to accept "Unskilled worker" position, which makes up 47% of all general high school graduates "Worker" sample ( this percentage is 42% for the vocational high school graduates).

rate. Similarly, general high school graduates at "Professional" and "Sales/clerk" levels have higher wages compared to vocational high school graduates.

**Table 13:** Average real log wages for general and vocational high school graduates, by gender (wage earners)

| | Males | | | | | Females | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Education level** | **Prof** | **Assoc** | **Sales/clerk** | **Worker** | **Total** | **Prof** | **Assoc** | **Sales/clerk** | **Worker** | **Total** |
| General high school | 1.62 | 1.48 | 1.30 | 1.12 | 1.29 | 1.52 | 1.39 | 1.19 | 0.89 | 1.19 |
| Vocational high school | 1.61 | 1.60 | 1.25 | 1.23 | 1.33 | 1.42 | 1.59 | 1.20 | 0.88 | 1.29 |

For the female sample, while the same applies to "Professional" and "Associate" levels, the wage gap is larger (Table 13). However, the opposite tendency compared to overall and male sample is observed for two remaining positions. Female vocational high school graduates at "Sales/clerk" enjoy slightly higher wages and "Workers" receive lower wages. Importantly, on average for the entire sample of high school graduates, and both for female and male samples separately, the average wage for vocational high school graduates is higher than that of general high school graduates

### 4.3. Trend in the Vocational High School Premium 2004-2011

Figure 1 shows that while the wage premium, i.e. the difference between the log hourly wages earned by the vocational graduates and general high school graduates, is positive during the entire period, it decreased after 2005. The drop in the premium could be due to the increase in the supply of the vocational graduates relative to the supply of the general high school graduates. Indeed, the relative ratio of vocational and general high school graduates in total degrees earned and the wage employment substantially increased until 2007 and remained at roughly the same level until 2011 (Figure 2). As the fall in the wage premium continued after 2007, the change of the overall supply of vocational high school graduates and of those graduates in the wage employment, perhaps is not the only factor causing this trend.

Another possible factor in the decreased premium is the change in the shares by the professional levels of the general and vocational high school graduates, as each professional level has different average wage. At the "Professional" level, the relative

**Figure 1:** The vocational high school wage premium (%)

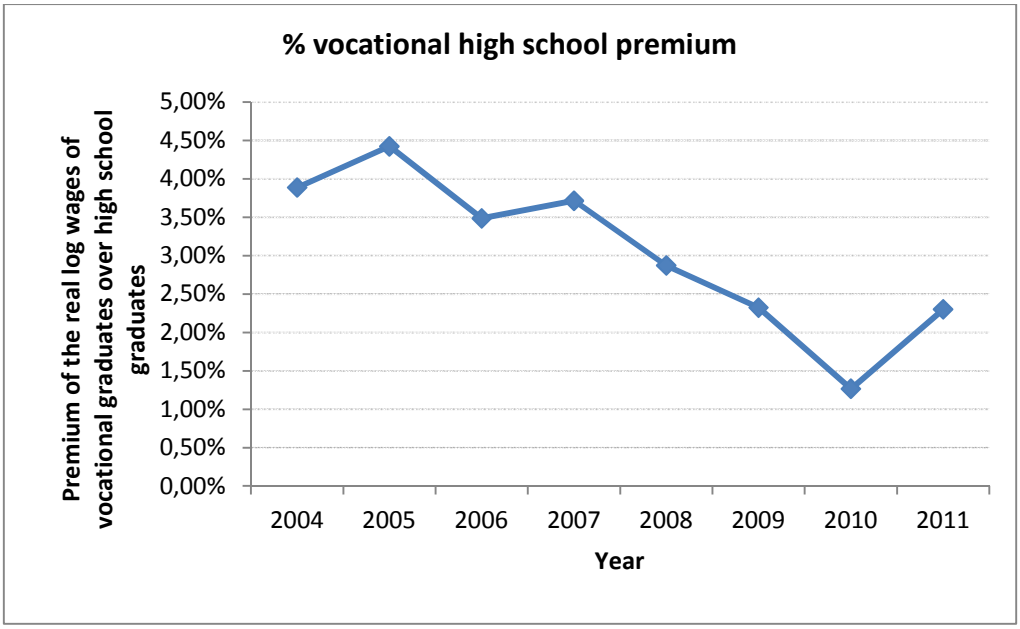
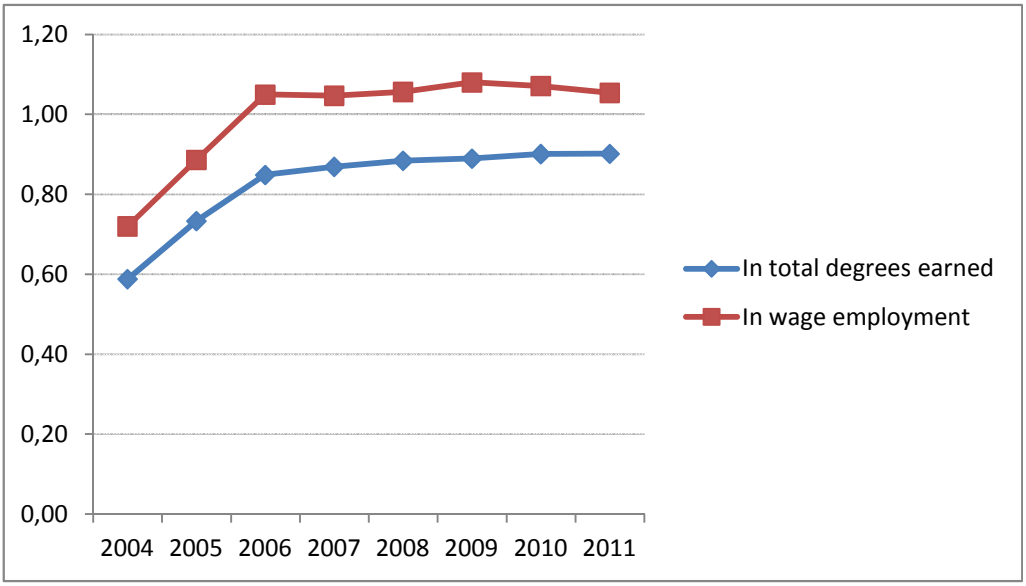
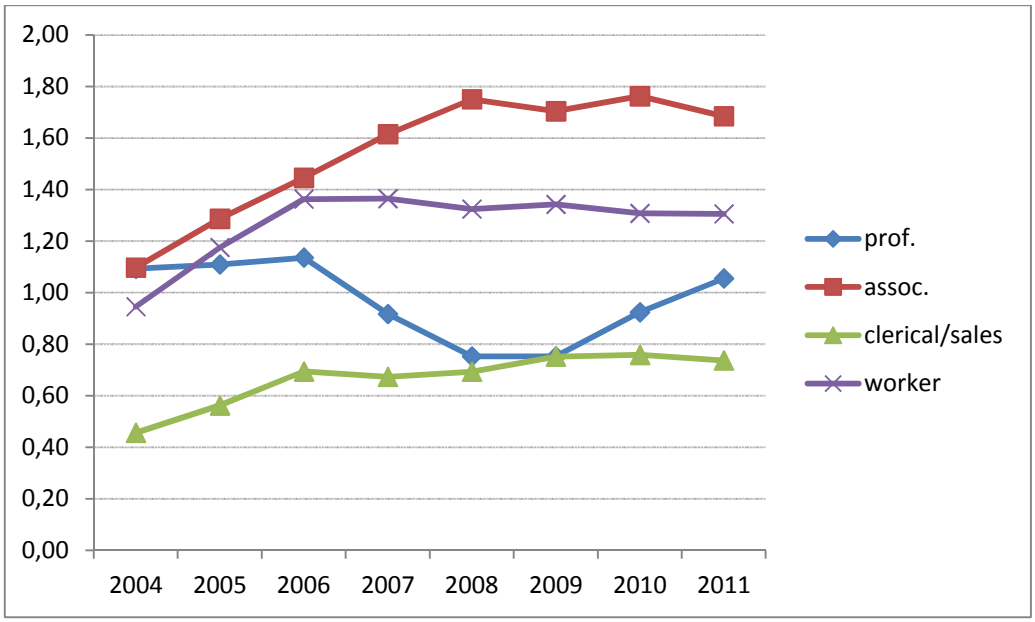



**Figure 2:** Relative ratio of the vocational and general high school graduates




ratio increased in 2006, indicating that relatively higher share of the vocational graduates started to be employed at this level (Figure 3). However, starting from 2006 the relative share started to decrease, which may have contributed to the lowered average wage premium, as the individuals employed at the "Professional" level are expected to have the highest wages. After 2008, the relative ratio started to increase and reached the initial level in 2011. The relative ratio at the "Associate" level also increased till 2008, then decreased in 2009, then increased and decreased afterwards but remained higher than 2004 level. Thus, the overall effect was likely to increase the

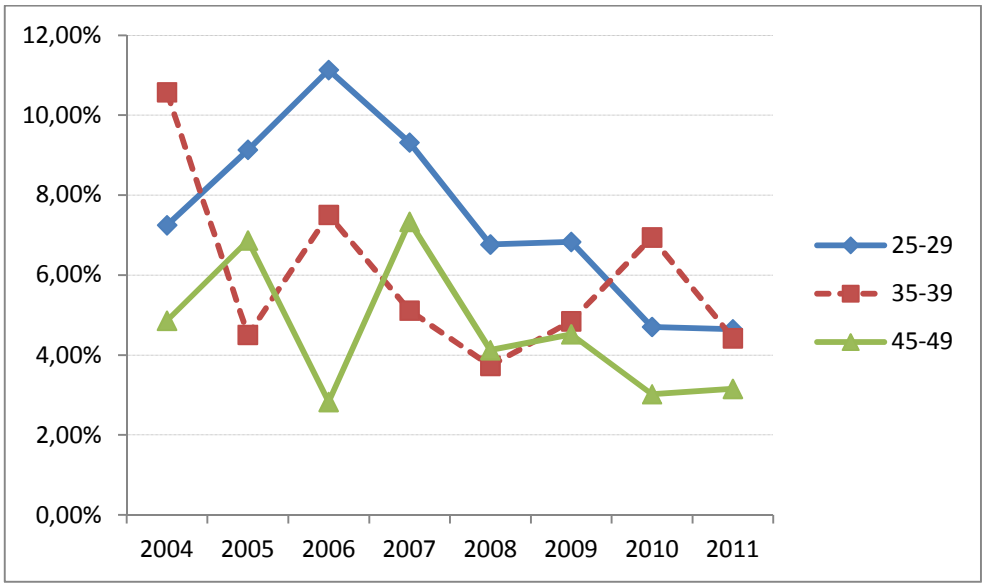
**Figure 3:** Relative ratios of professional level composition of vocational vs. general high school graduates in the wage employment.




wage premium of the vocational high school graduates. At the "Sales/clerical" and "Worker" levels relative ratio increased during the period. While former was likely to have positive effect, the latter should have decreased the average wage premium, as individuals at the "Workers" level tend to receive the lowest wages. Therefore, the changes in the relative composition show mixed tendencies, and it is challenging to say whether they were the reasons behind decreased wage premium of vocational high school graduates.

The overall wage premium could also mask diverse character of premiums for different age groups. Figure 4 illustrates that while for all age groups the wage premium is declining, the magnitudes are different. Indeed, for the period of 2005-2009, the premium of the younger graduates exceeded those of two other groups, which resulted in the largest average premium for the 2004-2011 period – 9.18%. This could signify that younger vocational high school graduates have better skills and are rewarded higher compared to general high school graduates of similar age, despite being the least experienced among all three groups. One more reason could be the change of the production structure in the reviewed period, which led to larger need of vocational skills compared to general qualifications. Izak and Bakis (2013) note higher share of

**Figure 4:** Vocational high school premium by age groups




manufacturing sector in the GDP during the period. Thus, we could assume that this involved increased demand of the vocational skills and raised premium for younger workers that possess up-to-date vocational skills (for instance, graduates of engineering, manufacturing and construction disciplines).

However, in 2010 and 2011 the younger group premium is declining and falls lower than that of middle age group. This is at odds with the expected effect of the change in the regulation in 2001, aimed at matching vocational education curriculum with labor market demands, as younger group includes graduates of 2003 and following years, who were expected to benefit from the reform. A probable explanation is that the graduates affected by the regulation constitute only small portion of my sample, thus, do not affect the average premium for the group. Consequently, in order to identify the actual effect, I compare the returns of 25 and 27-year-old vocational high school graduates from 2011 sample. [25] [26] Table 14 shows that more recent graduate faces higher

[25] Normally, we could assume that individuals graduate from vocational high school when they are 17 years old. Therefore, 25 year old graduate in 2011, studied three years of vocational high school in 2001-2003, thus, assumed to have benefited from the change in the regulation. These individuals are compared with 27 year olds, who graduated in 2001 prior the introduction of reform. This is done to minimize the difference in the potential experience in order to make the estimated returns comparable.

[26] I also examined the labor market conditions faced by 18–year-old graduates, who presumably started in vocational high school in 2006-2007 academic year, when the ISCED aligned curriculum was implemented. The comparison of these observations with 20-year-old graduate, however, were in favor of the latter in terms of employment and returns to leadership. As for the average wages, 18-year old graduates have higher wages for "Professional" and " Associate", while for two remaining occupational levels older graduates enjoy higher average earnings. These unimpressive results at least partially might be due to the fact the 18 –year-olds are the new entrants and at the initial entry to the market the first few years could make a great difference in terms of employment and

employment rate and is more likely to be a wage earner. At the same time, recent graduates are more likely to be "Workers", and less likely occupy "Associate" level (Table 15). As for the average wages, recent graduates have lower wages for all

**Table 14:** Labor force participation and employment status (2011)

| Education level | % empl | % unempl | % not LF | % Wage | % Emp | % Self | % Unpaid |
|---|---|---|---|---|---|---|---|
| 25 –year- old voc. grad. | 68 | 11 | 24 | 87 | 2 | 5 | 5 |
| 27- year- old voc. grad. | 66 | 14 | 24 | 83 | 2 | 8 | 6 |

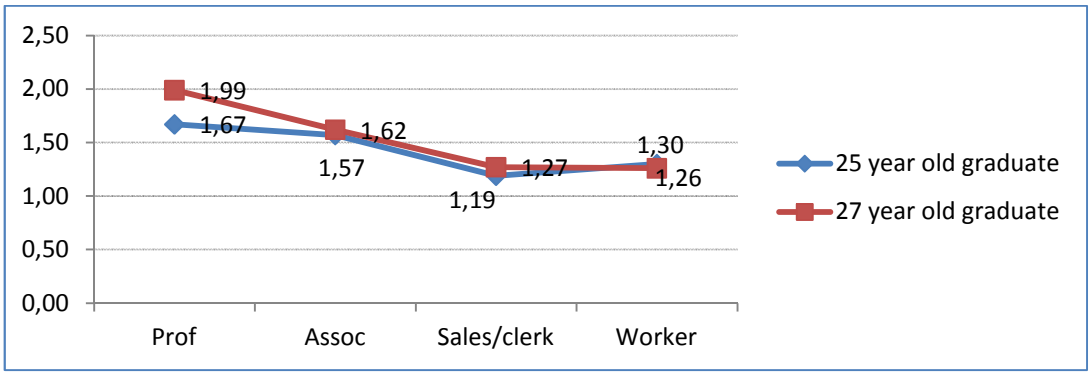
positions, except for workers. For certain part, it might be due to two years difference in experience (Figure 5). To summarize, following the changes in the regulation, recent vocational high school graduate enjoys higher employment, with larger proportion occupying "Worker" position and receiving larger average wage for this level.

**Table 15:** Occupational classification (wage earners, 2011)

| | All (%) | | | |
|---|---|---|---|---|
| Education level | Prof | Assoc | Sales/clerk | Worker |
| 25 year old voc. graduate | 3 | 12 | 38 | 46 |
| 27 year old voc. graduate | 4 | 17 | 39 | 40 |

Toward 2011 the premiums younger and middle age groups converge approximately at 4.5% level, while older graduates receive lower premium of 3.15% (Figure 4). The older group of 45-49 aged wage earners is steadily lower than younger group and mostly lower than middle aged group. A probable explanation may be outdated vocational skills of the older group, which are not matching the requirements

**Figure 5**: Average real log wages (wage earners, 2011)




wages. Thus, it will be probably useful to review the returns received by the graduates of new training standards at a later age, when they are 25-30-year-old.

of the current labor market. The wage premium for older group was also less prone to variation throughout the period, which could be explained that the earnings at older age for both vocational and general high school graduates are stable. [27]

### 4.4. 2009-2011 Labor Market Characteristics of Vocational High School Graduates by Disciplines

Before I undertake the analysis of labor market characteristics by vocations, it is essential to consider distribution of female population by vocational discipline. Females possess distinct characteristics as compared to males. In fact, for the overall high school graduates' and the vocational high school graduates' samples, they have lower employment and labor force participation, more likely to be wage earners, and less likely employers or self-employed. Females also tend to work at "Associate" and "Sales/clerk" levels, and less likely to occupy the "Worker" level. Furthermore, for all occupational positions, female vocational high school graduates have lower average wages. Therefore, concentration of female population at one discipline might alter its returns in terms of employment, leadership (professional level) and average wages relative to other disciplines.

**Table 16:** Gender distribution by disciplines (latest degree earned and wage earners)

| Disciplines | Total number (ALL) | Males (%) | Females (%) | Total number (wage earn) | Males (%) | Females (%) |
|---|---|---|---|---|---|---|
| Ed | 1.948 | 2 | 5 | 633 | 2 | 3 |
| Arts | 10.251 | 14 | 24 | 4.042 | 15 | 14 |
| SBL | 13.716 | 19 | 33 | 5.722 | 17 | 38 |
| SMC | 702 | 1 | 1 | 367 | 1 | 2 |
| Eng | 25.346 | 59 | 17 | 14.223 | 60 | 15 |
| Ag/Vet | 315 | 1 | 1 | 127 | 1 | 0 |
| Health | 3.786 | 1 | 15 | 1.637 | 2 | 24 |
| Services | 1.817 | 3 | 4 | 625 | 2 | 4 |
| **Total** | **57.881** | **100** | **100** | **27.376** | **100** | **100** |

[27]This in line with the findings of study by Mcintosh (2006) in UK, reviewed previously in Chapter 3. The author found that the returns to vocational qualifications are similar at all ages and earnings of individuals with general qualifications initially increase and remain at the same level after person reaches middle age.

As shown in Table 16, females concentrate at SBL (33%), Arts (24%), Engineering (17%) and Health (15%) disciplines. Thus, the returns received in terms of employment, leadership, and average wages are anticipated to be influenced by the fact that the largest share of females are choosing these majors. However, it should be emphasized that being the largest sub-samples Engineering, SBL and Arts also embrace the largest portion of male population – 59%, 19% and 14%, respectively. Therefore, I assume that the overall returns of these disciplines will not be affected as much by the fact that they are preferred by females. This is not the case for the Health major though, as only 1 % of males are choosing the discipline, thus, the graduates are predominantly females and the resulting returns will certainly exhibit relevant tendencies.

The review of the sample of vocational graduates shows that the labor market characteristics do vary by the disciplines of the vocational high school [28] (Table 17).

**Table 17:** Labor force participation and employment status (%) by the disciplines

| | **Empl** | **Unemp** | **Not LF** | **Part time** | **Wage** | **Emp** | **Self** | **Unpaid** |
|---|---|---|---|---|---|---|---|---|
| **ALL** | **50** | **10** | **45** | **12** | **58** | **6** | **23** | **13** |
| Vocational graduates | 62 | 10 | 31 | 4 | 76 | 7 | 13 | 4 |
| Ed | 45 | 12 | 49 | 7 | 73 | 7 | 15 | 5 |
| Arts | 55 | 9 | 39 | 6 | 72 | 6 | 16 | 6 |
| SBL | 56 | 12 | 36 | 4 | 74 | 8 | 13 | 4 |
| SMC | 65 | 13 | 25 | 2 | 81 | 6 | 8 | 4 |
| Eng | 73 | 9 | 20 | 3 | 77 | 7 | 13 | 3 |
| Ag_Vet | 48 | 9 | 47 | 1 | 83 | 4 | 9 | 4 |
| Health | 48 | 12 | 45 | 5 | 90 | 2 | 4 | 4 |
| Services | 45 | 12 | 49 | 6 | 76 | 8 | 11 | 4 |

The graduates of Engineering and SMC have the best perspectives for being employed, and the lowest percentage of the graduates not in the labor force. On the other hand, the lowest employment and the labor force participation are present among Ed and Services graduates. Low labor force participation for Ed might be the result of the limited opportunities for the employment. Only the graduates of the four-year vocational education university program are eligible to become vocational high school teachers (European Training Foundation 2002). Therefore, to find other employment opportunities for the graduates of this discipline might be challenging. In our sample, the Services discipline mainly includes the graduates of the personal and security services, 50 % of which are not in the labor force. Possible explanation is that if the

[28] As mentioned in Chapter 4, the LFS variable on the study disciplines is available only starting from 2009, thus, the analysis is limited to three years, i.e. 2009-2011.

graduates face low wage return, decide to drop from the labor market or provide the services at home (for instance, beauty and hair care services).

When the employment status by disciplines is considered, the Health graduates have highest wage earners share, but the lowest employer and self-employed percentages. This may be reflecting that the majority of the Health major graduates are females, working as nurses – 85% within discipline (and 15% of all female graduates), which is significantly higher than the average percentage for all vocational graduates in the sample – 64%.

The graduates of the SBL, Services are on average more likely to be employers. Moreover, significant percentages of Arts, Ed, SBL are self -employed. The sample contains data only on the wage earners. If the employers and self-employed are generally of higher or lower ability than wage earners, the correction for the potential selection bias might be especially important for these disciplines.

The distribution by professional level further proves the varying labor market outcomes faced by the wage earner vocational graduates of different disciplines (Table 18). The most striking result was that 46% of Ed graduates are employed as workers, including 12% engaged in the unskilled labor. The graduates possibly were forced to accept job at a worker position, as the only alternative to the unemployment. Arts graduates with the 37% at the workers level, including 13% occupying unskilled worker position, exhibit similar low returns in terms of leadership. Expectedly, more than half of the Engineering graduates work as workers, with the majority performing skilled manual and machine operation work. Also, the 59% share of the SBL graduates occupying the clerk positions was similarly anticipated. For SBL, a probable explanation is that large portion of the graduates may find work as secretaries and finance clerks. This might also explain the fact that SBL major is preferred by 38% of female vocational high school graduates in the wage employment (Table 16). However, it is worrying that 10 % of Eng and 9 % of SBL graduates are still working as unskilled workers. While the employment level is lower than the average, 73% of Health graduates are employed at the associate level and only 6% as workers. This could signify that the graduates (mostly females) who decided to work found a job at associate level, possibly as nurses or other support staff in the medical institutions. Interestingly, the Services graduates, characterized by low employment and labor force participation, have the highest percentage at professional level compared to the graduates of other

disciplines. However, the estimation is based on a relatively small sub-sample, thus, the magnitude is perhaps overstated.

**Table 18:** Professional level shares (%) by disciplines (wage earners)

| | **Prof.** | **Assoc.** | **Clerk** | **Worker** |
|---|---|---|---|---|
| Ed | 9 | 16 | 29 | 46 |
| Arts | 11 | 17 | 35 | 37 |
| SBL | 6 | 12 | 59 | 23 |
| SMC | 7 | 18 | 48 | 27 |
| Eng | 5 | 17 | 24 | 54 |
| Ag/Vet | 3 | 32 | 29 | 36 |
| Health | 5 | 73 | 16 | 6 |
| Services | 23 | 12 | 46 | 19 |

The varying labor market conditions discussed above are also reflected in the mean wages by the discipline (Table 19). While having lower than average employment and labor force participation, the Health graduates have the highest average wage with the lowest standard deviation. This reflects 73% concentration at the associate level and relatively lower number at a worker's level. For Services, the higher average wage may be the result of the highest concentration at the professional level and clerk positions. The Engineering graduates even though have the highest employment and labor force participation have the mean wage almost equal to the average wage. The Ed and Arts have the lower mean wage along with the general unfavorable labor market conditions.

**Table 19:** Log real wages for the full time vocational graduates by disciplines.

| **Disciplines** | **Mean** | **SD** | **Min** | **Max** |
|---|---|---|---|---|
| Ed | 1,44 | 0,61 | -1,77 | 2,85 |
| Arts | 1,44 | 0,56 | -2,33 | 3,45 |
| SBL | 1,46 | 0,55 | -2,75 | 3,73 |
| SMC | 1,47 | 0,58 | 0,06 | 3,37 |
| Eng | 1,52 | 0,55 | -1,8 | 4,7 |
| Ag_Vet | 1,59 | 0,61 | -0,19 | 2,91 |
| Health | 1,79 | 0,52 | -1,55 | 3,10 |
| Services | 1,68 | 0,66 | -0,27 | 4,07 |
| **Total** | **1,51** | **0,56** | **-2,75** | **4,7** |

## Chapter 5

## ECONOMETRIC MODEL AND RESULTS

First, I plan to estimate average return to schooling, using full time employment sample of wage earners and Mincer equation:

$$\ln W = \beta x + u \quad \textbf{(5.1)}$$

lnW is the logarithm of real hourly wage, x includes personal, workplace and regional characteristics and β is the return to each of explanatory variables. In this model, I'm the most interested in estimating the β on schooling level variable. This is done by adding dummy variables for the junior primary school, general and vocational high school, and college graduates. Primary school graduates are the reference category. x also includes potential work experience, which is calculated by subtracting years of schooling and 6 (primary school starting age in Turkey) from the age of individual. Other variables are gender, marital status, household head, household size, occupation, dummy on whether individual is a state employee, firm size, location (urban, rural) and region. Inclusion of some of the above variables may cause possible endogeneity issues. It might be the case that more able individuals tend to occupy positions at professional level and also tend to be more productive, which pays better. Therefore, the estimated return on professional level control may be to some degree biased because ability is omitted. Quality of school/social environment may also impact the amount of schooling obtained and also influence ability/productivity and thus affect wages. It might be the case that quality of schools is also correlated with the "urban" variable, i.e. there are more quality schools in the urban areas, which also enhances ability/productivity of the individual and affects wages. Thus, estimate on urban variable might be also biased and partly reflect the effect of ability.

The LFS does not contain data on the parent's education and to control for the family background I use average education in the household. Education levels attained

by the parents may reflect the ability and if it is to some extent hereditary, it could also signal the ability of the individual. Moreover, the educated parents create environment, which could also enhance the ability of the individual. Even though we do not have explicit data on the parental education, I use average education in the household as a proxy. u error term contains all unobservable factors, which are affecting the wage. Ability is one of these factors and it is also correlated with the schooling variable, which potentially biases the return. The LFS data does not provide a variable to control for this bias. Therefore, the resulting estimates might be biased. However, as previously was noted the ability bias might be offset by the measurement error, and regular OLS provides accurate estimates.[29]

Finally, the returns to particular discipline are estimated by restricting the sample only to high school graduates and introducing dummy variables for the disciplines. The reference category is "Ed". The "Ed" category was chosen as it has the lowest employment and the labor force participation, as well as the lowest mean wage. Therefore, I expect that the estimated returns will be the lowest for the "Ed" discipline graduates, thus, making it a convenient benchmark for estimation of marginal returns to other disciplines.

Using ordinary least squares (OLS) regression based on the Mincerian equation and LFS data for 2009-2011, the return to the vocational as compared to general high school education was estimated as 3.1 %. The returns to other educational levels are presented in Table 20. Obtained coefficients on controls - potential work experience,

**Table 20**: Returns to educational levels

| **Education level**[1] | **Coefficient** | **(Std. Err.)** |
|---|---|---|
| Junior Primary | -0,121*** | 0,0072 |
| General High School | 0,177*** | 0,004 |
| Vocational High School | 0,208*** | 0,004 |
| College | 0,684*** | 0,0039 |
| Number of observations | 193.620 | |
| $R^2$ | 0,58 | |

[a] Reference category is Primary High School graduates.
[b]For this and following tables *** significant at 1%, ** at 5% and * at 10% levels.

[29] IZA discussion paper by Eichhorst et.al. suggest that vocational education might be a good alternative to accommodate students with low ability or motivation. If this is the case for Turkey, this might lead to downward bias of the estimated returns. Ideally, it would be valuable to compare the test scores of the 9 th graders in the general and vocational high school, as they have the same curriculum in both types of schools. Unfortunately, existing data of the latest 2012 Programme for International Student Assessment (PISA) study, which evaluates the knowledge and skills of 15 year old students around the world, does not contain schooling variable that distinguishes between general and vocational high school.

gender, marital status, dummy on whether individual is a state employee, location (urban, rural), region, household head and size, firm size are summarized in Appendix C.

When I add "average education of the household" control variable for the family background, the estimates of the returns slightly change. The premium to vocational high school increases to 3.2 %. Therefore, the inclusion of this control variable did not result in significant change of premium for vocational high school graduates. The revised estimates for other educational levels are presented in Table 21. The relevant

**Table 21**: Returns to educational levels with family background control

| **Education level** | **Coefficient** | **(Std. Err.)** |
|---|---|---|
| Junior Primary | -0,105*** | 0,003 |
| General High School | 0,159*** | 0,004 |
| Vocational High School | 0,191*** | 0,004 |
| College | 0,621*** | 0,004 |
| Number of observations | 187.176 | |
| $R^2$ | 0,59 | |

estimates of controls are provided in the Appendix C (Attainment 2 column). Interestingly, gender variable estimate increases by 2.2%. It might be the case that the family background upwardly biases the gender variable through its correlation with females. The reason is that the most females in the full-time employed wage earner sample might have better family background that allowed them to get education and find employment. Thus, once the family background is controlled, the gender wage gap increases. Additionally, the introduction of family background variable into the wage equation reduces the urban wage gap, which could reflect the fact that individuals residing in the cities have better family background that translates into higher wages.[30]

**Table 22**: Returns to educational levels with professional level controls

| **Education level** | **Coefficient** | **(Std. Err.)** |
|---|---|---|
| Junior Primary | -0,099*** | 0,003 |
| General High School | 0,14*** | 0,004 |
| Vocational High School | 0,159*** | 0,004 |
| College | 0,474*** | 0,004 |
| Number of observations | 187.176 | |
| $R^2$ | 0,60 | |

[30] In fact, for the full employment wage earner sample, the mean of "average education of the household" variable is higher for females – 8.07 compared to 5.54 for males. Similarly, urban residents also have higher mean of this family background control – 6.26 compared to 4.77 for individuals living in rural areas.

When the professional level controls are introduced, the wage premium of vocational graduates compared to general high school decreases to 1.9% (Table 22). This shows that part of the wage gap can be due to higher concentration of vocational high school graduates at "Associate" level compared to general high school graduates. The fact that general high school graduates have a higher percentage at "Sales/clerical" level may have also contributed to the decreased wage premium. After introduction of the occupation variable controls, the estimate on "state employee" control variable decreases by 2.9%. It is likely that public employment provides benefits in terms of employment at the professional and associate levels that have higher wages and previously the "state employee" control variable has taken up some of this effect. [31]

Considering the rigid pay structure in public sector in Turkey and expected public-private wage differential, the returns to vocational and general high school graduates in public sectors were considered separately by including interaction terms. The estimated coefficients show that the high school graduates employed in the public sector enjoy higher wage premium compared to those employed in other sectors, with general high school graduates having slightly larger benefit.

**Table 23**: Returns to educational levels with state employee interaction terms

| **Education level** | **Coefficient** | **(Std. Err.)** |
|---|---|---|
| Junior Primary | -0,102*** | 0,003 |
| General High School | 0,104*** | 0,004 |
| Vocational High School | 0,13*** | 0,004 |
| College | 0,492*** | 0,005 |
| State employee x General High School | 0,147*** | 0,007 |
| State employee x Vocational High School | 0,129*** | 0,007 |
| Number of observations | 187.176 | |
| $R^2$ | 0,60 | |

Next, I limit the sample to high school graduates and estimate the returns to different disciplines (Table 23). The OLS estimation shows that there is a considerable variation in the returns to various disciplines ranging from 4.6% to 18% over reference category – Ed. The Ed discipline has the lowest return, as the wage premiums to all other disciplines compared to Ed are positive. The lowest premium is for Arts - 4.6%.

[31] Indeed, for the full employment wage earner sample, those in public employment account for 62% and 43% of all individuals occupying "Professional" and "Associate" levels.

Interestingly, the highest estimate was obtained for SMC (18%) and Services (12.5%). Engineering graduates face return of 11.2%, followed by Health graduates with 10.9% and SBL graduates 10.6%. The return to Ag/Vet discipline is not significant. A probable explanation is the small size of the full employment sample for this discipline, which consists of 139 observations only.

**Table 24**. Returns to vocational high school disciplines

| **Discipline**[a] | **Coefficient** | **(Std. Err.)** |
|---|---|---|
| Arts | 0,046** | 0,018 |
| SBL | 0,106*** | 0,018 |
| SMC | 0,18*** | 0,027 |
| Engineering | 0,112*** | 0,017 |
| Ag/Vet | 0,053 | 0,04 |
| Health | 0,109*** | 0,02 |
| Services | 0,125*** | 0,02 |
| Number of observations | 25.285 | |
| $R^2$ | 0,48 | |

[a]The reference category is Ed.

## Chapter 6

## SAMPLE SELECTION ISSUES

The sample used for estimations in Chapter 5 poses a few potential selection issues. While it is challenging to determine the size and direction of the resulting biases, it is important to consider these selection problems when interpreting the estimates.

First, our sample contains only high school graduates who did not proceed further with tertiary education at Higher Vocational Schools or Universities. Thus, we do not observe the wages of the graduates who have gained further degrees. If these individuals differ in some unobservable characteristics, then our estimated returns may not reflect the returns for the entire sample of vocational high school graduates.

Second, important issue to consider is whether the talent pool changes across the vocational disciplines. It might be the case that the large shares of graduates of particular disciplines, including the highest achievers, proceed with tertiary education as they expect higher returns. Thus, in our sample for these disciplines we observe the graduates that possibly possess lower than average ability. However, for other disciplines the top performing graduates may choose to enter the labor market immediately after the high school, as they may heavily discount future and do not anticipate the large increase in the wage returns for the additional degree. Therefore, for this discipline the sample will encompass high ability individuals. Another factor shaping the talent distribution by disciplines might be the higher university entrance points of some of the majors relative to others (for instance, engineering/computing/health vs. education/arts), which may discourage some of the able graduates to apply. Thus, the talent/ability may considerably vary among the disciplines and affect the comparability of estimated returns across disciplines.

Finally, our sample contains earnings data for wage earners only. Therefore, if excluded employers and self-employed individuals differ from the wage earner high

school graduates in some unobservable characteristics, then the resulting estimates could be biased. As one possible indicator of these differences, it is important to consider choice of professional level for the graduates in these groups.

**Table 25:** Occupational classification for employers and self- employed high school graduates

| | Employers | | | | Self-employed | | | |
|---|---|---|---|---|---|---|---|---|
| **Education level** | **Prof** | **Assoc** | **Sales/ clerk** | **Work er** | **Prof** | **Assoc** | **Sales/ clerk** | **Work er** |
| General high school | 72 | 6 | 6 | 16 | 36 | 6 | 11 | 48 |
| Vocational high school | 68 | 5 | 5 | 21 | 33 | 4 | 9 | 54 |

Compared to wage earner sample, the shares of employers and self-employed individuals occupying “Professional” level are 7.5 and 3.5 times higher, respectively (Table 25). This result is not surprising and might be explained by the fact that employers occupy positions as directors/chief executives/managers, while self-employed individuals being sole operators also act as the managers of their own business. Moreover, among employers the share working at “Sales/clerk” and "Worker" positions is significantly lower compared to wage earners. For self-employed, the similar tendency is observed for “Sales/clerk” level. Therefore, the difference in the observed professional distribution may suggest the existing disparity in the unobserved characteristics. For instance, employers and self-employed may have higher ability that allows them to occupy executive positions and initiate/run own business. Conversely, individuals in self-employed sample may have lower ability and expect to receive lower returns if they decide to join wage employment.

## Chapter 7

# CONCLUSIONS

Obtained findings could be used for several purposes. First, provided analysis gives initial overview of the employment opportunities, occupational status and wage returns faced by the graduates of different vocational disciplines. The regulations focusing on the redesigning the vocational high school education were introduced relatively recently in 2001. The received results in the form of declining vocational high school premium and low returns to some of the disciplines, shows that probably the share of recent vocational high school graduates is not significant enough to affect the overall trend. Another option is that the policy is not fully effective in practice and needs to be enhanced. In either case, the findings could be considered as a benchmark for evaluation of existing and potential new policies in long-term.

Second, the fact that the lowest returns were obtained for Education and Arts disciplines may reduce the incentives of individuals to choose these particular disciplines. This might have adverse effects for the society, as qualified education (supposedly mostly employed early childhood teachers) and arts graduates have a huge value for the society. In addition to revisiting the curriculum to match it more closely to the labor market demands, the incentive instruments should be considered in order to motivate individuals who are interested in these disciplines to follow their choice and prevent them from fleeing to other disciplines that provide larger economic benefit.

Finally, current work expands previous literature on returns of high school graduates in Turkey, which mainly focused on comparison of wage returns from vocational and general high school education. Estimated heterogeneity of employment, leadership and wage returns gives more detailed insight on the labor market conditions faced by the vocational high school graduates from different majors. This will also

allow to compare the returns in Turkey with the ones received by the vocational high school graduates across the world.

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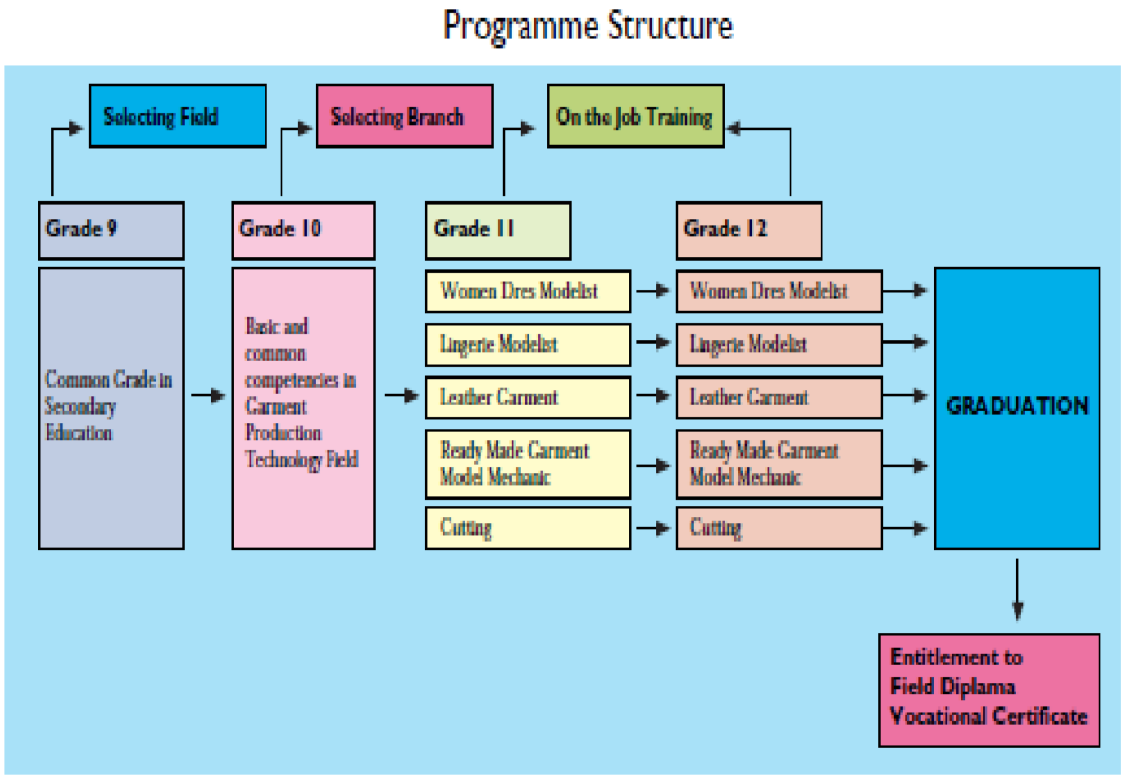
Appendix A. Types of the Vocational and Technical Schools. Source: Ministry of National Education of Turkey 2014.

Anatolian Technical High School
Anatolian Vocational High School
Technical High School
Vocational High School
Vocational School for Industry
Anatolian Marine High School
Anatolian Marine Technical High School
Vocational High School for Marine
Multiprogram High School
Anatolian Cadastre Vocational High School
Anatolian Vocational High School for Agriculture
Vocational High School for Agriculture
Technical High School for Agriculture
Anatolian Vocational High School for Girls
Anatolian Technical High School for Girls
Vocational High School for Girls
Technical High School for Girls
Anatolian Vocational High School for Commerce
Vocational High School for Commerce
Anatolian Vocational High School for HotelManagement and Tourism
Anatolian Vocational High School forCommunication
Vocational High School for Law
Anatolian Vocational High School for Public Health
Anatolian Imam and Preacher High School
Special Education Vocational Upper Secondary School (Hearing-Impaired), Special Education Vocational Upper Secondary School (Orthopedic-Impaired)

Appendix B. The Example of the Structure of Vocational Education in Turkey. Source: Ministry of National Education of Turkey 2010.




Note: The four-year structure of VTE secondary school includes 9 – 12 th grades, where:

1) 9 th grade includes compulsory and IT courses, analogous to the courses of the general high schools of the academic track;
2) 10 th grade envisages the development of the basic and common competencies in the occupation field;
3) 11 th grade further provides specialization in the occupational branch;
4) 12 th grade envisages the on the job training.
The arrangement during the 12 th grade to dedicate 40 % of the study time for the in-class instruction, while 60% are spent at the enterprise to acquire practical skills in the selected occupation (UNESCO 2012).

Appendix C. Estimates on Control Variables

| Variables | Attainment 1 | Attainment 2 | Attainment 3 | Disciplines |
|---|---|---|---|---|
| Potential experience | 0,029 | 0,0004 | 0,026 | 0,034 |
| Potential experience squared | -0,0005 | -0,0005 | -0,0004 | -0,0006 |
| Gender (male=1) | 0,074 | 0,096 | 0,097 | 0,044 |
| Marital status (married=1) | 0,05 | 0,069 | 0,062 | 0,055 |
| State employee | 0,512 | 0,513 | 0,484 | 0,55 |
| Urban | 0,044 | 0,037 | 0,043 | 0,018* |
| Regions: | | | | |
| West Marmara | -0,259 | -0,252 | -0,239 | -0,226 |
| Aegean | -0,217 | -0,214 | -0,206 | -0,217 |
| East Marmara | -0,192 | -0,183 | -0,174 | -0,148 |
| West Anatolia | -0,19 | -0,188 | -0,179 | -0,193 |
| Mediterranean | -0,264 | -0,254 | -0,242 | -0,24 |
| Central Anatolia | -0,261 | -0,254 | -0,241 | -0,277 |
| West Black Sea | -0,266 | -0,261 | -0,252 | -0,252 |
| East Black Sea | -0,226 | -0,219 | -0,21 | -0,23 |
| Northeast Anatolia | -0,22 | -0,21 | -0,204 | -0,246 |
| Middle East Anatolia | -0,26 | -0,242 | -0,237 | -0,244 |
| Southeast Anatolia | -0,319 | -0,3 | -0,298 | -0,259 |
| Household size | -0,018 | -0,0096 | -0,008 | -0,008 |
| Household head | 0,068 | 0,067 | 0,063 | 0,092 |
| Firm size 10-24 | 0,158 | 0,154 | 0,155 | 0,148 |
| Firm size 25-49 | 0,182 | 0,18 | 0,183 | 0,188 |
| Firm size 50 and more employees | 0,279 | 0,272 | 0,284 | 0,29 |
| Average education of the household | N/A | 0,015 | 0,013 | 0,009 |
| Associate | N/A | N/A | -0,129 | -0,109 |
| Sales/clerk | N/A | N/A | -0,29 | -0,297 |
| Worker | N/A | N/A | -0,28 | -0,338 |
| Constant | 0,733 | 0,621 | 0,915 | 0,978 |

Notes:
Reference categories:
For region variable - Istanbul
For firm size - less than 10 employees
For occupation variable - professional level
*Significant at 5% level
** Not significant