ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

DYNAMICS OF POST-SCHOOL INVESTMENT, EDUCATION AND WAGES IN TURKISH LABOR MARKET: A DESCRIPTIVE STUDY

TÜRK İŞGÜCÜ PİYASASINDA OKUL SONRASI YATIRIM, EĞİTİM VE ÜCRET DİNAMİKLERİ: BETİMSEL BİR ÇALIŞMA

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Abstract

Although Human Capital Theory asserts post-school investment as an important mechanism in the wage differentials, it is not adequately scrutinized by the literature. Post-school investment is linked to demographic factors like gender, age, education, marital status, etc., and has a dual effect in the wage differentials of individuals (Blaug, 1976; Mincer J. A., 1974a; Polachek, 1975; Rodríguez, Saltiel, & Urzua, 2018). Moreover, PSI can mediate the effect of education on wages which has been widely discussed in the literature. In light of these, this study aims to understand the dynamics of post-school investment, education, and wages in relation with other demographics ignoring the causal relationship between these variables using Adult Education Survey (TURKSTAT, 2007). Results indicate that PSI is high for observations who are young, non-married, women, high wage earner, non-routine job holder, and vocational collage school graduate. Interestingly, results indicate that low wage earners have to invest on their human capital to compete in the labor market against job losses most probably as they are low skilled workers, and their abilities are prone to depreciation easily. Moreover, men can earn more than women, even if they have a lower education level.

Keywords: Post-School Investment, Education, Wage, Adult Education.

JEL Classification: I20, I21, I26, J01, P46

[*]   This paper is produced from author's Ph.D. Thesis.

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Özet

Beşerî Sermaye Teorisi, okul sonrası yatırımın ücret farklılıklarında önemli bir mekanizma olduğunu öne sürse de literatürde yeterince incelenmemiştir. Okul sonrası yatırım, cinsiyet, yaş, eğitim ve medeni durum gibi demografik faktörlerle bağlantılıdır ve ücret farklılıklarında çift yönlü bir etki yaratabilmektedir (Blaug, 1976; Mincer J. A., 1974a; Polachek, 1975; Rodríguez, Saltiel, & Urzua, 2018). Ayrıca literatürde çokça tartışılan eğitimin ücretler üzerindeki etkisi üzerinde okul sonrası yatırımların aracılık etkisi bulunabilir. Bu sebeple bu çalışma okul sonrası yatırım, eğitim ve ücret değişkenlerinin dinamiklerini diğer demografik değişkenlerle ilintili olarak ve aralarındaki nedensel ilişkiyi göz ardı ederek incelemeyi amaçlar. Çalışmada TUIK tarafından yayımlanan Yetişkin Eğitimi Araştırması kullanılmıştır (TURKSTAT, 2007). Sonuçlar, okul sonrası yatırımın genç, evli olmayan, kadın, yüksek ücretli, rutin olmayan işlerde çalışan ve meslek lisesi mezunu gruplarda yüksek olduğunu göstermektedir. Elde edilen sonuçlar arasında, düşük ücretlilerin okul sonrası yatırımlarının yaşa bağlı olarak arttığı görülmektedir. Bu durum düşük ücretlilerin büyük olasılıkla düşük vasıflı oldukları için, iş gücü piyasasında iş kayıplarının önüne geçebilmek ve rekabet edebilmek için kolayca kaybolabilen yeteneklerini geliştirmek zorunda olduklarını gösterir. Ek olarak, erkeklerin daha düşük eğitim düzeyine sahip olsalar bile kadınlardan daha fazla ücret aldıkları gözlenir.

Anahtar Kelimeler: Okul sonrası yatırım, eğitim, ücret, yetişkin eğitimi

JEL Sınıflandırması: I20, I21, I26, J01, P46

1. Introduction

There are several papers investigating the relationship between education and wages. Common idea of these studies is that higher education leads to higher wages. A few of these studies concern the effect of post-schooling on wages. However, human capital theory gives importance to post-school investment. Because post-school investment creates differentials in the earnings of workers; and its form, quality/quantity, and timing over the working-life may lead to observe different age-earnings profiles. Besides, post-school investment can be a means for equalizing the life-time earnings of workers (Blaug, 1976, pp. 837-838). In other words, post-school investment has dual effect on the earnings; it may both increase and mitigate earnings differentials of workers having differentiated educational background.

Furthermore, adult education programs may protect workers against job losses due to skill distortions as a result of technological improvement. In fact, post-school investment (PSI) creates positive labor market benefits in terms of job promotion, higher wages, and getting into a job. In Turkish Labor Market, attendance to adult education programs is low compared to Europe (Dinçer, & Tekin-Koru, 2013, p. 13). However, increasing PSI may decrease high unemployment rates and underemployment in Turkish Labor Market. Considering all of these, this study aims to understand post-school education participation of individuals in line with some other demographics like education, wage, gender, age, occupation etc. using Turkey sample.

In this paper, I will present descriptive tables and graphs regarding post-school investment, education, and wages, along with their interaction with certain demographics. I will utilize data from the Adult Education Survey, 2007 which is released by TURKSTAT, disregarding the causal dependencies between these variables. Outline of the paper is as following; second section presents the highlights of the literature on post-school investment. Third section explains the data and variables used in

this study. Fourth section accounts for the results of the descriptive analysis, and the last section discourse the concluding remarks.

2. Literature Review

As suggested by Mincer (1974a) and Blaug (1976) excluding post-schooling investment in the human capital approach may lead to biased results due to its interaction to the wage and ability of a worker. Post-school investment is a broad concept that encompasses self-learning, on-the-job training, off-the-job training, apprenticeship, learning-by-doing, experience, formal or mass education after graduation, and voluntary work. Besides the old studies using the general concept of post-school investment, newer studies are mostly concentrating on on-the-job-training, and occupational investments.

There are some links in the acquisition of post-schooling and formal schooling (Mincer J. A., 1974a). Generally, higher educated individuals invest more in post-schooling. Some authors explain this with the ability constraint (Mincer J. A., 1974a; Rodríguez, Saltiel, & Urzua, 2018), while some explain it with the wage constraint; higher educated individuals obtain higher wages owing to this have more resources to invest in post-schooling (Blundell, Costa Dias, & Goll, 2020; Dave, Reichman, & Corman, 2008; Dinçer, & Tekin-Koru, 2013). As well as the level of formal education, post-school investment decision may differ in occupation categories (Hirsch, 1978; Shaw, 1984). The reason behind this fact is that some occupations require more investment, either in the form of on-the-job training, self-learning, apprenticeship, or self-training. Similar to these, firm structure can be a determinant in on-the-job training. More technologically improved firms offer more training for their workers (Acemoğlu & Pischke, 1998; Lentz & Roys, 2015; Mincer J. A., 1989). Additionally, on-the-job training, off-the-job training, or firm-specific training has several impacts on job mobility and unemployment based on the tenure of the worker (Cilasun, Demir-Şeker, Dinçer, & Tekin Koru, 2018; Lynch, 1992; Rubinstein & Weiss, 2007).

Whatever the case, positive returns from post-school investment have been confirmed by most of the literature, even sometimes returns of after school investment may exceed returns from former schooling. Gains from post-school investment is also related to the timing of the investment in the life cycle. Although returns to post-school investment increase with the experience, workers mostly invest on their human capital during their early career years (Mincer J. A., 1974a; Rodríguez, Saltiel, & Urzua, 2018). Because marginal benefit of investment is higher at younger ages and the opportunity cost of investment increase at older ages (Mincer J. A., 1974a). Nevertheless, Polachek (1975) rejects the declining pattern of post-school investment. He suggests that post-school investment behavior of workers is shaped according to their expected life-cycle labor force participation (Polachek, 1975). On this basis, gender, race, and marital status have substantial impacts on the post-school investment decision (Polachek, 1975).

The following studies use the Adult Education Surveys released by TURKSTAT. Their aim and findings are different from this study. Dinçer and Tekin-Koru (2013) describes the determinants of

adult education in Turkey. They use 2007 version of Adult Education Survey which is released by TURKSTAT. Their study is being the first application of post-school investment attitudes in Turkish Labor Market using Adult Education Survey. Their results indicate that adult education participation in Turkey is half of the average EU participation and the gender gap in the participation is high in Turkey in comparison to EU (Dinçer, & Tekin-Koru, 2013, p. 13). Moreover, adult education attendance of uneducated, old working women having uneducated fathers and little children are less; but attendance of young, educated, workingmen living in rural areas are high (Dinçer, & Tekin-Koru, 2013). They also find some attendance differences according to the field of activity and sector of employment (Dinçer, & Tekin-Koru, 2013). In a more recent paper Dinçer et. al. (2015) improve this study (with the same dataset) one step further by looking at the impact of the growth in the sector of employment on the determinants of adult education. They found positive and significant links between growth in the sector of employment and adult education attendance independent of gender (Dinçer, Tekin-Koru , & Aşkar, 2015). Their results indicate that young and educated individuals have more active performance in the adult education (Dinçer, Tekin-Koru , & Aşkar, 2015). The most important contribution of this paper is that economic growth affects education as well as the very well-known fact education and training stimulates economic growth.

Cilasun et. al. (2018) used Adult Education Survey 2012 to estimate the impact of adult education programs on job mobility in Turkish Labor Market. The results of the paper indicate that adult education programs increase the probability of finding a job and changing the job for young males (Cilasun, Demir-Şeker, Dinçer, & Tekin Koru, 2018). But contrary to the results of Dinçer and Tekin-Koru (2013) older, educated females with less children attend more in adult education programs if their household income level is high (Cilasun, Demir-Şeker, Dinçer, & Tekin Koru, 2018). Additionally, Cilasun et. al. (2018) suggest that government funded training programs can be a good tool for reducing unemployment.

Based on the opinions in the literature, I will display the post-school investment behavior of Turkish sample in comparison with education level, wage level, gender, marital status, age, tenure, and occupation.

3. Data and Variables

The data used in this study is Adult Education Survey 2007 which is released by TURKSTAT (2007). This is a cross-sectional data set giving information about the formal and mass education attitudes of individuals in the last 12 months together with the reasons and results of the participation. The data contains information about the individuals between 25 and 64 age. The aim of the survey is to determine the lifelong learning habits of workers. Observations consist of population who are in the labor force, who are continuing to education, retired, disabled, on the military duty, housewife, or else.

AES 2007 contains information only about the formal or mass education attendances in the last 12 months. So, if observations are attended to formal education activities before the last 12 months this

information can be tracked from the graduated and incomplete school degree variables. Because of this reason if an observation attended to formal education and graduated it before the last 12 months, he will be evaluated according to the current graduated school degree, even he has been invested on his human capital through intermittent education. Another obstacle is that AES 2007 is not appropriate to measure pre and post attainment wages of the observations.

In this study, I choose the sample as population who are employed, those full-time or part-time employed people. But unemployed people who are looking for a job are not included in the sample. Because unemployed observations do not have any wage and occupation information. Consequently, choosing sample as employed population includes some missing values in some variables such as wage, occupation, and tenure. I delated these missing observations as well as the zero earners. Additionally, I delated observations who started to job before 15 years old. Because in Turkish Labor Market, working before age 15 is only possible with informal working; and informal working is not the subject of this study. As a result, there remain 11636 observations in the dataset after deleting the missing observations, zero earners and informal workers.

Below Table 1 shows the related variables for this study and explains the type and form of each variable given in the dataset. Some of these variables are explicitly given in the data set, but some of them are constructed by using other relevant variables in the dataset. The variable gender is used as its original form given in the dataset. Marital status variable has four categories in the dataset; never married, married, divorced, widowed, but dichotomized as married and not married. Age variable is obtained by subtracting the birth year variable given in the data set from the year of the survey 2007.

Education variable denotes the highest graduated degree level given in 7 categories in the dataset. Since the sample size of doctorate graduates is so small I reorganized education variable as 6 category such that 1 '*not graduated from any school*', 2 '*primary school (5 years)*', 3 '*primary school, (8 years) middle school or vocational middle school*', 4 '*high school or vocational school*', 5 '*vocational high school (2-3 years)*', 6 '*university degree (4-6 years) and upper (those are graduated from masters and doctorate programs)*'.

AES 2007 does not contain a standard experience variable. In order to this, I used tenure variable. Since this study is about post-school investment there are some advantages of using tenure variable. Tenure variable is obtained by subtracting the existing variable 'start year of the current job' in the data set from the year of the survey. Tenure variable denotes the experience in the current job. It ignores the past work experiences.

Occupation variable is a nominal categorical variable, being given in the data set in 28 categories based on the ISCO 88 work codes. It is very hard to conduct analyses or observations using nominal categorical variables with such a high number of categories. Because of this, categories of occupation variable are aggregated into 2 categories. Aggregation into 2 categories makes a distinction about the types of the jobs as routine and non-routine. Routine jobs are related with basic tasks and non-routine jobs are related with more complex tasks. Dichotomization of occupations is obtained from Thewissen and Rueda (2016, pp. 4-5). They make a classification of ISCO-88 two digit occupation

codes based on a RCI (routine task intensity) index. This way of dichotomization for occupation codes gives some clues about the complexity and skill requirements of the jobs. More complex and technology intense jobs are prone to skill distortions over time and need more investment on the required abilities to persits the continuity of the work life.

Post school investment variable denotes the attended formal or mass education activities in the last 12 months which is obtained by summing the quantity of attended formal and mass education activities in the last 12 months given in the dataset. Mass education activities includes courses, special classes, distance learning tools, seminars, and on-the-job training. If the observation is attended only one of these activities, then he will be counted as attended into mass education. Post school investment variable is organized as 0 attended to neither formal or mass education, 1 attended to either formal or mass education.

Table 1. Variable Descriptions

Letter code of the variable	Name of the variable	Description of the variable	Type of the variable
A	Age	year of the survey – birth year	Continuous variable
G	Gender	1→ men 0→ women	Binary variable
M	Marital status	1 → married 0 → not married	Binary variable
E	Education	Highest graduated level of education: 1→ without a degree 2→ primary school (5 years) 3→ primary education and vocational middle school (8 years) 4→ high school and vocational high school 5→ vocational collage school 6→ higher education, university and upper (including doctorate)	Ordinal categorical variable
T	Tenure	year of the survey – start year of the current job	Continuous variable
O	Occupation (routine/ non-routine)	1→ non-routine 0→ routine	Binary variable
P	PSI: Post School Investment Behavior	1→ attended one of formal or mass, 0→ not attended either mass or formal	Binary variable
W	Wage	Wage quintiles: 1→ 1st quintile: 0,1-415 TL, 2→ 2nd quintile: 416-529 TL, 3→3rd quintile: 530-799 TL, 4 → 4th quintile: 800-1149 TL, 5 → 5th quintile: 1150+ TL	Ordinal categorical variable

For the wage variable (W), 'quantile' parameter (which indicates monthly net income obtained in the last month from the main job) is used. 'Quantile' variable is given in %20 income shares. To get an ordered categorical variable with meaningful cut points wage variable is obtained from the 'quantile' variable by replacing 1 with the lowest quintile and 5 with the richest quintile.

4. Descriptive Analysis

In this section I will illustrate the summary statistics and the distributions of the variables like education, wage and post-school investment over each other or some other variables like gender, marital status, age, occupation, and tenure using Adult Education Survey (TURKSTAT, 2007) with the sample selection explained in the previous section[3]. Here, I ignore the causal relationships between the variables and just show a comparison for the variable of interest over some other variable. Below table show the summary statistics of relevant variables. Average education level of the sample is equivalent to primary education and vocational middle school. PSI attainment is low in the sample. Mean wage is equivalent to middle quintile in the sample. Average age of the sample is 38,5 with standard deviation 9.3. Most of the observations is men in the sample. Mean tenure is 10.1 with standard deviation 9.6. More than half of the sample is married. About half of the sample have routine occupations while the other half have non-routine occupations.

Table 2. Summary Statistics of the Variables

Variable	# Obs	Mean	Std. Dev.	Min	Max
Education	11636	3.261	1.513	1	6
Post-School Investment	11636	0.238	0.426	0	1
Wage Quintiles %20	11636	3.008	1.412	1	5
Age	11636	38.578	9.307	25	64
Gender	11636	0.809	0.393	0	1
Tenure	11636	10.102	9.652	0	50
Marital Status	11636	0.857	0.35	0	1
Occupation	11636	0.536	0.499	0	1
(routine/non-routine)					

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

The below three graphs show the table statistics of the main categoric variables. As seen from Figure 1 different wage quintiles have almost the same shares. The smallest share has belonged to second poorest quintile which consist of %17.78 of the sample, the largest share has belonged to the second richest quintile which consist of %21.60 of the sample. The poorest quintile stands in the second largest share, the richest quintile stands in the second smallest share. In Figure 2, participation to after school activities of the sample is %23.8. It shows that nearly a quarter of the sample have done post-school investment.

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3   Sample is employed population excluding missing observation, zero earners and informal workers.
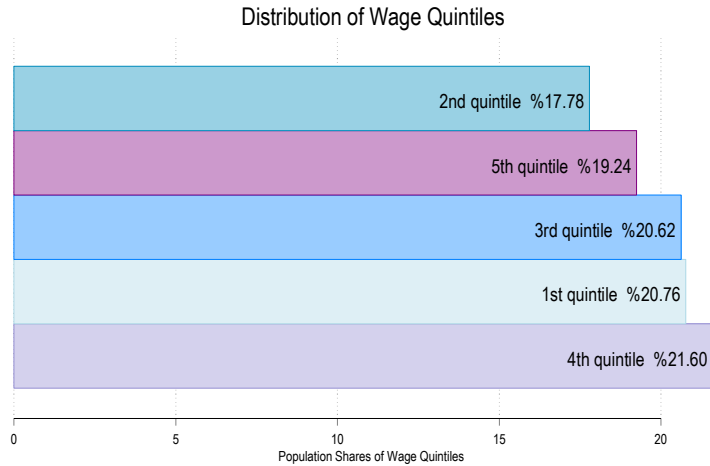
Distribution of Wage Quintiles

Figure 1: Table Statistic of Wage Variable

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

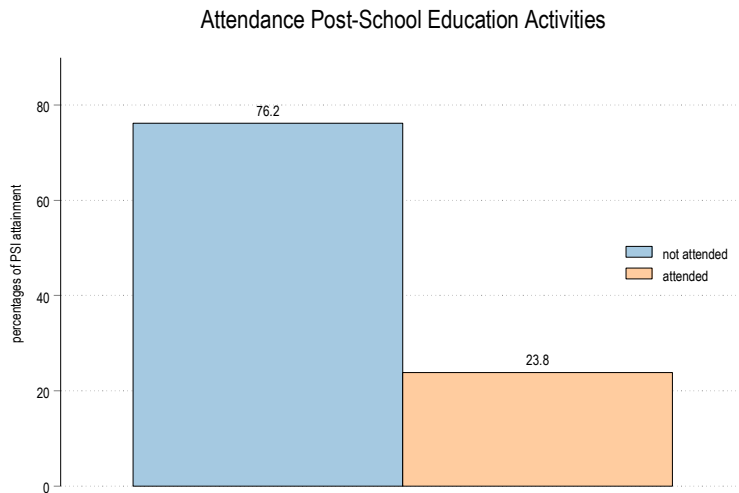*Note: 1 denotes the poorest quintile, 5 denotes the richest quintile*

Attendance Post-School Education Activities

Figure 2. Table Statistics of Post-School Investment Variable

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Below Figure 3 gives information about the education level of the sample. It is seen that more than half of the sample (%53) is primary school or primary education graduate. Around %5 of the sample

is not graduated from any school. %14.4 of the sample is higher education graduate, those are university degree, master, and doctorate programs. %5.8 of the sample graduated from vocational collage schools. Vocational high school graduates are not specifically indicated, but lump sum of high school and vocational high school graduates is around %22. Only one fifth of the sample has tertiary degree.
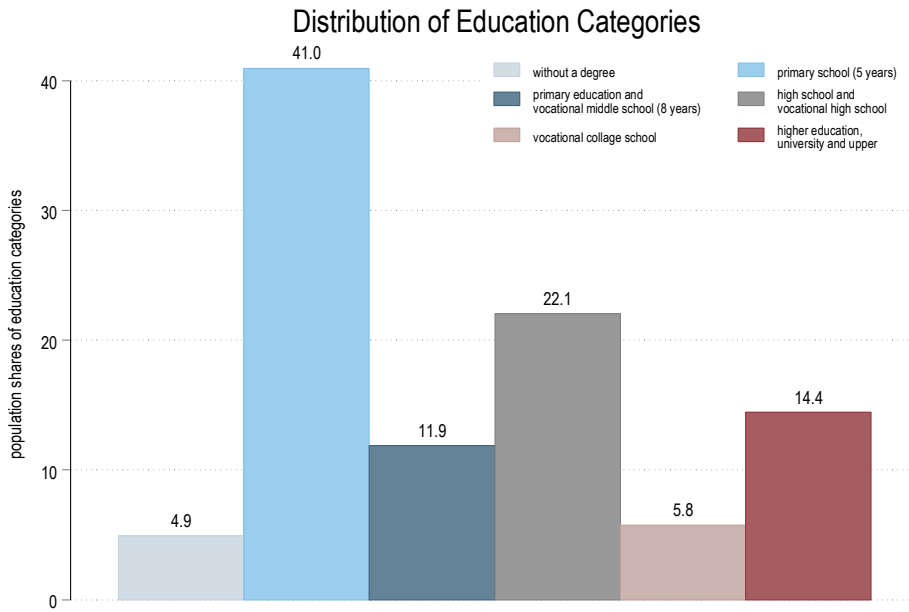

Figure 3. Table Statistics of Education Variable

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Table 3 shows the table statistics of the other categoric variables. Men observations constitutes %81 of the sample. Women employment is around %20 in this sample, but women employment becomes %25 when missing values, zero earners and informal workers are included in the sample[4]. Married observations constitute %85.7 of the sample and %46.38 of the sample work routine jobs while %53.62 work in non-routine jobs.

Table 3. Table Statistics of Other Categorical Variables

Variable	Categories	Table Statistics		
Gender		Freq.	Percent	Cum.

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4   A high majority of those groups are unpaid family workers.

	Men	9416	80.92	80.92
	women	2220	19.08	100
	Total	11636	100	
Marital Status		Freq.	Percent	Cum.
	not married	1664	14.3	14.3
	married	9972	85.7	100
	Total	11636	100	
Occupation (routine/non-routine)		Freq.	Percent	Cum.
	routine	5397	46.38	46.38
	non-routine	6239	53.62	100
	Total	11636	100	

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)
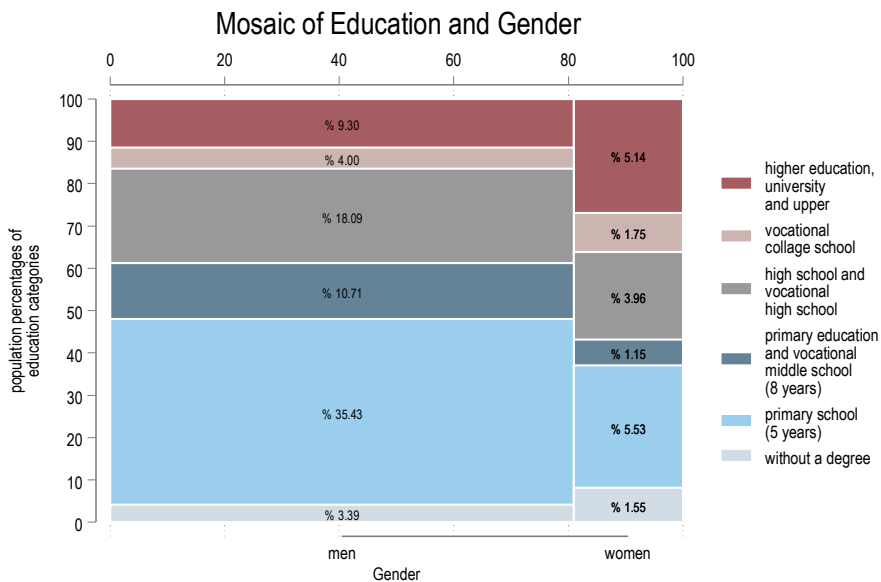
Figure 4. Gender Differences in Education

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Figure 4 compares the education categories with respect to gender. Primary school graduate men dominate the employed population, high school and vocational high school graduate men follows it. It can be observed from the height of the tiles that being tertiary education graduate (both for "vocational collage school" and "higher education, university and upper") is higher for employed women compared to employed men. Being secondary graduate (high school and vocational high school) is nearly the same in men and women (a little bit higher in men). More than half of the

employed men are primary school graduate, but primary school graduates constitute nearly one third of employed women. Women working without having a degree is %1.55 of the sample while men working without having a degree is %3.39 of the sample. However, the proportion of non-graduates in employed women is higher than that of men. Primary school graduates dominate both men and women. After that, higher education graduates are the second major group in employed women. For men higher education graduates are the fourth major group.

The below Figure 5 shows distribution of wage quintiles among education categories. As well as the previous two figures primary school graduates dominates the sample. Primary school graduate 1st quintile earners constitute the majority of the sample. Second and third major groups are second and third quintile primary school graduates, respectively. Higher education graduate 5th quintile earners are the fourth major group. Looking at the picture it can be said that higher educated individuals get higher wages and lower educated individuals get lower wages, on average. In other words, wages are monotonically increasing by education.
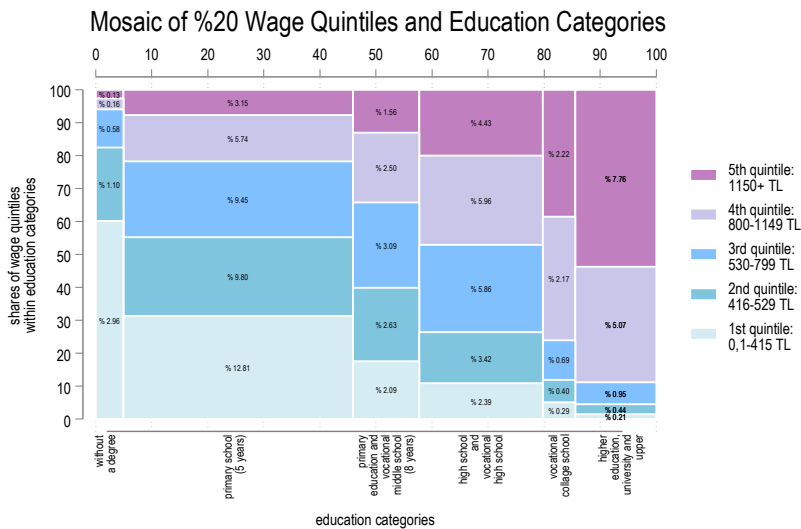

Figure 5. Wage Quintiles by Education Level

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Note: *Net job income obtained in the last month is expressed in %20 income shares.*

Figure 6 demonstrates gender differences in the distribution of wages by education. If we compare men and women within education or wage categories, it is evident that men dominate women in each category. Because %80 of the sample are men. For this reason, I showed the distribution of wage quintiles over education categories for each gender separately, in Figure 6. At first glance, it can be

said that men earn higher wages than women in lower education groups (those referring to primary and secondary degrees). But among employed women share of high educated (those equivalent to tertiary degrees) and high wage earners (above 3rd quintile) are higher compared to men. This situation may signal that employed women are more qualified compared to employed men. Besides share of 1st quintile men earners is around %19 while share of 5th quintile men earners is around %20. Whereas share of 1st quintile women earners is around %28 while share of 5th quintile women earners is around %17.
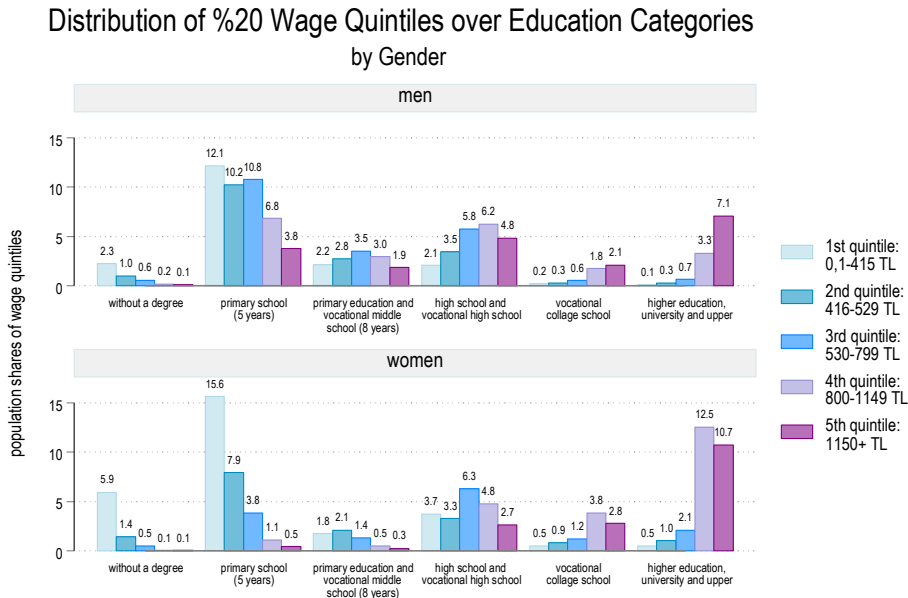
Figure 6. Distribution of Wage and Education by Gender

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Note: *Net job income obtained in the last month is expressed in %20 income shares.*

Below figures are related with post-school investment. Figure 7 shows shares of post-school education attendance among married/non-married men/women. As expected by the literature PSI is higher for non-married individuals (both for men and women) compared to married ones. The reason of this can be the time and source considerations of married population. On the other hand, as suggested by Polachek (1975) gender and marital status have effects on expected life-cycle labor force participation, and differences in post-school education attendance can be explained with expected life-cycle labor force participation. Married men show the highest participation in after-school investment, but compared to other groups PSI participation among married men is the lowest. Comparing men with women, women's post school education attendance is higher than

men both for married and non-married groups. This situation indicates that women need to invest on their human capital much more to compete with men in work life. On the other hand, looking at the previous figures share of employed women is low, but education levels of employed women are higher. A working woman is more qualified than a working man on average. So, employed women are idealist, competitive, skilled, and more capable on investing on their human capital compared to men.
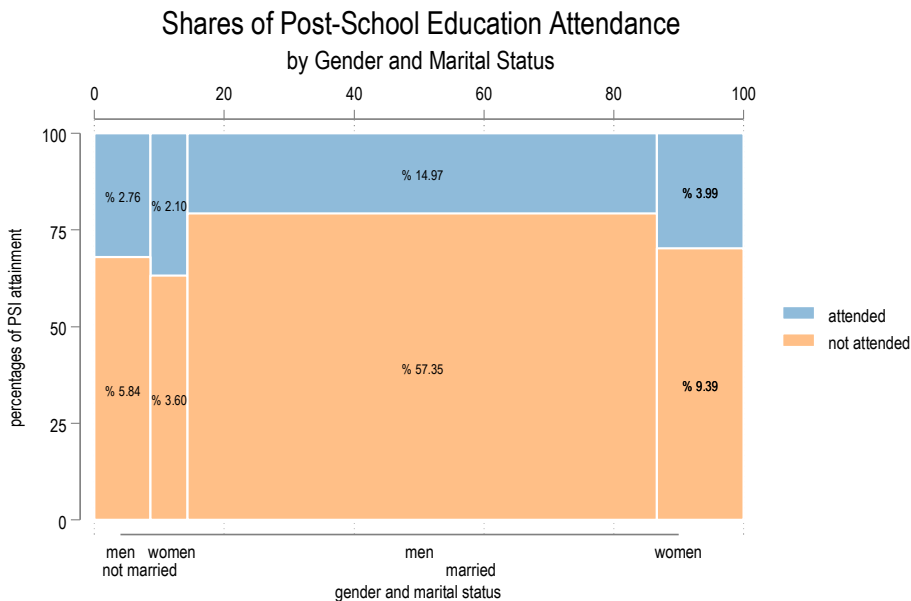

Figure 7. Differences in Post-School Investment by Gender and Marital Status

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Figure 8 shows attendance to post school education according to wage quintiles. As expected, attendance to post school education is higher in the richer quintiles compared to poorer quintiles. As suggested by the literature, PSI participation requires some resources, like time and money requirement, and high wage earners can easily supply PSI expenditures. Besides, Mincer (1989, pp. 2-4) asserts that workers acquiring more training have increasing wage profiles and slower depreciation of skills. So there is also a dual relationship between obtaining higher wages and PSI.
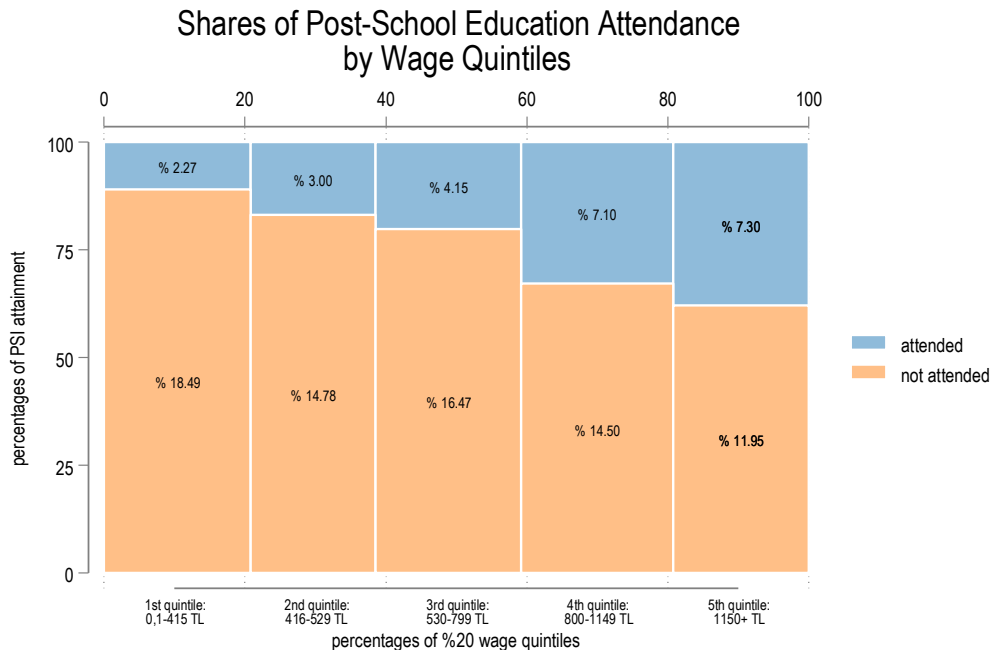
Figure 8. Differences in Post-School Investment by Wage Quintiles

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Note: *Net job income obtained in the last month is expressed in %20 income shares.*

Below Figure 9 shows differences in the post-schooling by education levels. It is seen that as the education level increase attendance to post-school education activities increase. In the literature it is explained with the ability constraint. Becker and Chiswick (1966, p. 368) assert that the determinants on investment into human capital is depending on distribution of abilities. Mincer (1970) also argues that more skilled individuals have higher incentive to invest in human capital. Mincer (1974b) links post-school investment and learning on the job (training) to the ability to learn at school; this means that individuals who invest more in human capital, invest more in both forms of it (both to regular schooling and post-schooling). Post-school education attendance of higher education graduates is highest, being %7. High school and vocational high school graduates follows them, being %6.7. Primary school and primary education graduates' PSI participation is %6.9 in total. Looking at the within groups, vocational collage school graduates'[5] attendance to post school education activities is highest, more than half of the VCS graduates attend into PSI. In Turkey vocational collage school

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5   Vocational Collage School is equivalent to 2 years university.

graduates are given the opportunity to complete their degrees to 4 years university degree with DGS examination. Since being a university graduate associates with higher wages and better work opportunities, it seems that more than half of the VCS graduates attend in PSI activities to enhance better skills. So, it can be said that PSI is highest for vocational collage school graduates. Higher education, university and upper degrees follow it. PSI of non-graduates is lowest being %0.2, and primary school graduates follow it.
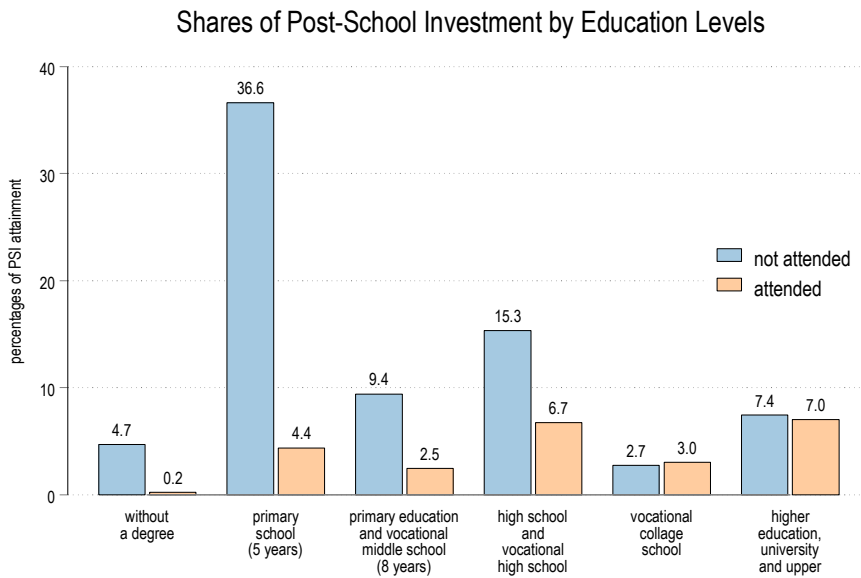
Shares of Post-School Investment by Education Levels

Figure 9. Differences in Post-School Investment by Education

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Figure 10 displays attendance to post-school education activities according to occupation types. It is seen that post-school education attendance for non-routine jobs is %16.4, this is higher compared to the post-school education attendance of routine jobs. PSI of non-routine jobs is high both for between and within group comparisons. This situation can be the result of the higher competition among the non-routine jobs, or the requirements of occupational investment for non-routine jobs.

Occupational differences in the human capital investment and post-schooling are also investigated by the literature. Shaw (1984) emphasizes the effect of occupational investment on income. Hirsch (1978) shows that differences in occupation leads to differences in the earnings-experience profiles. Because post-school investment behavior differ across occupations and this leads to differences in the period of the rise and decline of earnings (Hirsch, 1978, p. 39). Hirsch (1978, pp. 36-39) observes differences in the earnings against schooling, weeks worked and post-school investment across disaggregated occupation categories. As the number of occupation categories increase, the skill and

knowledge of workers among these occupation categories will be smilar and this leads to downward biased rates of returns to post-schooling (Hirsch, 1978, p. 36). Also, Hirsch (1978, p. 39) found that rates of return to post-schooling differ widely among white and blue-collar workers.
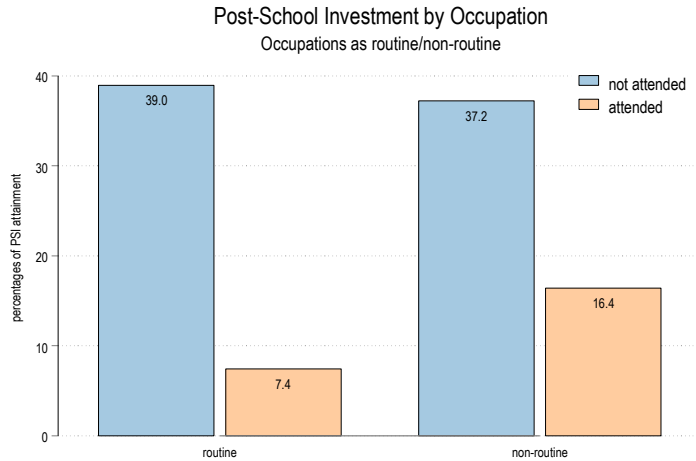
Post-School Investment by Occupation
Occupations as routine/non-routine

Figure 10. Differences in Post-School Education Attendance by Routine /Non-routine Occupations

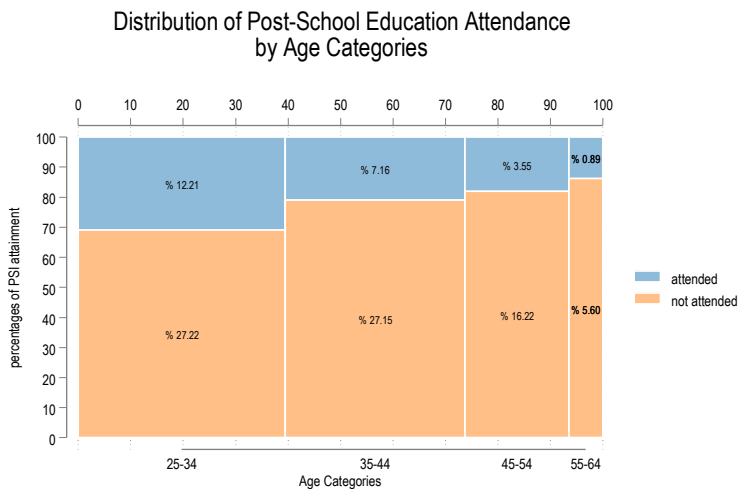*Source: Author's own calculations based on Adult Education Survey,* (TURKSTAT, 2007)

Distribution of Post-School Education Attendance by Age Categories

Figure 11. Differences in Post-School Investment by Age Groups

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Figure 11 shows post-school investment by age categories. As suggested by the literature post-school investment is high at younger ages and it monotonically decline towards older ages. Individuals' behavior is to invest on their human capital at younger ages, because marginal benefits are higher at younger ages and forgone earnings are higher at later ages (Mincer J. , 1970, pp. 10-14; 1974a).

Below Figure 12 shows the average share of PSI for the lowest, middle, and highest wage quintiles over ages with respect to gender. Interestingly PSI is increasing by age for the richest and poorest quintiles (for men and the all sample), but for the middle quintile it is declining by age till the ages 55 and 45 for men and women respectively; and then it starts to increase. The pattern of all sample is similar to men's. For the 1st quintile, PSI attendance is around %10 till the age 45 for men and slightly higher for women. At the first sight, PSI of 1st quintile earners follows a U-shaped pattern; it increases through the older ages. This indicates that low wage earners have to invest on their human capital to compete in the labor force most probably as they are low skilled workers and prone to depreciation of some abilities (for both gender). Attendance to post-school education for women slightly different. Women's PSI participation is dramatically high at the older ages for the poorest and richest quintiles. However, 3rd quintile women workers don't attend to PSI activities after age 50. Also, no women attend in PSI activities after age 60. Both for men and women, the highest PSI attendance is observed by 5th quintile wage earners whose age are between 45 and 64, 1st quintile wage earners follow it at this age group.
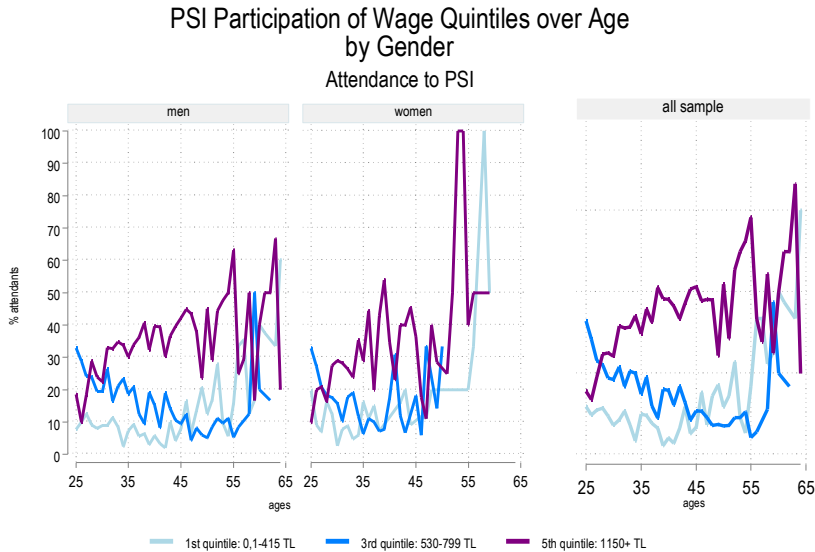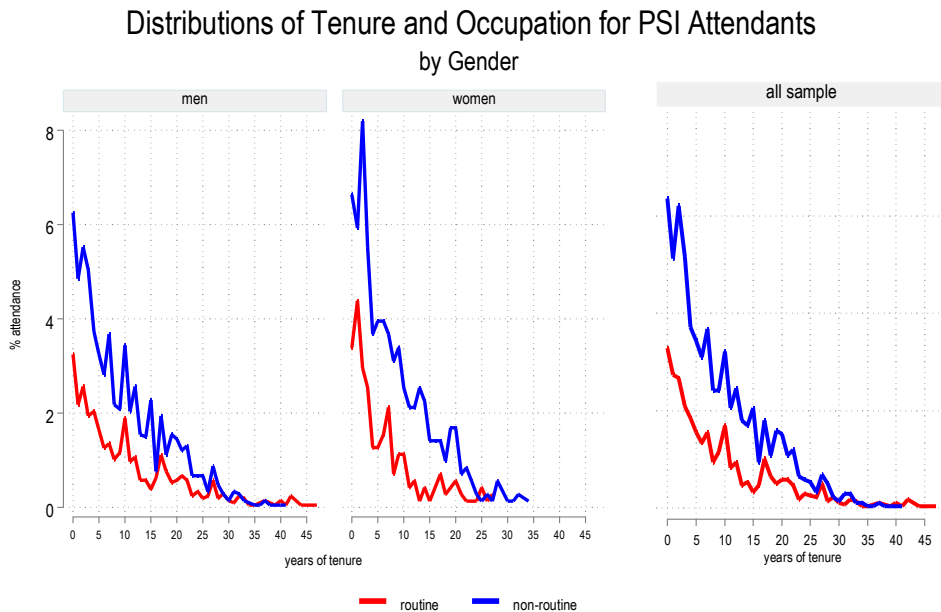

Figure 12. Average Share of PSI of Wage Quintiles over Age by Gender

Source: *Author's own calculations based on Adult Education Survey,* (TURKSTAT, 2007)

Note: *Net job income obtained in the last month is expressed in %20 income shares.*

Distributions of Tenure and Occupation for PSI Attendants
by Gender

Employed observations who attended to PSI.

Figure 13. Attendance to Post-School Education Activities Among Occupation Categories with Respect to Years of Tenure by Gender and All Sample

Source: Author's own calculations based on Adult Education Survey, (TURKSTAT, 2007)

Figure 13 shows shares of PSI attendants among occupation categories and years of tenure. It is seen that attendance to PSI activities is declining as tenure increases for all occupation categories and both genders. In other words, in the first years of work life post-school education attendance is increasing and then it has a declining pattern for both routine and non-routine jobs as suggested by the literature (Lynch, 1992; Mincer J. A., 1989). Moreover, PSI is higher for non-routine occupations compared to routine occupations for all tenure levels. These conclusions are as expected in the literature. Post-school education attendance becomes converging to zero after 35 years of tenure both for routine and non-routine jobs. Women's PSI attendance is higher than men's at 0 to 5 years of tenure. Routine women workers don't attend to PSI activities after age 27, and non-routine women workers don't attend to PSI activities after age 35. It is seen that PSI participation of routine women workers having 10-15 years of tenure is close to zero. Also, 0 years of tenured women workers attend less to PSI compared to 1-3 years of tenured workers. This situation is also observed by Lynch (1992) in United States for different types of post-schooling activities independent of gender.

5. Conclusion

To sum up this study aimed to overview post-school investment, education, and wage information of Turkish sample in comparison to some demographic factors like gender, age, marital status, occupation etc. The fundamental results are briefly described as below.

As seen in the previous section, descriptive graphics show compatible results with the literature. Similar to Blundell et. al. (2020); Dave et.al. (2008); Dinçer and Tekin-Koru (2013); Mincer J. (1974a; 1989, pp. 2-4); Rodríguez et. al. (2018) higher educated individuals attend more in PSI activities. PSI attendance is highest for vocational collage school graduates, university and upper degrees follow them. This is due to the common behavior of vocational collage school graduates to complete their degrees to university degree via DGS exam, in recent years. Posts-school education attendance is high for non-routine jobs. Occupational differences in PSI are as suggested by Hirsch (1978) and Shaw (1984); more complex tasks require more occupational investment. It should be noted that routine jobs are more prone to automation as the technology improves. So, PSI can avoid job losses due to technological improvement. There are also some differences in the PSI by gender, marital status and age. Women's PSI attendance is higher than men. Also, non-married observations are attending more in PSI activities. PSI is declining by tenure and age as suggested by Lynch (1992) and Mincer J. (1974a; 1989).

Moreover, attendance to post-school education is increasing as the wage level increase. An interesting result is observed in the PSI of poorest quintile wage earners. PSI attendance of 1st quintile earners are increasing by age. This result indicates that low wage earners have to invest on their human capital to compete in the labor market against job losses most probably as they are low skilled workers, and their abilities are prone to depreciation easily. Women's PSI participation is dramatically high at the older ages for the poorest and richest quintiles. Both for men and women, the highest PSI attendance is observed by 5th quintile wage earners whose age are between 45 and 64, 1st quintile wage earners follow it at this age group.

Additionally, employed women are more educated compared to employed men although labor force participation of women is nearly one third of men in Turkey at the survey year 2007. However, men earn higher wages compared to women in the education categories referring to secondary degree. But the share of high educated and high wage earners is higher compared to men among employed women.

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