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INSTITUTE OF SOCIAL SCIENCES

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**WOMEN EMPLOYMENT IN ENGINEERING:
CASE OF ISTANBUL**

Jarkynay TURGUNALI
510113006

Thesis Advisor:
Assoc. Prof. Dr. Havva ÇAHA

ISTANBUL, 2016

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APPROVAL PAGE

Student : Jarkynay TURGUNALI
Institute : Institute of Social Sciences
Department : Economics
Thesis Subject : Women Employment in Engineering: Case of Istanbul
Thesis Date : January, 2016

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.

Prof. Dr. Mehmet ORHAN

Head of Department

This is to certify that I have read this thesis and that in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts.

Assoc. Prof. Dr. Havva ÇAHA

Supervisor

Examining Committee Members

Prof. Dr. Murat KARAKGÖZ

Assoc. Prof. Dr. Havva ÇAHA

Assoc. Prof. Dr. Harun YÜKSEL

It is approved that this thesis has been written in compliance with the formatting rules laid down by the Graduate Institute of Social Sciences.

Prof. Dr. Mehmet KARAKUYU

Director

To my family

AUTHOR DECLARATIONS

1. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.
2. The program of advanced study of which this thesis is part has consisted of:
 - i) Research Methods course during the undergraduate study
 - ii) Examination of several thesis guides of particular universities both in Turkey and abroad as well as a professional book on this subject.

Jarkynay TURGUNALI

January, 2016

Üniversite : Fatih Üniversitesi
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KISA ÖZET

MÜHENDİSLİKTE KADIN İSTİHDAMI: İSTANBUL ÖRNEĞİ

Jarkynay TURGUNALI

Kadınlar erkeklere oranla daha az mühendislik alanları tercih ederler. Onları mühendislikten alıkoyan birçok engeller bulunmaktadır ve bu çalışmanın asıl amacı iş yerinde var olan üç engeli incelemektir. Çalışmada, literatür taramasına dayanarak, Türkiye ve diğer ülkelerdeki araştırmalar incelenerek, iş hayatında kadın mühendislerinin karşılaştıkları üç engelin, yani erkek egemen örgüt kültürü varlığı, iş yerinde iş tatmininin eksikliği ve iş-aile çatışması varlığı analiz edilerek aktarılmaya çalışılmıştır.

Bu araştırmanın uygulama kısmında, literatür taraması sonucu elde edilen bulgular aracılığıyla, mühendislik alanından mezun olan 112 kadın çalışana anket uygulaması yapılmıştır. Araştırma, özellikle Türkiye İstanbul kentinde yapılmıştır. Katılımcıların cevaplarına dayanarak, yukarıdaki belirtilen üç engeller hakkında görüşlerini, duygu ve düşüncelerini demografik özelliklerine dayanarak bu üç engellerin kadınların mühendislik mesleklere katılmalarına engel olarak karşılıklarına çıkıp çıkmadığını öğrenmeye çalışılmıştır. Bulgu, erkek egemen örgüt kültürünün, iş tatmininin eksikliğinin ve iş-aile çatışmasının var olup bu engellerin bazı kadınların mühendislik mesleklere katılmalarına kısmen engel olduğunu tespit edilmiştir.

Anahtar Kelimeler: STEM, mühendislik, kadın istihdamı, cam tavan.

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Supervisor : Assoc. Prof. Dr. Havva ÇAHA
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ABSTRACT

WOMEN EMPLOYMENT IN ENGINEERING: CASE OF ISTANBUL

Jarkynay TURGUNALI

There are fewer women prefer the engineering fields compared to men. Many obstacles are existed which suspend women from the engineering, and examinations of three of them is the aim of this study. The obtained findings from the literature review results and based on the related studies held in Turkey and other countries, it has been tried to analyze the three obstacles: the existence of male-dominated organizational culture at work, the existence of the presence of lack of job satisfaction at work, and the existence of the work-family conflicts, that are confronting women in entering and remaining in engineering occupations.

In the application part of this research, via the findings from the literature, the survey covers 112 women employees graduated from the engineering domain. The research was done particularly in the city of Istanbul, Turkey. From the answers of the participants, it has been attempted to find out their views, feelings and opinions about the existence of the three barriers are mentioned above, according to their demographic peculiarities. The finding are showed that these reasons, which are the existence of the men-dominated organizational culture, the presence of lack of job satisfaction, and the work-family conflict are existed and, in particular, confronted some women from entering and remaining in engineering occupations.

Key Words: STEM, engineering, women employment, glass ceiling.

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INTRODUCTION

Women's first enter and flow in the paid work has begun with the Industrial Revolution. In chapter 1, it is examined the history of women which have begun in the 19th century with the rise of the technological development, called industrialization. Before industrialization, people have lived in the simple way where women were primarily occupied in agriculture, domestic manufacturing and household service. Industrialization has changed women's working lives, especially of working mothers, by pushing them to work outside their home. On the one hand, industrialization has gained women to have wages and to perform work at the factories, but on the other hand, it has burdened working women who have responsibilities both in work and home. Thus, industrialization has gained more young and unmarried women, while has burdened married women with children.

The female employment, through the history, has increased in the wars when there was lack of the labor and has decreased after the wars, fortunately, not to the pre-wars level. Weighted increase in female employment was in post-WWII, where there was great increase of numbers of women in service sector, especially of married women. After that women labor force has continuously increased until today.

The rise of married women in paid workforce has accounted for the period of early 20th century. At the first time, exactly at that time in order to help to working women, the first care services for children such as daily kindergartens have begun to develop, which has pushed married women toward having jobs.

Today, more women than ever before are participated in the labor market, which is estimated about 40% of whole labor force. However, women are still underrepresented in such vacations, which are considered as belonging to men.

There also studies of the global shortage in the skilled workers, which increasingly becoming a matter due to the fast technological developments. The scientists are argued

that it has to increase the numbers of women labor in order to cut off this shortage. The percentage of women labor is very small in STEM since it is one of the occupations, viewed as male-dominated. According to Census Bureau's 2009 American Community Survey (ACS), women constitute only 24% of the STEM employees out of 48% of the female U.S. workforce in 2009, where only 14% of women, presenting in engineering fields.

There are many obstacles, which causing the low participation of women in related occupations. One of them is existence of a socio-cultural bias: explicit and implicit. Explicit bias related to discriminatory policies among genders and, according to some scientists, has less impact on women in preventing from STEM, and the implicit bias, where an individual consciously rejects the presence of gender disparities and stereotypes, but subconsciously believes in opposite. Thus, people subconsciously accept that STEM related to men, even if they reject it consciously. The implicit bias has negative effect not only on women in workforce, but also on girls' performance results in science and math scores. Another barrier, which preventing women to enter and stay in STEM fields, is a view on women's likability or competency. Women may be likable or competent but not both, i.e. if women are accepted as competent, then they cannot be likable and vice versa.

There is also notion of "leaky pipeline", where women from the beginning of their early ages leak, at every stage during their lives, from the path, which leads to the STEM fields. There are arguments that the environment, where the girls grow up, has impact on their future choices. Thus, if parents, and later teachers, do not separate girls from boys and perform equal tasks to them, if they exclude the gender stereotyping among them, then it may increase the interest of girls toward to such occupations, which traditionally accepted as masculine and may lead to lesser leak girls from STEM sector.

Chapter 2 is about the women's employment position in Turkey. As everywhere in the world, in Turkey women also have started paid work with industrialization in the same working conditions. The female labor had considerable increase in 1980s and 1990s, where they were employed especially in agricultural sector. However, this sector began to fall in following years, which refers to the great rate of migration from rural areas to

urban, where women hardly found a job. From that time, women's employment has considerable change, they have great shift to the service sector, where it presents the highest concentration of female labor in recent years. In 2014, women, participated in the paid and casual jobs, counted for 56.60%. The transition to paid employment was the important issue for women in obtaining the economic and decision-making freedom.

There are many factors that directly, or indirectly, have influenced women's participation in labor force. One of the factors is low wages. In order to be able to work, women have to be able to afford the needs of elder- and child- care, otherwise women choose do not work. The other factor, which decreasing the rate of women's labor is the informal economy, is unsecure work, where working women operate without any security, such as an unpaid family worker in agriculture. The main reason of the low participation of women in workforce is the insufficient level of women's education. With low level of education, women can get only low wage jobs, and this is the reason they hardly prefer to work, since their wages cannot cover the costs of care of children and elders. Even though, there is still high level of illiterate women, women continuously grow in education at its every level nowadays. The division of labor, based on gender, is another impact on women's participation in work, where traditionally, women are expected to have care of children, elderly and home, which prevent them to work and decrease their participation in workforce. In contrast, the rate of unmarried women in labor force participation is higher of those of married women, who own more freedom in decision to work. However, they usually quit their work after marriage as well, according to traditional ideology which views women as having stay at home. The patriarchal mentality in society is another barrier, which lowers further the rate of women labor, where it is related to the husband's permission to their wives to work. This situation is more profoundly faced among new migrants from rural areas to urban, where husbands cannot allow their wives to work at first time, fortunately, after some time passes, they accept their wives to work, but with severe restrictions. The other issue, that lowers rate of women's participation in labor market, is women's acceptance in the workplace. It is usually expected of women to put the family in the front of work. Thus, women have hardly found a job, since there is widely accepted view that women cannot concentrate at work as men, or that women work temporary. Some gender-oriented laws

restrict the participation women in labor force as well. Even they are enacted to protect women these laws also prevent them to get high-paying jobs. The “Glass Ceiling Syndrome”, related to the gender disparities where women are restricted to have promotions or to get higher work positions, also cuts their participation in workforce. Mobbing is another barrier that decreases the rate in women labor, where it prefers to the psychological harassment that women are faced in the workforce. The last reason, which also cut the women’s rate in labor force, is international migration, which increases the rate of labor and decrease wages as well.

Chapter 3 consists of the analyses about the existence of three obstacles that women faces in the workplace. According to answers of 112 women participants, who joined the questionnaire, it has tried to find out the presence of male-dominated organizational culture, lack of job satisfaction and work-family conflict at work, which move women away from choosing an engineering profession. The results are shown that all of them are presented in women working life.

CHAPTER 1

GLOBAL WOMEN EMPLOYMENT

1.1. History of Women Employment

Industrialization, traditionally connected with the late 18th and early 19th centuries, was an unavoidable process that changed the whole structure of the individuals' daily life in the steady agricultural world. Histories have been written about the influences of industrialization on the entire societies, i.e. the history of men has been contained the history of women, where women has been underrepresented in these histories of industrialization. However, women were practiced the historical process distinctly from men. Industrialization has affected women uniquely not only because they differ biologically from men, but also by the roles, imposed on women, which have undertook them throughout the history, even their share in the industrial history was inseparable (Berg, 1991: 1; Berlanstein, 1992: 65-66).

Women have always jointed in the work, thus, the Industrial Revolution did not change the women's participation in employment in that way. Pre-industrial world was considered as the "family economy", where all members of the family able to work have made the contributions to the family earnings. Women were primarily occupied in the agriculture, domestic manufacturing, household service, and commercial distribution. Their work did not affect their duties as the mothers and wives. But industrialization has pressed the workers to perform their works away from their homes, which has burdened the problems of the working mothers. Industrialization has influenced women, especially the married women, where it has decreased their economic activity deeply in the distinction between the house and their work. Being in conflict among their duties at home and capability to work and get money, women have replaced their choices in work

they were performed, which in turn, have created a typical women's occupational patterns that still continue until now (Berlanstein, 1992: 67).

Women's first enter and flow in the workforce has begun in the New England and Middle Atlantic. In the early stage of industrialization, the artisanal production was still persisted, but at that period of time also the manufacturing sector, especially of the textile industry (around 40%), has begun to expand (Goldin and Sokoloff, 1981: 2; Berlanstein, 1992: 69).

Three factors were insensitive in increase in the women's participation in labor force; a) change in population, b) change in institution, and c) innovation in technology and organization.

a) Women have tended to marry late, in the 18th and early 19th centuries. Both the high number of the unmarried women and widows, especially poor and unskilled women, and the low male wages forced women for looking a job, which in turn, created the high supply of the cheap labor. In addition to this situation, there were a high number of children, where they counted approximately one-sixth of the population in 1670s, which increased to a quarter in the 1820s. They also forced to work together with women as well.

b) The poor law and some changes in institution have led an increase in FLPR, too. Women's works constrained by the enclosure in gleaning, wood gathering and gardening during 18th century. Also some law has increased the difficulties for the individuals to obtain housing and settlement. Thus, all these restrains have pushed further women to work.

c) The developments and innovation in technology have increased the number of machines, which have caused the needs in the less skilled and cheaper, by the way, workers. This situation, in the one hands, has led workers out from agriculture, in the other hands, has increased labor in the factories and the large workshops (Berg, 1991: 2).

The gender division of the workforce was a major consideration in the demand for the labor in manufacturing. The wage rate is one factor, where women have received one third to one half of the male wage. High earnings were in the North and Midland areas (where textile, metal wares and potteries expand very rapidly), where women were able

to earn wages nearly equal of wages received by the local male in agriculture, there. Second and the most important factor was the technological and organizational innovation, where the simple tools in the hand-performed tasks have made employers to prefer women and children labor. However, during the rise in the real wages, the proportion of working women fell at a rate of 0.7% over the last half of the 19th century. In the early stage of industrialization, women have predominated in all major branches of manufacturing (four or even eight women per men). The large number of women, as well as children, were occupied in the most important and highly efficiently industry at that period – in textile, which was the biggest part of the manufacturing sector in the 18th century. In 1770, the woolen industry contributed around the one-third of the value added by the British industry (proportion of men-women-children were at 14:17:27). In the silk industry, fourteen women and children were employed per men in 1770. Lace making was almost a female trade, and hand knitting was fully employed by women, children and old men over the many areas. Furthermore, the large numbers of women and children work at the factories and large workshops in the metal manufactures and potteries (Berg, 1991: 2-3).

There was increasing of the participation of women in manufacturing around 1800s. However, the growth of the industries intensive in the male labor (heavy industries: mining, metallurgy and machines), the increase in the relative wages for women, and further technological developments have caused decline of the women's labor force in the manufacturing sector in 1850s (Goldin and Sokoloff, 1981: 3).

Industrialization and the work of women have centered round women in the manufacturing however, in this period the factories have employed only a small number of women. The concentration of the women's employment has continued in the other sectors: agriculture, domestic manufacturing, retail distribution and domestic service. It was found that one woman in four families in 1759, and one woman in seven families in 1801-03 was occupied in the agriculture. Also there were 800 000 women employed as domestic servants among the total numbers of 910 000, in England and Wales in 1806 (Berlanstein, 1992: 69; Berg, 1991: 3).

While unmarried women have worked as the domestic servants and in the factories, married women have been employed heavily in agriculture, domestic manufacturing or in the part-time, or casual employment, which usually jointed with retailing. Married women, recorded in the census, primarily have worked in the food shops, beer houses, bars, or have helped to run the small shops and inns, where the youngest wives, who had few or no children to care for, have employed in the factories. The others, who did not recorded as employed, have had retailing jobs, such as taking a laundry, or doing some cleansing part-time works. The largest women's employment in the nineteenth century was been accounted dominantly by employment alternative for the unmarried women in the domestic service. During this time, domestic service has employed more women (about one of every three women in Europe) than all types of the manufacturing together, where it was very popular job, since these employees have lived in the rich houses. Moreover, where they may be sending to some schools to get qualification, or receive an income after the death of their employer. Servants have had more chance for savings, in fact, they have created the majority of the deposits in 19th century saving banks (Berlanstein, 1992: 71-74).

Aside from these occupations, there were also occupations which have always been female-dominated, where the largest one was the area of education. From the early 18th century, dame schools were installed, where children were provided by education in the reading and writing by the "school dames", who were women who have supplied both the instruction and care. By the 1690s, women began to serve as the school teachers, and later by 1860s, they began to teach children of all ages and genders (Banaszak, 2012: 5-6).

During the war period of 1914-18, the shortage in the employment and the creation of the new jobs caused by war, led more female workers to enter in the labor force. There was increasing of the women's workforce not only in the heavy industries, but also in the war industries (some of 20% women workers in USA close to WWI). The serious deficit of the agricultural workers increased demands of the female workers as the farm workers as well. Many women workers left the domestic services during the same period, and in some occupations, they directly replaced men workers. In the post-war period, the female employment has been declined, after men were turned back from the

armed forces, even the female workers continued to stay in the manufacturing sector by 1929 in USA, where they constituted around 22% of all employees. The same condition was in the other parts of the world. For example, Great Britain, as well as Germany, has enough high rates of the women's workforce during the twenties, even though it was never reached the levels of war time (Joiner and Welner, 1942: 4).

Between 1920 and 1940, there were slightly increase in the women's employment. However in 1929 crisis, which began in the USA, called the Great Depression - the worldwide economic collapse, women's employment was declined in the industry sector. The crises imposed very different effects in gender, for instance, in the USA even the number of men workers fell by 898 000, the number of women workers rose by near 1.3 million. The service and manufacturing sectors became the most significant sectors for female labor, whereas manufacturing and agriculture were remained for men. Mostly young and unmarried women have got the well-paying jobs, especially in the service sector, which provided the occupations like teaching, clerical work, and domestic service, and which were less affected by Depression (McElvaine, 2004: 390; Costa, 2000: 108).

Along the way, the lives of many married women have still revolved around home, and even though, some of them have tried to superpose family with paid work, this goal was hardly to achieve. Thus, first services, like daily kindergarten, have begun to develop, in order to help working women with children. Moreover, the increasing of women's paid jobs has led to the enormous growth in the high school enrollment, even girls have received a basic high-school education, women have began to represent more than a third of all college students (Bingham, 2011: 12).

Although some segment of women managed rewarding jobs, the 1930s were not good years for female workers at a whole, where the societies faced with the problems of widespread unemployment. In order to provide more families with the job opportunities, many restrictions were developed against the women's participation in the paid work sector. These restrictions were such as the work hours regulations, marriage bar (women have to leave work after they married), and banning of women from certain industries

and occupations (e.g. law schools), which fully cancelled only close to 1950s (Jacobsen, 2011: 8).

In the late of 1930s, there was further declining in women employment in industry sector, caused by preparation of countries to the Second World War. Even there was some increase at the beginning of the rearmament program, after the transformation of many industries into war production and cutting in the consumer-goods production led to significant unemployment, especially among women. However, the relocation in the consumers-goods industries led to shortages in the vital materials, and after the initial short-term decline, increase in employment was even rapidly. According to 1940 census figures, there has been a very noticeable increase in women's employment in every sector. The largest part of women, more than one-fourth, was employed in personal-service industries, mainly in domestic service. The second largest part was employed in manufacturing industries, particularly in the factories and textile mills, and in communication industries. Also women employment was occupied in wholesale and retail trade, as well as in professional and related service industries, primarily as teachers and trained nurses (Joiner and Welner, 1942: 4-5).

From 1940 to 1944 the number of working women had rose by around half that of the 1940. This rise, in the participation of female labor, was included the female seasonal employment in agriculture, as well as women labor in war factories. However, more than nine-tenths of this extra female labor participation was appeared in the non-agricultural workforce. One year later in 1945, there was decreasing in the female workforce, where more than half of female labor decline occurred in the non-agricultural women's labor force. However, the increase in the rate of women's unemployment in the post-war period was not as high as the decrease in rates of female employment, in compare with 1940. The biggest decline was in the domestic and other services which fell nearly 10% in post- war period. Manufacturing sector, among the other groups, had the most numbers of women workers. It was employed over 140% of women's labor by 1944, even it had decline after war, when it was employed for 460% of women's labor. As it shown in the Table 1.1, even there was the decline after the war period there were considerable increase in the total women employment in many industries in comparison

with 1940, where the biggest transform of women employed was toward trade and service sectors (Bulletin 211, 1946: 2-12).

Table 1.1

Women in the Non-agricultural Labor Force in 1940, and Placements in 1944 and 1945

	Proportion women constituted of all workers in-			
	Total agricultural	non-Manufacturing	Trade and service	Government
Labor force:				
1940 (Mar.)....	28.1	22.0	42.8	19.5
Placements:				
1944 (Mar.)....	36.0	36.6	54.9	43.2
1945 (Mar.)....	32.1	33.7	45.3	40.0
(July)....	29.0	28.8	45.0	41.7
(Aug.)...	29.8	29.2	46.4	40.7
(Sept.)....	30.1	27.1	48.6	35.0
(Oct.)....	28.8	24.0	48.2	32.5
(Nov.)....	29.0	24.1	47.7	28.0
(Dec.)...	28.4	22.6	47.4	20.2

Resource: Bulletin 211, 1946

By the end of 20th century, the labor participation rate of all women (married and unmarried) older than 16 had increased to 60%, idem the married FLPR older than 16 to 62%. Moreover, the participation rates among the female college graduates were higher than the high school female graduates and less. In comparison of the FLPRs in the Great Britain and France, it showed differences in the developing. In 1881, the FLPRs in France were much higher than in the Great Britain. However, while the FLPRs in the Great Britain remained constant in 1881 and 1961 and then increased to 53% by 1998, the FLPRs in France rose to 48% until 1911 and after a sharp decrease, it began to raise again after 1960s (Costa, 2000: 101-103).

In the United States, the growth in the FLPRs constantly rose from 18% in 1890 to 60% by 1998. These rates in United States were higher than in both Great Britain and France, since British and French FLPRs were not counted for the family and casual female employment. In the twentieth century, the biggest rise in the female participation rates has been for married women, in both United States and Great Britain. If until 1998 the FLPRs of British single women were higher than married women, then by 1998 the

participation rates for the married women were exceeded that of single ones. In contrast, the FLPRs for the single women in the United States were always higher than that of married women and by 1998 they reached 68%, however, the participation rates for married women rose considerably between 1950 and 1998, where they increased from 22% to 62%. The increase of FLPRs still continued in the 1990s, however, at a lower rate (Costa 2000: 104-105).

With the appearance and increase of the clerical sector, women's work was transformed from other sectors. In the very late of the nineteenth century, the considerable numbers of female workers held jobs in the service and the manufacturing sectors, as it shown in the Table 1.2, whereas most male workers occupied jobs in agriculture or manufacturing. By 1970, the women's work in sectors shifted overwhelmingly toward to the clerical sector, where their participation rates increased to 34.5% and left men behind at 7.6% of the male participation rates. However, the female workers still held jobs, at the important rates, in the service and manufacturing services, i.e. 20.5% and 17.9%, respectively. This increase was occurred due to rise in demand for the jobs such as typewriters, accounting, bookkeeping and etc., which allowed the women workers to hold occupations in this sector not only of the high school or college women graduates, but also women, who just attended or taken classes in the commercial schools and had a very small percentage of the needed training (Costa, 2000: 108).

Table 1.2

Occupational Distribution, (%), 1890-1999

	1890/1900		1930		1970		1999	
	Men	Women	Men	Women	Men	Women	Men	Women
Professional	10.2	9.6	13.6	16.5	24.9	18.9	31.5	35.9
Clerical	2.8	4.0	5.5	20.9	7.6	34.5	5.5	23.4
Sales	4.6	4.3	6.1	6.8	6.8	7.4	11.3	13.0
Manufacturing	37.6	27.7	45.2	19.8	48.1	17.9	37.9	9.2
Service	3.1	35.5	4.8	27.5	8.2	20.5	9.9	17.4
Agricultural	41.7	19.0	24.8	8.4	4.5	0.8	3.8	1.1

Resource: Costa, 2000

The most increase in the women's employment is been composed of the rise in the part-time work between 1950 and 1970. In this period, the participation rates of the female labors in the part-time jobs were especially consisted of married women workers. By 1950, women's participation was at 23% of all working married women in the part-time work, this proportion was increased to 35% and 33% in 1970 and 1998, accordingly. Female part-time work was particularly and faster adopted in Britain in the period of 1950-1970 rather than in the United States. Their precedence still lasts until now, 40% in the U.K. versus 20% in the United States (OECD, www.oecd.org).

The FLPR began to increase after 1950s, especially in the service sector, which began to increase in large sizes since 1970. The female college graduates in the 1950s mostly majored in the fields such as education and nursing, where men less likely got involved in and took degrees. After graduation, these women paved the way into traditionally female sectors, in spite of their specializations. Furthermore, they tended to leave the workforce after their first baby was born and only returned in the labor force when their all children were grew and began schooling (Blau and Ehrenberg, 1997: 7-8; Goldin, 1986: 559).

Only many years later the college female graduates got closer to their male peer. If there were just 10% of the bachelor's degrees in economics were awarded to women in 1970, then they were increased to 30% by 1996, as well as, between the same periods the women's doctoral degrees also increased from 5% to 22%. Furthermore, there was also sharp increase in the share of the women's professional degrees. For example, women in order to be able to got the professional degrees in the health area had to require the six years studying at the colleges and then got the two years of the pre-professional training. If they obtained only 6% of all these degrees in 1970, then the proportion were increased to 43% by 1996. Moreover, in 1970 there were only 10% of women physicians, whose numbers also increased to 29% by 1998 (Costa, 2000: 109-110).

1.2. General Information of Women Employment

Women constitute nearly half of 7.2 billion of worldwide population. Thus, in every period of the history women have stood in the one side of the economic and social life and men have formed the other side. However, the women's participation in the economic life and beneficial effect of the social and economic development for women are not proportional, their working conditions have not led to the true social and economic empowerment. In this case, even the development level of the countries usually associates with it, women in all societies remain behind men. Unfortunately, women for centuries have contributed to all stages of the production, but they could not receive enough interest from the opportunities of development (World Population Data Sheet, 2014: 1; Kocacık and Gökkaya, 2005: 195).

Today, more women than ever before are participated in the labor market in the world, where they are either in work or actively looking for job. The female labor force was estimated for 1.3 billion in 2012, it is about 39.9% of the total labor force of 3.3 billion worldwide (ILO, 2012: 15).

The female labor force participation rates have varied across regions with the significant differences in the levels and trends; from 21% in the Middle East and North Africa to more than 63% in East Asia and Pacific and sub-Saharan Africa. However, if some regions, such as Latin America and Caribbean, have experienced increases in the FLFPRs of some 13%, then these rates have decreased in some other areas like in South Asia, and have stayed constant in Europe and Central Asia (Elbourgh-Woytek and others, 2013: 6).

Moreover, the female labor force participation rates have varied significantly across countries as well. In the Figure 1.1, it shows that the participation rates of women force ranged from the lowest (16%) in Jordan to the highest (88%) in Tanzania in 2012 (ILO, 2012: 15).

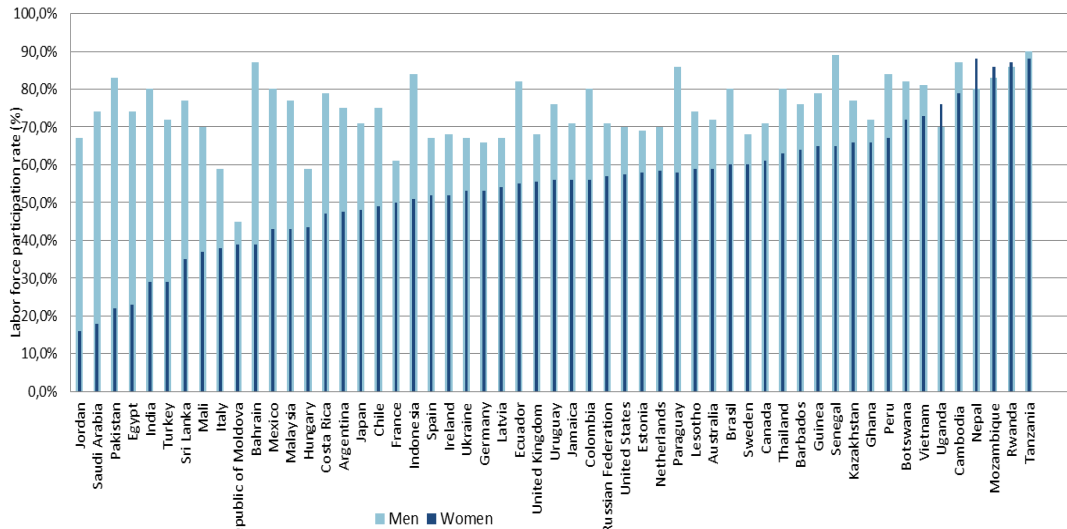


Figure 1.1 Labor Force Participation Rate by Sex in 2012, Selected Economies

Resource: Global Employment Trend for Women, ILO, 2012

However, even there is increase in the female labor force participation rates this increase differs between ages among women in the last decade, where the participation in labor force fell for the young women more than for the adult, at the world level. This decrease is mainly explained by an increase of the female rate in education and training, which produces a rise in the opportunity costs of not working in terms of real cost and years, and which also leads to have more educated female labor force. With the increase of female education, the rise in adult female labor force is leaded also by other changes such as economic development, decline in fertility rates and etc. For example, in the household, the technological developments lead to reduce time and efforts spending at home and increase the women's ability to work. Nevertheless, on average, women still spend much more time on unpaid work (household activities, care work) than men (Elborough-Woytek and others, 2013: 8; ILO, 2012: 17-20).

Despite of the increase of the female labor force participation, women still have faced the numerous challenges in the labor market. Whether in the informal or formal economies, or in the developing or developed countries, the labor markets are still highly gender-segregated and women are still limited in their choices for employment across sectors. Thus, in 2012, a third of women were employed in agriculture, near half in

services, and a sixth in industry worldwide. With increasing of sector segregation, women have begun to move out of agriculture in the developing countries and out of industry in developed countries into services. In this process, the women's share has increased in services, decreased in agriculture and only has slightly rose in industry over past two decades. If in the developed economies, women's employment in agriculture has remained very low for the last two decades, the female labor force has halved in industry and accordingly increased (more than 85%) in services, then in the developing economies, where women have left their main employment in agriculture at a slow pace, the female labor force has begun to move out of agriculture directly into services. There is only exception for East Asia, where women's employment has rose to a quarter in industry sector. Yet, agriculture has still accounted for more than half of the employment of women in some developing economies in sub-Saharan Africa (excluding Southern Africa) and in Southern Asia (ILO, 2012: 22-24).

Statistics cover only the women workers in paid (formal) work where the FLFP has lower participation rate than male participation, and who may exposed to lower wage, discriminated and restricted for paid work in the labor market, therefore, had lower representation in senior positions and entrepreneurship. Those who are employed in the paid work are overrepresented in the informal sectors, such as the part-time work, and have high risk of the old-age poverty among women. Most of women's work are performed in the low-income countries and their work usually are informal (unpaid), such as domestic work, contributing family workers, or work based at homes, which have entailed no direct payment as well as no protective legislation, no social security, and assigned low social status. Thus, although women around the world continue to make big contributions to the economy, much of their work is unpaid work. The lack of income seriously affects women's ability to improve their lives (Elborough-Woytek and others, 2013: 4-9).

It is important to underline that, studies show that increasing in women's participation in paid employment not only strengthens their social status and their financial situations, but also benefits their mental and physical health. Work outside home helps women to avoid social isolation, take social support, and helps to raise their self-esteem. Although employment benefits women, it also involves risks and hazards triggering their health at

work. These hazards are related to both physical and psychological which are the heavy lift and carrying, long hours, night work, violence, noise, heat, cold, chemicals, are related to the physical, and whereas stress related to high mental demand, speed, lack of control over the way work is made, lack of social support, lack of respect, discrimination, psychological and sexual harassment to the psychological. In addition, the combination of paid and unpaid work also affects women's health. Consequently, the health problems, physical and mental, are more common among women (WHO, 2004: 1-3).

Increasing female work force participation not only benefits women's lives but also contributes to the living standards, public finances and economies of countries and societies everywhere. This is also mentioned in The Global Gender Report 2007 by the World Economic Forum which states that "*the advancement of women is an important economic, business and societal issue with a significant impact on the growth of nations*". For instance, increasing women's participation in labor force could raise GDP in the USA by 5%, in Japan by 9%, in the UAE by 12%, and Egypt by 34%. Furthermore, women usually are more likely to invest a large share of their income in education of their children. So, higher female participation in labor force could contribute to broader economic development and as a result in more skilled labor force, and it may be only most important poverty reduction factor as a whole (Elbourgh-Woytek and others, 2013: 4-5).

1.3. Women Employment in the STEM Worldwide

Today our world faces rising of many interlinked challenges. The most pressing challenges are climate change, globally health epidemics, demographic changes, pressures from rapid technological advances, and unprecedented inequalities which consistently grow every day. To overcome with these concerns, more skilled employees are needed in STEM sector – acronym for Science, Technology, Engineering and Mathematics – that stands for research and industry which are important for technological development (UNESCO, 2015: 1).

1.3.1. Shortage in the STEM sector

Despite more skilled employees are needed, today, world faces a serious shortage of skilled labor. As it is shown in the Figure 1.2, the shortage of skilled labor is increased from the last year where it was at 36% in 2014 and rose to 38% in 2015. It is also reported that the shortage in 2015 is the highest point since the globally economic recession in 2008, where it was needed 31% of the talent employees. By the way, the highest talent shortage was in 2007, which was counted for 41% and then fell to its lowest need 30% in 2009 (ManpowerGroup, 2015: 6).

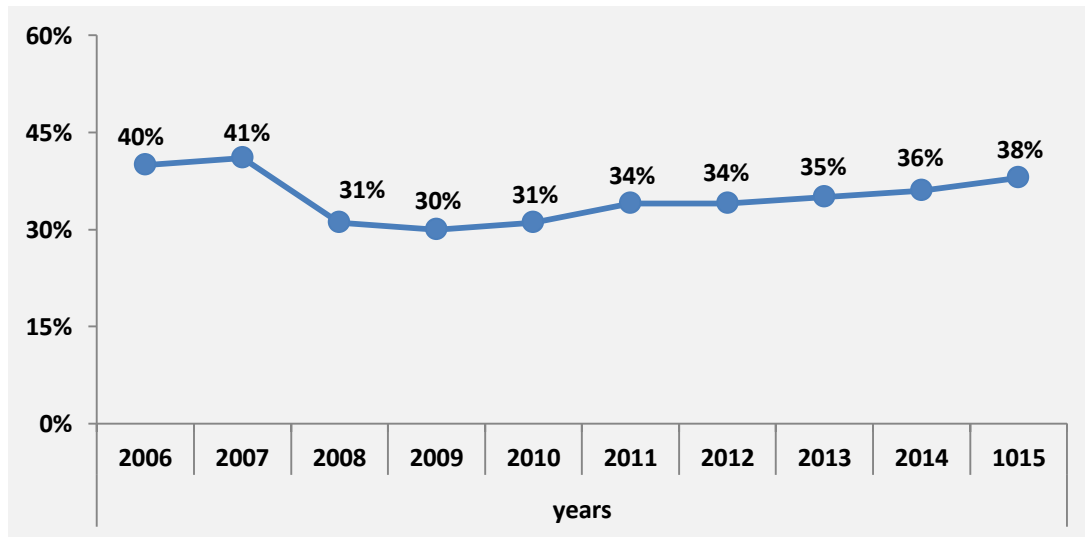


Figure 1.2 Global Percentage Having Difficulty Filling Jobs

Resource: ManpowerGroup, 2015.

Among 42 countries, the talent shortage increases in 27 countries and decreases in 14 countries in the period 2014-2015, except China where it shows no change in this period, as it is shown in the Table 1.3. The highest need in the talent workers of 2015 considers in Japan, which is the case since 2010. In the period 2014-2015, its need increases from 81% to 83% and takes the first place in the list among 42 countries for the both years. Among the 27 countries where the talent shortage was increased, the greatest shortages are in Singapore, where it increases from 10% in 2014 to 40% in 2015 (30%), in South Africa from 8% to 31% (23%) and Romania from 40% to 61% (21%) in

2014 and 2015, respectively. The smallest talent shortage of 2015 is observed in Ireland. Although it has increase from 2% 2014 to 11% in 2015, it still takes the last place in the list among considered 42 countries for the both years 2014 and 2015. Among the 14 countries where the talent shortage was decreased, seven of them are located in the Americas. The most of decline is in Argentina, where the percentage falls from 63% to 37% (26%), Panama from 58% to 46% (12%), Finland from 33% to 22% (11%) and Turkey from 63% to 52% (11%) in 2014 and 2015, respectively. Nine out of ten countries have at least percentage change of the talent shortage (from 0% to 2%) from last year, where they are located in Europe, Americas, Eastern Asia and Oceania (ManpowerGroup, 2015: 6; ManpowerGroup, 2014: 4).

Table 1.3

Global Percentage Having Difficulty Filling Jobs among Countries (2014 – 2015)

Countries	2014	2015	Percentage Change	Countries	2014	2015	Percentage Change
GLOBAL AVERAGE	36	38	2				
Singapore	10	40	30	Japan	81	83	2
South Africa	8	31	23	Hungary	45	47	2
Romania	40	61	21	UK	12	14	2
Greece	42	59	17	Peru	67	68	1
Taiwan	45	57	12	Australia	41	42	1
Belgium	13	24	11	Canada	31	32	1
Spain	3	14	11	China	24	24	0
Mexico	44	54	10	Brazil	63	61	-2
Norway	20	30	10	Guatemala	46	44	-2
Hong Kong	56	65	9	Austria	42	39	-3
Netherlands	5	14	9	Costa Rica	51	46	-5
Ireland	2	11	9	India	64	58	-6
Poland	33	41	8	Italy	34	28	-6
Switzerland	33	41	8	New Zealand	59	51	-8
France	21	29	8	USA	40	32	-8
Slovenia	19	27	8	Colombia	57	47	-10
Czech Republic	11	18	7	Israel	49	39	-10
Bulgaria	44	50	6	Turkey	63	52	-11
Germany	40	46	6	Finland	33	22	-11
Sweden	33	39	6	Panama	58	46	-12
Slovakia	22	28	6	Argentina	63	37	-26

Resource: ManpowerGroup, 2015; ManpowerGroup, 2014

According to the report which is shown in the Table 1.4, among the jobs in 42 countries, taken place in this report, there are skilled trades vacancies are the most difficult to fill

which has been the case for the previous three years. In the second hardest job to fill there is a change from the last year 2014, where the sales representatives rose up from fourth place to second in the list by withdrawing the engineer category from second to third and technicians from third to fourth places in 2015 (ManpowerGroup, 2015: 6; ManpowerGroup, 2014: 4).

Table 1.4

Global Top 10 Jobs Employers Are Having Difficulty Filling (2014 – 2015)

2014		2015	
1	Skilled Trade Workers	1	Skilled Trade Workers
2	Engineers	2	Sales Representatives
3	Technicians	3	Engineers
4	Sales Representatives	4	Technicians
5	Accounting & Finance Staff	5	Drivers
6	Management/Executives	6	Management/Executives
7	Sales Managers	7	Accounting & Finance Staff
8	IT Staff	8	Office Support Staff
9	Office Support Staff	9	IT Staff
10	Drivers	10	Production/Machine Operations

Resource: ManpowerGroup, 2015; ManpowerGroup, 2014

Together with the global economic growth driven by the life sciences, alternative energy, aging populations and consumption in the emerging markets, it is going to explode more STEM talent in the next decade. Only in the United States, employment in STEM is estimated to grow nearly twice between 2008 and 2018 rather than employment in the non-STEM occupations. Also it is projected that the India's technological sector will raise more than six fold in the seven years. The government in South Korea has allocated 200 billion dollars into a new green smart grid project that is expected to serve 500 000 tech occupations. The UK is forecasted an 80% rise in demand for the biological science graduates and 49% for the computing and mathematical science graduates between 2007 and 2017 (Hosaka, 2010: 1; Wilson, 2009: 38).

Not only countries, even the high-tech multi-companies that depend on STEM skills already feel shortages for the STEM employment. The companies such as Facebook,

Apple, Amazon and Cognizant in the United States will need to create beforehand of 650 000 new jobs by 2018, to able to catch their growth projections where two-thirds of hires at these new jobs will be STEM employee. Google already made known that it would to recruit more than 6 200 employees in 2011, where they are mainly computer engineers. The Chinese companies like Baidu, Renren and Alibaba are already “swallowing up” software engineers, programmers and systems analysts, and the other industries depended on STEM skills also have huge demand on STEM workers. In addition, there are other industries and companies that not only rely on STEM skills, but who need graduates from math, physics and engineering, for example, the utilities industry, which is looking for engineers and technicians (Bureau of Labor Statistics, 2011: 1; associated Press, 2011: 1; O’Donnel, 2010: 1).

1.3.2. The place of women in the STEM sector

Beyond the globally advancements in the STEM fields, which have strong impact in the poverty reduction issues and achieving of sustainable development, as well as continually expanding of the information and communication technologies (ICT), all of them create a growing number of the STEM-related jobs. It is crucial importance for women and girls to have equal approach to education at all its levels and to get appropriate skills, especially in STEM-related fields in order to have advantages of the increasing opportunities in these fields (Commission on the status of women, 2014: 2).

There are two primarily forms in occupational segregation: horizontal and vertical. Horizontal segregation consists of the particular occupations where women representation is overwhelmed men, while vertical segregation occurs when both men and women work in the same occupations. The STEM sector, which refers to the vertical segregation in workforce, women are still underrepresented; only 24% in USA in 2009, around 32% in EU-27 in 2010, 28% in Australia in 2011, and 43% in OECD countries in 2012, even they account for around 40% of the global workforce. The whole shortage in the STEM occupations is compounded by the female STEM shortage. It is a matter since, thanks to the growing technology, the STEM fields are projected to grow over time, where it is forecasted that the largest growth will be in engineering-related and

computer-related fields (ILO, 2012: 25; Beede and others, 2011: 1; Roberts, 2014: 2; Hill, Corbett and Rose, 2010: 2-3).

Even though the representation of women grow in higher education, they face obstacles in accessing the equal job opportunities in STEM fields as men, and end off these jobs since they cannot to introduce their full ability and skills. They are underrepresented not only in STEM employment but, more significant, in STEM sectors where the job opportunities are rather expanded. For example, it is estimated that sub-Saharan Africa needs near 2.5 million of engineers and technicians in order to get better access to clean water and sanitation which have significant impact on women's lives. In 25 countries, in order to gather clean water, women waste 16 million hours a day. However, they have no idea how to develop and manage the water resources and sanitation needs, and how to improve infrastructure and get solutions, by using science and technology. Energy sector expands its projections that employment will grow to 8.4 million occupations in wind and solar energy alone by 2030, but here also women represent only near to 20% of the energy sector occupations today and most of them work in administration and public relations (Commission on the status of women, 2014: 4).

At 2013 study on women's introduction in the ICT sector in Europe, it was estimated that if women worked as men in this sector in 2013, then the GDP of Europe could rise by 9 billion euro. However, women represent only 30% of the 7 million employees are worked in ICT sector in Europe. Also in India, a research indicates that women quit the ICT sector more than men at their mid-level career (Commission on the status of women, 2014: 4-5).

Generally, the STEM fields are accepted as male-dominated, so they are structured corresponding to men. According to the Figure 1.3 of the Census Bureau's 2009 American Community Survey (ACS), women are constituted only 24% of the STEM employees out of 48% of the female U.S. workforce in 2009. In the other words, women are represented half of the whole female labor force and less than one quarter of the workforce in total (Beede and others, 2011: 1-2).

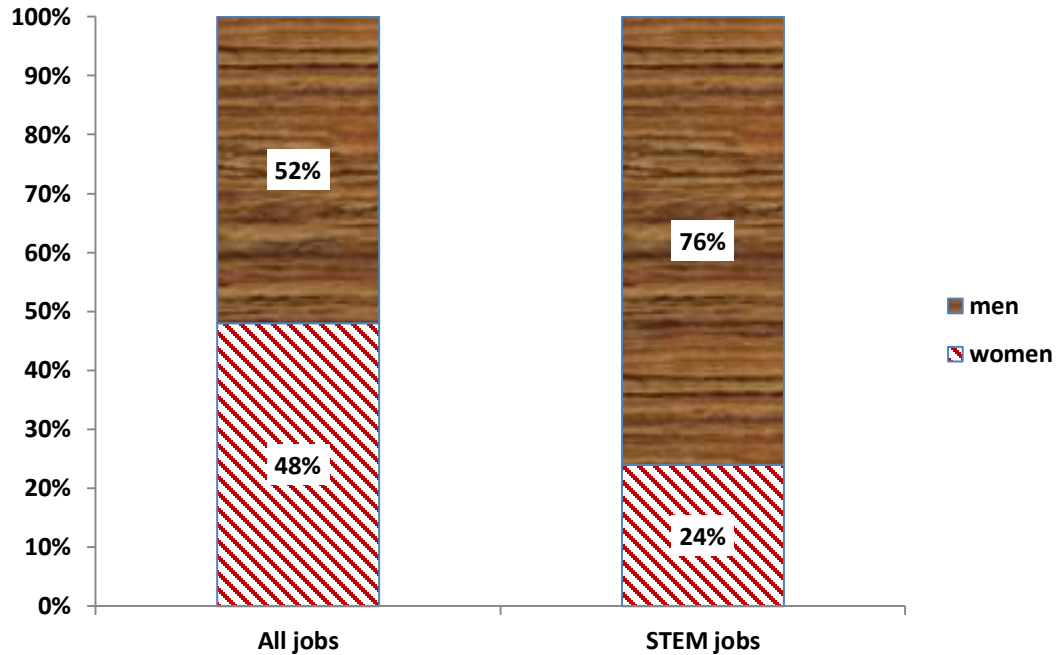


Figure 1.3 Gender Shares of Total and STEM Jobs, 2009

Resource: Beede and others, 2011

As it shown in the Table 1.5, although the female proportion has fallen in the computer science and math jobs from 30% in 2000 to 27% in 2009, which is accounted as the first biggest STEM workforce in U.S. , their proportion has increased in the other STEM professions. The engineering, which is the second biggest STEM occupational labor group, had the smallest amount of the female workers, where only one of seven engineers is woman. Albeit the number of women engineers grew up by 12 000, which in contrast, dropped in the number of men engineers by 106 000 workers. However, women employment did better in the physical and life sciences as well as in the STEM managers professional groups, where they increased by 40% and 2%, respectively from 2000 to 2009 (Beede and others, 2011: 3).

Table 1.5

Employment Participation in STEM Occupations in 2000-2009

	Male		Female		Percentage Female (%)	
	2000	2009	2000	2009	2000	2009
STEM total	5321	5640	1680	1790	24	24
Computer science and math	2202	2534	940	929	30	27
Engineering	2185	2079	318	330	13	14
Physical and life sciences	551	553	310	374	36	40
STEM managers	382	474	111	157	23	25

Resource: Beede and others, 2011

In some researches it was found that there is an important relation between the STEM occupations, gender and wages. On the one hand, STEM employees earn much more, in contrast with their non-STEM peers. On the other hand, there are differences in the wages among gender, i.e. women earn significantly less compare with men. These relations present in the Figure 1.4, where there is the average of the full-time hourly wages for a year in the private STEM and non-STEM sectors. Thus, it shows that in the STEM occupations men earn \$36.34 and women \$31.11 per hour, which is higher than of the non-STEM jobs where wages is \$24.47 for men and \$19.26 for women per hour. Furthermore, if women earn \$0.86 (14%) where men earn \$1 in the STEM occupations, then in the non-STEM jobs women earn even less which is \$0.79 (21%) for a \$1 of the men's income in non-STEM jobs. In addition, it has been found that workers in the STEM jobs get considerably higher wages than the non-STEM workers in the private sector, too (Beede and others, 2011: 4).

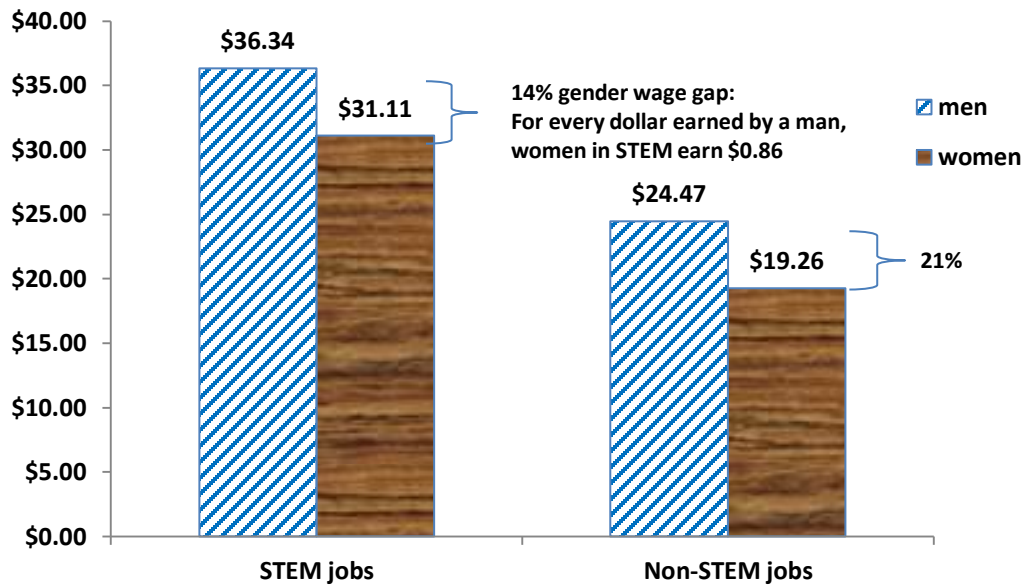


Figure 1.4 Average Hourly Earnings by Gender and Occupation, 2009

Resource: Beede and others, 2011

Women continue underrepresented amongst tenured faculty in the STEM disciplines as well. An analysis, about the retention of departments belonging to STEM, found out that the majority of STEM-related faculties has employed women fewer than men. However, once women and men were employed they were tenured and promoted at an equal level, except mathematics which is out of such pattern where women were less likely to be employed and more likely to quit their work than their male counterparts. Thus, it seems that the problem is in recruitment of the female staff in positions, than in retention in those faculties. Furthermore, in the STEM men usually promote to the position of supervision fairly often and more rapidly than women. However, even women generally underrepresented at the upper stages of leadership, they have had much greater development of leadership in the non-STEM fields. For instance, a survey found that if women have had a high post just about 2.7% in engineering and 5.9% in the math and physic science departments, then in business departments as well as in humanities departments they have had about 23.4% and 31.5%, respectively (Diekman, Weisgram, and Belander, 2015: 56).

1.3.3. Reasons of the small number of women in the STEM field

Since the STEM occupations are initiated as men-oriented, women have less chance in such jobs and this situation greatly affects them to enter and stay in these fields.

Gender and Work – Family Relations: One of these obstacles, according to the several researches, is the existence of a **socio-cultural bias** – explicit and implicit, that is even humans consciously rebut the presence of gender and stereotypes they subconsciously may give credence to them. Thus, it was investigated that explicit biases (discriminatory policies among gender) are not very effective in an impediment of women from the STEM labor force as implicit biases (relations and assumptions), and people unconsciously adopt the implicit biases that the STEM jobs are more related with men than women. By the way, these implicit biases affect not only STEM workforce but also the performance results of boys and girls from the beginning of their math and science scores (Nosek, Tulbure, Weirs and Vianello, 2009: 10596-10597).

Even explicit bias affects the female entering and retention in STEM workforce at some scale, the most influence has implicit bias which is not only deeply ingrained but which is also invisible. One of examples, society traditionally imposes the care responsibilities primary on women, accordingly it is waited that their selected job will not influence their parental responsibilities and not prevent their “real” work of being a mother, they have to be either “job-oriented or home-oriented” but not both. It is still a case in the USA, where women who prefer to continue the paths to career is immediately marked as a scattering mother rather than a good mother. They displease employees if they skip their work for the care responsibilities of their children and if they wish to stay at the same level at work as their male counterparts, then their private lives have not to influence their work lives. If in this condition, women get a great amount of stress at the work, it is finally, may push them out to look for a new more women-oriented jobs usually toward the non-STEM sectors (Dillaway and Pare, 2008: 437-442).

Researchers have found that exactly the implicit biases include the cold relations and feeling of loneliness at the workplace, as well as the compatibility of the work together with the family responsibilities, lead to icy climate in many workplaces in the STEM

sector. They offer that in order to destroy, or at least decrease, the impact of these implicit biases at work the several policies have to be enhanced the explicit strategies. These policies may be something like establishing of a friendly atmosphere toward the employees' career, which are will not be in favor of women or against men. Furthermore, both public and private workplaces have to set up not only career-toward but also the family-friendly policies. Together with the flexible labor hours options, unpaid and paid leave alternatives, greater clarity in the decision making, and flatter institutional frameworks; there should be alternatives for the child-, seniors- and disables-care services, as well as assistance groups for helping parents, options for working at home, and a sentience of co-workers, employers and supervisors to the parental liabilities. Even though, all these policies can help the female workers to manage family and work relations liabilities, it might not lead to opportunity for progression, promotion or removal of icy organizational climates and sensation of isolation. To reduce such barriers, there should be altering of the socio-cultural climates where women workers will feel supported. They can be like the flexible work timetables of parents and establishing of the social intra-office networking instruments to increase the women's encouragement and feeling of involvement (Kenney, McGee and Bhatnagar, 2012: 6-7).

According to another researches, women might be punished for the success they have in the "masculine" occupations for what the STEM jobs are also belonged. People, as a rule, view women either **likable or competent** but not both. It was found that these specialties are both may highly influence the women's ability to advance in their job. If there is doubtful progress in a male-oriented job, then the women employee is viewed less competent but identically likable in compare with men held the same performance. In contrast, the women employees are rated as identically competent as men in the prosperous male-dominated job, but less likable and even hostile towards co-workers. This is a clear double bind which is should be noted, not observed in the feminine or gender-neutral occupations. Women could be both successful and less disliked in the men-oriented jobs only if they own the communal or social traits like being responsive, understanding and concerned relative to others (Heilman, Wallen, Fuchs, and Tamkins, 2004: 420).

Some scientists have pointed out that a fundamental ground of gender gaps in the STEM aspiration lies more likely in the gender dissimilarity in **communal or public motivation** rather than in the aptitude and attainment motivation. Even though the communal features are greatly valued by both genders in the society, the possession of these peculiarities is appreciated especially in women. It tend to consider women as more communally-oriented (toward others), and the STEM occupations as more agentic-oriented (toward self). These social beliefs do women feel dissatisfaction in the STEM jobs that conduct to their unwillingness to pursue further the STEM-oriented fields (Diekman and others, 2015: 60-61).

Leaky Pipeline: There are many researchers agree at a common point about why women stay far away from STEM sector, and most of them come to general opinion that the ground for a STEM career is lie in the early ages. The STEM pipeline¹ initiates to leak at the early ages of 4-6, when some traditions as well as cultural believes, which create a view of stereotypes, are begun to recognize by children from their environment and further to identify their role in the society. Thus, learning from early ages affect their further choices to select or not the STEM fields (Diekman and others, 2015: 54).

There are arguments which suggest that boys and girls follow science and mathematics, however, they perform it in the dissimilar ways, and where these distinctions appear through behaviors of children as well as adults. Involvement in the science-related tasks shows that theme of those tasks differentiates among boys and girls. Boys recorded more attainments with a diversity of tools like electric toys, microscopes, batteries, fuses, but girls are more interested in planning seeds, knitting, bread-making and sewing (Jones, Howe and Rua, 1998: 1).

The childhood period is most affected by parents, where they have huge influence on their children lives at early ages of 4-6. At the same period, they tend to give more chances to train boys about science than girls. For example, at an observational research, which examined the children's behaviors at a science museum, it was discovered that

¹ The "leaky pipeline" is a metaphor which describes the large possibility of women to quit the STEM sector at each points or stages, which begins from early age and continues till workforce compare with men.

boys and girls who manipulated, spent time and observed the exhibits at an equal level, parents explained three times more the scientific notion to boys than to girls. Thus, through the various science and math informal knowledge from their environments, children develop different rates of involvement and interest in the science- and math-related out-of-class activities, and this is the first beginning stage of women's STEM "leaky pipeline" (Diekman and others, 2015: 54).

This situation continue further with following adolescence, which is a crucial point for girls to choose STEM-related subjects at high school, because, at that time the learning that they are required in the past effect their identification and involvement with STEM. High school allows the opportunities to involve deeper in STEM by providing the activities that can build skills, increase encourage and confidence, and push toward STEM fields. However, in severe countries, such as Australia, England, and in some parts of USA, where mathematics and science classes are not compulsory, can make girls away of these classes, accordingly away from entering in STEM fields (Australian Industry Group, 2015: 10; Diekman and others, 2015: 55).

Gender differentiation in pursuing STEM appears even greatly in contest of higher education. The transformation from high school to colleges and universities is a crucial moment for girls, because many of them leave the STEM at that time. Even girls are the larger in number of college students, they far from the idea to major in a STEM field than their male counterparts. Those girls who choose STEM majors, however, tend to leave their education before graduation, same as their male counterparts. The loss of the female students in the STEM majors is a specific concern, since they already enter in the STEM majors at a small numbers (Hill and others, 2010: 5-9).

According to the Table 1.6, although there is still a little percentage of girls that majoring in the STEM fields, the ratio of STEM Bachelor's, Master's and doctoral degrees have slightly grown during the last decade. For 2004 to 2014, the ratio of bachelor's degrees for the S&E fields rose 1%, master's degrees is constant and doctoral degrees increased by 1% for women (National Student Clearinghouse, 2015: 1).

Table 1.6

Science and Engineering Degrees as Percentage of all Degrees, 2004 – 2014

		S&E	
		2004	2014
Bachelor's Degrees	Men	24	26
	Women	11	12
Master's Degrees	Men	21	22
	Women	7	7
Doctoral Degrees	Men	45	48
	Women	20	21

Resource: National Student Clearinghouse, 2015

The most problematic concern in the women's STEM pipeline is transforming from education to workforce. Even though, the STEM workers, regardless of women or men, have the higher salary than the non-STEM workers, women with STEM degrees same as men not always enter in the STEM-related occupations, they more likely to get into the non-STEM fields like healthcare or education. If nearly 40% (2.7 million) of the men-college-graduates with the STEM degrees serve in the STEM occupation, then this rates is just 26% (0.6 million) for the women-college-graduates, as it shown in the Figure 1.5. Among them 27% of women work as computer professionals, 41% as life and physical scientists, 47% as mathematical workers, 61% as social scientists and the smallest part among them occupy by women engineers with 13% (Beede and others, 2011: 4-6; www.experty.com, 2014).

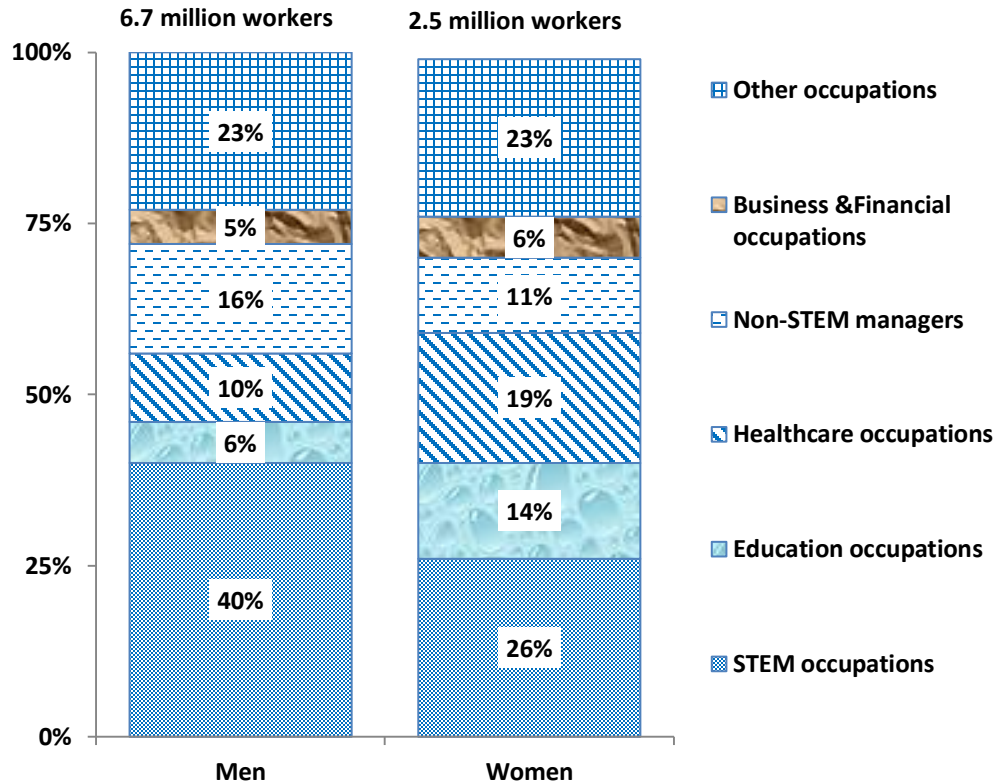


Figure 1.5 College-Educated Workers with a STEM Degree by Gender and STEM Occupation, 2009

Resource: Beede and others, 2011

According to the data supplied by the Census Bureau’s 2009 American Community Survey (ACS), where the relationship between undergraduate studies and employment was examined, showed that the half of women employed in the STEM occupations in the USA are college graduates, however, just 25% of women employed are the holders of the STEM degrees and only 20% of the STEM degree holders worked in the STEM sector (Beede and others, 2011: 5).

Education Policies: Mathematical abilities are viewed as the main key to success in the STEM domains. Although many girls enter in the colleges and universities, a small percentage of them choose STEM majors. Historically, the STEM subjects have accepted as “masculine” or “male-oriented” and therefore, STEM has overrepresented by men, while the studies such as humanities, arts and social sciences as “feminine”

have prevailed by women. However, it is not a matter today. As it is shown in the Figure 1.6, the gender gap between boys and girls has tightened, and on average girls are fulfilled in the math as well as boys in the recent years. Many researches agreed on that there is a little differences between male and female students in the mathematical performance and in IQ test on average, and thus there is no the “smarter sex”. However, on the higher level mathematical tests, boys doing better than girls although at a little grade, for example, on the SAT and on the ACT mathematical examinations boys outscore girls on average, as well as in the STEM domains like calculus, computer science and physics where men are more performed than women. Thus, it has been indicated that not ability in science and math affects women in their achievements in the STEM (Hill and others, 2010: 3-5).

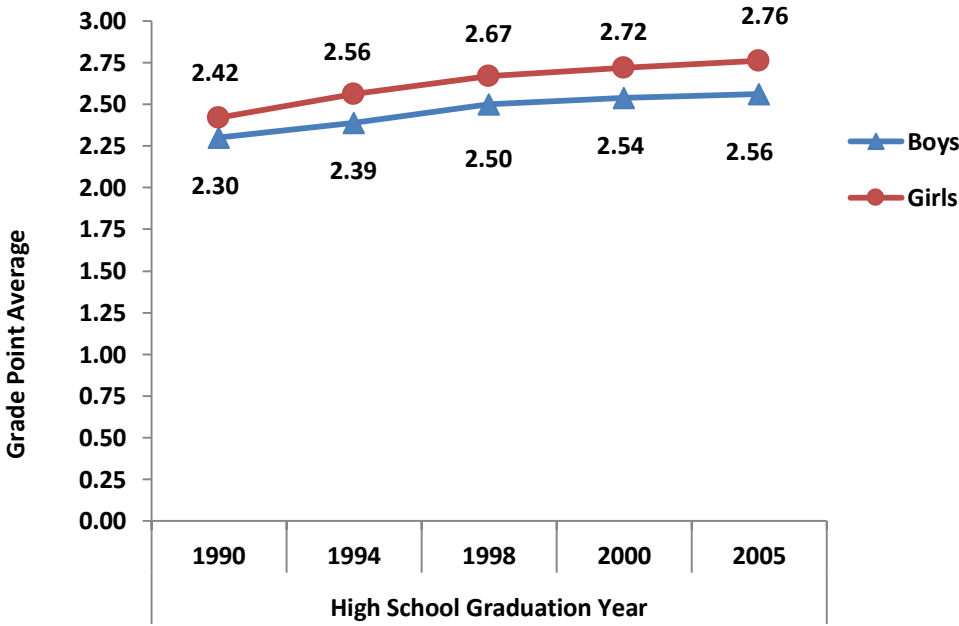


Figure 1.6 Grade Points Average in High School Mathematics and Science, by Gender, 1990-2005

Resource: Hill and others, 2010

According to some scientists, the “**stereotype threat**”² or a faith about the men’s superiority may have an impact on women’s and girls’ performance in math and science. It is the environmental informal knowledge and societal beliefs prevent them to prefer a STEM career and in turn reduce their interest in these subjects. Men outscore women in calculus not because they are better in mathematics, but because they believe that they are so. This fact that the STEM careers belongs to men as a profession could increase male tendency to desire STEM careers and reduce women’s concernment in these fields. It also may explain the inequality in scores or grades in mathematical performing between girls and boys, and which may answer the reason of the girls’ low interest in the STEM-related subjects. The researches have offered that, on the one hand, if the math self-assessment scale were monitored in the colleges and universities, then the gender gaps there were reduced. On the other hand, parents and also teachers may lower the effect of these societal influences by talking with students that they are identically successful in the STEM-related professions (Correll, 2001: 1695; Diekman and others, 2015: 67-68; Aronson, Fried and Good, 2001: 114).

There is an experiment where researches also have found that both gender carried out almost equal on the math tests when the “stereotype threat” was removed in the related fields. In this experiment which was concentrated especially on women, the female students were separated in two groups. In one group it was told them that boys are better in the test than girls (the treat situation) and in the second group that there is no differences between male and female students (the non-threat situation). The Figure 1.7 shows, in the group where the threat was not existed, the test scores were nearly closed to each other (Hill and others, 2010: 39).

² “Stereotype Threat” is a psychological factor which refers to the fear of confirming negative stereotypes regarding to an individual’s gender, racial, cultural, or ethnic groups.

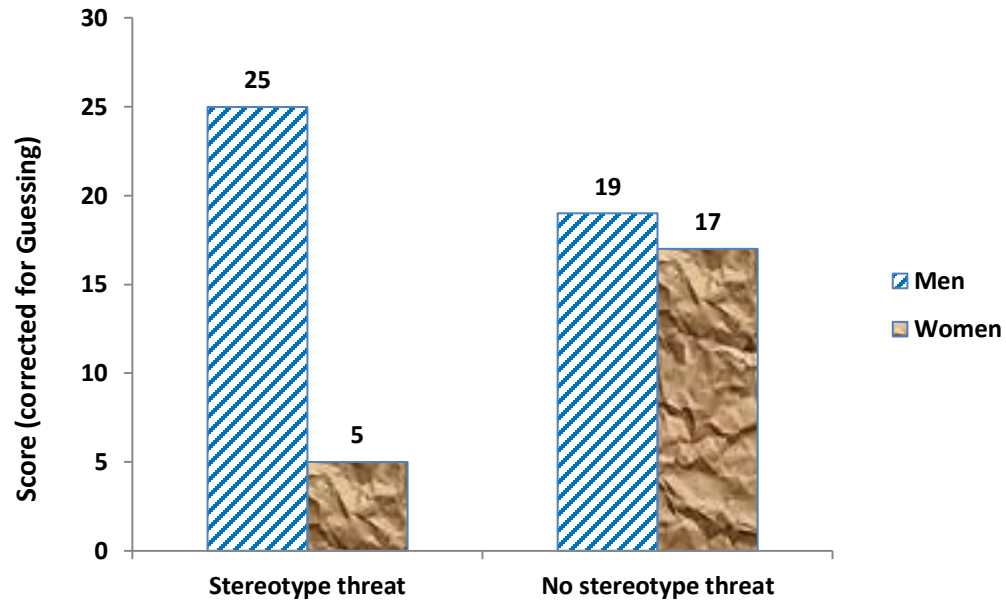


Figure 1.7 Performance on Challenging Math Test, by Stereotype Threat Condition and Gender

Resource: Hill and others, 2010

Stereotype threat, according to the scientists, can be overcome by teaching students about it. They recommend encourage and guide the female students to have growth or open mindset that will help them to adopt the flexible thinking about intellect which may diminish the negative impact of stereotype threat and increase their capacity. Moreover, the frequent meeting with the successful women’s role models in math and science will show them that stereotype threat can be controlled and overcome. Finally, it needs to educate not only students but also teachers about stereotype threat, since they are the most suitable someone that can do this in the best way (Aronson and others, 2001: 115-116).

It has found that the large persistence of the gender gap exists in the cognitive potential of the students in the field of the **spatial skills**, particularly in the level of intellectual rotation where men outperform women at a serious rate. The spatial skills are regarded as one of the most significant field of study to succeed especially in engineering. Even girls are outscored boys in the verbal skills boys do well in the fields such as visualization and spatial orientation. But an experience has showed that 3-D spatial-visualization abilities can be improved with training in a short period of time. It proved

that these trainings have not only retained girls but also have helped to engage more in the STEM-related faculty (Linn and Petersen, 1985: 1480-1493; Hill and others, 2010: 52).

Well-educated spatial skills are significant in establishing of student's self-confidence in his or her ability to prosper in the math and science classes, because the spatial skills teach how to interpret and explain the diagrams and graphics in the related textbooks. It was found that girls who had a spatial-visualization class in the middle school are more likely to take advanced-level math and science classes in the high school. Thus, in order to help students, especially girls, in expanding spatial skills parents and teachers have to explain them that the spatial skills are not inherent but developed. Furthermore, the spatial skills can be developed by playing with the construction playthings or toys, things where they can be put apart and back together, also by drawing, work with using hands and the handheld models which can help to train the visualization (Hill and others, 2010: 56).

In the other researches, there are two kinds of **mindsets** which have an important role in the students' math and science attainment. Even though, students with a "growth mindset" owned a thought that their intelligence or ability in math and science can be improved, then students with a "fixed mindset" unfortunately, believe that their capacity is just a fixed feature which put them at a considerable disadvantage. Students as well as their educators may have cloven opinions about intellectual aptitudes. Someone think that the intellectual aptitudes not changeable or fixed, that is people possess the distinct levels of ability and that is all. The others think that the intellectual aptitudes could be developed by trainings. They accept that people are differed in their skill levels, but they also believe that these levels could be improved (Dweck, 2008: 1).

Students with a "fixed mindset" are be liable to loss their encourage or confidence in the face of challenges, they do that because of their belief in that if they are really "smart" then they may overcome things easily. If these things are not came easily they usually questioning their capabilities and lose self-confidence. In contrast, students' confidence grows up with a "growth mindset", because these students believe that learning and challenging themselves get them smarter (Hill and others, 2010: 31).

There were created two the growth mindset workshops studies, where two groups were included. In the one group students were told that the brain is a muscle and as any muscle in the individual's body with training it could become stronger and with learning new things the brain created new connections. In the both two studies, there were impressive outcomes. Students in control group showed a higher motivation and they received notable higher grades in their math test (Dweck, 2008: 6).

These researchers have found the same results on middle school, high school, college or university girls. In their observation, at the beginning of studying these girls have similar interest and purpose to proceed in math. However, by the end of the education year, the interest in math has increased of those girls who constantly received messages of growth mindset related to the stereotype. Thus, it can be concluded that a growth mindset can be protected the female students from the influence of the negative stereotypes such as girls are not good as boys at math. This funding is important for women in STEM, since they always have to fight with the obstacles and challenges, and cope with the stereotypes in the "male-oriented" STEM fields (Hill and others, 2010: 33).

Parents and teachers again play the important role here, they have to teach children that the intellectual skills could be obtained by hardworking and by learning new subjects, because the brain is a muscle which becomes stronger by applying exercises and turn them to be smarter. Also praise them for their diligence and good marks. Furthermore, it is unfavorable to use the titles such as "gifted" or "talented" in the programs, since they can give a wrong message for students as "gift". Teachers should to change these titles into "advanced" or "challenge" in order to emphasize a growth mindset rather than a fixed mindset. Finally, parents and teachers should represent the challenges, misuses and mistakes as extremely valuable things. They should teach them that the center of the mathematical and scientific contributions is love of challenge, hardworking, and the ability to learn from the unpreventable mistakes (Hill and others, 2010: 35-36).

CHAPTER 2

WOMEN EMPLOYMENT IN TURKEY

Women's participation in the working life in Turkey, as everywhere in the world, has improved in parallel with industrialization. Before the Industrial Revolution women could not get out of the traditional roles, working for fee and having status as "labor", which have been possible only with the Industrial Revolution. The women's main activities were intensively in the agricultural and home-based fields in the period of the Ottoman Empire. However, in the second half of the 19th century they have begun to appear first in the paid jobs at the workshops and later in the workplaces like fabrics (Özer& Biçerli, 2004: 56; Makal, 2010: 13).

2.1. Women Participation Labor Force in Turkey

The beginning of women's participation in the labor market has been much more as a need than development in the labor market, or economy-induced factors. On the one hand, the women's desire and necessity to participate in the working life and, on the other hand, the employment needs in the economy have accelerated the women's employment. In the first period of industrialization, women have worked at the low wages in the poor working conditions. The working life started to be envisaged in Tanzimat in the period of the Ottoman Empire. Arrangements for the female participation labor force have took place later in the Republican Period, especially after 1950s, due to increasing of the family migration from the rural to the urban areas (Berber and Eser, 2008: 2-3; Korkmaz and others, 2013: 1849).

Except of the women's participation as the free-fee workers in the production in the rural areas of the Ottoman Empire, the women's participation in the working life have simultaneously improved with the capitalism settlement. In the process that started with Tanzimat, women have begun to participate in the social life, too. However, their participation has been directly linked with their social-class position (Önder, 2013: 37).

In the urban areas, while women with the good financial conditions and education, taking at home or from the Muslims schools, have entered in the working life, women with the low-income conditions have had to work in the city-established workshop-type industries at the low wages for 14-15 hours daily. Women in rural areas have worked for the western companies where they have got money per loop in the carpet textile, or more intensively they have worked as the family workers for free-fee in the agricultural sector, as well as in the west, women at the first time have entered in the private sector in the Ottoman Period. With the different estimates, since 1908 in the Ottoman Empire there were counted for 250 000 of the industrial workers, where 75 000 of them were the women workers. Women have entered much late in the public sector, where only after the second half of the 19th century, they first have entered in the health and education areas and the professions in the public services (Aslan, 2006: 120-121).

The Ottoman Empire industrial statistics, which have reflected the data of the big Anatolian cities such as Istanbul and Izmir in the period of 1913-1915, have represented 32% of the women workers in the manufacturing sector in 1913, and 29% of women's employment in 1915. There rates have increased to 90% in the weaving industry, especially in the cotton and silk weaving. The tobacco industry were the another area where the women's participation was around 50%. In addition, parallel with the industrial sector, a large number of the women were employed in the sector services. According to the researches of some American scientists made in 1920, in contrast to the 785 men workers, 350 women worked only at the 19 large retail stores in Istanbul. On the one hand, the main determinant factor in the participation of women in the Ottoman industry, as everywhere, was the lower wages paid to girls and women, in contrast to men. On the other hand, the women's concentration in certain works in the manufacturing sector, such as weaving, based on the distinction between the work for men and women according to gender (Önder, 2013: 38; Makal, 2010: 18).

Increasing in the women's labor force participation began with the Balkan War of 1915, where they obligated to fulfill the absence of men, who were participated the army, thus, caused declining of the male labor force participation, and continued further increasing during the WWI, the National and the WWII. However, even some part of women continued to stay in the labor market, with the men's demobilization after the wars, the majority of women have lost their jobs and returned to the traditional household works (Berber and Eser, 2008: 3).

After the wars and ongoing the financial crisis, the states, and Turkey, have begun to expand the individuals' (women and men) participation in the economic and social areas. With industrialization the new working areas were created for women, but it also have begun to install the new roles for women in the family and society (Korkmaz and others, 2013: 1849).

The Industrial Revolution which has begun in the 18th century, not only has increased the new discoveries and production, but at the same time has enabled the foundation of capitalism. Capitalism has advanced in parallel with the growing industries in the 19th century, but in the 20th century the world economy has experienced an unprecedented change unseen in any century. In this process, the world's economy has experienced the cutbacks of the crisis on behalf of so-called the political or economic reasons. The biggest political disruptions in Turkey, as everywhere in the world, were the WWI and the WWII, and the biggest disruptions of the economic crisis have been the 1929 Depression and the experienced stagflation due to the excessive rise of the oil price in 1973 (Önder,2013: 38).

The Fordist regime of the accumulation, that was shaped before the 1929 Depression and the Second World War and then was emerged in the post-war period, has both positive and negative effects on societies. On the one hand, it has offered the development of production of the Fordist state's labor in areas of the social services such as education, the social security, or culture. On the other hand, it has undertaken the production of some raw materials and the stock goods for the development of the capital. Also the regulations such as the social security system and the minimum wage determination have begun to implement in this period. The crisis of Fordism in the world

and Turkey began to appear after the second half of 1960s, and has taken a turning point in 1974 (the oil crisis). Due to the economic constriction the unemployment has been increased, and increase in the social security spending was exceeded the government spending. Thus, at the first time capital has started to flow outside an economy in order to find new cheap labor (Saklı, 2013: 120-125).

Since the last quarter of the 20th century, the capital such as the production and the service activities had gained at an international attribution, the name of this the globalization process. The impact of globalization on the labor market is the transformation primarily occurred under the name of “flexibility” in the production system. It was brought the serious changes in the female labor supply, in their wage levels and FLPR. Especially, flexibility in the working hours has provided an increase in the married women participation rate in the workforce. In the period of crisis or in the hard time the women’s participation in the labor market usually has been increased in Turkey and in the world. Especially, in the big families with the small number of working members, inflation, lesser opportunities to work, or the increase in the number of the fired workers, have caused lesser income to these families and have pushed women to work outside home (Önder, 2013: 43).

With the males lose of their jobs in order to compensate for the reduction in the family income, women have entered the labor market and those who cannot find work in the formal economy have entered in the informal economy, in such as the self-employed or paid work, employers, workers, contractors, temporary, part-time works. Women who already have disadvantage in the labor market, in the period of crisis have become even more unprotected. In crisis conditions, albeit at the limited levels, the employment of women has been increased. But at this point, it is important to find that under which conditions the employment of women has been increased. To compensate for the declined family income, at the world experience, if women have participated in the labor market, they often can find the unprotected work and the jobs in the informal sector (Toksöz, 2009: 5-6).

Migration from the rural areas to the urban, the adaptation to the city-life attributions and the mindset changing are the reasons that have brought some changes in the family

structure and the internal family relations. Furthermore, these conditions have influenced the woman's social position and her place in the work life as well. Women, burdened by the new and different roles based on the changes and developments in the social structure, have begun to aware her own position in the society also they have begun to take education and to work in service and in the other sectors. However, the traditional attitudes and thoughts in the society have brought the limitations on women's work outside home (Berber and Eser, 2008: 3).

Although the participation of women shows slightly upward trend in the resent years, it tended to decline proportionally in the 1950s in Turkey, in the contrary of the whole world. The reasons for this are the Turkish economy which was the economy based on agricultural production until the end of the 1950s, and the changes occurred in the economic structure and accompanied their social transformations (Korkmaz and others, 2013: 1851).

The total women population in period of 1988-2014 had considerable increase from 17.85 million women to 28.44 million. However, the female employment rate in Turkey reached the highest its point in 1980s and 1990s, which then has continuously fell until now. As it shown in the Table 2.1, the FLPR were at 34.3% in 1988 which fell to 30% in 1999, as well as the women's participation rate were 30.6% in 1988 which also fell to 27.8% in 1999. According to these data, in January of 2014 the women's labor force participation ratio counted for 29.7%, and the employment rate for 26.2%. In spite of the past years at the first view, it can be concluded that there was any structural and numerical development in the women's employment. However, the vast majority of the women employment in 1980s and 1990s was in the rural areas, generally in the agricultural sector. The majority of women are employed in this sector have worked as the unpaid family workers without obtaining any income and without involving in the social security system. However, until 2014 the women's employment has experienced the significant changes in its structure, where the employment rate in agriculture has decreased and has increased in the service sector (Metin and Arabacı Kariman, 2013: 4).

Table 2.1

Status of Women in the Labor Market (thousands, 15+age)

	Years						
	1988 Oct.	1999*	2000	2005	2010	2013	2014
Non-Institutional Population	26 636	32 606	33 129	33 898	35 941	37 430	37 679
Population at 15 years	17 085	22 848	23 295	24 686	26 740	28 197	28 440
Labor Force	5 855	6 852	6 188	5 750	7 383	8 674	8 437
Employed	5 235	6 334	5 801	5 108	6 425	7 641	7 443
Employment Rate (%)	30.6	27.8	24.9	20.7	24.0	27.1	26.2
LFPR (%)	34.3	30.0	26.6	23.3	27.6	30.8	29.7
Unemployment Rate (%)	10.6	7.6	6.3	11.2	13.0	11.9	11.8
Not in Labor Force	11 230	15 996	17 108	18 936	19 357	19 523	20 004

*The data of 1999, calculated by TURKSTAT, was taken on average of April and October

Resource: TURKSTAT (TÜİK), Labor Force Statistics

According to the urban-rural division in Turkey, in 1980s and 1990s, the rate of the female employment stood between 12-14% in the urban areas, and 40-50% in the rural areas which was much higher depended on the unpaid family workers in agriculture. Migration from the rural to urban areas, which lasted for the long period and accelerated in the 1980s, has caused the important changes in the workforce profile in both the rural and urban areas. Even though the ratio of the total female population of women living in the rural areas was at 51.1% in 1988 and at 41.7% in 1999, it fell to 31.6% in 2012. Thus, due to these changes in the women's population living in the rural areas, the employment rates started to fall in these years. The female employment in the rural areas which stood at 48.5% in 1988 and at 46.3% in 1999, decreased to 35.6% in 2012. In the consideration of the rural-urban distinction of the female employment, the actual conversion has happened in urban areas. According to this, if the total female population living in the urban areas was 48.9% in 1988, then this ratio rose to 58.3% in 1999 and to 68.4% in 2012. Thus, a significant increase in the rate of female employment has occurred due to the growing population of women living in the urban areas, which rose from 12.7% in 1988 to 14.7% and 22% in 1999 and 2012 accordingly (Metin and Arabacı Kariman, 2013:4-5).

Although women have worked at least as unpaid family workers in the agricultural production in the rural areas, where they were counted status as “workers”, they have

fully got out from the employment with migration to the urban areas. In the cities these women have stood at the home, out of the labor force, or either have worked in the informal sector, or have been unemployed (Önder, 2013: 45-46).

The increase in the female population in the cities was not at the same rate as the increase in the women's employment, and there were several factors, underlying this disproportion. In the condition where the family members, who have worked jointly as the family workers in their owned agricultural lands in the rural areas, have compelled to leave in order to migrate to the cities. On the one hand, the male members have had able to find jobs in the informal sector in the cities, especially as street vendors and as workers in the construction. On the other hand, primarily uneducated and unskilled female members, who were expected to take responsibility of housework and the child- and the elderly-care, have forced to move away from the labor force and trapped inside the house. Although the male members who migrated from the rural areas to the cities were able to find jobs, even in the public sector, then the female members have had to work in the available jobs and appropriate to them, where they were generally cleaning the house, participating in domestic production, or working in the clothing and textiles workshops. After 1980s, Turkey began to articulate more in the international market, especially in labor-intensive sectors such as textile, clothing and food production, which have emerged as strategic sectors in term of cost for the domestic firms in order to compete in the international markets. One of the reasons, that have undertaken these areas as strategic sectors, was the consistence of the largest source of women workers as the cheap and unorganized labor supply in these sectors. This female labor, without of adequate training, low-skilled, cheap and unorganized, have begun to be preferred as intense labor in these sectors. The biggest advantage of the domestic firms, in the competition at the international market, were unskilled female labor in the cities whose the vast proportion worked as the unregistered workers at lower wages, the condition which has changed a lot today compared to the past (Metin and Arabacı Kariman, 2013: 5).

According to the Table 2.2, in 1988, 11 230 000 million women were not included in the labor force, where 8 860 000 million (78.9%) were included for the reason to be "busy with housework". By the years 1999 and 2002, the numbers of women not included in

the workforce and included for being “busy with housework” were increased in numbers to 11 754 000 and 12 211 000, respectively, however, the percentage were decreased since 1988, to 73.5% and 69.9%, accordingly. Inability sharing housework and care of children, elderly and disabled, the negative outlook on the working women in the society, as well as the inappropriate working conditions and women discrimination are the important factors answered the low women’s participation in the labor force. However, as a result of the several policies, which were pursued to increase the participation of women in employment, have triggered decreasing of this ratio to 59.3% in 2014.

Table 2.2

The Reasons of Women Not Being in the Labor Force

	1988 Oct.	1999*	2000	2002	2004	2010	2014
Population not in labor force	11 230	15 996	17 108	17 455	18 624	19 357	20 004
Not seeking a job, but available to start	423	391	429	364	542	1 135	1 186
Working seasonally	22	86	339	443	270	49	39
Busy with housework	8 860	11 754	12 339	12 211	13 042	11 914	11 856
Education, Training	564	1 236	1 144	1 260	1 417	1 912	2 394
Retired	195	406	443	541	565	730	865
Disable, old, etc.	813	1 432	1 359	1 505	1 803	2 156	2 296
Others	353	694	1 055	1 132	984	1 461	1 368

*The data of 1999, calculated by TURKSTAT, was taken on average of April and October

Resource: TURKSTAT (TÜİK), Labor Force Statistics

As it is shown in the Table 2.3, from the total employment rate of women (30.6%) in 1988 the majority were employed in the agricultural sector at 76.8%. Depending on the concentration of female labor in the agricultural sector, the employment rate in the service sector was only 14.4%, in the industrial sector, which is the part of the manufacturing sector and one of the female labor-intensive sectors, was at the rate of 8.8%, and the lowest rate was 0.29% in the construction sector. Becoming to 2014, although the total women’s employment falls to 26.2%, it shifted from the agricultural sector (31.9%), service sector (51.9%), the industrial sector (15.1%), and the

construction service (1.06%). For the long years, the women's incentive participation in the agricultural sector, where they have worked as the unpaid family workers, has begun to be employed in the service sector, in parallel with the economic growth. Today, the majority of the female participation in the labor force has concentrated in the service sector (Metin and Arabacı Kariman, 2013: 7).

Table 2.3

Sectoral Distribution of Female Employment

Sectors	Years					
	1988 Oct.	1999*	2000	2005	2010	2014 Jan
Agriculture	4 019	4 209	3 508	2 367	2 724	2 378
%	77.00	66.40	60.50	46.30	42.40	31.90
Industry	448	720	730	819	966	1 123
%	8.60	11.40	12.60	16.00	15.00	15.10
Construction	15	25	33	28	56	79
%	0.29	0.39	0.57	0.54	0.87	1.06
Services	752	1 382	1 529	1 895	2 680	3 862
%	14.40	21.80	26.40	37.10	41.70	51.90

*The data of 1999, calculated by TURKSTAT, was taken on average of April and October

Resource: TURKSTAT (TÜİK), www.turkstat.gov.tr, Labor Force Statistics

Although many works have been conducted in order to increase the women's employment, the unregistered employment issue has continued to be a problem, which is encountered for the many years. The rate of working women without of any records in the social security system was quite high at 82.3%, in 1988. At the end of the policies which have pursued the fight against the unregistered economy and employment, this rate have begun to decrease in the following years, i.e. to 67.1% in 2004 and 54.1% in 2012. Women in the unregulated jobs were usually worked at the low wages, but even there, if these wages could not to afford the basic needs, such as the expenses for the child-care, cooking or cleaning, women have preferred to not work and get out of the labor force. If the majority of women in 1980s worked as unpaid family workers, today, as a result of dissolution in urbanization and in agriculture, it is noticeable that in rate of women in the paid jobs is increased. Indeed, the rate of women labor worked for the fee or wages stayed at 22.7% in the 1988, this rate increased to 56.6% in 2014. Without

including in any social security system and without of any income, the working relation dominated in “unpaid family workers” has had serious decline since 1988. Thus, the rate of women’s employment as unpaid family workers declined from 70.19% in 1988, to 49.5% in 2002, and to 31.45% in 2014, as it shown in the Table 2.4. In the following years, despite the increase in the paid women’s employment, the unpaid family workers still have had a significant proportion in employment of women. Especially, it is not possible to speak about the economic freedom of the unpaid family workers, even these women take place in the economic activities they are largely unable to obtain any income. In 2014, women participated in the paid and casual jobs counted for 56.6%, 1.2% as employers, and 10.7% were included as self-employed. At this point, the transition to paid employment was the important issue in women’s obtaining the economic and decision-making freedom (Metin and Arabacı Kariman, 2013: 9).

Table 2.4

Employed Persons by Status in Employment (15+age, %, Female)

Employment	Years						
	1988	1991	2000	2002	2010	2012	2014
Regular Employee	18.13	17.51	30.82	30.92	50.74	54.28	56.56
Causal Employee	0.46	0.26	0.45	0.61	0.00	0.00	0.00
Employer	0.25	0.37	0.74	1.00	1.29	1.27	1.23
Self-Employed	6.84	8.20	11.84	12.46	12.79	10.78	10.74
Unpaid Family Workers	70.19	71.34	52.13	49.56	35.18	33.66	31.45

Resource: Turkish Statistical Institute (TÜİK), www.turkstat.gov.tr, Labor Force Statistics

It is not unquestionable that the basis of increasing of the women’s employment is increasing the education level of women. In Turkey, as in whole world, it is also observed that increasing of the education level of women increases their participation rate in the labor force. As it is shown in Table 2.5, the female LFPR of illiterate women counts for 16% where it is less than the high education which counts for 25.8%, the high and vocational school graduates for 71.7%, and the higher education graduates for 71.3%. Thus, the results from the table prove the view that increase in women’s

education level leads to increase the participation rates as well (Metin and Arabaci Kariman, 2013: 9).

Table 2.5

Labor Force Status by Educational Level (15+years, %, Female)

Education Level	(%)	Years				
		1988	2000	2005	2010	2014
Illiterate	LFPR	32.3	25.2	15.6	16.3	16.0
	Unemployment	3.2	2.2	2.3	2.4	3.0
Education Below High School	LFPR	32.4	23.0	19.9	23.8	25.8
	Unemployment	10.8	4.4	8.1	10.3	9.3
High and Vocational High School	LFPR	47.4	31.8	63.7	70.2	71.7
	Unemployment	31.5	16.4	47.1	47.4	38.4
High Education	LFPR	82.5	70.1	69.1	71.0	71.3
	Unemployment	17.6	9.1	14.1	15.9	15.5

Resource: Turkish Statistical Institute (TÜİK), www.turkstat.gov.tr, Labor Force Statistics

2.2. Factors Influence the Participation of Women in Workforce

There are many interrelated factors that directly or indirectly affected the women's participation force in Turkey. The first and significant of factors determined the low women's participation in the workforce is the **low wages**. In the traditional family system, women in Turkey, as everywhere in the world, are loaded by child- and elderly-care and housework. Thus, in order to participate in the labor force wages that women received have to meet these costs, i.e. the payments to the kindergarten, or to someone who will undertake their works at home. If some women employed in the well-paid jobs do not have such a problem, women with the lower levels of education can find only the low-paid jobs. The total value of the services produced by the woman at home called "the booking fee" ("rezervasyon ücreti"), and to enter in the labor market the woman's wage is compared with these services. Thus, if the wage earned at the woman's work cannot meet "the booking fee" and kindergarten, then woman give up joining the workforce (Önder, 2013: 47-48).

Another factor, affected the women's participation in the labor force in Turkey, and caused the low women's participation rate in the urban labor market, is the size of "**the informal economy**" which has grown in the recent years. In the working life, more women than men tend to work in the informal economy, and this situation reduces the women's expectations for the future which is also an important reason in reducing their labor force participation. Even the Turkish economy experienced significant changes since the 1970s today women still cannot find enough paid work opportunities in the urban areas which leads them into the informal employment. According to the TURKSTAT statistics, some part of the urban areas women in the informal economy seen as "does not work" usually employed in the labor-intensive sectors like textile, clothing, confection, food, and service. There are about two thirds of women in this economy, who worked for the low wages and out of the paid work and social security (Özer and Biçerli, 2003: 67; Önder, 2013: 48).

The lack of the places where women can leave their children or the expensiveness of these places also is an important reason that leads women to work in the unregistered employment. On the one hand, this condition completely pushes women out of the labor market. On the other hand, it leads them to do jobs which bring them money at home such as textile, knitting, or tailoring. However, not all women can find even this kind of occupations which based on the places where they live and the job opportunities. For example, in one study conducted in 1973 among married and in the reproductive age women, 92% of women in the big cities and 43% of women in the town have been found such jobs. The low level in the female employment rate in the urban areas may also be due to the women's attitude about the work status. For example, the jobs such as daily laborers (i.e. cleaners and babysitters) accepted as the low-status jobs, and women are worked in such works introduce themselves as the "housewives" most in the statistical counting. Thus, if men in the same situation introduce themselves as "unemployed" and counted as the active population, women misrepresented in this way which leads to the even wider gap between the counted male-female labor force participation rates (Özer and Biçerli, 2003: 67).

By analyzing the women's employment status in Turkey, there is a significant portion of employed women in "**the unpaid family worker**" status (31.45% in 2013). While the

unpaid family workers are crowded in the rural areas due to the higher rate of women employed in the agricultural sector, they lesser in the urban labor market, and this situation causes the different participation rate of women's employment between the rural and urban areas. Even women in the rural areas take the part in the labor market as the unpaid family workers, in the urban areas the majority of jobs are expressed as the paid and casual works. The State Institute of Statistics (Devlet İstatistik Enstitüsü (DİE)) data, calculated "the proportion of the women employed and unpaid family workers in the labor force", also supports this funding. According to this, if the ratio ranges between 75-85% in the rural areas, in the urban areas it ranges between 9-13% (Özer and Biçerli, 2003: 66).

While the level of the LFPR of women in the rural areas decreases significantly from 1988 (34.3%) until now (29.7% in 2014), the level of the LFPR of women in the urban areas almost remains the same. It shows that with migration of the female labor force from the rural to the urban areas has resolved the women's employment in the agricultural sector, but this labor force of immigrants cannot enter in the labor market in the cities (Toksöz, 2009: 23).

One of the main reasons of the low level of the participation of women in the labor force in Turkey is the insufficient level of women's **education**. Women unable to benefit from the opportunities of education, as a result, with the low education level they could obtain only the low wages, and if they get a job, it leads to the high opportunity cost. Lack of the public support and services in such issues as child care and elderly care, existence of logic that women should to solve these problems at the individual level, and the reduction of these services in the market, increase the opportunity cost of working. According to the Table 2.6, the rate of the illiterate women is still very high (83%) of the total illiterate population in 2013, where the men's rate at 16.9%. However, the gender disparity decreases while the level of education increase. At the primary education the girls' rate is at 43.8% and boys' at 56.2%, also if girls count at 42.2% in the high and vocational schools then boys at 57.7%, and 43.9% of higher education is counted for girls and while 56.1% for boys. Even though there is still very big gap between men and women in illiterate level, then the girls' participation in education is nearly close to boys. (Önder, 2013: 49).

Table 2.6

Population by Educational Level and by Gender (6+ years, 2013)

Educational Level	Total		Men		Women	
	mln.	mln.	%	mln.	%	
Illiterate	2 654 643	449 328	16.93	2 205 315	83.07	
Literate but no School Completed	14 053 831	6 459 316	45.96	7 594 515	54.04	
Primary School	14 994 232	6 454 722	43.05	8 539 510	56.95	
Primary Education	13 018 720	7 317 838	56.21	5 700 882	43.79	
Junior High School or Vocational						
School at the Same Level	2 828 299	1 720 425	60.83	1 107 874	39.17	
High School or Vocational						
School at the Same Level	12 085 335	6 976 694	57.73	5 108 641	42.27	
Higher Education	6 706 780	3 762 530	56.10	2 944 250	43.90	
Literacy Status Unknown	1 706 368	873 453	51.19	832 915	48.81	
Total	68 735 145	34 421 110	50.08	34 314 035	49.92	

Resource: Turkish Statistical Institute (TÜİK), www.turkstat.gov.tr, Labor Force Statistics

According to the Basic Law on National Education (Milli Eğitim Temel Kanunu) the education of children in the 3-5 age group, that not reached the compulsory school age, is optional. In the data of 2011/2012 academic year, there are in total 1 169 556 of the pre-school children in education, and 562 504 (48%) of them are girls. The pre-school enrollment rate of the 3-5 age group children is 30.87% in total, where 30.49% are girls and 31.23% are boys. At the 4-5 age group 44.04% in total, where 44.56% are girls and 43.50% are boys. In the recent years, despite the rate of the pre-school education in Turkey nearly doubled, it still below the desired level (for example, in the European Union countries the pre-school education enrollment rate is 88.4%). Ministry of Education expanded the pre-school classroom capacity and the teaching staff in 57 provinces for the academic year of 2010-2011, and made the pre-school education compulsory there. In this context, the pre-school education in the coming years is expected to increase continuously in the enrollment rate. Increasing the duration of the compulsory education to eight years, has affected positively in the girls' primary education enrollment rate over the past decade. If for 2001/2002 academic year, the primary school net enrollment rate was 92.4% in total, 96.2% for boys and 88.4% for girls, then for the 2011-2012 academic year the net enrollment rate was reached 98.67% in total, where the net enrollment rate for boys and girls was realized at 98.77% and 98.56%, respectively. The gender ratio in the primary education increased by 10% over

the last decade and reached 100.4% (Önder, 2013: 49; T.C. Aile ve Sosyal Politikalar Bakanlığı, 2012: 13).

The secondary level of education is defined as at least four years and is not compulsory. The enrollment rates in the secondary education level have increased continuously in the recent years. Even though in 2001/2002 academic year, the secondary education level net enrollment rate recorded 48.1% in total, where boys at 53% and girls at 42.9%, then in the 2011-2012 academic year, the net enrollment rate reached 67.37% in total, and the net enrollment rate for boys and girls realized as 68.53% and 66.14%, respectively. The "Gender Ratio", which was at 100% in the primary education, at the secondary education level has declined to 93.3% (T.C. Aile ve Sosyal Politikalar Bakanlığı, 2012: 14).

As noted above, the disparity in the ratio of male-female enrollment in the educational levels is still in progress. In the vocational and the technical education institutions, that prepare students for employment and the higher education, the gender discrimination continues to exist in a very significant way, where the female and male students are still distributed according to the type of the school. From 1975 until now, despite there is the absence of any obstacles to enter in the vocational technical schools, which prepare the students to the profession traditionally accepted as "masculine", is not preferred by the girls (45%, in 2011-2012 academic year). Changing the rules in this direction could affect the traditional understanding of gender, but yet in a limited way (Önder, 2013: 49).

The development in the basic levels of education has provided the significant development in the tertiary education, too. In the recent years, the universities in Turkey have spread to the all provinces where there are 103 public and 65 private universities. In parallel with these developments in the higher education, there was also a significant increase in the enrollment rate. If the net enrollment rate in the higher education for the academic year 2001/02 was 12.9%, then for the year 2010/11 it is seen to rise to 33.06%. In terms of women, for 2001/02, it was 12.1% which increased to 32.65% for 2010/11. The gender ratio in the tertiary education was 83.38%. Since 2011/12 the total number

of the students continued to study at universities were 4 315 836, and among them 1 973 303 (45%) were women (T.C. Aile ve Sosyal Politikalar Bakanlığı, 2012: 14).

The number of students, according to the level of the degrees between women and men, increased significantly in the period of 1996-2013. Even though the number of the female university graduates were counted for 60 746 000 of women in 1996, then in 2013 these numbers increase to 285 362 000. Also there is increase of the graduates of the master's degrees and doctorate, where women graduated from 2 266 000 of the master's degree and from 603 000 of doctorate in 1996 to 12 542 000 and 2 082 000 of the master's degrees and doctorate, respectively, in 2013.

Moreover, in parallel with rise of the female graduates the number of male graduates also has increased significantly at each level of the higher education in this period. Thus, the main difference lies in the proportion between men and women graduates which has had to decrease over time. If the rate between the under-graduated men and women was 1.32%, as well as 1.39% of master's degree and 1.68% of doctoral degrees in 1996, then in 2013 it declines to 1.08%, 1.05% and 1.14%, respectively. This change is occurred due to the increase of the female graduates and decrease of the male graduates at each level of the higher education between 1996 and 2013, as shown in the Table 2.7.

Table 2.7

Number of Students According to Level of Degrees by Gender

Education Level	1996		2000		2010		2013	
	women	men	women	men	women	men	women	men
Bachelor Degree	60746	80040	94594	126940	262275	297593	285362	309273
	43.15	56.85	42.70	57.30	46.85	53.15	47.99	52.01
Master Degree	2266	3143	3147	4792	22734	19869	12542	13162
	41.89	58.11	39.64	60.36	53.36	46.64	48.79	51.21
Doctoral Degree	603	1011	783	1330	2084	2575	2082	2380
	37.36	62.64	37.06	62.94	44.73	55.27	46.66	53.34

Resource: ÖSYM (Ölçme, Seçme, ve Yerleşme Merkezi), www.osym.gov.tr

According to the data of 2012 in the Table 2.8, even though the rate of women is higher than men in the fields like Language and Literature, Mathematics and Natural Sciences, Health science, Social Sciences and Art; the majority of the male students is noted to be higher in the fields of Technical Sciences and Agriculture and Forestry. The disparity in the ratio of male-female enrolment in the tertiary education is also continued. In the parallel with the fields accepted as the traditionally feminine, such as Language and Literature, Social Sciences, and Art, there are important changes in the fields of the Mathematics and Natural Sciences and Health Science in the period of 1995-2013. According to data, in the field of Mathematics and Natural Sciences the rate of the women students increases from 1.18% in 1995 to 1.62% in 2013, and in the Health Science from 1.07% to 1.62% in the same years. However, there is still high gender disparity in the Technical Sciences which continues to stay at the high rate in 2013 (2.81% in 1995 and 2.13% in 2013). It is observed that more than 70% of male students studied in the technical sciences (T.C. Aile ve Sosyal Politikalar Bakanlığı, 2012: 15).

Table 2.8

Number of Undergraduate Students According to Field of Study by Gender
Division of Labor by Gender

No:	Fields of study	Years							
		1995		2000		2010		2012	
		women	men	women	men	women	men	women	men
1	Language & Literature	1588	1006	3014	2268	5727	2660	6807	3271
2	Mathematics & Natural Science	3019	2553	5440	5386	8047	8107	12739	7872
3	Health Science	3540	3783	5615	4636	8896	5832	10813	7187
4	Social Science	2913	4173	6172	8850	9925	9041	15073	10560
5	Technical Science	3324	9353	4823	13939	7883	22135	11738	25048
6	Agriculture & Forestry	1463	2256	1867	3046	1650	3142	2942	3774
7	Art	612	437	907	572	2247	1778	2236	1882

Resource: ÖSYM (Ölçme, Seçme, ve Yerleşme Merkezi), www.osym.gov.tr

Furthermore, in the situation of women in the academic staff (Professor, Associate Professor, Assistant Professor, Lecturer, and Research Fellow), the ratio of the female staff (41%) in Turkey are seen higher than in many countries, but even it is very significant proportion, the top position, such as rectorate (5.9%) continues to be dominated by men (T.C. Aile ve Sosyal Politikalar Bakanlığı, 2012: 15).

Except education of the women participated in the employment, the introduction of the mandatory pre-school education for children, the promotion of nurseries, care homes and kindergartens can be considered as the indirectly contribution of education to the employment. It is observed that the level of education in Turkey seriously affect the participation of women in the labor force. In March 2013, according to the results of the household labor force survey, the labor force participation rate of the college graduates around 80.7%, the high school and the vocational school is 52.5%, and the lower education level than the high school is 47.2% (Önder, 2013: 49).

In a survey, the "education" parameters have been found to be at the forefront, in terms of the working conditions. This parameter has directed to the workforce and influenced to leave it. Particular in the conservative and the low level of education sections, been educated women is seen as one of the most determinant factor in her work. There is a dominated idea that uneducated women will work only if they have the financial necessity, but educated women work in the every situation. The most important reason for this that the actual working conditions (the long working hours, the low pay, the high risk of discrimination and harassment) are a barrier for women with the low level of education (Eyüpoğlu and others, 1998: 207).

Education is the key in order to allow women independently enter in the labor market. In the same time, it is also the most important step of the individual freedom and liberation. As seen above, it is obvious that there is a parallel relationship between the women's labor force participation rates and their education level. As the level of education increases in the cities, the female labor force participation increases significantly, too. Education not simply allows the rise in the wage levels by increasing the productivity of labor, but also by the weakening the patriarchal mentality, provides the female labor force participation legitimacy in the eye of society (Önder, 2013: 50).

In the society where is a division between the men's and women's roles, responsibilities, and activities in accordance with the cultural and historical background, called **the division of labor based on gender**. This division of labor between genders is an indicator of the interdependence and cooperation. On the one hand, the work made by men considered as more prestigious with the higher income, then the work made by women based more on the housework, or the jobs with the lower wages. On the other hand, it identifies the works between the men's and women's works. As everywhere in the world, the married women in Turkey are also associated with the housework, and expected to take care of the children and elderly. Unmarried young women can obtain the work outside home more freely, however, it is also observed that if there is no a consent of their husbands after marriage they usually move out of the workforce. So, it is look like that marriage is one of the main determinants influenced the women's decision to join, stay, or leave the labor market. According to the research, most of women in Turkey begin to work at the early ages and while they are single, but later they quit their works on their own initiatives. It is found that among the reasons of this, are primarily betrothal and marriage. Marriage is seen as almost a rescue for the single young girls, especially who worked in the hard conditions and with the low level of education marriage is even seen as the opposite of the work. It is understood that women especially with low level of education prefer to not work after marriage in the parallel with the traditional ideology widely existed in the society (Önder, 2013: 54-55).

While the women decide to work they have to think how to set the works at home and who care of the children and elderly. Children's schooling years are the most problematic periods for the working women. This situation is an important factor affected their decision to continue their participation in the workforce. Unlike men, the lack of the institutionalization of the child-care, which is one of the main obstacles to work, directly affects women's participation in the participation labor force. If the working women can get a support on the child education and care, then they may be not leave their jobs and will have a chance doing the career and getting the retirement opportunities. Women, before entering the workforce or while working, need to find the solutions to all these problems (Önder, 2013: 54).

In the families, the word “care” includes two meanings physical and emotional. On the one hand, the care is related to the physical care activities on the other hand, it is the feelings feeds toward the care-undertaken people (children, parents, siblings, etc). The care work and the emotional work, when interrelated in the each other, become out of the ordinary categories of the care works adopted in marketplace. In this context, the household chores can be made easily by a third person, but the emotional care, which does not have a measurement, cannot make as easy as the housework. In this case, the working mothers, whose children brought up by the sitters or in the kindergarten, carry an emotional heaviness and attract remorse. Thus, the lack of the kindergartens and the nursing homes, as well as the inadequate costs of existing ones cause women to give up the workforce before the job search (Özkaplan, 2009: 16-17).

Women's low level of participation in the workforce is also affected by the **patriarchal mentality** and the effectiveness of its structure that restricts the supply of female labor force participation. The participation of women in the labor market, or taking a decision to work is determined by the man's permission and supervision beyond the women's individual decision. Especially, among the new immigrants from the rural areas in the cities, the married women are not welcomed to work the priority in the family have first belongs to the male members. In the case if it not enough then the unmarried girls allowed to work. The longer time has spent in the city after migration the more husbands are allowed their wives to work, but with the severe restrictions in their work (Önder, 2013: 50).

In a patriarchal society dominated by the traditional ideology on the gender roles, women are primarily responsible for the housework and child-care. Therefore, the majority of women stays away from the social production and acquires the skills according to the gender thoughts and the behavior patterns adopted from an early ages. From time to time, these skills allow them to have the opportunity to work in some professions like an extension of the housework. Separated the professions into categories in terms of gender, the traditionalist approach, by preserving the traditional status of women allows them to work only where it necessary in the workforce. Therefore, women are intensively employed in the sectors such as health, education, and food. Also, employers are not preferred women in the decision-making positions, because of

the reasons like marriage and children, where the high probability of an interruption or quitting the job (Önder, 2013: 55).

Starting from the women's social status that the home and children's responsibility are the women's duties, even women are received the same education and the same level of the skills according to men, they are exposed in the **acceptance in the workplace**. Although there are attempts to prevent the gender disparity in the labor demanded at entering in a workplace, the choice which determined by the desire of employers cannot be fully avoided. The employers have even wider thought that “women usually work temporary, they are not concentrated as men, due to pregnancy and housework they do not get promotions and thus could not to get higher positions”. So, it is expected that women have to put family at first place and their work at second.

Even though there are certain data in the public sector for the employment by the occupation groups, the provision of the secure data is not available for the private sector. By the household labor force survey, if the proportion of women is higher than men in the unqualified jobs, then in the professions like operators, seen as the men-related work in the community, the rate of the male employees is higher than the female employees. Also if the rate of women-professionals exceeds the men's rate, they are quite behind the men in the senior management (Önder, 2013: 52; Kocacık and Gökkaya, 2005: 208).

The compensation policies implemented in Turkey vary according to the level of education and gender. Despite the arrangements made with “equal pay for equal work” in the public sector in recent years, the similar practice in the private sector seems unlikely to perform. According to Turkey Statistical Institute 2010 Earnings Structure (TÜİK 2010 Kazanç Yapısı) research, the monthly gross wages for the male employees received elementary and secondary schools education is 1 061TL, per high school graduates is 1 317 TL, and per colleges and the higher graduates is 2 842 TL. While the monthly gross wages for the female employees who the primary and secondary school graduates is 870 TL, per high school graduates is 1 177 TL and 2 380 TL for the college graduates and above. In this case, the hiring and promotion processes at work as well as the wage policies in practice, is an indicator of discrimination and inequality against women (Önder, 2013: 52).

As in the whole world, also the Constitution as well as the signatory international conventions prohibited **discrimination on gender**, but the gender-oriented practices still exist in the application. No.2010/14 circular states, “by providing gender equality in the society that strengthening the women's socio-economic position, which need for getting sustainable economic growth and achieving social development, there is a need to increase the employment of women and a necessity to ensure there requirement of equal pay for equal work opportunities” (Önder, 2013: 51).

Although the gender equality policies implemented in the recent years have changed the position of women in the labor market in the positive way, still the reasons such as the permission to leave the job due to pregnancy are seen as cost-increasing factors in the private sector. Even in the labor intensive sectors such as banking, during the recruitment women are questioned about their intention of marriage and having children. In the other hand, some rules and regulations in the enacted law to protect the women workers may reduce the women’s LFPR, especially in the urban areas. For example, the Labor law which stated that "women have the rights to receive a compensation if they leave their work after marriage based on the unwillingness of their husbands them to work" time to time have been abused. This statement has a negative impact on the labor force participation of women. There are also the other similar laws like the employers are obligated to run a "lactation room" if there are between 100-150 of the women workers are employed, and to operate the "slot-nursery" with the existence of more than 150 women workers in staff. Thus, these requirements may lead to stop the employment of women before coming to these figures. Another factor restricted the employment of female labor force is the jobs prohibited or restricted by the Labor Law for women in some working areas. For example, the Labor Law 4857 Article 72 prohibits employing women in the under-ground and underwater jobs such as mines, cable floored, sewage and the tunnels construction. The provision of Article 73 of the same law expresses: “the regulations, related to the women employees worked at night in the industrial sector, have to be prepared by the Social Security Ministry and Ministry of Labor with an approval of the Ministry of Health”. This provision restricts the female employment as well. Although these substances are introduced to protect women, they unfortunately

block the entrance them to the high-paying jobs, as well as make the "weaker sex should be protected" image of women (Özer, 2003: 70).

The provisions of the law in many of the developed countries, as well as the international documents on gender discrimination offer the equal opportunities to all employees (men and women) in all areas in the workforce. However, women are still exposed by the invisible barriers that not openly stated. Such barriers are called "**Glass Ceiling Syndrome**" (Kocacık and Gökkaya, 2005: 209).

The reasons for the formation of the glass ceiling syndrome are the broken women's participation in the labor market, i.e. women employment is underrepresented in the certain areas like the human resources and in the public relations, where women less likely to have a rise in their position, as well as the obstacles in the recruitments to the senior positions, the sex discrimination in the promotions, and the traditional social roles which are undertaken by women. As well as in the whole world, a very small number of women exist in the senior management positions in Turkey, a condition that continued from the past until now. According to the State Personnel Presidency (Devlet Personel Başkanlığı) of the 2011 data, only 37% of the staff employed in the public institutions was women compared to 63% of men. These rates in the bureaucracy are counted for 13.6% for women and 86.4% for men, and the proportion of the women at the top management is 31% (Korkmaz, 2014: 2-3).

It is slightly better picture observed in the examination of the private sector. Turkey Statistical Institute (TISK) made a survey with the female executives the results are shown in Table 2.9. The survey has been taken from 111 companies where the female representation in the management is very low. However, the survey included in the total 85 427 number of employees where only 14.4% (12 260) were women among them. Thus, the proportion of women in the senior management, of the large enterprises included in the survey, in total are higher in comparing with the public institutions. If compared this rate at the international level, the number of women at the top management in Turkey is higher than in the other countries. According to the document published by the European Commission (2009) across the EU large companies' management, the proportion of women in the board chairman is 3%, while this rate,

according to a survey by Turkey Statistical Institute (TISK) is 14%. In addition, women in the management board members of the large companies across the EU are counted at 11%, while at 23% in Turkey (Korkmaz, 2014: 7).

Table 2.9

Senior Women Executives in the Private Sector in Turkey (2009, TISK)

Title	Women (%)	Men (%)
Senior Executive	22.8	77.2
Board member	22.6	77.4
General Manager	27.9	72.1

Resource: Korkmaz, 2014

The barriers of the glass ceiling that women have experienced in their working life can be divided in three main parts. First, the barriers imposed by the men managers: The most important barrier that men managers put in front of women to raise to senior stage is a stereotype about women they believe women could not be successful at the senior positions. Second, the obstacles imposed by the women managers: Women managers do not like other women get the same position. It may be because they do not want to compete with them, or like to be the only woman in this position which refers to “Queen Bee Syndrome”. Third, the barriers that a person imposed itself: Some of the biggest obstacles which force the glass ceiling occur when barriers imposed by self. They are a concerns do not damage the family, the lack of self-confidence (I cannot rise anyway), or tendency to see the co-workers of same sex as the competitors (Korkmaz, 2014: 9).

Various approaches have been suggested in order to overcome with the glass ceiling in the workplace. The companies are followed the first approach teach women to behave like men in order to attract women into the workforce and suggest them to serve like men in the masculine jobs. The companies are followed the second approach try to fit the women’s special needs and situations such as a parental leave, nursery, and the flexible working conditions. In the third approach, companies do not assimilate or adapt women, instead they emphasize the differences that women bring to the workplace, and

strive to add women into the work where they think women have to be due to their traditional female activities or products. These approaches can be described as the superficial approaches where they find solutions to the symptoms rather than the source of the gender inequality. The first approach never eliminates the systemic factors which will not solve any women's problem. The second approach which balances the home and the work cannot shake the woman's belief in the problem, i.e. the problem still exists. In the third approach the limits are clear. The fourth approach claims to discover the roots of discrimination, to eliminate them by the progressive changes, and gradually to solve these problems by executing of the persistent campaigns. In order to find a solution, this approach starts with the belief that the roots of the inequality are in our cultural patterns. This approach claims that the small gains can let the quick changes in the people's ideas which not only improve the position of women at work, but also the organization which in turn will eradicate the roots of discrimination. The one research made in the Turkish management at "Women's Glass Ceiling Overcoming Strategies" represents that among the general and vocational education, the developments in the social relationships, the participation in the career programs, getting help from the mentors and showing the high performance, only "high performance" was determined to be effective in the women's career advancement. This strategy is significant not only for the women workers, but also for the workplaces and the human resources departments. The implementation of the human resources policies, aimed achieving the balance in the women's work and private life, will improve their performance at the work, and will contribute to break the glass ceiling, which is a major obstacle in the women's career advancement (Önder, 2013: 53-54).

In the recent years, a new concept emerges and takes place in the center of the main problems women are faced in the workplace. This concept, called "**mobbing**" which is referred to the psychological harassment in the workplace. The concept "mobbing" is derived from the Latin word "mobile vulgus" which means the psychological violence, oppression, siege, harassment, disturbing, or distress. In the Turkish "mobbing" is expressed in terms of the psychological harassment, psychological terror, emotional lynch, intimidation, emotional abuse, or despotism in the workplace. In the terminology for the person who apply mobbing there are expressions like offensive, abusive,

aggressive, or bully; mobbing applied to the person is expressed as has suffered emotional assault, mobbing victim, aggrieved , or victim. The psychological harassment may occur without depending on the age and gender of the victim. However, it shows that the rates of women are subject to the psychological harassment more than men. This data is described in the decision of European Parliament regarding the workplace harassment where it was reported that women victims face more the attack, both vertical and horizontal, compared to men. According to a report prepared by the French Economic and Social Committee, especially women in their 40s are more exposed to the psychological harassment, and it happens because women began to climb to the senior position in a firm at this age (Önder, 2013: 55-56).

By the size of the impact and the damage of mobbing people are exposed to, causes them to become insufficient at their work. Research conducted on the subject showed that the shorter duration of mobbing is the 6 months, the generally average period is 15 months, and the period of the appearance of the heavy permanent impacts is 29-46 months (Metin and Arabacı Kariman, 2011: 6).

Some researches, about where and who are exposed to mobbing, show that mobbing is common in the non-profit organizations, primarily in the health and education sectors, and especially in the universities where it happened much more frequently. The direct cost of mobbing (psychological harassment) in the workplace which are the loss of the jobs together with the dimension of the security, forces to pay a heavy price for the individual's mental and physical health. There is no provision in the Turkish Constitution that includes the psychological abuse directly. However, according to the psychological harassment taken into account in the national and the international law based on the personal rights, there are regulations regarding to these rights in the Constitution (Gazi University, <http://mobbing.gazi.edu.tr>).

Another the major problem area which effects the women's participation in the labor force is the **international migration** movements that continuously increase due to globalization. According to the UN data, in 2000 there were 175 million of the international migrants in the world. In 1960, it is considered around 76 million migrants in the world, in the 40-year period the number of the worldwide immigrants is seen to be

increase almost three-fold. The biggest increase of the international migration in Turkey occurred in the period between the years 1990-2000 with the Eastern Bloc collapsed. Created by the transition to a market economy, economic, social and political problems have resulted in an increase in the east-west migration movements (Gökbayrak, 2006: 2).

In the recent years, there is also a labor migration from Africa, the Balkans, the Caucasian countries and the Middle East into Turkey. The unregistered foreign workers are employed in almost every industry and every region of the country. For example, in the summer period they work in the tourist areas as the cleaners, animators, floor workers in the hotels, guesthouses, and at the pleasure grounds. In addition, alongside the Eastern Black Sea region the foreign workers are worked in the agriculture and the construction sectors, and in the cities such as Istanbul, Bursa, and Izmir foreigners are employed in many sectors and professions (textile, retail, tourism, and etc). The size of the illegal foreign labor is inherently impossible to determine precisely. In a study on the subject, it represents that the number of the illegal foreign workers consisted approximately 5% of the total workforce (Karagöl and Akgeik, 2010: 7).

A prominent feature of the international migration that there is increasing in the number of women's migration. The psycho-social trauma appeared due to the migration process the most affected by women and children. Women constitute half of all international migrants. Therefore, today there are a lot of the talks about the "feminization of migration". Impoverishment caused by the neoliberal policies has made families dependent on the women's labor which has accelerated the feminization of the migration flows. In particular, the care services are the determinant in the demand of the female labor migrants in the country. The fact that the in expensive and flexible immigrant labor not as much helps to the educated women willing to develop the career opportunities, as considerably increases the rate of the migrated women workers in the informal sector. The social gender division of labor is somewhat reproduced itself at each stage of migration. The studies interpreted the gender context of the international migration shows that women are at a disadvantage as the women migrant workers against domestic women and as women in front of the men migrants. The immigrant women are faced the unfair working conditions. Although the developments have been made in the last

quarter century, the inequality between men and women in the labor market has continued. Moreover, if the workers are the women migrants then this injustice is increased further. The unskilled migrant workers in Turkey generally are employed in the highest of the unregistered jobs such as nursing and domestic services. In the period 1960-1970, Turkey was known as a country of emigration to the European countries, however, due to its geography and the immigrants are hosted, it shows a shift the country as the "transit country" and "target country" in the recent years. This situation raises the need to establish a migration policy in Turkey (Önder, 2013: 44-45).

CHAPTER 3

WOMEN IN ENGINEERING AND THE ANALYSIS OF THE HYPOTHESES

3.1. Women in Engineering in Turkey

Even the number of women in the engineering has increased over last years it still has represented lower proportion in contrast with men. As it was showed the chapters above fewer women enter and stay in the engineering field in the world. The same situation is in Turkey, too. However, by comparing Turkey with the other countries the women engineers represent more than half larger in numbers than in the USA and outperform the EU countries. Even the number of women engineers is greater in Turkey, they are still underrepresented in the engineering fields compare to men at every stage that started from education and continued until employment in these fields.

The first enter in engineering is begun with enter in the colleges and universities. The Table 3.1 presents the proportion of student graduated from of the engineering and non-engineering faculties in Turkey, in the period of the selected years 1996-2013. Although the number of the girls graduated is slightly increased and the number of the boys graduated is slightly decreased during these years, these numbers quite close between girls and boys graduated.

Table 3.1

Percentage of the Students Graduates among Engineering and Selected Non-Engineering Faculties by Gender (%)

	Years									
	1996		2001		2006		2011		2013	
	women	men	women	men	women	men	women	men	women	men
Engineering Fields										
Total for Universities	43.3	56.7	42.9	57.1	44.8	55.2	46.3	53.7	48	52
Technical Education	5.6	94.4	9.2	90.8	9.4	90.6	14	86	14.4	85.6
Naval Architecture & Marine Science	20.6	79.4	12.8	87.2	12.5	87.5	7.6	92.4	7.2	92.8
Electrical & Electronic	13.3	86.7	13.7	86.3	14.5	85.5	12.9	87.1	15.5	84.5
Chemistry & Metallurgy	38.2	61.8	35.1	64.9	43.5	56.5	46.7	53.3	55	45
Civil Engineering	15.3	84.7	17.3	82.7	20.2	79.8	18.6	81.4	21.7	78.3
Mining Engineering	14.3	85.7	27.2	72.8	33.3	66.7	17	83	27.8	72.2
Mechanical Engineering	14.8	85.2	14.1	85.9	9.7	90.3	14.2	85.8	18.2	81.8
Faculty of Engineering	25.5	74.5	24.3	75.7	22.9	77.1	24.5	75.5	29.9	70.1
Engineering & Architecture	25.2	74.8	25.1	74.9	24.8	75.2	26.2	73.8	33.9	66.1
Aeronautics & Space Science	19.5	80.5	19.1	80.9	19.5	80.5	19.4	80.6	28.6	71.4
Engineering & Technology			40.8	59.2	38.3	61.7	34	66	50.9	49.1
Engineering & Computer Science							32.9	67.1	27	73
Engineering & Design							52.5	47.5	52	48
Non- Engineering Fields										
Pharmacy	64.1	35.9	56.7	43.3	52.1	47.9	53.6	46.4	58.5	41.5
Letters	58.2	41.8	61.2	38.8	68.2	31.8	64.9	35.1	63.1	36.9
Faculty of Science	60.5	39.5	59.5	40.5	59.2	40.8	50.5	49.5	60.8	39.2
Arts and Science	50	50	46.4	53.6	51.1	48.9	55.3	44.7	63.3	36.7
Faculty of Education	43.6	56.4	45.7	54.3	56.2	43.8	58.5	41.5	60.4	39.6
Educational Science	39.8	60.2	54.1	45.9	56.2	43.8	69.9	30.1	62.4	37.6
Vocational Education	98.1	1.9	96.9	3.1	89	11	89.3	10.7	90.8	9.2
Fine Arts	61.7	38.3	62.9	37.1	57.4	42.6	57.3	42.7	57.5	42.5

Source: ÖSYM (www.osym.gov.tr)

The number of the girls graduated in the engineering fields is continuously increased in the period of 1995-2013. There is exception only of some faculties such as Naval Architecture and Marine Science; Engineering and Computer Science; and Engineering and Design where the number of the girls graduated is decreased in the same period. Also there are faculties where the proportion of the girls under 20%. The lowest rate of the girl's graduates is 7.2% from the Faculty of Naval Architecture and Marine Science in 2013 which is followed by the Faculty of Technical Education (14.4%), the Faculty of Electrical and Electronic Engineering (15.5%), and the Faculty of Mechanical Engineering (18.2%). Even though the engineering fields are lesser preferred by girls, there is surprisingly existence of some faculties where the number of girls graduated are greater than boys. From the table it is showed that the proportion of girls graduated from the Faculty of Engineering and Technology (50.9%), the Faculty of Engineering and Design (52%), and Faculty of Chemistry and Metallurgy is larger in 2013 than boys'.

In addition, the total number of the boy students graduated from the engineering faculties was decreased over the period of 1996-2013, except of the Faculty of Naval and Architecture and Marine Science where the rates of the boys graduated increased from 79.4% in 1996 to 92.8% in 2013, in the Faculty of Engineering and Computer Science from 67.1% in 2011 to 73% in 2013, and from 47.5% in 2011 to 48% in 2013. Here, it seems that the decreasing of the other engineering faculties may be according to the new faculties which were started to serve in the same area in the following years.

In compare with the engineering, girls are more preferred the non-engineering areas. The table shows also a list of the selected non-engineering faculties of the students graduated in the period of 1996-2013. According to this table, as many scientists are agreed at the point that there is existence of the occupational segregation: horizontal occupations (feminine) and vertical occupations (masculine) to which engineering jobs are refer for, it seems that the occupational segregation is exactly existed in Turkey.

As it can see, there is an extremely high proportion of the girls graduates in the non-engineering fields which is above 50%, even the rate of girls are graduated from the Faculty of Educational Sciences is 90.8% in 2013 which was even higher (98.1%) in the 1996. Even though, there is decreasing in the Faculty of Pharmacy from 64.1% to 58%.5

in 1996 and 2013 respectively, and in the Faculty of Fine Arts from 61.7% in 1996 to 57.5% in 2013.

Not all women engineers after graduation are employed in the fields where they graduated from. However, as it is mentioned above the women engineers are covered larger proportion in Turkey than in the several developed countries.

The rate of women in the department faculty of engineering in Turkey is 29%, whereas in the USA it counts for 11%. Moreover, it is estimated that the number of the women engineers are worked in the professions outside the universities and who are registered in the Engineering Unions (Mühendisler Odaları) in Turkey increased from 7% to 12% in the period of 1975-1995. These rates showed approximately as 6% for the USA and for the European countries as 1.5% for the England and 4% for Germany, except Norway where there is 25% of women engineers worked in the engineering fields (Okay, 2007: 1).

There are several obstacles for women who like to enter and stay in the engineering area. As everywhere in the world also in Turkey, the women engineers face the same problems which are the stereotypes, prejudices, and attitudes of the society about the women engineers. The glass ceiling syndrome is expressed at the quite high level in the engineering based on the traditional view of engineering as being an male-dominated field as well as there is also the problems of mobbing and lack of satisfaction at the workplace. Thus, this work paper is going to examine and try to find if the impacts of the three barriers among demographic data of women with the engineering degree are negatively affect and retrain women or not from engineering professions.

3.2. Evaluation of the Research

3.2.1. The aim of the research and data collection process

This research paper aims to identify the views and suggestions of working women with engineering degrees upon the questionnaire. There are the three obstacles (the existence of male-dominated organizational culture, the lack of job satisfaction and the existence

of work-family conflict) that is going to examine in this study and which are observed to have negative impact on women's participation in engineering fields. It is tried to reveal the existence of these three barriers that "negatively affects and holds women away from preferring the engineering professions" according to their demographic variables. This research based on the literature, statistics and results which were received from the research area (i.e. Istanbul).

Hypotheses of the Research: H1: There is statistically significant difference in opinions among women who know at least one foreign language and who do not know any foreign language that there is the male-dominated organizational culture at work that negatively affects and turns women away from having an engineering profession.

H2: The view of women that the male-dominated organizational culture is existed at work and negatively affects and keeps women away from preferring an engineering profession, has significant difference among women who have and do not have an administrative task.

H3: The opinion of women participants in this survey that there is male-dominated organizational culture at work which negatively affects and suspends women from choosing an engineering profession has significant difference according to having or not of a business travel beyond the city limits.

H4: The women's opinion, that there is a male-dominated organizational culture at work which negatively affects women and turn them away to follow a non-engineering profession, has statistically significant difference among women who satisfied or do not satisfied with their work position.

H5: The view of women in the study, that there is lack of job satisfaction at work which negatively affects and keeps women away from choosing an engineering profession, has statistically significant difference according to having or not of a business travels beyond the city limits.

H6: The thought of women participants – the male-dominated organizational culture is exist at work and negatively affects and holds women back from preferring prefer an

engineering profession – has statistically significant difference among women with different level of education.

H7: The view of the women participated in this research, the male-dominated organizational culture is existed at work which also negatively affects and suspends women from preferring an engineering profession has statistically significant difference among women who receive at different level of help from their husbands in homework.

H8: Women participants with an engineering degree believe that there is the male-dominated organizational culture at work which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of support of the business travels from their husbands.

H9: The opinion of women – the male-dominated organizational culture is existed at work and restricts women to choose an engineering profession – has significant difference among women who own divers types of the possessed social insurance.

H10: Women participants believe in the existence of work-family conflict which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of help in housework from their husbands.

H11: The view of women in the research – the existence of work-family conflict, negatively affects women from selection an engineering profession – has significant difference among women who have had or have problems with breast-feeding during work.

H12: The opinion of women participants that the presence of lack of job satisfaction at work has negative impact on women from following an engineering profession, has statistically significant difference among women with different quantity of work years at corporation.

H13: The opinion of women participants that there is lack of job satisfaction at work which has negative impact on women and makes them to get round of an engineering vocation, has statistically significant difference among women who differ in reasons of dispute with spouses.

The main resource for the data collection has been taken primarily from the questionnaire results, i.e. the question paper which was implemented directly face to face with the women engineers and working women in non-engineering fields with the engineering degree, worked at both the public and private sectors and live in Istanbul. The survey was applied by the random sampling method and specifically only to the women graduated from the engineering fields. In this research, there are 112 women participants who were asked the prepared questions and tried to get their thoughts, views and feelings related to their job, family and their places in the work. It attempted to reveal the differences in their views about the impact of the three obstacles (the existence of male-dominated organizational culture, the presence of lack of job satisfaction and the existence of work-family conflicts) on women in suspending them from the engineering sector. It was attempted by comparison of their answers with their demographic peculiarities. The question paper consists of the twenty-one sub-questions which constitute the three obstacles of the study. These three obstacles (the existence of male-dominated organizational culture, the existence of work-family conflict and the presence of lack of job satisfaction at work) consist of the sub-questions which were prepared with 5-point Likert technique. The results are taken from the questionnaire were analyzed in the computer programs Microsoft Excel and SPSS 12.0 and the results were showed into the tables in this paper. The survey also includes the women's demographic variables frequency analyses. In order to test the hypotheses there were used Mann-Whitney U Test (nonparametric test) for samples with two variables, One-Way Anova Analysis (parametric test), Independent-Samples Kruskal-Wallis H Test (nonparametric test) for the samples with more than two variables and Cross-tabulation Analysis. The analysis of the data was tested at 95% confidence interval level.

3.2.2. The analysis of the survey data

Demographic Data: This research paper is included totally 112 participants, where all worked women are graduated from the engineering faculties but not necessarily have engineering occupations. The Table 3.2 shows the profile of the participants. The ages of the participants vary from 20 to 49 years old. It is observed here, that they are quite

young women since more than half of women participated in the survey are between 25-29 years old (55.9%). Furthermore, most of women participants are unmarried (51.8%). It means that, as Dillaway and Pare have examined in their researches, mostly unmarried women and fewer married women are worked. Moreover, among 51 married women participants (45.5%) 34 of them have children (20.4%), where half of them are mother with two children (50%). However, with increasing of the number of children the number of worked women are sharply decrease, where five women participants have three children and only one women have four children (Dillaway and Pare, 2008: 437-442).

Table 3.2

Descriptive Analyses 1

AGE	Frequency	%	MARITAL STATUS	Frequency	%
20-29	62	55.9	Unmarried	58	51.8
30-39	37	33.3	Married	51	45.5
40 and above	12	10.8	Divorced	3	2.7
Total	111	100.0	Total	112	100.0
HAVING CHILDEN	Frequency	%	NUMBER OF CHILDREN	Frequency	%
Have child	34	20.4	1	10	31.3
Have not child	78	69.6	2	16	50.0
Total	112	100.0	3	5	15.6
			4	1	3.1
			Total	32	100.0

As it was mentioned above, all women participants in this research are graduated from the engineering fields. Thus, according to Table 3.3, in the research participated much more women with bachelor's degree (60.6%), but there are also women with master's degree (33.9%) and doctoral degree (5.5%). Based on the table 2.6, where it shows the total numbers of graduated students at the national level, 48% of women got the bachelor's degrees in 2013, as well as 48,8% master's degrees and 46,7% doctoral degrees. Thus, it can be said that the interest and participation of women is really high in engineering. They overlap the average of the national undergraduate level, but they are much lesser at next steps of further education. In compare with USA, according to the data from table 1.6 of the research center of National Student Clearinghouse where women with bachelor's degree count for 12%, master's degree for 7% and doctoral degree for 21% in 2014, women in this research do better at undergraduate and graduate

levels, only there is a difference at doctoral level where women in USA are greater in numbers than women in this study (National Student Clearinghouse, 2015: 1).

Table 3.3

Descriptive Analyses 2

EDUCATIONAL STATUS	Frequency	%	ENGINEERING FIELD	Frequency	%
Undergraduate	66	60.6	Agricultural eng.	2	1.8
Graduate	37	33.9	Aircraft eng.	1	0.9
Doctorate	6	5.5	Biomedical eng.	1	0.9
Total	109	100.0	Chemistry eng.	12	11.0
FACTOR INFLUENCED TO CHOOSE ENGINEERING FIELD			Computer eng.	19	17.4
ENGINEERING FIELD	Frequency	%			
Family	37	33.9	Constructional eng.	14	12.8
School-teacher	26	23.9	Electric-electronic eng.	6	5.5
Personal skills	30	27.5	Environmental eng.	7	6.4
Friends	9	8.3	Food eng.	10	9.2
Others	7	6.4	Genetic eng.	1	0.9
Total	109	100.0	Industrial eng.	21	19.3
KNOWLEDGE OF A FOREIGN LANGUAGE			Landscape eng.	1	0.9
FOREIGN LANGUAGE	Frequency	%			
Have	102	91.1	Mathematical eng.	4	3.7
Have not	10	8.9	Mechanical eng.	6	5.5
Total	112	100.0	Mechatronic eng.	1	0.9
NUMBER OF FOREIGN LANGUAGES			Metallurgy eng.	1	0.9
LANGUAGES	Frequency	%			
1	55	54.5	Physical eng.	1	0.9
2	31	30.7	Product design eng.	1	0.9
3	13	12.9	Textile eng.	1	0.9
4	2	2.0	Total	109	100.0
Total	101	100.0			

According to results of this survey, there is the leaky pipeline in engineering which is continued to exist. Even a weighty number of women graduated from the engineering domains and have bachelor's degree, they are less likely to continue further education. They continue to leak from pipeline where their numbers are narrowed at every higher stage, i.e. women are halved at master's level and even lesser, one of every twelve women, at doctoral level. This is important findings, because as many scientists have mentioned, the female underrepresentation in the engineering faculties means lesser women lecturers there which have negative effects on female students, such as feeling loneliness that can lead quit their education even at the beginning stage.

Most of women participants, in the study, are graduated from industrial engineering (19.3%), next come computer engineering (17.4%), constructional engineering (12.8%),

chemistry engineering (11%) and food engineering (9.2%). However, there are nine engineering fields where from the each fields only one woman has graduated.

According to finding, it can be exactly emphasized that there is occupations in engineering domains, that women less likely to prefer. Among some engineering jobs where the number of women is quite high, in most occupations there is very low women's participation. In such jobs like aircraft engineering, biomedical engineering, genetic engineering, landscape engineering, mechatronics engineering, metallurgy engineering, physical engineering, product design engineering and textile engineering where women are counted only one for every listed jobs. Thus, it can be said that engineering applies to vertical job segregation or male-dominated, as Beede and ILO scientists have mentioned in their studies (ILO, 2012: 25; Beede and others, 2011: 1)

The greatest numbers of women participants have chosen their engineering education by influence of their family on them (33.9%) and according to their personal ability (27.5%). As it was studied in the Diekman's and other scientists' researches, children are manipulated and guided mostly by their families at their early ages which can affect their choices in their future (Diekman and others, 2015: 54)

Almost all women participants can speak foreign language (91.1%), where the majority of them speak at least one language (54.5%). It means that the knowledge of at least one foreign language nowadays is needed for women who plan to pursue a carrier in the engineering fields.

As it was seen in chapter 2, according to Kocacık and Gökkaya who say that there is an existence of glass ceiling syndrome which prevents women from having equal opportunity in their carrier paths, it also has seen here from examination of the Table 3.4. It shows that even more than half (55.9%) of women participants work as engineers, 42 women (37.8%) work in the other non-engineering fields rather than in their profile and only 7 women (6.3%) pursue their carrier in the academic field. Thus, women underrepresented and leak out from engineering as well as from academic field. It is also observed that 56.4 per cent of women participants work at the same position from the beginning of their jobs. The rest of them (39.7%) get rise from their initial position, even

54.9 per cent of them work more than nine hours a day (Kocacık and Gökkaya, 2005: 209).

Table 3.4

Descriptive Analyses 3

WORK YEARS AT THE CORPORATION			TYPE OF THE CORPORATION		
	Frequency	%		Frequency	%
2 years and less	40	36.4	Public	17	15.6
3 to 9 years	53	48.2	Private	92	84.4
10 years and more	17	15.5	Total	109	100.0
Total	110	100.0			

HAVING AN ADMINISTRATIVE TASK			WORK FIELD		
	Frequency	%		Frequency	%
Yes	40	37.4	Engineer	62	55.9
No	67	62.6	In non-engineering field	42	37.8
Total	107	100.0	In academic field	7	6.3
			Total	111	100.0

WORK POSITION			WORK HOURS		
	Frequency	%		Frequency	%
At the same position from entering	44	56.4	1 to 8 hours	41	45.1
Started at lower position, later moved up	31	39.7	9 hours and more	50	54.9
Others	3	3.8	Total	91	100.0
Total	78	100.0			

WORK POSITION SATISFACTION			REASONS NOT WORK AS AN ENGINEER		
	Frequency	%		Frequency	%
Yes	59	63.4	Do not find work as engineer	16	38.1
No	34	36.6	Limits in rising to higher position	4	9.5
Total	93	100.0	Non-flexible work hours	5	11.9
			Never planning work as engineer	6	14.3
			Willingness to have an own business	6	14.3
			Dislike work environment	3	7.1
			Others (sufficient exam grade)	2	4.8
			Total	42	100.0

HAVING A BUSINESS TRAVEL BEYOND CITY			HAVING A BUSINESS TRAVEL ABROAD		
	Frequency	%		Frequency	%
Yes	35	33.3	Yes	16	15.2
No	70	66.7	No	89	84.8
Total	105	100.0	Total	105	100.0

Nearly half of women participants in this study work between 3 to 9 years at their corporations (48.2%). 62.6 per cent of them have not an administrative or managerial task, and mostly of them also work in the private sector (84.4%). It is very high

percentage of women who work at the private sector. According to the funding of Beede with her colleagues where stated that STEM workers earn much more than the non-STEM workers at the private sector. It seems that the same view applies to engineering workers in Turkey as well, where they also get higher salaries in the private sector rather than in the public sector. In addition, as Korkmaz was mentioned, the reason of women preferring to work in the private sector may be because that the larger number of women in the senior management is existed in private sector than in the public sector. However, 63.4 per cent of women participants are satisfied with their position (Beede and others, 2011: 4; Korkmaz, 2014: 3-7).

The question about reasons that women do not prefer working as an engineer, were asked women participants who occupied a non-engineering job. Among the participants answered the question, 16 women cannot find a job according to their professions (38.1%). Whereas 6 participants never planning to work as an engineer (14.3%). 6 women prefer to have own business (14.3%). 5 women think that there are not flexible work hours (11.9%). 4 women think that there is little or no chance of promotion (9.5%), and 3 participants dislike the engineering work environment (7.1%). There are also 2 persons that have chosen the engineering fields because they receive the sufficient exam grades (4.8%) (ÖSS sınavları). Thus, among the several reasons why women do not work as engineer, the weighted numbers of them can get an engineering job. Moreover, the participants tend to not have work travels. Only 35 women have the business travels beyond city (33.3%), and 16 women have travelling abroad (15.2%).

The Table 3.5 analyses the work-family relation of the married women participants. The most (21 women) participants receive their husbands help sometime (41.2%). The other two options “helps very much” and “helps, but not much” have equal numbers of 14 of women participated (27.5%). It is also observed that the husbands usually support their wife’s business travels (35.9%), or do not interfere in it (30.8%). They basically debate about the children (27.5%) and housework-based (23.5%) issues, as well as for the some other problems (27.5%) which not explained in the questionnaire. It is interesting to note that in the question about reasons of dispute among spouse the wife’s work issues hold the last place.

Table 3.5

Descriptive Analyses 4

SPOUSE'S HELP IN HOUSEWORK			SPOUSE'S SUPPORT OF BUSINESS TRAVELS		
	Frequency	%		Frequency	%
Helps very much	14	27.5	Definitely supports	2	5.1
Helps sometime	21	41.2	Supports	14	35.9
Helps, but not much	14	27.5	Does not interfere	12	30.8
Others	2	3.9	Does not support	9	23.1
Total	51	100.0	Definitely does not support	2	5.1
			Total	39	100.0

CHILD-CARE AT HOME			CHILD-CARE DURING TRAVELS		
	Frequency	%		Frequency	%
Big children, no need to care	11	34.4	Big children, no need to care	3	13.6
Babysitter	4	12.5	Relatives	17	77.3
Relatives	14	43.8	Babysitter	2	9.1
In kindergarten	3	9.4	Total	22	100.0
Total	32	100.0			

REASONS OF DISPUTE AMONG SPOUSES			PROBLEMS WITH BREAST-FEEDING DURING WORK		
	Frequency	%		Frequency	%
Economic issues	8	15.7	Have very much problems	6	19.4
Housework-based issues	12	23.5	Have some problems	12	38.7
Children issues	14	27.5	Have rare problems	13	41.9
Wife's work issues	3	5.9	Total	31	100.0
Others	14	27.5			
Total	51	100.0			

The mothers-participants have not big problems with care of their children, too. The 43.8 per cent of mothers leave their children with relatives (husbands included) during work time, as well as while travelling (77.3%). However, even at small rates, there is a matter with breast-feeding during work time, where 13 out of 31 women say that they have the rare problems (41.9%) and 12 out of 31 say that they face some problems (38.7%) of breast-feeding during work.

Among the other obstacles working women are faced in their work lives, the child-care issues are the one of the most important barriers in Turkey. According to Önder, if women can solve these problems they usually continue to work; otherwise they quit their work until the children grow up. Thus, from the results of the table it can be said that among married women only those women work who receive, or partially get some help from their husbands. In other words, only those who do not have some obstacles to work

depending on their husbands, i.e. when they let them to work, and especially only when there is not the problems with children care, they get opportunity to work (Önder, 2013: 54).

Table 3.6

Descriptive Analyses 5

TIME INTERVAL OF PRENATAL ALLOWED			TIME INTERVAL OF POST-NATAL PAID LEAVE		
	Frequency	%		Frequency	%
Between 1 and 15 days	4	12.1	Less than 1 month	9	28.1
Between 16 and 30 days	7	21.2	Between 1 and 2 months	11	34.4
Between 1 and 2 months	11	33.3	Between 2 and 3 months	10	31.3
More than 2 months	10	30.3	Between 3 and 4 months	1	3.1
Others	1	3.0	More than 5 months	1	3.1
Total	33	100.0	Total	32	100.0

HAVING OF POST-NATAL UNPAID LEAVE		
	Frequency	%
Have used	13	39.4
Have not used	20	60.6
Total	33	100.0

The Table 3.6 examines the condition of working mothers-participants in their prenatal period time. The most of them took between 1 and 2 months (33.3%), where 20 women out of 33 (60.6%) have not used the post-natal unpaid leave. Almost all of them used the post-natal paid leave, where the biggest number of them used between 1 - 2 months (34.4%) and between 2 - 3 months (31.3%). Even though many laws are existed which facilitate the conditions of working mother, still as it is shown in the table, there are problems with childbirth period during the work. 1-2 months of the prenatal allowed and the post natal leave, which most of the mother-participants have got, are a quit short period in order to care a newborn baby. Only in one condition where relatives can care the children (43.8%), except when the children are big enough and do not need a care (34.4%), women have possibility to work.

From the Table 3.7 which presents the economic condition of women participants, the average of the salary of the participants is quite low, where the majority of them (40.2%) earn 2 900TL and less (it is important to note that more than half of the participants are

young women). However, women who earn between 3 000TL – 4 900TL (38%) hold the second majority and there are 4 women (4.3%) who receive more than 10 000TL. Based on TURKSTAT news where the annual disposable income of household is equal to 14 553TL in 2014, it can be said that the wages of women participants are much higher on average (TURKSTAT, 2015).

Table 3.7

Descriptive Analyses 6

AVERAGE OF SALARY			PERCENTAGE OF PERSONAL SPENDING		
AVERAGE OF SALARY	Frequency	%	PERCENTAGE OF PERSONAL SPENDING	Frequency	%
2900 YTL and less	37	40.2	Less than 10%	13	12.5
3000 YTL to 4900 YTL	35	38.0	Between 10-30%	33	31.7
5000 YTL to 9900 YTL	16	17.4	Between 31-50%	29	27.9
10000 YTL and more	4	4.3	Between 51-70%	16	15.4
Total	92	100.0	Between 71-100%	12	11.5
			Others	1	1.0
			Total	104	100.0

TYPE OF POSSESSED SOCIAL INSURANCE	Frequency	%
SSI (SSK)	55	50.5
SEI (Bağkur)	14	12.8
Private Insurance (Özel Sigorta)	23	21.1
Private Pension (Bireysel Emeklilik)	2	1.8
SSI-Private Insurance	7	6.4
SSI-Private Pension	4	3.7
SEI-Private Pension	1	0.9
SSI-Private Insurance-Private Pension	2	1.8
No a social insurance	1	0.9
Total	109	100.0

Around 10% - 30% (31.7%) and 31-50% (27.9%) of the women participants used their incomes on their personal spending. The whole participants, except one of them, have at least one of the several types of social insurance, where the largest share of them have SSI (50.5%), private insurance (21.1%) and SEI (12.8%). These data are delightful since all women participants, except one woman, have protection.

Identification of the Three Obstacles Women are Faced at Work: In order to identify the three obstacles of the study: the existences of male-dominated organizational culture, the presence of lack of job satisfaction and the existence of work-family conflict at

work, the sub-questions were prepared by using 5-points Likert technique. The results of the questions of this survey are shown below in the Tables 3.8, 3.9 and 3.10.

For the **first question**: If there is existence of the male-dominated organizational culture at work that negatively affects and keeps women away from choosing an engineering profession, women answer the sub-questions from 1 to 10 and which are shown in the Table 3.8, in percentage:

- ❖ On the first sub-question of the survey “The existence of women discrimination at work”, 43% out of 93 women participated are agreed. The rate of doubtful is 6.5%.
- ❖ On the second sub-question of the survey “More chance and facility are given to men” 44.7% out of 94 women are participated are agreed. The rate of doubtful is 16%.
- ❖ On the third sub-question of the survey “Discrimination in salary, bonus and status of women”, 38.3% out of 94 women participated are agreed. The rate of doubtful is 11.7%.
- ❖ On the fourth sub-question of the survey “Even with high level of ability, women have lower position”, 44.1% out of 93 women participated are agreed. The rate of doubtful is 20.4%.
- ❖ On the fifth sub-question of the survey “Existence of male-dominated culture at work”, 61.9% out of 92 women participated are agreed. The rate of doubtful is 13%.
- ❖ On the sixth sub-question of the survey “Women engineers are exposed to the loneliness at work”. 44.1% out of 93 women participated are agreed. The rate of doubtful is 21.5%.

Table 3.8**Descriptive Analyses 7 (Existence of the Male-Dominated Organizational Culture at Work)**

		1	2	3	4	5	Total
		Definitely agree	Agree	Doubtful	Disagree	Definitely disagree	
1-The existence of women discrimination at work	Frequency	13	27	6	29	18	93
	%	14.0	29.0	6.5	31.2	19.4	100.0
2-More chance and facility are given to men	Frequency	11	31	15	27	10	94
	%	11.7	33.0	16.0	28.7	10.6	100.0
3-Discrimination in salary, bonus and status of women	Frequency	5	31	11	36	11	94
	%	5.3	33.0	11.7	38.3	11.7	100.0
4-Even with high level of ability, women have lower position	Frequency	11	30	19	24	9	93
	%	11.8	32.3	20.4	25.8	9.7	100.0
5-Existence of male-dominated culture at work	Frequency	21	36	12	16	7	92
	%	22.8	39.1	13.0	17.4	7.6	100.0
6-Women engineers are exposed to the loneliness at work	Frequency	15	26	20	25	7	93
	%	16.1	28.0	21.5	26.9	7.5	100.0
7-Women engineers are expected to have high performance	Frequency	7	28	26	28	4	93
	%	7.5	30.1	28.0	30.1	4.3	100.0
8-Society justify harder women engineers	Frequency	20	32	13	22	6	93
	%	21.5	34.4	14.0	23.7	6.5	100.0
9-Managers justify harder women engineers	Frequency	16	22	12	36	6	92
	%	17.4	23.9	13.0	39.1	6.5	100.0
10-Women engineers get equal in-service training	Frequency	2	17	15	37	21	92
	%	2.2	18.5	16.3	40.2	22.8	100.0

- ❖ On the seventh sub-question of the survey “Women engineers are expected to have high performance”, 37.6% out of 93 women participated are agreed. The rate of doubtful is 28%.
- ❖ On the eighth sub-question of the survey “Society justify harder women engineers”, 55.9% out of 93 women participated are agreed. The rate of doubtful is 14%.
- ❖ On the ninth sub-question of the survey “Managers justify harder women engineers”, 41.3% out of 92 women participated are agreed. The rate of doubtful is 13%.

- ❖ On the tenth sub-question of the survey “Women engineers get equal in-service training”, 20.7% out of 92 women participated are disagreed. The rate of doubtful is 16.3%. The tenth sub-question was transformed from 1 to 5, 2 to 4, 4 to 2 and 5 to 1 answers by using SPSS statistics program, since this sub-question has opposite sense in contract to the other nine sub-questions.

For the **second question**: There is lack of job satisfaction at work which has negative impact on women’s choice to prefer an engineering profession, the sub-questions (from 11 to 14) and answers in percentage are shown below in the Table 3.9:

Table 3.9

Descriptive Analyses 8 (Presence of Lack of Job Satisfaction at Work)

		1	2	3	4	5	Total
		Definitely agree	Agree	Doubtful	Disagree	Definitely disagree	
11-Unwilling to go to work	Frequency	6	18	28	38	6	96
	%	6.3	18.8	29.2	39.6	6.3	100.0
12-Impatient to end the work and go home	Frequency	12	33	22	24	5	96
	%	12.5	34.4	22.9	25.0	5.2	100.0
13-Impatient to start to work	Frequency	7	17	25	38	9	96
	%	7.3	17.7	26.0	39.6	9.4	100.0
14-Love own profession	Frequency	13	31	28	19	5	96
	%	13.5	32.3	29.2	19.8	5.2	100.0

- ❖ On the eleventh sub-question of the survey “Unwilling to go to work”, 25.1% out of 96 women participated are agreed. The rate of doubtful is 29.2%.
- ❖ On the twelfth sub-question of the survey “Impatient to end the work and go home”, 46.9% out of 96 women participated are agreed. The rate of doubtful is 22.9%.
- ❖ On the thirteenth sub-question of the survey “Impatient to start to work”, 25% out of 96 women participated are disagreed. The rate of doubtful is 26%.

- ❖ On the fourteenth sub-question of the survey “Love own profession”, 45.8% out of 96 women participated are disagreed. The rate of doubtful is 29.2%. The answers on the thirteenth and fourteenth sub-questions were transformed from 1 to 5, 2 to 4, 4 to 2 and 5 to 1 answers in SPSS program, since having the opposite sense compare to the remaining two sub-questions.

For the **third question**: The existence of work-family conflict at work negatively affects and deviates women from preferring an engineering profession, the questions (from 15 to 21) and answers in percentage are shown below in the Table 3.10:

- ❖ On the fifteenth sub-question of the survey “Stress at work affects family”, 63.2% out of 95 women participated are agreed. The rate of doubtful is 14.7%.
- ❖ On the sixteenth sub-question of the survey “Inability to have enough time to spouse due to work”, 51% out of 53 women participated are agreed. The rate of doubtful is 15.1%.
- ❖ On the seventeenth sub-question of the survey “Inability to have enough time to children due to work”, 55.5% out of 36 women participated are agreed. The rate of doubtful is 11.1%.
- ❖ On the eighteenth sub-question of the survey “Inability to have enough time to family due to work”, 56.5% out of 92 women participated are agreed. The rate of doubtful is 14.1%.
- ❖ On the nineteenth sub-question of the survey “Inability to have enough time to friends due to work”, 64.6% out of 96 women participated are agreed. The rate of doubtful is 9.4%.

Table 3.10

Descriptive Analyses 9 (Existence of the Work-Family Conflict at Work)

		1 Definitely agree	2 Agree	3 Doubtful	4 Disagree	5 Definitely disagree	Total
15- Stress at work affects family	Frequency	17	43	14	16	5	95
	%	17.9	45.3	14.7	16.8	5.3	100.0
16- Inability to have enough time to spouse due to work	Frequency	9	18	8	12	6	53
	%	17.0	34.0	15.1	22.6	11.3	100.0
17- Inability to have enough time to children due to work	Frequency	4	16	4	7	5	36
	%	11.1	44.4	11.1	19.4	13.9	100.0
18- Inability to have enough time to family due to work	Frequency	8	44	13	19	8	92
	%	8.7	47.8	14.1	20.7	8.7	100.0
19- Inability to have enough time to friends due to work	Frequency	15	47	9	16	9	96
	%	15.6	49.0	9.4	16.7	9.4	100.0
20- Inability to have enough time to myself due to work	Frequency	14	41	12	21	8	96
	%	14.6	42.7	12.5	21.9	8.3	100.0
21- Work problems are solved easier than family problems	Frequency	12	32	25	20	5	94
	%	12.8	34.0	26.6	21.3	5.3	100.0

- ❖ On the twentieth sub-question of the survey “Inability to have enough time to myself due to work”, 57.3% out of 96 women participated are agreed. The rate of doubtful is 12.5%.
- ❖ On the twenty-first sub-question of the survey “Work problems are solved easier than home problems”, 46.8% out of 94 women participated are agreed. The rate of doubtful is 26.6%.

The Analysis of the Hypothesis: First of all, before the testing the differences of parameters of the hypotheses, the test of the Normality of Distribution was applied in order to examine how the frequencies were distributed in data and which test is appropriate to use. There are two kinds of distributions of the samples which are normal

and no normal distributions. Normally distributed samples apply parametric tests whether no normally distributed samples are used nonparametric tests. The normality of distribution of a sample depends on its shape. Normally distributed sample have well-shaped curve, instead no normally distributed sample can be skewed to right or left sides or to be taller or flatter. Skewness measures symmetry of distribution and kurtosis depicts the shape of variables' probability distribution. According to Tabachnik and Fidell, the value of skewness and kurtosis between -1.5 and +1.5 is acceptable (Tabachnik B. and Fidell L.S., 1996: 67-110; Brown S., 2011: 1-16).

In order to test the normality of distribution of data of this study the Shapiro-Wilk Test was applied. According to the results of normality of distribution tables which are shown in Appendix 1, the significance level of the Shapiro Wilk Test shows $p=0.000$ in all questions, and therefore it has to check the statistics of skewness and kurtosis. As the results show, from 30 demographic variables questions 11 are skewed, or peaked, or flat, or have both skewness and kurtosis. The rest 19 variables have normal distribution.

According to the results of the normality of distribution test, in order to test the hypotheses, the three appropriated tests were used. The Mann—Whitney U Test was used to compare two means of no normally distributed two independent answer options in a question. One-Way Anova Analysis was used to compare means of normally distributed three and more independent frequencies in a question. The Independent-Samples Kruskal-Wallis H Test was used to test the means differences of no normally distributed three and more independent frequencies in a question.

Thus, the Mann-Whitney U Test was applied to nine demographic questions with 2 variables, including the one question with normal distribution since it showed non-homogeneity of variance after applying the Levene's Test on the equality of variances. From the twenty-one demographic questions with 3 and more answering options, the One-Way Anova Analysis was used to nineteen questions, and the Independent-Samples Kruskal-Wallis H Test to two questions. According to the significance level results in the tests were used which are shown in Appendix 2, the thirteen questions have $p<0.05$ which it means that there are statistically significant differences among the means of answer options.

Mann-Whitney U Test was used for the first five hypotheses where the results of the test are shown in the Appendix 3. Mann-Whitney U Test is a statistical technique, which is option to the Interdependent Sample T-Test. It is a nonparametric test, in contrast of Independent T-Test, that is used to test whether or not there is a difference in only two independent groups' or means of frequencies which come from the same population at a certain confidence level (such as 95% or 99%). For the first five hypotheses, there was implemented the Mann-Whitney U Test since that these five hypotheses are no normally distributed (Nachar N., 2008: 14).

H1: There is statistically significant difference in opinions among women who know at least one foreign language and who do not know any foreign language that there is the male-dominated organizational culture at work that negatively affects and turns women away from having an engineering profession.

Hypothesis 1: Table Result of Mann-Whitney U Test							
	Knowledge of a foreign language	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Sig. (2-tailed)
The existence of male-dominated organizational culture	Have	87	50.45	4389.00	135.000	-2.857	0.004
	Have not	8	21.38	171.00			
	Total	95					

In the hypothesis 1, at the 5% significance level $Z = -2.86$ and $p = 0.004$. Since $p < 0.05$, the null hypothesis H_0 is rejected and the hypothesis 1 is ACCEPTED. Thus, from the statistical view the H_1 has significant difference. The view of women participants that the male-dominated organizational culture is existed at work which negatively affects and pushes women away from preferring an engineering profession has significant difference. According to the results, women who know at least one foreign language with 3.05% mean have tendency toward the existence of the male-dominated organizational culture which is hesitated women to prefer an engineering vocation. However, women who do not know a foreign language with 2.09% mean have tendency

toward that male-dominated organizational culture is not existed at work, therefore, it cannot influence women's choice to possess or not an engineering profession.

H2: The view of women that the male-dominated organizational culture is existed at work and negatively affects and keeps women away from preferring an engineering profession, has significant difference among women who have and do not have an administrative task.

Hypothesis 2: Table Result of Mann-Whitney U Test

	Having an administrative task	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Sig. (2-tailed)
The existence of male-dominated organizational culture	yes	34	55.40	1883.50	615.500	-2.803	0.005
	no	56	39.49	2211.50			
	Total	90					

The hypothesis 2, at the 5% significance level has $Z=-2.80$ and $p=0.005$. According to significance level, since $p<0.05$ then H_0 is rejected. From the statistical view there is significant difference in the H2 hypothesis which is ACCEPTED. The opinion of women participants, that there is male-dominated organizational culture at work which negatively affects and holds women away from preferring an engineering profession, has significant difference between women who have or do not have an administrative task at work. Women who have an administrative task with 3.31% average mean, show greater tendency toward to the thought that there is a male-dominated organizational culture at work that has negative impact on women in preferring engineering profession. In contrast, women who do not have an administrative task at work with 2.80% average mean show greater tendency toward the view of that there is not a male-dominated organizational culture at work.

H3: The opinion of women participants in this survey that there is male-dominated organizational culture at work which negatively affects and turns women from choosing

an engineering profession has significant difference according to having or not of a business travels beyond the city limits.

Hypothesis 3: Table Result of Mann-Whitney U Test							
	Having a business travels beyond city		Mean Rank	Sum of Rank	Mann-Whitney U	Z	Sig. (2-tailed)
	Yes	No					
The existence of male-dominated organizational culture	Yes	31	56.84	1762.00	594.000	-2.816	0.005
	No	60	40.40	2424.00			
	Total	91					

At the 5% significance level, the hypothesis 3 has $Z=-2.82$ and $p=0.005$. Since $p<0.05$, there is statistically significant difference among women in the H3. Thus, H_0 is rejected and H3 is ACCEPTED. Women participants' believe about of the existence of the male-dominated organizational culture at work that holds women from preferring an engineering profession, has significant difference between women who have the business travels beyond city and who have not. Thus, women who have the business travels beyond city with 3.30% on average, accept the existence of the male-dominated organizational culture at work that negatively affects women to choose an engineering profession. In opposite, women who do not have the business travels beyond city with 2.77% mean have more tendency do not accept the existence of the male-dominated organizational culture at work that negatively that keep women away from getting an engineering profession.

H4: The women's opinion, that there is a male-dominated organizational culture at work which negatively affects women and turn them away to follow a non-engineering profession, has statistically significant difference among women who satisfied or do not satisfied with their work position.

Hypothesis 4: Table Result of Mann-Whitney U Test

	Work Position satisfaction	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Sig. (2-tailed)
The existence of male-dominated organizational culture	Yes	58	51.57	2991.00	692.000	-2.380	0.017
	No	34	37.85	1287.00			
	Total	92					

At the 5% significance level, in the hypothesis 4 $p=0.017$, since $p<0.05$, the H4 hypothesis has statistically significant difference, where H_0 is rejected and H4 is ACCEPTED. The women's opinion, that there is a male-dominated organizational culture at work which negatively affects women and turn them away to follow a non-engineering profession, has significant difference among women who satisfied or do not satisfied with their work position. Women who satisfied with their work position with 3.08% mean statistically accept the existence of the male-dominated organizational culture at work which negatively affects and turns women from choosing an engineering profession. Women who do not satisfy with their work position with 2.71% mean have greater tendency toward to not accept the existence of the male-dominated organizational culture at work that negatively affects and deviates women from getting an engineering profession.

Table 3.11

Cross-tabulation of work field with work position satisfaction

		Work position satisfaction				Total	
		Yes		No			
Work field	Engineer	35	57.4%	26	32.6%	61	100.0%
	In non-engineering field	21	77.8%	6	22.2%	27	100.0%
	In academic field (engineering)	3	60.0%	2	40.0%	5	100.0%
	Total	59	63.4%	34	36.6%	93	100.0%

In order to get better picture, the Table 3.11 shows the relation between two demographic data work field and work position satisfaction. It shows that the majority of women are satisfied with their work position without distinction among working fields,

where women engineers present 57.4%, working women in non-engineering field 77.8% and women engineers are worked in academic field 60.0% of satisfaction related to work position.

H5: The view of women in the study, that there is lack of job satisfaction at work which negatively affects and keeps women away from choosing an engineering profession, has statistically significant difference according to having or not of a business travels beyond the city limits.

Hypothesis 5: Table Result of Mann-Whitney U Test

	Having a business travels beyond city		Mean Rank	Sum of Rank	Mann-Whitney U	Z	Sig. (2-tailed)
	Yes	No					
The lack of job satisfaction at work	Yes	33	59.06	1949.00	625.000	-3.069	0.002
	No	61	41.25	2516.00			
	Total	94					

At the 5% significance level, in the hypothesis 5 the statistical test Z is equal to -3.07 and the significance level is $p=0.002$. Since $p<0.05$, from the statistical view H5 has significant difference, where H_0 is rejected and accordingly the H5 hypothesis is ACCEPTED. Thus, there is significant difference in women participant beliefs' that there is lack of job satisfaction at work which also negative impact on women in preferring an engineering profession. Women who have the business travels beyond city with 3.27% mean accept that there is the job dissatisfaction at work which negatively affects and holds women from choosing an engineering profession. In contrast, women who do not business travels beyond city with the average of 2.86% have tendency to not accept the existence of a lack of job satisfaction at work.

One-Way Analysis is a statistical technique that is used to test whether or not there is a significant difference among the means of more than two independent groups or samples

at a certain confidence level. Thus, after the application of the One-Way Anova Analysis for the normally distributed with more than two independent variables, it was founded that there is a statistically significant difference in the means of the questions from 6 to 13 (Bayram, 2004: 99-100).

Moreover, the Independent-Samples Kruskal-Wallis H Test is a non-parametric method for one-way analysis of variance which used to determine if three or more samples originate from the same distribution. This test is similar to the Mann-Whitney U Test only applicable to three or more sample groups. Thus, the Independent-Samples Kruskal-Wallis H Test was applied for the no normally distributed with more than two independent variables in this study and it was found no significant difference in means in 2 questions where this test was applied (www.businessdictionary.com).

H6: The thought of women participants – the male-dominated organizational culture is existed at work and negatively affects and holds women back from preferring an engineering profession – has statistically significant difference among women with different level of education.

Hypothesis 6: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	4.345	2	2.172		
Within Groups	59.775	89	0.672	3.234	0.044
Total	64.119	91			

Table 3.12

The Mean Difference among Groups of Women's Educational Level

Educational level	N	Mean	Std. Deviation
Undergraduate	55	2.8966	0.84340
Graduate	32	3.1931	0.81115
Doctorate	5	2.2689	0.49143
Total	92	2.9656	0.83941

According to the One-Way Anova Analysis, at the 5% significance level, in the hypothesis 6, $F=3.234$ and $p=0.044$. Since $p>0.05$, H_0 is rejected and H_6 is ACCEPTED. The thought of women participants – the male-dominated organizational culture is existed at work and negatively affects and holds women down to prefer an engineering profession – has statistically significant difference among women with different level of education. This means that there is significant difference in the means in variables of educational level of women participants.

According to LSD test from the tables in the Appendix 3, the result shows, at the significance level $p=0.021$, mean difference (0.92%) between women at graduate level and doctorate level. Thus, women with master’s degree and 3.19 per cent mean are more likely to accept the existence of male-dominated organizational culture at work which prevents the women from choosing an engineering profession, while women with doctoral degree with 2.27 per cent are less likely to have the same view.

H7: The view of the women participated in this research, the male-dominated organizational culture is existed at work which also negatively affects and suspends women from preferring an engineering profession has statistically significant difference among women who receive at different level of help from their husbands in homework.

Hypothesis 7: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	6.963	2	3.482		
Within Groups	33.334	39	0.855	4.073	0.025
Total	40.298	41			

Table 3.13

The Mean Difference among Groups of Women's Spouse's Help in Housework

Spouse's help in housework	N	Mean	Std. Deviation
Helps very much	11	3.5131	1.08316
Helps sometimes	18	2.5290	0.97444
Helps rarely	13	3.1000	0.67454
Total	42	2.9635	0.99140

At the 5% significance level $p=0.025$ in the hypothesis 7, since $p<0.05$ from the statistical view has significant difference then the H7 hypothesis is ACCEPTED. Thus, the view of the women participated in this research about the existence of the male-dominated organizational culture at work which negatively affects and suspends women from preferring an engineering profession has significant difference among women who receive at different level of help from their husbands in homework.

According to Tukey HSD Test is shown in the Appendix 3, at the significance level $p=0.022$, there is significant mean difference (0.98%) between women whom their husbands help very much and women whom their husbands help sometime. Thus, women who receive help from their husbands very much with 3.51 per cent mean accept the existence of the male-dominated organizational culture at work which negatively affects women from choosing an engineering profession. In contrast, women who receive help from their husbands sometime with 2.53 per cent mean have tendency to do not accept the existence of the male-dominated organizational culture at work negatively affects and turn women away from preferring an engineering profession.

H8: Women participants with an engineering degree believe that there is the male-dominated organizational culture at work which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of support of the business travels from their husbands.

Hypothesis 8: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	14.193	4	3.548		
Within Groups	17.447	28	0.623	5.694	0.002
Total	31.64	32			

Table 3.14

The Mean Difference among the Groups of Spouse's Support of Business Travels

Spouse's support of business travels	N	Mean	Std. Deviation
Definitely supports	2	2.2500	1.62635
Supports	11	3.6909	0.85727
Does not interfere	12	2.9917	0.80052
Does not support	6	1.9574	0.28165
Definitely does not support	2	2.1611	0.08642
Total	33	2.9414	0.99436

According to One-Way Anova Analysis, at the 5% significance level in the hypothesis 8 $Z=5.694$ and $p=0.002$, since $p<0.05$ then H_0 is rejected and H_8 hypothesis is ACCEPTED. Women participants with an engineering degree believe that there is the male-dominated organizational culture at work which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of support of the business travels from their husbands.

According to Games-Howell Test, there is significant difference among women whose husbands support the business travels and do not support ($p=0.000$), as well as between support and definitely do not support ($p=0.001$). Also there is significant mean difference among women whose husbands do not interfere and do not support ($p=0.009$), as well as do not interfere and definitely do not support their wives business travels ($p=0.031$). However, there is no difference between women whose husbands do not support and definitely do not support their wives business travels, and no difference

between women whose husbands support and do not interfere in their wives business trips.

Thus, it can be concluded that women whose husbands both support (3.69% mean) and do not interfere in their wives business travels with 2.99 per cent mean accept the existence of the male-dominated organizational culture at work which negatively affects women from choosing an engineering profession. Women whose husbands both do not support (1.96% mean) and definitely do not support their business travels (2.16% mean) are less likely accept the view that the existence of the male-dominated organizational culture at work which negatively affects and deviates women from preferring an engineering profession.

H9: The opinion of women – the male-dominated organizational culture exists at work and restricts women to choose an engineering profession – has significant difference among women who own divers types of the possessed social insurance.

Hypothesis 9: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	8.403	3	2.801		
Within Groups	54.777	88	0.622	4.500	0.006
Total	63.180	91			

Table 3.15

The Mean Difference among the Groups of Women's Type Possessed of Social Insurance

Type of possessed social insurance	N	Mean	Std. Deviation
SSI (SSK)	46	3.0196	0.90685
SEI (Bağkur)	13	2.4923	0.66265
Private Insurance (Özel Sigorta)	18	2.6821	0.74428
Other types of social insurance	15	3.4770	0.46935
Total	92	2.9536	0.83324

At the 5% significance level, according to the One-Way Anova Analysis, in the hypothesis 9 $F=4.500$ and $p=0.006$, which indicates the statistically significant difference among the means of the groups in the types of social insurances. Thus, in hypothesis 9, H_0 is rejected and H_9 is ACCEPTED. The opinion of women – the male-dominated organizational culture exists at work and restrains women to choose an engineering profession – has significant difference among women who own divers types of the possessed social insurance.

According to the result of Tukey HSD Test, women who own the other types of social insurance rather than SSI, SEI and Private Insurance have statistically significant difference in means with women are held SEI ($p=0.008$) and women are held Private Insurance ($p=0.025$). Thus, women are held the other types of social insurance rather than SSI, SEI and Private Insurance with average mean of 3.48% have more tendencies to believe in existence of male-dominated culture at work. Instead women are held SEI (2.49%) and women with Private Insurance (2.68%) show tendency toward the non-existence of male-dominated organizational culture at work which hold women down from possession of engineering profession.

H10: Women participants believe in the existence of work-family conflict which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of help in housework from their husbands.

Hypothesis 10: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	7.288	2	3.644		
Within Groups	51.655	48	1.076	3.386	0.042
Total	58.944	50			

Table 3.16

The Mean Difference among the Groups of Spouse's Help in Housework

Spouse's help in housework	N	Mean	Std. Deviation
Helps very much	14	3.1020	1.08171
Helps sometime	21	2.7800	1.24865
Helps rarely	16	2.1443	0.59224
Total	51	2.6690	1.08576

According to One-Way Anova Analysis, at the 5% significance level in the hypothesis 10 $Z=3.386$ and $p=0.042$, since $p<0.05$ then H_0 is rejected and H_{10} hypothesis is ACCEPTED. Women participants believe in the existence of work-family conflict which negatively affects women to prefer an engineering profession, has significant difference among women with different levels of help in housework from their husbands.

According to Games-Howell Test, there is statistically significant difference (0.96% mean difference) between women who receive very much help and rare help from their husbands. Thus, women who get spouses' help very much (3.10% mean) accept the existence of work-family conflict which negatively affects women from choosing an engineering profession. Women who have rare help from their husbands (2.14%) are less likely accepted the view that the existence of work-family conflict which negatively affects and deviates women from preferring an engineering profession.

H11: The belief of women participants in the existence of the work- family conflict at work which also turns women away from preferring an engineering vocation has significant difference among women (mothers) with different levels of heaviness in the period of the breast-feeding during the work.

Hypothesis 11: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	18.108	2	9.054		
Within Groups	22.664	28	0.809	11.186	0.000
Total	40.773	30			

Table 3.17

The Mean Difference among the Groups of Women's Problems with Breast-Feeding during Work

Problems with Breast-Feeding During Work	N	Mean	Std. Deviation
Have very much problems	6	2.1905	0.88372
Have some problems	12	2.2024	0.65736
Have rare problems	13	3.7473	1.08037
Total	31	2.8479	1.16580

At the 5% significance level in the hypothesis 11, $Z=11.19$ and $p=0.000$, since $p<0.05$ from the statistical view has significant difference, thus, H_0 is rejected while the H_{11} hypothesis is ACCEPTED. The belief of women participants in the existence of the work- family conflict at work which turn women away from preferring an engineering profession has significant difference among women (mothers) with different levels of heaviness in the period of the breast-feeding during the work.

According to Tukey HSD Test in the Appendix 3, there is statistically significant difference (1.56%) between women who have very big problems and rare problems with breast-feeding during work ($p=0.004$). Also there is statistically significant difference (1.54%) between women who have some problems and rare problems in breast-feeding period during work ($p=0.001$). However, women who have very much problems and women who have some problems with breast-feeding during work time are both identical in means. Thus, women who have rare problems with breast-feeding during the work time with 3.75% mean more likely believe in the existence of the work-family conflict at work. In contrast, women who have some problems or very much problems with breast-feeding during the work with means of 2.20 per cent and 2.19 per cent,

respectively, less likely believe in the existence of the work- family conflict at work which negatively affects women from preferring an engineering profession.

H12: The opinion of women participants that there is lack of job satisfaction at work which have negative impact on women from following an engineering profession has significant difference among women with different quantity of work years at corporation.

Hypothesis 12: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Group	2.485	2	1.243		
Within Groups	34.754	91	0.382	3.254	0.043
Total	37.239	93			

Table 3.18

The Mean Difference among the Groups of Women's Work Years at Corporation

Work Years at Corporation	N	Mean	Std. Deviation
2 years and less	28	2.7679	0.62334
3 to 9 years	49	3.0306	0.52943
10 years and more	17	3.2353	0.82192
Total	94	2.9894	0.63279

At the 5% significance level in the hypothesis 12, $Z=3.25$ and $p=0.043$. Since $p<0.05$ from the statistical view has significant difference, H_0 is rejected while the H12 hypothesis is ACCEPTED. The opinion of women participants that there is lack of job satisfaction at work which has negative impact on women to prefer an engineering profession has statistically significant difference among women with different quantity of work years at corporation.

According to the Tukey HSD Test at the significance level $p=0.041$, there is significant difference (0.47% mean difference) between women who worked for two years and less

at their corporation and women are worked for ten and more years. Women are worked for two years and less at their corporation with 2.77 per cent mean have tendency to reject the existence of job dissatisfaction at work which negatively affects and turn women out from getting an engineering profession. However, women are worked for 10 years and more at the corporation with 3.24% mean accept the concept that there is lack of job satisfaction at work.

H13: The opinion of women participants that there is lack of job satisfaction at work which has negative impact on women and makes them to get round an engineering profession has statistically significant difference among women who differ in reasons of dispute with spouses.

Hypothesis 13: Table Result of One-Way Anova Analysis

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Groups	3.693	4	0.923		
Within Groups	14.853	46	0.323	2.859	0.034
Total	18.547	50			

Table 3.19

The Mean Difference among the Groups of Women's Reasons of Dispute among spouses

Reasons of dispute among spouses	N	Mean	Std. Deviation
Economical issues	8	3.0000	0.44320
Housework-based issues	12	2.9792	0.40534
Children issues	14	3.3036	0.61377
Wife's work issues	3	3.6667	1.15470
Other issues	14	2.7143	0.56208
Total	51	3.0392	0.60904

At the 5% significance level in the hypothesis 13, $Z=2.86$ and $p=0.034$. Since $p<0.05$ from the statistical view has significant difference, H_0 is rejected while the H13 hypothesis is ACCEPTED. The opinion of women participants that there is lack of job satisfaction at work which has negative impact on women and makes them to get round

an engineering profession has statistically significant difference among women who differ in reasons of dispute with spouses.

According to the LSD Test in the Appendix 3, there is statistically significant difference (at 0.95% mean) between women who have debates with spouses on their work issues versus the other issues ($p=0.011$) which do not mention in the questionnaire. Moreover, they also have disputes on the children issues versus other issues ($p=0.009$). There is no statistically significant difference between women's work and children issues. Thus, women who have disputes with their husbands on the some other issues which not mentioned in the questionnaire with 2.71% mean have tendency to reject the existence of job dissatisfaction at work which negatively affects and turn women out from getting an engineering profession. However, women who have debates about their work (3.67% mean) and children issues (3.30% mean) with their husbands accept the concept that there is lack of job satisfaction at work which restricts women from having an engineering profession.

In summary, according to the funding shown in the Table 3.20, more than half of women participated in the research accept the existence of all three barriers in engineering fields, where the presence of the lack of job satisfaction and male-dominated organizational culture at work have the highest average mean of 3.00% and 2.97%, respectively, in range of 1.00% and 5.00%. The existence of work and family conflict has less average mean of 2.68% in the same range, although it is still at high rate.

Table 3.20

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
The existence of male-dominated organizational culture	95	1.10	5.00	2.9719	0.82825
The existence of work-family conflict	97	1.00	5.00	2.6813	0.95453
The lack of job satisfaction at work	96	1.00	5.00	3.0000	0.64685

CONCLUSION

Nowadays the life of individuals is increasingly accelerating day by day. With the technological developments and increasing of educational level the numbers of women are participated in workforce also continuously increase in Turkey as everywhere in the world. Women are became more confident and free in taking decisions about their future. More women begin to enter in occupations which were traditionally accepted as male-dominated or masculine jobs. Thus, it should be expected that women have to be also increase in such types of vocations as engineering.

There is great increase in the needs of professional engineers in the world, where they occupy the third place among ten jobs having difficulty to fill. Even though women engineers earn higher wages in compare with women in the non-engineering occupations, it was found that the gender inequality among wages is also exists in engineering. It is also found, that women engineers prefer to work in private rather than in public sector. Women engineers continue to under-represent in academic field as well as in the upper stages of leadership. In order to increase the participation of women in the engineering fields there are targets are put in front to achieve by increasing the inclusion and interest of girls with the STEM subjects both in formal and informal environments, fostering mentoring in order to support female students throughout their academic education and professional experiences, and encouraging efforts of women retaining in the STEM workforce.

The position of women engineers in Turkey do not differ in comparison with the world. However, even though the participation of women engineers in Turkey are under the men's participations, women engineers present more than half larger in numbers than in the USA and outperform the EU countries. However, they are still under-represented at every stage in engineering, in contrast with men. At the university level, the number of

women graduated in engineering is continuously increased in ten out of thirteen faculties where the women's participation in the three faculties is decreased, they are Naval Architecture and Marine Science, Engineering and Computer Science, and Engineering and Design. However, there is a huge difference of the women participation in engineering and non-engineering faculties, where there is high percentage of women are preferred non-engineering fields. As in the world, the participation of women engineers is continue to decreased in workforce where women with the engineering degree prefer to work in other than engineering fields. Women engineers in Turkey also have higher wages in engineering than in non-engineering jobs as well as they are also preferred to work in private sector rather than public. They also face the same barriers as women engineers everywhere.

This study is aimed to examine three common obstacles which are existed in engineering fields by the view, fillings and opinions of women are participated in this research. The three obstacles in this study are: the existence of male-dominated organizational culture, the presence of lack of job satisfaction at work, and the existence of work-family conflict. These barriers were attempted to explore through the demographic peculiarities and answers of the questions in the prepared questionnaire of only women who graduated from engineering domains. In this research 112 of working women, who are held an engineering degree but not necessarily work in the engineering sector, were participated and answered the questionnaire face by face. The research was implemented in city of Istanbul and the participants were randomly selected.

Not all women participants in the research work as engineers, even they all are graduated from engineering faculties. Even though more than half women work as engineers, there is also high percentage of women that work in non-engineering sector. From their answers about the reasons not working in own sector, the majority of women answers that they did not find related job, as well as most of working women work at the same position from beginning of entering their job. Moreover, most of working women have not any administrative task at work and business travel beyond city or abroad. Although, of them are satisfied with their work position. The data show that even there are restrictions on women in work, most of those who work still accept and satisfy with their work position.

According to the funding of the research, the existence of male-dominated organizational culture, the presence of lack of job satisfaction at work, and the existence of work-family conflict which are affected women negatively from pursuit engineering vocation, all these three obstacles are presented in the workplace. However, the view of women engineers of the existence of male-dominated organizational culture (eight hypotheses have difference in means according to this condition) more prevailing than the presence of lack of job satisfaction at work (three hypotheses) and the existence of work-family conflict (two hypotheses).

- The differences in the opinions, related to the existence of male-dominated organizational culture at work, vary among women. Women accept the existence of male-dominated organizational culture who know at least a foreign language, have an administrative task, have business travel beyond city, who are satisfied with their work position, women with graduate level, women who receive their husbands help very much, women whose spouses do not interfere of who receive support in business travel, and lastly women are held the other types of social insurance, rather than the SSI, SEI and Private Insurance.

In contrast of women who do not know any foreign language or who only get help of their spouses' sometime in housework, women are knew at least a foreign language and are received their husbands' endless help in the home-based work can get faster and better job, so accordingly they have more involvement in their work and relations with men where they more sharply feel the priority of them over women.

Women who have their husbands' support or at least their non-interference in travels related to work respectively travel more than women whose spouses do not support or strongly against wives' business travels. Thus, women are had business trips as well as women are held an administrative task are being more often in touch with their fellows where they also get underestimation as a woman.

It is interesting that women who are satisfied with their work position have view of existence male-dominated organizational culture in workplace. Here, it may explained only by that these women accept the perception of the vertical

segregation of the occupations and accordingly that the engineering fields are masculine ones.

Among levels of education, women with master's degree face more obstacles related to gender disparities at work. However, women with doctoral degree argue the equality of man and women at work. Women with doctoral degree more often work in academic field and even not still have high respect to their personalities which may let to feel them less the authority of men. Finally, women who held other types of social insurances than SSI, SEI and Private Insurance face more male dominance at work. Here, the other types of social insurances are Private Pension as well as compatibility of SSI-Private Insurance, SSI-Private Pension, SEI-Private Pension, and SSI-Private Insurance-Private Pension. Thus, as it shown here women are possessed two or three types of insurance at the same time. If women who are held these types of insurance can afford them, it means that they have better financial conditions which may relate to their job, i.e. they may have higher work position, an administrative task, have business travels, etc.

These results show that those women engineers who take decisions in their working life more freely, such as getting their families help and support, or have greater opportunities to work like having greater working responsibilities, more frequently face the barrier stayed in front of them just because of being a woman. However, at the highest level of education it is not a matter where the gender inequalities are fell down.

- Three different disagreements were found among women engineers about their satisfaction with work. Women, who are travelled beyond the city limits, have long work years and have debates with spouses on children and their work issues, are not satisfied with their jobs.

Most of time women spend on their trips according to work compare with women who have not such travels. The business travels can last for hours or even days therefore, these women may not spend enough time to their private lives and accordingly are dissatisfied with their job conditions. On the other hand, women who have long years of working (more than 10 years) with its burdens, in

compare with women those who have short period of work (2 years and less), dream about long vacations which also lead to feeling of dissatisfaction with their occupations.

Furthermore, it is accepted as usual thing that every family has disputes among family members, the reasons of them might differ from each other. In this research it was found that women who have dispute with their husband about children and work are more likely not satisfied with their jobs. In comparison, women who have some other dispute issues besides the economical, home-based work, children and work issues, are satisfied with their jobs. It could be seen, that the problem, of those working women are argued about children and their work with spouses, usually lies in the lack of leisure time which needed for the child- and home-based care therefore, it is not a surprise in their dissatisfaction with their work conditions.

- According to the opinions of the participated women engineers, the third obstacle of the research, that is existence of work-family conflict, also have presence. It was found, that women who get great help from their husbands in housework and those who have rare issues in the breast-feeding period are more likely to accept the clash of work with family, in contrast of women who get rare husbands' help in home-based work and those who have problems with the breast-feeding during the work time.

Women, that able to continue to work due to help of their husbands and families, feel dissatisfaction since they cannot pay more attention to them. This situation makes them rush between work and home and in many cases prevent them to concentrate particularly on one – work or family. On the other hand, women who do not receive help in housework and in breast-feeding time period, the conflict between work and family affect them much less since they able to pay attention in both cases.

In conclusion, based on the results of this study, all the three obstacles, the presence of male-dominated organizational culture, lack of satisfaction with work and work-family conflict, women are faced in their working lives. The funding shows that more than half of women engineers are accepted the presence of lack of job satisfaction and the

existence of male-dominated culture at work almost at the same rate and at the highest rate than the present of work-family conflict, which however, also has quite high rate. Thus, in order to eradicate or at least decrease the presence of male-dominated organizational culture and increase female employment in engineering fields, it has to re-educate children from their yearly years about equality between boys and girls that is only education make an individual get smarter not because they are boy or girl and the great responsibilities lies on parents and teachers in this case. Only in this way girls could increase their confidence as well as interest in such occupations (i.e. engineering) which traditionally accepted as belonging of men. The reasons of existence of lack of job satisfaction and work-family conflict lay in the lack of the free time which restricts the attention to family, home, friends and women themselves. The laws are existed in Turkey which protected working women according to some Turkish scientists, but it is also important to regulate them in order to be sure that they are applied in practice.

In order to increase the participation of women engineers in engineering workforce, there needs for eliminating of inequalities and discrimination among men and women engineers, increasing of appropriate and affordable child- and elder-care places as well as establishing of compulsory daily child-care places at work places, increasing of maternity leave and establishing of male maternity leave and controlling the application of existed regulations against the gender discrimination at workplace.

It this study, there are only 112 women were participated and most of them are young. This is inadequate quantity to appropriate testing. However, since there is a very little number of researches are done, it is a hope that this research is will be a contribution to the future researches.

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APPENDIX 1

Normality of Distribution

Test of Normality (for independent samples with 2 variables)	N	Mean		Shapiro-Wilk Test		Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	P	Statistic	Std. Error	Statistic	Std. Error
Having children	111	1.55	0.065	0.726	0.000	0.859	0.229	-0.441	0.455
Knowledge of a foreign language	112	1.09	0.027	0.321	0.000	2.920	0.228	6.644	0.453
Type of the corporation	109	1.84	0.035	0.435	0.000	-1.923	0.231	1.729	0.459
Having an administrative task	107	1.63	0.047	0.613	0.000	-0.529	0.234	-1.753	0.463
Work hours	91	1.55	0.052	0.633	0.000	-0.202	0.253	-2.004	0.500
Position satisfaction	93	1.37	0.050	0.610	0.000	0.567	0.250	-1.715	0.495
Having a business travel beyond city	105	1.67	0.046	0.595	0.000	-0.717	0.236	-1.515	0.467
Having a business travel abroad	105	1.85	0.035	0.430	0.000	-1.963	0.236	1.888	0.467
Having of post-natal unpaid leave	33	1.61	0.086	0.621	0.000	-0.455	0.409	-1.913	0.798

Test of Normality (for independent samples with 3 and more variables)	N	Mean		Shapiro-Wilk Test		Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	P	Statistic	Std. Error	Statistic	Std. Error
Age	111	1.55	0.065	0.726	0.000	0.859	0.229	-0.441	0.455
Marital status	112	1.51	0.052	0.700	0.000	0.451	0.228	-0.884	0.453
Number of children	32	1.91	0.137	0.829	0.000	0.608	0.414	0.243	0.809
Educational level	109	1.45	0.058	0.689	0.000	0.981	0.231	-0.021	0.459
Factor influenced to choose engineering field	109	2.29	0.115	0.862	0.000	0.612	0.231	-0.464	0.459
Number of foreign languages	101	1.62	0.078	0.749	0.000	1.032	0.240	0.236	0.476
Work years at the corporation	110	1.79	0.066	0.792	0.000	0.303	0.230	-0.882	0.457
Work field	111	1.50	0.058	0.715	0.000	0.814	0.229	-0.313	0.455
Work position	78	1.51	0.079	0.657	0.000	1.719	0.272	3.963	0.538
Reasons not work as an engineer	42	3.60	0.366	0.863	0.000	0.210	0.365	-1.345	0.717
Spouse's help in housework	51	2.04	0.108	0.807	0.000	-0.068	0.333	-1.302	0.656
Spouse's support of business travels	39	2.87	0.161	0.899	0.002	0.269	0.378	-0.583	0.741
Child-care at home	32	2.28	0.186	0.812	0.000	-0.082	0.414	-1.427	0.809
Child care during travels	22	1.95	0.104	0.661	0.000	-0.147	0.491	2.077	0.953
Reasons of dispute among spouses	51	3.06	0.201	0.867	0.000	0.147	0.333	-1.269	0.656
Problems with breast-feeding during work	31	2.23	0.137	0.790	0.000	-0.415	0.421	-1.121	0.821
Time interval of prenatal allowed	33	2.91	0.186	0.900	0.005	-0.296	0.409	-0.693	0.798
Time interval of post-natal paid leave	32	2.19	0.176	0.866	0.001	0.638	0.414	0.461	0.809
Average of salary	92	1.85	0.089	0.817	0.000	0.737	0.251	-0.158	0.498
Percentage of personal spending	104	2.85	0.120	0.913	0.000	0.396	0.237	-0.591	0.469
Type of possessed social insurance	95	2.9719	0.08498	0.990	0.673	0.000	0.247	-0.266	0.490

APPENDIX 2

Total Results of U-Tests

	Mann-Whitney U (Nonparametric) Test (for samples with 2 variables)								
	The existence of male-dominated organizational culture			The existence of work-family conflict			The lack of job satisfaction at work		
	U-test	Z	P	U-test	Z	P	U-test	Z	P
Having children	797.000	-1.426	0.154	1050.000	-0.159	0.874	999.000	-0.428	0.669
Knowledge of a foreign language	135.000	-2.857	0.004	387.500	-0.564	0.572	346.500	-1.017	0.309
Type of the corporation	397.000	-1.621	0.105	461.000	-1.360	0.174	461.500	-1.309	0.191
Having an administrative task	615.500	-2.803	0.005	978.000	-0.065	0.948	968.500	-0.004	0.997
Work hours	776.500	-1.680	0.093	681.000	-1.415	0.157	801.500	-1.120	0.904
Position satisfaction	692.000	-2.380	0.017	760.500	-0.463	0.643	652.500	-1.376	0.169
Having a business travel beyond city	594.000	-2.816	0.005	997.000	-0.204	0.839	625.000	-3.069	0.002
Having a business travel abroad	366.000	-1.904	0.057	519.500	-0.500	0.617	401.500	-1.709	0.087
Having of post-natal unpaid leave	94.500	-0.417	0.677	108.500	-0.796	0.426	129.500	-0.019	0.985

	One-Way Anova (Parametric) Test (for samples with 3 and more variables)					
	The existence of male-dominated organizational culture		The existence of work-family conflict		The lack of job satisfaction at work	
	F	P	F	P	F	P
Age	1.268	0.286	0.636	0.532	2.255	0.111
Marital status	0.869	0.423	0.286	0.752	0.259	0.773
Number of children	2.712	0.067	0.534	0.663	1.326	0.286
Educational level	3.234	0.044	2.410	0.096	0.809	0.449
Factor influenced to choose engineering field	0.698	0.595	0.599	0.664	0.222	0.925
Number of foreign languages	0.108	0.955	0.517	0.672	0.438	0.726
Work years at the corporation	0.392	0.677	0.029	0.972	3.254	0.043
Work field	0.037	0.963	1.686	0.191	3.073	0.051
Reasons not work as an engineer	0.832	0.561	0.680	0.667	1.969	0.104
Spouse's help in housework	4.073	0.025	3.386	0.042	0.047	0.954
Spouse's support of business travels	5.694	0.002	1.458	0.237	0.582	0.678
Child-care at home	0.731	0.544	0.446	0.722	0.237	0.870
Reasons of dispute among spouses	1.049	0.396	2.544	0.052	2.859	0.034
Problems with breast-feeding during work	1.073	0.358	1.186	0.000	2.213	0.128
Time interval of prenatal allowed	1.364	0.276	0.853	0.504	1.775	0.162
Time interval of post-natal paid leave	1.009	0.423	2.066	0.113	1.357	0.275
Average of salary	1.169	0.328	1.187	0.320	0.458	0.712
Percentage of personal spending	4.500	0.006	0.595	0.620	0.137	0.938

	Independent-Samples Kruskal-Wallis H (Nonparametric) Test (for samples with 3 and more variables)								
	The existence of male-dominated organizational culture			The existence of work-family conflict			The lack of job satisfaction at work		
	Test Stat	df	Sig. (2-sided test)	Test Stat	df	Sig. (2-sided test)	Test Stat	df	Sig. (2-sided test)
Work position	3.417	2	0.181	0.999	2	0.607	2.911	2	0.233
Child care during travels	0.956	2	0.620	0.303	2	0.859	2.196	2	0.334

APPENDIX 3

Hypotheses Testing H1. Mann-Whitney U Test

Ranks				
	Knowledge of a foreign language	N	Mean Rank	Sum of Ranks
The existence of male-dominated organizational culture	have	87	50.45	4389.00
	have not	8	21.38	171.00
	Total	95		

Test Statistics ^a	
	The existence of male-dominated organizational culture
Mann-Whitney U	135.000
Wilcoxon W	171.000
Z	-2.857
Asymp. Sig. (2-tailed)	.004

a. Grouping Variable: Knowledge of a foreign language

H2. Mann-Whitney U Test

Ranks				
	Having an administrative task	N	Mean Rank	Sum of Ranks
The existence of male-dominated organizational culture	yes	34	55.40	1883.50
	no	56	39.49	2211.50
	Total	90		

Test Statistics^a

	The existence of male-dominated organizational culture
Mann-Whitney U	615.500
Wilcoxon W	2211.500
Z	-2.803
Asymp. Sig. (2-tailed)	.005

a. Grouping Variable: Having an administrative task

H3. Mann-Whitney U Test

Ranks

	Having business travels beyond city	N	Mean Rank	Sum of Ranks
The existence of male-dominated organizational culture	yes	31	56.84	1762.00
	no	60	40.40	2424.00
	Total	91		

Test Statistics^a

	The existence of male-dominated organizational culture
Mann-Whitney U	594.000
Wilcoxon W	2424.000
Z	-2.816
Asymp. Sig. (2-tailed)	.005

a. Grouping Variable: Having business travels beyond city

H4. Mann-Whitney U Test

Ranks

	Having business travels beyond city	N	Mean Rank	Sum of Ranks
The lack of job satisfaction at work	yes	33	59.06	1949.00
	no	61	41.25	2516.00
	Total	94		

Test Statistics^a

	The lack of job satisfaction at work
Mann-Whitney U	625.000
Wilcoxon W	2516.000
Z	-3.069
Asymp. Sig. (2-tailed)	.002

a. Grouping Variable: Having business travels beyond city

H5. Mann-Whitney U Test

Ranks

	Work Position satisfaction	N	Mean Rank	Sum of Ranks
The existence of male-dominated organizational culture	yes	58	51.57	2991.00
	no	34	37.85	1287.00
	Total	92		

Test Statistics^a

	The existence of male-dominated organizational culture
Mann-Whitney U	692.000
Wilcoxon W	1287.000
Z	-2.380
Asymp. Sig. (2-tailed)	.017

a. Grouping Variable: Work position satisfaction

H6. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of male-dominated organizational culture

Levene Statistic	df1	df2	Sig.
.932	2	89	.397

Multiple Comparisons

Dependent Variable: The existence of male-dominated organizational culture
LSD

(I) Educational level	(J) Educational level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Undergraduate	Graduate	-.29649	.18221	.107	-.6585	.0656
	Doctorate	.62768	.38280	.105	-.1329	1.3883
Graduate	Undergraduate	.29649	.18221	.107	-.0656	.6585
	Doctorate	.92417*	.39410	.021	.1411	1.7072
Doctorate	Undergraduate	-.62768	.38280	.105	-1.3883	.1329
	Graduate	-.92417*	.39410	.021	-1.7072	-.1411

*The mean difference is significant at the 0.05 level.

H7. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of male-dominated organizational culture

Levene Statistic	df1	df2	Sig.
2.019	2	39	.146

Multiple Comparisons

Dependent Variable: Existence of male-dominated organizational culture
Tukey HSD

(I) Spouse's help in housework	(J) Spouse's help in housework	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Helps very much	Helps sometime	.98412*	.35382	.022	.1221	1.8461
	Helps rarely	.41313	.37875	.525	-.5096	1.3359
Helps sometime	Helps very much	-.98412*	.35382	.022	-1.8461	-.1221
	Helps rarely	-.57099	.33650	.219	-1.3908	.2488
Helps rarely	Helps very much	-.41313	.37875	.525	-1.3359	.5096
	Helps sometime	.57099	.33650	.219	-.2488	1.3908

*The mean difference is significant at the 0.05 level.

H8. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of male-dominated organizational culture

Levene Statistic	df1	df2	Sig.
3.655	4	28	.016

Multiple Comparisons

Dependent Variable: Existence of male-dominated organizational culture

Games-Howell

(I) Spouse's support business travels	(J) Spouse's support travels	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Definitely supports	Supports	-1.44091	1.17869	.769	-25.7755	22.8937
	Does not interfere	-.74167	1.17299	.949	-26.0682	24.5848
	Does not support	.29259	1.15573	.998	-28.5185	29.1037
	Definitely does not support	.08889	1.15162	1.000	-29.6747	29.8525
Supports	Definitely supports	1.44091	1.17869	.769	-22.8937	25.7755
	Does not interfere	.69924	.34672	.293	-.3360	1.7345
	Does not support	1.73350*	.28290	.000	.8458	2.6213
	Definitely does not support	1.52980*	.26560	.001	.6682	2.3914
Does not interfere	Definitely supports	.74167	1.17299	.949	-24.5848	26.0682
	Supports	-.69924	.34672	.293	-1.7345	.3360
	Does not support	1.03426*	.25812	.009	.2378	1.8307
	Definitely does not support	.83056*	.23903	.031	.0681	1.5930
Does not support	Definitely supports	-.29259	1.15573	.998	-29.1037	28.5185
	Supports	-1.73350*	.28290	.000	-2.6213	-.8458
	Does not interfere	-1.03426*	.25812	.009	-1.8307	-.2378
	Definitely does not support	-.20370	.13022	.565	-.6955	.2881
Definitely does not support	Definitely supports	-.08889	1.15162	1.000	-29.8525	29.6747
	Supports	-1.52980*	.26560	.001	-2.3914	-.6682
	Does not interfere	-.83056*	.23903	.031	-1.5930	-.0681
	Does not support	.20370	.13022	.565	-.2881	.6955

*The mean difference is significant at the 0.05 level.

H9. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of male-dominated organizational culture

Levene Statistic	df1	df2	Sig.
2.860	3	88	.041

Multiple Comparisons

Dependent Variable: The existence of male-dominated organizational culture

Tukey HSD

(I) Type of possessed social insurance	(J) Type of possessed social insurance	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SSI (SSK)	SEI (Bağkur)	.52726	.24782	.152	-.1217	1.1762
	Private Insurance (Özel sigorta)	.33747	.21935	.419	-.2370	.9119
	Others	-.45747	.23458	.215	-1.0718	.1569
SEI (Bağkur)	SSI (SSK)	-.52726	.24782	.152	-1.1762	.1217
	Private Insurance (Özel sigorta)	-.18979	.28717	.911	-.9418	.5622
	Others	-.98473*	.29897	.008	-1.7677	-.2018
Private Insurance (Özel sigorta)	SSI (SSK)	-.33747	.21935	.419	-.9119	.2370
	SEI (Bağkur)	.18979	.28717	.911	-.5622	.9418
	Others	-.79494*	.27583	.025	-1.5173	-.0726
Others	SSI (SSK)	.45747	.23458	.215	-.1569	1.0718
	SEI (Bağkur)	.98473*	.29897	.008	.2018	1.7677
	Private Insurance (Özel sigorta)	.79494*	.27583	.025	.0726	1.5173

*The mean difference is significant at the 0.05 level.

H10. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of work-family conflict

Levene Statistic	df1	df2	Sig.
6.206	2	48	.004

Multiple Comparisons

Dependent Variable: The existence of work-family conflict
Games-Howell

(I) Spouse's help in housework	(J) Spouse's help in housework	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Helps very much	Helps sometime	.32200	.39727	.699	-.6563	1.3003
	Helps rarely	.95770*	.32481	.021	.1344	1.7809
Helps sometime	Helps very much	-.32200	.39727	.699	-1.3003	.6563
	Helps rarely	.63570	.31011	.118	-.1287	1.4001
Helps rarely	Helps very much	-.95770*	.32481	.021	-1.7809	-.1344
	Helps sometime	-.63570	.31011	.118	-1.4001	.1287

*The mean difference is significant at the 0.05 level.

H11. One-Way Anova Analysis

Test of Homogeneity of Variances

The existence of work-family conflict

Levene Statistic	df1	df2	Sig.
2.006	2	28	.153

Multiple Comparisons

Dependent Variable: The existence of work-family conflict

Tukey HSD

(I) Having problems with breast-feeding at work	(J) Having problems with breast-feeding at work	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Have very big problems	Have some problems	-.01190	.44985	1.000	-1.1250	1.1012
	Have rare problems	-1.55678*	.44404	.004	-2.6555	-.4581
Have some problems	Have very big problems	.01190	.44985	1.000	-1.1012	1.1250
	Have rare problems	-1.54487*	.36016	.001	-2.4360	-.6537
Have rare problems	Have very big problems	1.55678*	.44404	.004	.4581	2.6555
	Have some problems	1.54487*	.36016	.001	.6537	2.4036

* The mean difference is significant at the 0.05 level.

H12. One-Way Anova Analysis

Test of Homogeneity of Variances

The lack of job satisfaction at work

Levene Statistic	df1	df2	Sig.
1.215	2	91	.301

Multiple Comparisons

Dependent Variable: The lack of the job satisfaction

Tukey HSD

(I) Work years at the corporation	(J) Work years at the corporation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
2 years and less	3 to 9 years	-.26276	.14640	.177	-.6116	.0861
	10 years and more	-.46744*	.19001	.041	-.9202	-.0147
3 to 9 years	2 years and less	.26276	.14640	.177	-.0861	.6116
	10 years and more	-.20468	.17395	.470	-.6192	.2098
10 years and more	2 years and less	.46744*	.19001	.041	.0147	.9202
	3 to 9 years	.20468	.17395	.470	-.2098	.6192

*The mean difference is significant at the 0.05 level.

H13. One-Way Anova Analysis

Test of Homogeneity of Variances

The lack of job satisfaction at work

Levene Statistic	df1	df2	Sig.
2.260	4	46	.077

Multiple Comparisons

Dependent Variable: The lack of job satisfaction at work

LSD

(I) Reasons of dispute among spouses	(J) Reasons of dispute among spouses	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Economical issues	Housework-based issues	.02083	.25937	.936	-.5012	.5429
	Children issues	-.30357	.25185	.234	-.8105	.2034
	Wife's work issues	-.66667	.38470	.090	-1.4410	.1077
	Other issues	.28571	.25185	.262	-.2212	.7927
Housework-based issues	Economical issues	-.02083	.25937	.936	-.5429	.5012
	Children issues	-.32440	.22355	.154	-.7744	.1256
	Wife's work issues	-.68750	.36680	.067	-1.4258	.0508
	Other issues	.26488	.22355	.242	-.1851	.7149
Children issues	Economical issues	.30357	.25185	.234	-.2034	.8105
	Housework-based issues	.32440	.22355	.154	-.1256	.7744
	Wife's work issues	-.36310	.36152	.320	-1.0908	.3646
	Other issues	.58929*	.21478	.009	.1570	1.0216
Wife's work issues	Economical issues	.66667	.38470	.090	-1.077	1.4410
	Housework-based issues	.68750	.36680	.067	-.0508	1.4258
	Children issues	.36310	.36152	.320	-.3646	1.0908
	Other issues	.95238*	.36152	.011	.2247	1.6801
Other issues	Economical issues	-.28571	.25185	.262	-.7927	.2212
	Housework-based issues	-.26488	.22355	.242	-.7149	.1851
	Children issues	-.58929*	.21478	.009	-1.0216	-.1570
	Wife's work issues	-.95238*	.36152	.011	-1.6801	-.2247

*The mean difference is significant at the 0.05 level.

QUESTIONNAIRE

Dear Participant,

The number of women engineers is extremely low both in Turkey and in the world. This study aims to specify characteristics of women with engineering degree as well as to identify the barriers are they faced in their working lives.

This study is made for the MA thesis. The information is received about your personality and organization will not be used for any other purpose, except for this study.

A. PROFIL/EDUCATION OF WOMEN ENGINEER

How old are you?

What is your marital status?

1. Unmarried
2. Married
3. Divorced

Do you have a child?

1. Yes
2. No

How many children you have? (Will be asked to women with children)

What is your educational status?

1. Undergraduate
2. Graduate
3. Doctoral

Engineering

field:

Which factors are influenced you to choose engineering field?

1. Family
 2. School-teacher
 3. Personal skill
 4. Friends
 5. Others (identify)
-

Do you know a foreign language?

1. Yes
2. No

Which foreign language you are known? (Will be asked to those who say yes)

		Beginner	Moderate	Advanced
1				
2				
3				
4				

B. INFORMATION ABOUT THE CORPORATION

What is a status of the corporation you work for?

1. Public
2. Private

How long do you work at your corporation?

Do you have an administrative task at your corporation?

1. Yes
2. No

Whom do you work?

1. Engineer
 2. Non-engineering field (identify please) _____
 3. Academic field (identify department)
-

a) Will be asked to women who work in non-engineering field:

What are the reasons of working in non-engineering field?

1. Do not find work as engineer
 2. Low salaries paid
 3. Limits in rising to higher position
 4. Non-flexible work hours
 5. Never plan to work as engineer
 6. Willingness to have an own business
 7. Disliked work environment
 8. Others (identify)
-

b) Will be asked to women who work in engineering field:

Do you work at the same position from entering into your corporation?

1. Having the same position from entering
2. Started at lower position, later moved up
3. Started at higher position, status fell in time
4. Others

(identify)

How many hours do you work a day?

Do you think you deserve your work position?

1. Yes
2. No

Have you business travels beyond city?

1. Yes
2. No

Have you business travels abroad?

1. Yes
2. No

What do you think about the propositions below?

	Definitely agree	Agree	Doubtful	Disagree	Definitely disagree
The existence of women discrimination at work					
More chance and facility are given to men					
Discrimination in salary, bonus and status of women					
Even with high level of ability, women have lower position					
Existence of male-dominated culture at work					
Women engineers are exposed to the loneliness at work					
Women engineers are expected to have high performance					
Society justify harder women engineers					
Managers justify harder women engineers					
Women engineers get equal in-service training					

What do you think about the propositions below?

	Definitely agree	Agree	Doubtful	Disagree	Definitely disagree
Unwilling to go to work					
Impatient to end the work and go home					
Impatient to start to work					
Love own profession					

C. FAMILY

What is a reason of debate between you and your spouse?

1. Economic issues
2. Housework-based issues
3. Children issues
4. My work issues
5. Others

Who take care of your children? (Will be asked to women with children)

1. Having big children who do not need a care
2. Babysitter
3. Relatives
4. They are in kindergarten

Does your spouse give you help at housework?

1. Helps very much
2. Helps sometime
3. Helps, but not much
- 4.

Others

(identify)

Does your spouse support your business travels? (Will be asked to married women)

1. Definitely supports
2. Supports
3. Does not interfere
4. Does not support
5. Definitely does not support

Will asked to women with children:

Who take care of your children during your business travels?

1. Having big children who do not need a care
2. Babysitter
3. Relatives
4. They are in kindergarten

Did you have the problems with breast-feeding during your work? (Will be asked to women with children)

1. Have very much problems
2. Have some problems
3. Have rare problems

What do you think about the propositions below?

	Definitely agree	Agree	Doubtful	Disagree	Definitely disagree
Stress at work affects family					
Inability to have enough time to spouse due to work					
Inability to have enough time to children due to work					
Inability to have enough time to family due to work					
Inability to have enough time to friends due to work					
Inability to have enough time to myself due to work					
Work problems are solved easier than family problems					

What is time interval of prenatal allowed you have in your last pregnancy? (Will be asked to women with children)

1. Having between 1 and 15 days
 2. Having between 16 and 30 days
 3. Having between 1 and 2 months
 4. Having more than 2 months
 5. Others (identify)
-

What is time interval of post-natal paid leave you have? (Will be asked to women with children)

1. Having less than 1 month
2. Having between 1 and 2 months
3. Having between 2 and 3 months
4. Having between 3 and 5 months
6. Having more than 5 months

Did you have post-natal unpaid leave? (Will be asked to women with children)

1. Yes
2. No

D. ECONOMIC CONDITION

How many percent have you allocate on your personal expenses?

1. Having less than 10%
 2. Having between 10-30%
 3. Having between 31-50%
 4. Having between 51-70%
 5. Having between 71-100%
 6. Others (identify)
-

Which one of social insurance do you possess?

1. SSI
2. SEI
3. Private Insurance
4. Private Pension
5. SSI-Private Insurance
6. SSI-Private Pension
7. SEI-Private Pension
8. SSI-Private Insurance-Private Pension

What is average of your monthly earnings?

1. 2900 YTL and less
2. 3000 YTL to 4900 YTL
3. 5000 YTL to 9900 YTL
4. 10000 YTL and more

Thanks for everyone who participates and answers the questions in this survey.

Name and surname of participated person in the survey:

ANKET

Sayın Katılımcı,

Türkiye’de ve Dünyada kadın mühendis sayısı son derece azdır. Bu çalışma mühendislik eğitimi olan kadınların özelliklerini belirlemenin yanı sıra iş hayatında karşılaştıkları sorunları tespit etme amacı ile düzenlenmektedir.

Bu çalışma yüksek lisans tezi için yapılmakta olup şahsınız ve kurumunuzla ilgili özel bilgiler alınmayacak ve başka hiçbir amaçla kullanılmayacaktır.

A. MÜHENDİS KADIN PROFİLİ / EĞİTİMİ

Kaç

yaşındasınız?

Madeni durumunuz nedir?

1. Bekar
2. Evli
3. Boşanmış

Çocuğunuz var mı?

1. Var
2. Yok

Kaç

çocuğunuz

var?

(Çocuğu

olanlara

sorulacak)

Eğitim durumunuz nedir?

1. Lisans
2. Yüksek lisans
3. Doktora

Mühendislik

alanı:

Mühendisliği seçmenizi ne etkiledi?

1. Aile
2. Okul – öğretmen
3. Kişisel yetenek
4. Arkadaş
- 5.

Diğer

(belirtiniz)

Bildiğiniz herhangi bir yabancı dil/diller var mı?

1. Var
2. Yok

Varsa hangiler? (Evet diyenlere sorulacak)

		Başlangıç	Orta	İleri
1				
2				
3				
4				

B. KURUMLA İLGİLİ BİLGİLER

Çalıştığınız kurumun statüsü?

1. Kamu
2. Özel

Kaç yıldır bu kurumda çalışıyorsunuz?

Kurumunuzda idari bir göreviniz var mı?

1. Evet
2. Hayır

Ne olarak çalışıyorsunuz?

1. Mühendis olarak
2. Mühendislik dışı bir görevim var (lütfen belirtiniz)
3. Akademik alanda (bölümünüzü belirtiniz)

a)Mühendis olarak çalışmayan kadınlara sorulacak:

Mühendis olarak çalışmıyorsanız neden?

1. Mühendis olarak iş bulamadım
2. Daha düşük maaş ödenmesi
3. Yükselme imkanının sınırlı olması
4. Çalışma saatlerinin ağır olması
5. Mühendis olarak çalışmaya hiçbir zaman planlamadım
6. Kendi işimi kurmak istedim
7. Mühendislerin çalışma ortamından hoşlanmadım
8. Diğer (belirtiniz)

b)Mühendis olarak çalışan kadınlara sorulacak:

Bu kurumda hep aynı pozisyonda mı çalıştınız?

1. Kuruma girdiğimden beri aynı pozisyonda çalışıyorum
2. Düşük bir görevle başladım, ama daha sonra yükseldim
3. Daha yüksek bir görevle başladım, zamanla statüm düştü
4. Diğer (belirtiniz)

Günde kaç saat çalışıyorsunuz?

Siz hak ettiğiniz pozisyonda çalıştığınızı düşünüyor musunuz?

1. Evet
2. Hayır

Şehir dışı görevlendirmelere gidiyor musunuz?

1. Evet
2. Hayır

Yurtdışı görevlendirmelere gidiyor musunuz?

1. Evet
2. Hayır

Aşağıdaki önermeler hakkında ne düşünüyorsunuz?

	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
İşyerimde kadın olduğum için ayrımcılığa maruz kaldığımı düşünüyorum					
İşyerimde erkeklere daha fazla şans ve imkan veriliyor					
Kadınlar, maaş, prim, statü gibi konularda ayrımcılığa maruz kalmaktadır					
Kadınlar yeteneklerine göre daha düşük konumlarda çalıştırılmaktadır					
İş yerinde erkek egemen kültür hakimdir					
Mühendis olarak çalışan kadınlar iş ortamında daha fazla yalnızlığa maruz kalırlar					
Kadın mühendislerden daha yüksek performans beklenmektedir					
Toplumun mühendis kadına karşı tutumu daha katıdır					
Kurum yöneticilerinin mühendis kadına karşı tutumu daha katıdır					
Hizmet içi eğitimlerde kadınlara da eşit fırsat tanınmaktadır					

Aşağıdaki önermeler hakkında ne düşünüyorsunuz?

	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
Sabahları kalktığımda işe hiç gitmek istemiyorum					
Mesai bitiminin gelmesini iple çekiyorum, bir an önce eve gitmek istiyorum					
Mesaiden sonra eve gittiğimde işe gitmek için ertesi günün gelmesini iple çekiyorum					
Mesleğimi çok seviyorum, tekrar bir iş seçecek olsam yine bu mesleği seçerim					

C. AİLE

Evde eşinizle tartışma nedenleriniz genellikle hangi konularda olur?

1. Ekonomik konularda ilgili
2. Ev işi ile ilgili
3. Çocuklarla ilgili
4. İşimle ilgili
5. Diğer

Çocuklarınıza kim bakıyor? (Çocuğu olanlara sorulacak)

1. Bakım yaşını aştılar
2. Yardımcı kadın
3. Ailemden biri
4. Kreşte bakılıyor

Ev işleri konusunda eşiniz size yardımcı olur mu?

1. Çok yardımcı olur
2. Bazen yardımcı olmaz
3. Pek yardımcı olmaz
- 4.

Diğer

(belirtiniz)

Eşiniz şehir dışı/yurtdışı seyahatlerinizi nasıl karşılıyor? (Evli olanlara sorulacak)

1. Kesinlikle destekliyor
2. Destekliyor
3. Karışmıyor
4. Desteklemiyor
5. Kesinlikle desteklemiyor

Çocuklu olanlara sorulacak:

Siz seyahatte olduğunuzda çocuklarınızla kim ilgileniyor?

1. Bakım yaşını aştılar
2. Yardımcı kadın
3. Ailemden biri
4. Kreşte bakılıyor

Çalışırken çocuğunuzu emzirmeyle ilgili sorunlarla karşılaştınız mı? (Çocuğu olanlara sorulacak)

1. Çok ciddi sorunlar yaşadım
2. Biraz sorun yaşadım
3. Pek sorun yaşamadım

Aşağıdaki önermeler hakkında ne düşünüyorsunuz?

	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
İşimdeki stresim aileme yansıyor					
İşten dolayı eşime gerekli zaman ayıramıyorum					
İşten dolayı çocuğuma gerekli zaman ayıramıyorum					
İşten dolayı aileme gerekli zaman ayıramıyorum					
İşten dolayı arkadaşlarıma gerekli zaman ayıramıyorum					
İşten dolayı kendime gerekli zaman ayıramıyorum					
İşimdeki sıkıntıları çözmek aile sıkıntılarını çözmekten daha kolay					

Son gebeliğinizde kaç gün doğum öncesi izin kullandınız? (Çocuğu olanlara sorulacak)

1. 1 ile 15 gün arası
2. 16 ile 30 arası
3. 1 ay ile 2 ay arası
4. İki aydan fazla
- 5.

Diğer

(belirtiniz)

Doğum sonrasında ne kadar ücretli izin kullandınız? (Çocuğu olanlara sorulacak)

1. 1 aydan az
2. 1 ile 2 ay arası
3. 2 ile 3 ay arası
4. 3 ile 5 ay arası
6. 5 aydan fazla

Doğumdan sonra ücretsiz izin kullandınız mı? (Çocuğu olanlara sorulacak)

1. Evet
2. Hayır

D. ECONOMIC DURUMU

Elde ettiğiniz gelirin yüzde kaçı kişisel harcamalarınıza gidiyor?

1. Pek gitmiyor
2. Yüzde 10-30 arası
3. Yüzde 31-50 arası
4. Yüzde 51-70 arası
5. Yüzde 71-100 arası
- 6.

Diğer

(belirtiniz)

Aşağıdaki bulunan sosyal güvencesinden hangilerine sahipsiniz?

1. SSK
2. Bağkur
3. Özel sigorta
4. Bireysel emeklilik
5. SSK-Özel Sigorta
6. SSK- Bireysel Emeklilik
7. Bağkur- Bireysel Emeklilik
8. SSK-Özel Sigorta-Bireysel Emeklilik

Ayda ortalama ne kadar kazanıyorsunuz?

1. 2900 TL ve aşağı
2. 3000 TL'den 4900 TL'ye kadar
3. 5000 TL'den 9900 TL'ye kadar
4. 10000 TL ve yukarı

Anketimize cevap vererek araştırmaya katıldığınız için çok teşekkür ederiz.

Anketi yapan kişinin adı soyadı:

CURRICULUM VITAE

Turgunali, Jarkynay. Under-graduated education is completed both in the Department of Economics and Department of International Relations in the Faculty of Economics and Administrative Sciences at Fatih University in 2013. Since 2013 continues education of Master of Arts in the Department of Economics in Institute of Social Sciences at Fatih University. jarkynay@yahoo.com