

DISSERTATION
WOMEN'S LABOR SUPPLY: A CROSS-COUNTRY STUDY

Submitted by
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In partial fulfillment of the requirements
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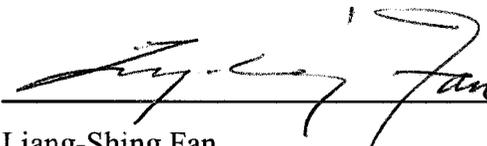
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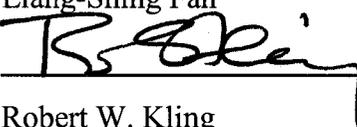
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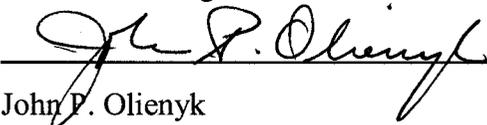
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ABSTRACT OF DISSERTATION

WOMEN'S LABOR SUPPLY: A CROSS-COUNTRY STUDY

This study aims at analyzing the cross-country variations in women's participation rates (WPRs) and the gender-gap in economic activity. It covers 45 countries over 1970-2002, 15 countries from each group: low income countries (LICs), middle income countries (MICs), and high income countries (HICs). The study employs the Seemingly Unrelated Regression Model in conjunction with the Fixed Effects Model to guarantee the individuality of each country and to control for spatial autocorrelation. Several factors such as GDP growth, GDP/capita, education, fertility, urbanization, government's role, and cultural factors are used as explanatory variables.

The empirical work confirms the main hypothesis that cross-country variations in WPRs are attributed to the inter-group variations in average characteristics (mean values of explanatory variables) and to the inter-group variations in women's participation behavior (the responsiveness of women's participation to the change in characteristics). Furthermore, the results reveal that gender-gaps in education and in earned income are major sources for the gender-gap in economic activity.

Common findings in all models regarding the positive impact of education and favorable cultural factors on WPRs, while the impact of other suggested variables on WPRs varies according to the stage of economic development i.e. GDP growth rate

reveals a negative impact -dominance of “added worker effect”- in MICs and a positive impact -dominance of “discouraged worker effect”- in LICs and HICs. The fertility rate (ratio of population <15 was used as proxy) has shown a negative impact only in HICs and MICs. Moreover, GDP/capita and urbanization reveal a positive impact on WPRs only in HICs and MICs supporting the hypothesis of over-urbanization in LICs. Accordingly, the suggested U-shaped relationship between GDP/capita and WPRs has been proven only in HICs. The government’s role reveals a positive impact only in HICs.

Apparently, despite the progress that Jordanian women have made in education, their participation rates are relatively low compared to the average MICs. The study provides some explanations for this puzzle i.e. the high unemployment rate has a discouraging effect among women, the demographic characteristics are very restrictive for more women’s participation, and the high influence of cultural factors is limiting women’s job opportunities.

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CHAPTER 1

INTRODUCTION

1-1 The Study Theme

The world has witnessed large variations in women's labor market participation, and the issue continues to puzzle academic scholars and government policy makers alike. Some countries such as Greece, Spain, Egypt, and Jordan have experienced a substantial progress in women's education, yet still have very low rates in women's labor market participation. Some developed countries such as Italy and Spain are observed to have low fertility rates and low levels of women's participation rates, while others such as Denmark and France have relatively higher fertility rates and higher women's participation rates¹. The motivation of this study is an attempt to conduct a comprehensive study so that all possible causes of deviations in women's participation rates can be systematically analyzed.

In general, female labor force participation trends have witnessed a historical rise in the last century, and more specifically since World War II. However, there are two important features one can draw from this development. First: the rates in most countries are still below male participation rates, reflecting a gender-gap in economic activity

¹ ILO database 2002

around the world. Second: there is a substantial difference in female participation rates among countries, especially between developed and developing countries².

Past studies of women's labor supply have tried to explain the gap between male and female participation rates by incorporating, on one hand, the supply side factors such as wage rate, education and some other background factors that reflect personal and family characteristics of individuals, and on the other hand, the demand side variables such as labor market environment, job discrimination and differences in unemployment rates between sexes.

The difference in female participation rates among countries is one of the most interesting subjects that need to be studied. By analyzing individual case data for countries in the same region or in different stages of development, there have been some studies which have attempted to explain the cross country variation in female labor force participation rates (FLFPRs) (Antecol, 2003; Jaumotte, 2003, Clark et al, 1991, Jaumotte, 2003/2). However, there has not been any study attempting to relate these cross-country variations with aggregate general indicators such as socioeconomic, demographic, cultural, and the role of the government.

This study aims at analyzing the aggregate level variations in female labor force participation over time and among different groups of countries. Also, the study will try to provide recent evidence on the most important determinants of the gender-gap in economic activity. So, the objectives of this study can be summarized as follows:

² See Table A1 in Appendix A. Table A1 also shows the associated changes over time in some relevant demographic and economic variables. These changes would help understand the evolution in female participation trends and the variation among low, middle, and high income countries.

First: to provide aggregate level evidence on the most important sources of cross-country variations in FLFPRs and to make an overall comparison of the role of some standard variables such as education, GDP growth...etc, among different countries.

Second: to explain the trend behavior of female participation rates for each group of countries and its most important contributing factors.

Third: to explain the gender-gap in economic activity by introducing socioeconomic, demographic, cultural and political differences among countries as explanatory variables.

Fourth: to conduct a descriptive analysis to reflect the evolution and structural changes in labor market indicators among different countries, the focus of which will be women.

To achieve these objectives the study will incorporate the following general indicators:

- Socioeconomic factors: GDP growth, GDP per capita, and education.
- Demographic factors: fertility and urbanization.
- The role of the Government: government size as measured by total government expenditures as the share of GDP or by using a more refined measure such as government expenditure per person.
- Cultural factors: the gender-gap in economic activity as a proxy for the attitudes of the society toward women's participation in the labor force.

Specifically, the study will first provide some aggregate-level evidence by dealing with general indicators and not just individual cases to analyze cross-country variations in FLFPRs and show the most influential indicators. Most studies that have treated women's

labor supply have focused on specific country or countries and depended on individual observations from surveys (micro level analysis) in explaining the major determinants of women's labor force participation decisions and the evolution in FLFPRs (Killingsworth, 1983). Examples of the determinants used in these studies can be categorized into three main groups: (1) economic factors such as own wage rate, family income level, and the unemployment rate, (2) demographic factors such as age, fertility rate, and existence of infant and preschool children, and (3) social and cultural factors such as education, religion, and society's attitude toward women's work. Mincer (1985) was the first to attempt to analyze the inter-country comparison by using individual observations.

This study is intended to be comprehensive. It will not be limited to one country or one group of countries in the same region. It will try to cover most countries in the world under three major groups according to the World Bank classification³: low, middle and high income countries. Also, this study will introduce new factors into the analysis.

This study will also provide recent cross-sectional evidence to show that the cross-country variations in gender-gap in economic activities can be attributed to other gender differences such as the gender-gap in education, the gender-gap in earned income, the gender-gap in governmental high positions, and the gender-gap in employment.

1-2 The Hypothesis and Questions

The main question raised in this study is whether cross-country variations in FLFPRs are attributable to cross-country differences in general socioeconomic, demographic, and cultural and government indicators. The following sub questions are posed as the basic benchmarks:

³ See Appendix B.

First: what are the main differences over time among different groups of countries regarding economic, social, demographic, and political indicators?

Second: what is the specific impact of each of the suggested variables or indicators on the general trend of female labor force participation rates? Examples of these variables are GDP growth, education, fertility, urbanization, government and cultural factors.

Third: how could the effect of these suggested indicators be different among the different groups of countries?

Fourth: how much of the cross-country differences in FLFPRs attributed to the cross-country differences in the related characteristics and/or in the women's participation behavior?

Fifth: what are the main determinants for the gender-gap in economic activity?

1-3 The Methodology and the Data

To achieve its purposes, countries in the world will be categorized into low, middle, and high income groups according to the World Bank definition, and aggregate-level panel or pooled data for 15 countries in each group will be gathered. There are four potential data sources for the descriptive and regression analysis:

First: The World Bank Group, World Development Indicators (WDI) Online and 2005 World Development Indicators. Most of the online indicators are available since 1960 but for limited points of time for some demographic variables such as fertility rate.

Second: International Labor Organization (ILO database). The ILO Bureau of Statistics for some aggregate-level indicators in labor market.

Third: different issues of Human Development Reports by the United Nations.

Fourth: International Financial Statistics (IFS) of the International Monetary Fund (IMF).

Using panel data in analysis has some cautions. On one hand, the individuality of each country should be taken into account. On the other hand, there is a high possibility of spatial autocorrelation that needs to be treated. Considering the above cautions, the study will provide an estimation of aggregate-level evidence of the impact of some socioeconomic, demographic, cultural, and governmental factors on FLFPRs by combining two statistical methods. It will employ the Seemingly Unrelated Regression Model technique in conjunction with the Fixed Effects Regression Model technique. Explanations of cross-country variations will be attempted thereafter. However, the regular OLS method will be used for the analysis of the gender-gap in economic activity.

1-4 The Study Order

After this introduction, the study will present in Chapter two the economic literature review behind the female labor force participation decision in the neoclassical labor supply model, followed by Becker's work on allocation of time and other evolutions in labor theory. Chapter two will also present some relevant studies as empirical evidence of the female labor force participation decision and the evolution of the FLFPR trends.

Chapter three will present a descriptive analysis of some important indicators and facts about women in the labor market in order to provide a solid background on the status of women in the labor force and the structural changes and evolution of FLFPRs

over time. Some comparison among different groups of world's countries regarding the major labor market indicators as well as some relevant variables will also be presented in this chapter.

Chapter four will offer the justification behind each suggested indicator from theoretical foundation and empirical evidence. In chapter five, the study will present the details of model specification and the statistical results of the empirical work and interpret the significance and direction of the impact of different indicators in the FLFPRs. It will also offer the required comparison among different groups of countries. Moreover, Chapter five will discuss the empirical work regarding the gender-gap in economic activity. In Chapter six, a descriptive analysis of Jordanian women's labor market participation will be provided to examine the fit of the theoretical model to this country. Finally, Chapter seven will discuss the different conclusions based on the empirical results and offer policy recommendations accordingly.

CHAPTER 2

LITERATURE REVIEW AND THE EMPIRICAL EVIDENCE

2-1 The Concept of Labor Force

According to the International Labor Organization (ILO), the labor force includes employed as well as unemployed people. So, the labor force participation rate is the percentage of the employed and unemployed people who are of working age in the total population.

The concept of the labor supply is directly related to the concept of the labor force in two ways: qualitatively, it describes the levels of education, knowledge, skills and experience; and quantitatively, it measures the total quantity of hours actually supplied in the labor market.

So, the general concept of labor supply is actually defined as the total hours that workers, employed or unemployed, are willing to supply at a specific point of time (Fallon and Verry, 1989). At the individual level, it is defined as the number of hours that a worker is willing to offer at the existing market wage rate assuming other related factors such as non-labor income, prices, and preferences are constant. At the aggregate level the total available labor supply is determined by the population size, the percentage of the population of working age, the percentage of the population who are participating

in the labor force and the quantity of hours that participating people are willing to supply (Addison and Stanley, 1979).

2-2 Theoretical Foundation

2-2-1 The Labor Supply Decision

The individual work decision is a two-part decision. The individual should decide first if she is going to participate in the labor force or not, and after that, to decide how many hours she is willing to offer in the labor market, given the wage rate and other related factors. The individual decision about work is related directly to the decision about how to allocate the available time for different activities.

2-2-1-1 The Neoclassical Theory on Labor Decision

According to the basic model of the neoclassical consumer theory, the utility maximizing individual can decide how many hours she is willing to supply in the labor market in conjunction with the quantity demanded of leisure (Borjas, 2005). The demand for leisure time is determined by its opportunity cost which is the market wage rate. Therefore, the number of hours supplied by a worker is dependent on the real market wage and real income, given the worker preferences, as presented in the following equation:

$$H = (T - L) = F(W, Y)$$

Where: H: The quantity of hours supplied by the worker.

T: the total time available.

L: leisure time.

W: The real market wage

Y: The real non-labor income.

The change in non-labor income would affect the hours of work negatively, assuming leisure is a normal good. In responding to a wage change, the effect on the hours of work includes a positive *substitution effect* and a negative *income effect*.

So, the final effect of a change in the wage rate on the hours of work depends on which of the two effects dominates. If the substitution effect dominates, we face the normal case of an upward sloping labor supply curve. But if the income effect prevails, we have the case of a *backward bending* labor supply curve.

2-2-1-2 The Participation Decision in the Neoclassical Theory

According to the neoclassical theory, the analysis of the worker's participation decision is the first step toward the general analysis of the labor supply decision. The worker should decide whether to enter the labor market or not. So, the worker's decision on how many hours she is willing to offer in the labor market is based initially on the presumption of participation in the first place.

The participation decision is also dependent on the market wage rate. Simply, an individual would participate in the labor force and start looking seriously for a job if the prevailing market wage exceeds the individual's reservation wage, and vice versa. (McConnell and Bruce, 1995).

The reservation wage reflects the marginal utility for a unit of leisure time and it could be defined as the least required wage rate above which an individual would decide to work (Hamermesh and Rees, 1984). In reality people are different in their preferences toward leisure time. Some people assign high value for leisure time and therefore they demand a higher wage rate to compensate them for each hour of leisure time forgone.

2-2-2 An Extension of the Neoclassical Theory: The Becker Model

As we have seen above, labor theory in the basic neoclassical model focuses on the individual worker and applies the consumer behavior theory to show how workers would choose between leisure time and working in the labor market. Becker (1965) developed the analysis of work decision by focusing on the family as a unit of decision making and by including new alternatives for time uses.

These features of the Becker model have the following important implications: First: by treating the entire family as a unit of analysis, there is interdependence among the family members regarding the decision making process. Second: there is a broader view for the time use alternatives on and off the labor market compared to the basic traditional alternatives of leisure versus work.

According to Becker, there is no such thing as pure leisure time. People can spend their time outside the labor market in productive activities that are called home commodities. Thus, the comprehensive alternatives for time use include market time and non-market time. Gronau (1977) followed the same general analysis but kept the leisure time as a separate time use alternative. Therefore, the time use alternatives include market activities, non-market activities and leisure time. Moreover, Fan (1972) in his

analyses for the “second best” consumer equilibrium as a result of enforcing the work-hour regulations, classifies leisure time into time associated with consumption and time of pure leisure.

In reality, the assumption of the normality of leisure time is questionable. Recent data from the U.S and Japan show that people prefer participating in labor market activities rather than in leisure activities. Participating in the labor market yields high level of satisfaction per dollar relative to leisure activities (Juster and Stafford, 1991). This finding assures the importance of supply side factors besides the demand side factors on the allocation of time between market and non-market activities such as the types and conditions of offered jobs.

Within the Becker and Gronau models, the family as a productive unit is trying to maximize a combined utility function by consuming what is produced of home commodities within the total family’s income and time constraints. The family produces its own home commodities by using market goods and non-market time as inputs. The home commodities here could be tangible such as food, children...etc., or intangible such as watching T.V, trips or any activity that generates utility. Some of the home commodities are time-intensive, others are good-intensive and they have a high degree of substitutability.

The analysis of the income and substitution effects within the Becker and Gronau model takes a new pattern. A change in family income either from the increase in the wage of any family member or from the increase in the family non-labor income would encourage the family to increase its consumption of home commodities which requires

more time as well as goods to be devoted to home production and consumption, which in turn, decreases the family labor market time. This is the income effect.

At the same time, an increase in the wage rate of any family member will increase the value of time in the labor market. This in turn would encourage the family to use less time in production and consumption of home commodities by adopting time-saving production methods and/or substituting the consumption from time-intensive commodities to good-intensive commodities. So, the family would allocate more time to the labor market. This is the substitution effect.

In reality, women are having higher substitution effect than men as a response to the change in market wage rate. They encounter simultaneous substitution in consumption and production at home production while men are encountering mostly substitution in consumption and very small substitution in production. By analyzing the labor supply of females as secondary income earners, Fan (1988) finds that women will respond more vigorously to any tax-induced changes in wage rate by entering or leaving the labor force in the first place and by altering the number of working hours in the market. Although there is a big responsiveness of women labor supply to change in wage rate, empirical evidence from the U.S shows that the main reason for the increasing rate of employment for married women during the 1980s is the increase in their willingness to work and not the rising wage opportunities (Lombard, 1999). More precisely, only 12 percent of the increase in married women's participation over the period 1975-1991 can be attributed to changes in wages.

According to the above analysis, the work participation decision of any family member, especially the wife, depends mainly on the comparison between the individual

productivity in the labor market which is measured by the individual potential wage rate and the productivity in non-market activities that are measured by the value of time outside the labor market – the reservation wage (Freeman, 1979). Therefore, the individual would participate in the labor market if her productivity in the labor market exceeds her productivity outside the labor market.

Within this context, children as an example of high time-intensive home commodities would increase women's home productivity and makes them less likely to participate in the labor market, depending on the number of children and their ages. From this perspective, some studies of female labor force participation incorporate marital status, fertility, the presence of children and sometimes their number and ages to show how these factors would affect women's home responsibility and productivity and then would reduce their labor market participation.

2-3 Women's Labor Force Participation and the Empirical Evidence

By looking at the labor force participation trends in the last century especially in the developed countries, one would observe that while men's participation rates declined over time, there was a dramatic increase in the general level of women's labor force participation. This phenomenon was accompanied by a substantial growth in the wage earnings for both men and women (Mincer, 1993).

For men, it is found that the decrease in their participation was concentrated among young age men who started devoting more time for education, and among older age men attributed mainly to the development in social security programs. More precisely, the negative income effect associated with the growth in men's wage earnings

dominated the positive substitution effect. In general, women have a much larger substitution effect than men because they participate more in household production which is a more substitutable activity for market work than is leisure (Mincer, 1993).

Since income and substitution effects associated with the growth in real family incomes and wages have not provided the full explanation of the development in women's participation over time, a new generation of studies at the micro level started asserting the importance of other factors that might influence women's participation in the labor force. Long (1958) was the first to point out the importance of some dynamic factors on women's participation rates, namely, the decline in fertility rate and the growing use of home appliances

Mincer (1962) analyzes women's participation within the context of using the household as the decision making unit. He presents a comprehensive model by which he specifies the labor supply of married women as a function of their own wage rate, their non-labor income (husband's income), education level, fertility rate and unemployment rate. One of the main findings of this study that supports the upward trends in women's participation is that the positive wage effect exceeds the negative income effect. He explains this by the fact that women are facing a higher possibility of substitution between household production and market activities. Also, he explains the upward trends in women's participation by pointing out the contribution of household technology. The observed growth in labor market productivity (measured by real wages growth) was accompanied by a growth in the household productivity as a result of introducing new home technology which in turn release more time to labor market.

After that, women's labor supply studies started to follow the same line of reasoning by incorporating the most relevant factors that might influence women's work decision. These factors include a set of personal characteristics as well as some economic and demographic factors (Cohen et al, 1970; Elizaga, 1976; Anker and Knowels, 1979; Behrman and Wolfe, 1984, Assaad and El-Hamidi, 2002). By the method of estimation, the labor supply studies for women were classified into two types: the first generation studies prevailed in 1960s and 1970s and used a simplified estimation technique such as OLS, and the second generation studies were established in the beginnings of 1980s and used more sophisticated estimation techniques such as Tobit, Probit and Logit models. (Killingsworth, 1983)

Becker's contribution in his model of time allocation still provides the most powerful explanation for the increase in women's participation rates. More precisely, since women are used to participating more in non-market activities outside the labor market than men, the positive substitution effect in consumption and production in non-market activities would dominate the negative income effect associated with wage increases, allowing the release of more hours of women's time to labor market. The reasoning is consistent with the fact that the development of home technology, the decline in fertility rate, and the availability of child care services reduce the demand for women's work at home by enhancing the substitutability between the time-intensive and good-intensive commodities.

Other factors that played a significant role in explaining the increase in women's labor force participation include the improvement in women's position economically, socially, and politically due to the feminist movements during the last century (Cullison,

1989). All of these positive changes have empowered women and enhanced their participation in the decision making process.

Since this study focuses on the first part of the women's labor supply, i.e., the participation decision, and since it deals with the aggregate level –macro level- of female participation rates and not at the individual – micro level-, this section will present the most recent empirical evidence from some studies on the main factors that are believed to have an effect on the female labor force participation rates.

Contreras et al, (2005) uses the synthetic cohort methodology to analyze the evolution of female labor force participation in Chile over the last four decades. A cohort can be defined as “a set of people born in the same period that may be followed-up in time using cross-section surveys”. Basically this methodology enables researchers to keep track of the characteristic behavior of the same group of people over a long period of time. In our case, this methodology takes a specific group of females or a specific generation and analyzes how their labor force participation behavior changed over an age structure or a life-cycle. Also, it takes a specific age group of females from different generations and analyzes how their participation behavior changed over time.

By using data from the yearly surveys of employment and unemployment conducted by University de Chile since 1957, the study uses as explanatory variable the age effect, the year effect, and the cohort effect and uses the Weighted Least Square technique to analyze the impact of these explanatory variables on $FLFPR_{it}$ -for each cohort (i) in each year (t)-.

The cohort (or generation) effect variables include schooling and the presence of children in different age categories. The year (or contemporary) effect can be expressed

by some proxies such as male and female wages, the unemployment rate, the non-labor income, and GDP. The age effect is measured by women's age and its square.

Regarding the cohort effect variables, the results show that the participation rates of cohorts with higher levels of education are significantly different compared with that of other education levels. And the most significant effect of children was for the age category 6-10 years.

For the year effect variables, the study shows that the FLFPR is pro-cyclical. GDP growth has a positive effect on participation rate but it is statistically insignificant. Unemployment rate has a significant negative effect on female participations. While the non-labor income (or male wages) shows a small positive significant effect on women's participation rates, the female's own wage doesn't show any statistical significance. This last result would seem to be a major flaw, according to theory.

Finally, the cohort's age is the most significant explanatory variable of the FLFPR behavior. The women's age and its square are highly significant and exhibited an inverse-U-shaped relationship with female participation rates. This finding can be explained by the fact that young women have low participation rates due to schooling and the presence of young children where old women have more tendencies for retirement.

Hotchkiss (2005) aims at analyzing the observable factors that contributed to the unprecedented decline in the FLFP behavior among women ages 25-54 years between 2000 and 2004 in U.S. More specifically, an important point of inquiry is whether this decline was caused by the change in women's characteristics or by behavioral change over time with given characteristics.

The change in characteristics is measured by the change in the values of the explanatory variables across years (i.e., weighted sample means of characteristics), while the change in behavior is reflected in the change in coefficients of the estimated parameters over time. The included explanatory variables are age, presence of children, marital status, education, non-labor income, race, disability income, and the state unemployment rate.

Hotchkiss' study uses the ML Probit model technique and data from the Current Population Survey that covers the period (1976 – 2004) to estimate a separate equation each year for female labor force participation. The study analysis focuses on the period (2000 – 2004) because this period has witnessed a decline in FLFPR.

In terms of the main characteristics change between 2000 through 2004, the findings show that the average of women with high school education decreased from 60.9 percent in 2000 to 58.9 percent in 2004, while those with college degrees or higher, increased from 28.2 percent to 30.4 percent for the same period. The unemployment rate also increased from 4.29 to 6.04 percent for the same period.

However, in terms of the change in the marginal effect of each explanatory variable and relative to year 2000 as base, the FLFPR in 2004 becomes less responsive to education level (college degree), unemployment rate, marital status, non-labor income, and children between 6-18 years, and becomes more responsive to age, race, and disability income.

To determine the net effect of behavior and characteristic changes in the observed change in FLFPRs for the period 2000-2004, the study uses a decomposition technique based on the assumption that the behavior of women (i.e., in year 2004) is the same as the

behavior of women in a specific past year (i.e., in year 2000). Using the coefficients of base year (2000) variables in conjunction with women's characteristics in the compared year (2004), the study calculates the FLFPR for year 2000 using the characteristics of women in 2004 and estimates the coefficients for year 2000. By comparing the predicted FLFPR with the simulated one, the study determines the net effect of characteristic and behavior changes on the observed decline in FLFPR in 2004. The same way is applied for different periods from 1976 through 2004.

As an example, the net decline of 2.0 percentage points in the predicted FLFPR between 2000 through 2004 is a combined result of a net increase of 1.5 percentage points in behavior changes and net declines of 3.5 percentage points in characteristic changes. In brief, the study shows that the unprecedented decline in FLFPR in 2004 is caused mainly by women's characteristic changes during the period 2000-2004 that dominates the changes in behavior (i.e., the responsiveness of women's participation rates to their characteristics).

Kizilirmak (2005) examines the determinants of wives' labour force participation in Turkey. Specifically, the study investigates the effect of husbands' labor market status on their wives' participation in labor force. Kizilirmak employs the multinomial Logit technique for estimation and uses data samples from the 2003 Household Budget Survey that include 13,896 married couples in Turkish urban areas.

Different explanatory variables are used in this study such as wife's potential experience, level of education, non-labor income, children in different age categories, employment status of husband -and the duration of unemployment-, predicted earnings, and regional dummy variables.

The study findings suggest that married women in Turkey are still considered as secondary workers in the labor market. The empirical evidence advocates the dominance of the “added worker effect”. This means that urban Turkish woman would participate in labor market mainly to compensate for the loss of income caused by the husband’s unemployment. However, the “discouraged worker effect” would dominate and the “added worker effect” would vanish if economic recession gets worse. Also, the study insists on the crucial role of education as a driving factor for more women’s participation. Moreover, it finds that non-wife income and fertility level are considered as depressing factors for women’s participation in labour market.

Wang and Cai (2004) present a comprehensive understanding of the three simultaneous states of labor market: employment, unemployment, or out of labor force. More specifically, the study analyzes changes in the Chinese labor force participation during the period of intense restructuring of State-Owned Enterprises (SOEs).

According to this study, the major changes in the labor market situations in China during the period of intense reform and adjustments (1995-2002) are the decline in the urban labor force participation rate from 72.9 to 66.5 percent, and the sharp increase in the unemployment rate from 7.9 to 16.2 percent in spite of the high level of economic growth in the same period.

The study uses data from the 2000 census in China and utilizes Probit and multinomial Logit models to specify the most influential factors in labor force participation for males and females in different age groups, incorporating as explanatory variables different social and demographic factors such as age, level of education, marital status, family size, and presence of children younger than five years old.

The results of the Wang and Cai study show that the age variable has a positive impact on the probability of participation for women 16-25 compared with other age groups. The education level (college degree and higher) is related positively to the probability of participation for all age groups except for women who are still in school and for women 55+ who are retired. Marital status reveals a negative impact on the participation of married women in age groups 16-25, and 46+. While the presence of young children has a negative impact on the probability of women's participation, the family size depicts a positive impact except for women 55+ who usually receive economic support from their adult children.

The study also analyzes the three labor market state model by using the multinomial Logit model to explain the main determinants of the three different market states using employed people as a reference group. This model would show the relative impact of each of the relevant variables on the probability of people who are unemployed or out of labor force.

A major finding is that women with higher education (college degree) are less likely to be out of the labor force or unemployed as compared to being employed, while women with a high school education level are less likely to be out of the labor force and more likely to be unemployed. Another finding is that, while the age variable has a negative impact on the relative probability of being unemployed for all age groups; it shows the same impact on being out of the labor force only for women ages 16-25 and 26-35.

Marital status shows that young married women are less likely to be unemployed and out of the labor force. Family size has a positive impact on the relative probability of

being unemployed and a negative impact on being out of the labor force for women in all age groups. Presence of young children shows the opposite impact on each probability. Women with young children are more likely to be out of the labor force and less likely to be unemployed.

Finally, the study concludes that understanding of the labor force during the State-owned Enterprise reform period would help policy makers in formulating anti-cycle macro economic policies and in directing employment assistance and other welfare programs.

Antecol (2003) aims at analyzing how cultural factors play a role in explaining cross country variations in FLFPRs. The study draws data from the international social survey programme 1994 (covering 23 countries in most world regions from Europe, Middle East, Asia, North America, Eastern Europe and Former Soviet Union) and employs the Linear Probability Model technique to examine the role of culture on FLFPRs.

To control the impact of demographic and human capital characteristics, the study estimates first the linear probability of the participation decision against a country's dummy variables (the first specification). It then adds a vector of demographic and human capital characteristics such as age categories, education levels, marital status, household size to capture children effect, and uses past employment status of the respondent's mother to capture the inherent attitude toward FLFP (the second specification).

The empirical findings of the first specification model argue that while women in Eastern Europe and the former Soviet Union and North America are more likely to

participate in the labor force compared to women in the United Kingdom, women in Europe and Asia are less likely to participate than women in the United Kingdom.

From the second specification model, the coefficients of country indicators remain similar in significance and magnitude as in the first specification model. However, women were more likely to participate if their mothers have participated in the labor force in the past. The same finding holds for older and highly educated women compared to younger and less educated ones. Also, household size shows a negative impact on FLFPR as expected. Even though these explanatory variables explain some of the cross-country variations in FLFPRs, most of variations remain unexplained. This finding stems from the fact that the weighted standard deviations of the two specifications remain similar in magnitude.

To capture the impact of cultural factors on cross country differences in FLFPRs, the study re-estimates the linear probability regression by replacing country indicator variables with various measures of male attitudes toward family and gender roles and by adding GDP per capita to the explanatory variables.

The measures of male attitudes toward family and gender roles are drawn from males' answers in the form of strongly agree, agree, neutral, disagree or strongly disagree to the following statements: " Family life suffers if the woman works full-time", " Pre-school children suffer if mother works", " Working mothers can establish just as warm a relationship with children as non-working mothers", " A man's job is to earn money; A woman's job is to look after the home and the family", " Job is all right, but what most women really want is home and children", " Both husband and wife should contribute to

household income". The first three statements reflect the male attitude toward family roles and the rest reflect the males' attitude toward gender roles.

Regarding the males' attitudes toward gender roles, the results show that women are more likely to participate in labor force if men strongly disagree with "A man's job is to earn money; A woman's job is to look after the home and family" and disagree with "Job is all right, but what most women really want is home and children". Also, women are less likely to participate if men strongly disagree with "Both husband and wife should contribute to household income".

In terms of males' attitudes toward family roles, the results argue that women are more likely to participate in the labor force if men disagree with "Pre-school children suffer if the mother works" and with "Family life suffers if the woman works full-time".

All in all, the general findings of the study argue that cross country variations in FLFPRs is correlated to cross country variation in males' attitudes toward family and gender roles and support the hypothesis that cultural factors play an important role in women's participation rates.

El-Ghannam (2002) aims at explaining the relationship between women's participation in economic activity in Arab societies and educational, economic, cultural, social, and health factors and analyzes the main factors that impede or contribute to women's work in Arab societies.

The study is comprehensive and covers all Arab societies to include twenty two countries. Different sources of data are used such as the United Nations Statistical Year Book 1996, World Bank's Social Development Indicators 1996, Arab Economic Report 1995, United Nations Reports 1997, and the World's Women: Trends and Statistics 1995.

The study uses descriptive analysis techniques such as the correlation coefficient analysis and the Recursive Path Analysis to estimate the total direct and indirect effects of the explanatory variables on Arabic women's participation in different economic activities. The dependent variable is the women's participation in different economic activities i.e. agricultural, industrial, and service sectors. The independent variables are categorized into: social factors i.e. family size, number of children, total fertility rate, and women's life expectancy at birth. Educational factors i.e. illiteracy rate and the percentage of educated women. Economic factors i.e. GNP per capita and the percentage of income earned by female. Cultural factors i.e. newspaper circulation, television and radio receivers, and books published per 100,000 people. And health factors such as population per physician and per nurse, and the expenditures on public health as a percentage of GDP.

The study findings support its hypothesis that the participation of women in the different economic activities in all Arab societies is negatively related to the family size, number of children, total fertility rate, illiteracy rate, and to the number of population per physician or per nurse. On the other hand, the women's participation in Arab societies is more likely with a higher level of women's education, higher percentage of income earned by women, higher women's life expectancy at birth, more urbanization, higher newspaper circulation, more television receivers, more book publishing, and with higher GNP per capita. However, the statistical analysis doesn't support the importance of other variables such as the public health expenditures as a percentage of GDP and the number of radio receivers.

Tansel (2002) uses the OLS estimation method and a pooled data covering 67 provinces in Turkey for 1980, 1985 and 1990 to analyze the cross-provincial determinants of FLFPR and to verify the hypothesis that FLFPR exhibits a U-shaped relationship during the economic development process.

Beside the quadratic term of per capita gross provincial product, which is used as a measure of the economic development, and some dummy variables for region and time that capture the regional labor markets differences and time differences, the econometric model of the study also includes the growth rate of the gross provincial product, education, males and females unemployment rates, urbanization, the agricultural and industrial shares from the total provincial employment as determinants of FLFPRs. The study estimates two models: the first model is general and covers the total provincial female labor force, and the second one covers the provincial female nonagricultural labor force participation.

The general findings of the first model confirm the study hypothesis of a U-shaped relationship between FLFPR and the economic development process measured by GPP per capita. The per capita GPP has a negative impact and its square has a positive impact on the FLFPR. But these variables are statistically insignificant in the second model. However, this finding can be interpreted by the dominance of the negative income effect at low levels of income and the positive substitution effect at higher levels of income due to the higher level of education associated with high levels of income. The GPP growth rate in two models is significant and has a positive effect on FLFPR. High rates of output growth increase the FLFPR. Female illiteracy rate is used only in the first

model and gives a significant negative effect as expected. Furthermore, the education level reveals a positive impact in two models as expected.

Urbanization is insignificant in the second model, while it is significant and has a negative impact on the FLFPR in the first model. The agricultural and industrial shares are statistically significant and depict different results. While they give positive and negative effects respectively on the FLFPR in the first model as compared to the service sector share, they show opposite effects in the second model. These results are consistent with the urbanization effect since industrial and service sectors usually are concentrated in the urban areas.

The FLFPR is more responsive to the negative impact of the female unemployment rate as compared to the negative impact of the male unemployment rate in the two models. This finding confirms the dominance of the negative discouraging effect for the relationship between the FLFPR and unemployment rate.

Tansel's study results regarding region and time dummy variables in the two models substantiate the regional differentials in the FLFPRs, implying that regional labor markets are different. Time differences in FLFPRs are observed only in the first model between 1980 and 1990 after controlling for all relevant factors.

Cameron et al, (2001) discusses the importance of education on women's participation. This study emphasizes the role of education in creating more job opportunities and increasing women's participation in the labor market which, in turn, would raise women's income, empower women, and enhance their position within the family and the society.

The study analyzes the impact of education in conjunction with other relevant variables on women's participation within the collective model (or household decision making model) by which women's decisions to participate in the labor market depends on women's preferences as well as on their husbands' preferences.

For five Asian countries, South Korea, Thailand, Sri Lanka, Indonesia, and Philippines, the study uses data from the World Fertility Surveys 1975-76 to carry out the binary choice Probit model separately for each country. Besides using different categories of education level for wives and husbands, other variables are used such as the age of wives and husbands, age square, live births, total number of children, children born in the last five years, a rural dummy variable to reflect different structures of the labor market in rural and urban areas, and a specific country dummy variable to capture cultural differences among countries.

The marginal probabilities which are derived from the coefficients of the estimated Probit model confirm the importance of education on women's participation. There is a positive and statistically significant impact of high levels of education on women's labor market participation, with variation among countries. Women with tertiary education are more likely to participate in Thailand and Philippines than in other countries. Low levels of education in general have an insignificant and negative effect. These results are consistent in the sense that more education is usually related to higher market wage which, in turn, increases the probability of participation. On the other hand, the husband's level of education which is assumed to reflect husband's earnings, has a negative impact on women's participation as expected, except among husbands with

intermediate levels of education in Thailand, and primary and illiterate levels in Indonesia.

The empirical results about women's age, which is assumed to reflect the level of earnings in a concave function, show a significant positive impact of age on women's probability of participation and a negative impact for the age square. This finding confirms the assumption of the concavity of women's earning function over the life cycle. Men's age and age square are insignificant in general and depict a negative impact on the probability of women's participation.

The number of women's live births has a positive impact on women's participation in all countries except Thailand. The study interprets the unexpected result of this variable by the fact that the higher number of births for a given number of children is a proxy for low income or wealth. On the other hand, the number of children under five years old is statistically significant and affects women's probability of participation negatively as expected. This variable is stronger in Sri Lanka and South Korea.

Finally, the rural / urban dummy variable is statistically significant in all cases with positive impact only in Philippines and Sri Lanka and negative in the others. This result would reflect different cultural backgrounds and different stages of the development course.

In general, the most influential factor on women's participation in all five Asian countries is the women's education level, especially the tertiary level, with obvious variance in its magnitude among countries. For example, in Thailand, the probability of participation in the labor market among women with tertiary education is 48.5 percent higher as compared with women with no education. These probabilities are 23 percent in

Philippines, 17 percent in Sri Lanka, 16 percent in Indonesia, and 3 percent in South Korea.

The cross-country variation in traditional gender roles and the phase of development process play important roles in explaining the variation in women's participation rates. These cross-country differences would shape the relationship between education and women's participation in the labor market and explain the cross-country variations in this relationship.

Mizala et al, (1999) investigates the main factors that affect female labor supply in Chile and the pattern of their participation rates according to the levels of household income. Also, the study analyzes the difference between male and female participation in the labor force.

Using data from the 1996 CASEN -National Household Survey- and employing Tobit- Maximum Likelihood Method- , the study first estimates the labor supply function for both men and women in Chile, then estimates the females' labor supply function by using different explanatory variables that would help in explaining the differences in their participation behaviour with different socioeconomic levels.

To estimate the labor supply function for both men and women, the study regresses the work hours per week as a dependent variable on different explanatory variables such as education, experience, current job experience, professional title, the state of being head of household, per capita non-wage income, children under seven years old, marital status, and regional dummy variables.

For both models of men and women the level of education, experience, current job experience, and professional title reveal as expected a positive impact on the hours of

work supplied per week. Accordingly, the non-wage income as expected has a negative impact, and being the head of household shows a positive effect. On the other side, being married and having children less than seven years old negatively affect women's hours of work supplied per week, while they show a positive impact in the case of men.

The study re-estimates the female labor supply model by adding more explanatory variables that are related to the family structure and to the availability of basic facilities at home. Examples of these variables are children in different age categories, young sons and daughters -as a substitute for mother in home responsibilities-, connection to public water supply, and the availability of electricity.

The findings again confirm the negative impact of children regardless of their age as well as the negative effect of non-wage income on women's participation. They also confirm the positive impact of wage on women's labor supply. Moreover, the study findings suggest that the availability of minimum facilities at home such as the connection to public water supply and the availability of electricity would enhance women's labor supply. These facilities help women in saving some non-market time and increasing market time. The presence of young sons doesn't show any impact on women's work while the presence of young daughters shows positive effect on women's labor supply. This empirical evidence about the role of young daughters assures the traditional gender role that females are more tied to home activities than men. This fact prevails in most of the developing countries.

Depending on the results of the estimated female labor supply, the study employs the probability of participating in the labor market to carry out two simulations. The first one is to show the effect of each additional level of education on the probability of

participation for women. This simulation argues that the probability of participation increases with more years of schooling. The second simulation in terms of family structure and income level suggests that the probability of participation among women whose family's average level of income from the highest 20 percent is more than women from the lowest 20 percent. This means that educated women from rich families are more likely to participate in the labor force than educated women in poor families.

The study also supports the well-known fact that women have on average higher elasticity of labor supply than men. It is explained mainly by the compensated wage elasticity. Moreover, the empirical findings of this study argue that most of the changes in women's labor supply -as a response to changes in explanatory variables- are due largely to the changes in their participation rates and not to the changes in the hours of work supplied. However, for men the opposite is true.

Knudsen and Peters (1994) offers a cross-country comparison in labor supply of married women with young children. It includes the U.S, Canada, Germany, and Australia. The analysis is based on a standard labor supply model that employs uniform Logit and OLS estimation techniques. The source of data is the Luxemburg Income Study (LIS) that includes samples of households in fourteen different countries during 1980s.

To overcome the problem of selection bias, the study estimates first the probability of employment for married women to create Mill's ratio that need to be included in the wage and work hours supply equations. Different explanatory variables are used in this study such as human capital variables -education and age-, differential wage opportunities, discrimination, and other variables that might affect the value of non-market time such as children and income.

Although there are some differences among these four countries, the empirical findings argue that the probability of women's employment rises with more education and falls with high non-earned income and in the presence of young children. In terms of the differences, the probability of women's employment in the U.S has the least effect due to young children compared to other countries. Also, unearned income shows a positive impact on the probability of employment for Australian women.

Moreover, the study estimates two labor supply models for women in each country. The dependent variable in the first one is the weekly hours worked by women while the second one uses the yearly worked hours as a dependent variable. The second model takes into account the number of weeks worked per year besides the number of hours worked per week. The results vary from country to another; i.e. the race/ethnic variables reveal a significant and negative association with women's labor supply only in the U.S and Germany. Children's effect on women's labor supply is the largest in Germany and the lowest in the U.S. Germany also has the highest labor supply wage and income elasticities. More precisely, the income elasticity for women's labor supply in Germany is five times larger than in the U.S.

All in all, the main finding of this study is that the differences in women's labor supply across these four countries account for the differences in the behavioral parameters of the labor supply – how women's labor supply would respond to the changes in women's characteristics. Thus, the differences in the characteristics of the population are not the source of the differences in women's labor supply. However, the study argues that the cross-country differences in the fundamental parameters of the labor supply are due mainly to the cross-country differences in the social attitudes and norms

regarding mother's role and child care as well to the differences in social and family policies that subsidize child care. Moreover, the study documents substantial differences among these four countries in the social and family policies regarding child care.

CHAPTER 3

WOMEN IN THE LABOR FORCE: DESCRIPTIVE ANALYSIS (1990-2004)

This chapter offers descriptive analysis to present some facts and numbers about women in the labor force around the world. In a comparative way and at different points of time, the main labor force indicators and some relevant economic and social indicators will be presented to reflect the over time development in women's labor force and the basic changes in its labor force structure. Moreover, the gender-gap in some indicators will be considered when it is possible. For these purposes, the comparison will be held among three groups i.e. low, middle and high income countries.

Accordingly, four sections will be presented in this chapter. The first section investigates the status of women in labor force. Economic differences and women's participation will be discussed in the second section. The third section focuses on some demographic differences that are related directly to women's labor force participation. The last section analyzes the social differences and women's participation in all countries. However, studying the variations in these relevant factors would help in explaining the over time structural changes in women's labor force and understanding the cross-country variations in women's participation rates.

3-1 Women in the Labor Force: Cross-Country Analysis

Table 3.1 offers the most recent changes in the structure of the labor force during the last fifteen years. All groups of countries have witnessed a substantial growth in the total labor force. Low income countries have had the highest growth rate (2.3 percent) in total labor force during the period 1990-2003. However, more facts in terms of the changes in the structure of the labor force can be drawn from this table.

First of all the relative size of each group's labor force from the total world's labor force has changed during this period. The percentage of low income countries' labor force over the total world's labor force has increased from 31 percent in 1990 to 34 percent in 2003 while it shrunk in other groups.

Another well known fact is that while the males' labor force participation rate has witnessed a decline over time in all countries, the female rate has risen substantially. As obvious in Table 3.1, middle income countries have kept the highest rate of female participation in the labor force over the study period 1990-2003, while the high and low income groups have achieved the highest growth rate in females' labor force respectively. If the females' participation rates continue the same trend in the future, the female participation rates in high income countries will exceed those in middle income countries soon. As an example, the FLFPR in high income countries increased from 58.9 percent in 1990 to 63.7 percent in 2003 while it increased from 64.7 to 65.1 percent over the same period in the case of middle income countries. For low income countries, only 54.6 percent of females of working-age participated in the labor force in 2003. This percent is around 86.3 percent for males in the same group.

Also, the gender-gap in economic activity as measured by the increasing ratio of females' labor force to total labor force has declined over time in all groups. This positive fact would be explained mainly by the improvement in the relevant factors in favor of more women's participation. The best performance was in the high income group. This ratio has increased from 41.5 percent in 1990 to 43.3 percent in 2003.

Table 3.1
Labor Force Structure

Indicator Group	Labor Force Participation Rate (% of Ages 15-64)				Labor Force				
	Male		Female		Total (Million)		Average Annual Growth Rate (%)	Female as % of Total Labor Force	
	1990	2003	1990	2003	1990	2003	1990-2003	1990	2003
High Income Countries	81.9	80.9	58.9	63.7	420.4	473.1	0.9	41.5	43.3
Middle Income Countries	86.6	85.8	64.7	65.1	1287.4	1549.4	1.4	41.5	42.2
Low Income Countries	87.5	86.3	51.8	54.6	775.8	1040.0	2.3	36.4	37.6

Source: The World Bank Group, 2005 World Development Indicators.
<http://devdata.worldbank.org/wdi2005/Section2.htm>

To show the entire picture of women's status in the labor market, Table 3.2 offers important facts from the demand side in the labor market regarding women's

employment and unemployment. Because of the lack of data at group level about women's employment and unemployment, especially for low and middle income countries, the study selected three random countries from each group to reflect the status of women in the labor market. Australia, Spain, and the United States are in the high income group. Brazil, Ecuador, and Philippines are middle income countries. And for low income countries there are Bangladesh, Malta, and Sri Lanka.

Table 3.2
Female Employment and Unemployment: Selected Countries

Indicator Group	Female Employment (% of Total Employment)		Unemployment Rate (2004)		
	1990	2004	Total	Male	Female
High Income Countries:					
Average ¹	42.01	44.8	6.0	6.0	7.0
Australia	41.55	44.90	5.6	5.5	5.7
Spain	31.82	39.16	11.0	8.2	15.0
United States	45.20	46.40	5.5	5.6	5.4
Middle Income Countries:					
Average ²	35.93	38.94	9.9	8.8	11.6
Brazil	35.56	41.79	8.9	6.8	11.8
Ecuador	35.64	40.69	8.6	6.6	11.4
Philippines	36.33	37.51	10.9	10.4	11.7
Low Income Countries:					
Average ³	34.06	32.78	5.3	4.4	7.5
Bangladesh	39.31	22.21	4.3	4.2	4.9
Malta	25.84	30.15	5.4	3.8	6.1
Sri Lanka	33.32	31.64	8.5	6.4	14.6

Source: computed from the; 1- International Labour Organization Database, ILO Bureau of Statistics, Laborsta <http://laborsta.ilo.org>. 2- The World Bank Group, WDI online.

¹ Included countries are Australia, Bahamas, Canada, Greenland, Hong Kong China, Japan, Republic of Korea, Singapore, Spain, and U.S.A.

² Included countries are Angola, Argentina, Barbados, Belize, Brazil, Bolivia, Chile, Ecuador, Morocco, and Philippines.

³ Included countries are Bangladesh, India, Malta, Mongolia, Pakistan, Sri Lanka, and Vietnam.

Table 3.2 suggests that women in high and middle income countries have more favorable labor market conditions than in low income countries. On average, high and middle income countries have higher female employment ratios from total employment compared to low income countries. Also, the female employment ratio is growing in these two groups while it is falling in low income countries.

In terms of unemployment rates, the real evidence in Table 3.2 advocates three important facts as of 2004. First, middle income countries have the highest unemployment rates among women and men than other groups. In other words, unemployment rates are low in the early and later stages of economic development. However, the high female unemployment rates in the middle income group could explain the low employment ratio among females. Second, women on average still have higher unemployment rates compared to men in all countries. This fact could provide some reasoning for the low women's participation rates compared to men over the world. And third, high income countries have a lower gender-gap in unemployment rates compared to other groups. This fact also would confirm that the labor markets in high income countries are organized in such a way to encourage more women's participation.

Table 3.3 exhibits the evolution in the economic sector employment's share over the last two decades. This table also reflects the changes in the relative importance of each sector in terms of the employment's share in the labor force. Two facts can be concluded from this table. The first important fact is that, in all groups, the relative importance of the service sector in terms of employment's share has been growing over time, while it has been declining for the agriculture sector. Second, despite the fact that the relative importance in terms of employment's share for the agriculture sector in low

and middle income groups is declining, this sector is still the largest employer in these two groups compared to high income countries as of 2002.

Table 3.3
Employment Structure:
Employment in Each Sector as a Percentage of Total Employment

Indicator Group	1990 Employment Ratio			2002 Employment Ratio		
	Agriculture	Industrial	Service	Agriculture	Industrial	Service
High Income Countries	6.1	29.8	64.0	3.9	25.7	70.3
Middle Income Countries	43.91	21.71	23.68	35.30	19.90	32.60
Low Income Countries	66.6	14.7	18.9	59.2*	14.2*	26.5*

Source: The World Bank Group, World Development Indicators (WDI) Online.

* As of 1995.

However, the contraction in the share of the agricultural sector from total employment and/or the growth in the share of the service sector may not guarantee high participation rates for women unless this transition has been accompanied by more development in women's status. Therefore, the steady growth in the relative importance of the service sector as employer at the expense of the agriculture sector raises a big question of how women can benefit from this inevitable transition.

Accordingly, the next sections deliver some important facts that are associated with the above changes in the women's labor force and with the changes in their labor market status. The analysis of these associated variations in economic, demographic, and social factors could contribute to the explanation of the variations in women's labor force participation among countries.

3-2 Economic Differences and Women's Participation

Table 3.4 shows the huge differences among different groups of countries in economic development as measured by GDP per capita. As an example, the GDP per capita in low income countries to that in high ones is 1.5, 1.4, and 1.6 percent in the years 1980, 1990, and 2004 respectively. Also, this ratio between low and middle income countries is 20.8, 22.4, and 23.4 percent for the same years. These numbers suggest that the income gap among these three groups has been growing over time. Since women always have less GDP per capita than men, they are the group most affected by this gap. For example, the average female's real GDP per capita in 1997 was \$731 in least developed countries compared to \$1,258 for males. For industrialized countries, it is \$17,660 on average for females compared to \$30,050 for males. And for the whole world, it is \$4,523 on average for females compared to \$8,103 for males⁴. (Human Development Report 1999)

Besides the other important factors, the differences in women's capability that are associated with the huge difference in GDP per capita among countries would explain part of the cross-country differences in women's labor force participation rates. In

⁴ GDP per capita by gender is no longer available in the HDR.

general, higher levels of income are usually associated with a high level of living standards and better human capital quality. Therefore, it is no wonder that high income countries have experienced higher growth rates in women's participation rates compared to low income ones.

Table 3.4
The Economic Development: GDP Per Capita
(Constant 2000 US \$)

Year Group	1980	1990	2004
High Income Countries	1,7281.1	21,870.8	27,705.0
Middle Income Countries	1,249.0	1,399.9	2,068.9
Low Income Countries	259.4	314.1	484.9

Source: The World Bank Group, World Development Indicators (WDI) Online.

At the aggregate level, Table 3.5 shows the cross-country variations in the average annual growth rate of GDP as well as in the output of each sector i.e. agricultural, industrial, and services during the periods 1980-1990 and 1990-2003.

All groups of countries have experienced reasonable annual growth rates in GDP and in the individual sector's output with some variations. However, the output growth rate in the service sector is the highest for all groups. Women in high income countries are more qualified and have better labor market conditions that enable them to benefit

from the new job opportunities that are associated with the high growth in the service sector. This would explain why the high income group has achieved the highest growth rate in female participation rates during the period from 1990 to 2003 (see Table 3.1 above) with a lower growth rate in the service sector compared to other groups.

Table 3.5 also reveals that low income countries have experienced the highest growth rates in GDP and in the output of individual sectors during the last two decades. This finding is consistent with fact (see Tables 3.1 and 3.2) that low income countries have had the highest growth rate in total labor force and the lowest unemployment rates.

Table 3.5
Growth of Output

Indicator Group	GDP Growth		Agriculture		Industry		Services	
	Average Annual % Growth		Average Annual % Growth		Average Annual % Growth		Average Annual % Growth	
	1980- 1990	1990- 2003	1980- 1990	1990- 2003	1980- 1990	1990- 2003	1980- 1990	1990- 2003
High Income Countries	3.4	2.6	1.8	1.2	3.0	1.9	3.4	3.1
Middle Income Countries	2.8	3.5	3.6	2.2	2.6	4.2	3.1	3.5
Low Income Countries	4.4	4.7	2.8	3.0	4.6	5.0	5.1	5.9

Source: The World Bank Group, 2005 World Development Indicators.
<http://devdata.worldbank.org/wdi2005/Section4.htm>

However, the cross-country differences in total labor force growth rate can be attributed partially to the cross-country differences in GDP growth rates and in individual sectors growth rates. But to understand how the cross-country differences in women's participation rates can be related to economic differences, other factors such as the relative importance of each sector to total GDP should be investigated.

Table 3.6 presents the changes over time in the relative importance of each economic sector to total GDP for each group of countries. As expected, there is a huge decline in the relative importance of the agricultural sector from 1990 until 2003 in all countries. On the other side, the relative importance of other sectors has been growing over the same period with some variations among countries. The highest expansion was in the relative importance of the service sector. The possible effect of this change on women's participation could be explained by the readiness and ability of women to benefit from this expansion.

In general, the shrinking role of the agricultural sector is expected to negatively affect women's participation rates in low and middle income groups for two reasons. First, the agricultural sector in low and middle income countries is still the largest employer in the economy. Second, the lack of satisfactory development in women's status socially, economically, and politically in these countries is one of the impediments that deters women from taking advantage of the new job opportunities associated with the transition process from the agriculture to service sectors.

Table 3.6
Structure of Output

Indicator Group	GDP		Agriculture		Industry		Services	
	\$ Millions		% of GDP		% of GDP		% of GDP	
	1990	2003	1990	2003	1990	2003	1990	2003
High Income Countries	1,7691,266	29,340,557	3	2	33	27	65	71
Middle Income Countries	3,377,092	6,023,146	15	10	39	36	46	54
Low Income Countries	619,349	1,103,018	32	24	26	27	41	49

Source: The World Bank Group, 2005 World Development Indicators.
<http://devdata.worldbank.org/wdi2005/Section4.htm>

3-3 Demographic Differences and Women's Participation

Demographic variables such as fertility rate and urbanization ratio have proved to be important determinants for women's participation rates. In a comparative way, Table 3.7 depicts some relevant demographic variables at two points of time to show how cross-country variations in demographic variables could be related to the cross-country variations in women's participation rates in the labor force.

All groups of countries have showed an improvement in the population age structure in such a way that would increase labor supply for both women and men. The working age category, which is 15-64 years old, has been growing over time at the expense of the 0-14 year's age category. Table 3.7 reveals two more important facts that are related to the change in the structure of the population. First, the simultaneous changes in the ratios of different age categories have led to a decline in the age dependency ratio that is measured by the ratio of dependents to working-age population. For the people age 65+, the obvious relative growth in this category size can be attributed to the development in health services over the world.

Table 3.7
Demographic Structure

Indicator Group	High Income Countries		Middle Income Countries		Low Income Countries	
	1990	2004	1990	2004	1990	2004
Age Group:						
0-14	20.42	18.35	31.27	25.40	40.19	36.76
15-64	67.00	67.05	63.12	67.38	56.01	58.93
65+	12.53	14.64	5.61	7.21	3.79	4.31
Population Growth (Annual %)	0.84	0.70	1.59	0.87	2.37	1.82
Age Dependency Ratio*	0.49	0.49	0.59	0.49	0.79	0.71
Fertility Rate (Total Births Per Woman)	1.81	1.71	2.63	2.11	4.71	3.69
Urban Population (% of Total)	74.61	78.46	44.30	53.23	25.79	30.61

Source: The World Bank Group, World Development Indicators (WDI) Online.

* Dependents to working-age population.

Second, the changes in the age structure can be explained in the first place by the fact that all groups of countries have experienced a decline in fertility rates over time. In other words, the annual population growth rates have been falling in most countries.

In terms of fertility rate, it is the key factor that is responsible for most of the cross-country variations in other demographic variables such as annual population growth rate, population age structure, and age dependency ratio except urbanization. Therefore, the cross-country variations in women's participation rates can be explained primarily by the cross-country variations in fertility rates.

Finally, all countries have witnessed a growing urban population as a percentage of total population. High income countries have the highest urban ratio, while low income countries still have a very low urban population. Although urbanization is not always real development, the cross-country variations in urbanization would also contribute to the differences in women's participation rates. In the case of low income countries, it is mostly a matter of measures or what is called the over-urbanization phenomenon.

3-4 Social Differences and Women's Participation

Due to the lack of aggregate level data, this section considers the recent evidence during the 1990s to offer the cross-country variations in social factors such as education and health services that might affect women's participation in the labor force.

The cross-country variations in education are a key factor in understanding women's participation rates in different countries. According to the economic theory, education enhances directly women's participation by raising the potential market wage

rate and increasing the speed and ease of finding job. Indirectly, it is the basic drive for changing social attitudes in favor of women's role and women's work.

Table 3.8 presents some facts about women and education over the last fifteen years. First of all, it displays the differences in public spending on education as a percentage of GDP for different groups of countries.

Table 3.8
Women and Education

Indicator Group	Public Spending on Education as % of GDP		Literacy Rate for Young People Ages 15-24 as % of the Same Age Group						Ratio of Female to Male Enrollments in Tertiary Education.	
			Female		Male		Female/ Male Ratio		1991	2003
	1990	2003	1990	2004	1990	2004	1990	2004		
High Income Countries	5.01	5.54	.*	.*	.*	.*	.*	.*	1.01	1.2
Middle Income Countries	3.91	4.50	91.07	96.78	95.28	97.69	95.17	99.01	0.69	0.97
Low Income Countries	2.82	3.09**	55.32	66.50	73.14	81.29	73.78	80.92	0.52	0.64

Source: The World Bank Group, World Development Indicators (WDI) Online.

* Not available for high income countries. It is assumed to be one.

** As of 2000.

High income countries have the highest percentage. Middle income countries are in second place, while low income countries have the lowest public educational expenditures as a percentage of GDP. This order was expected and would help in explaining the educational opportunities that are available for women in each group.

On the other side, the high literacy rates for males and females explain the progress that has been achieved by high and middle income countries in this field compared to low income countries. Recently, there is no available data about literacy rates in high income countries. It is assumed to be closed to 100 percent for both men and women.

For the ratio of female to male enrolments in tertiary education, Table 3.8 exhibits huge differences among different groups. The importance of this indicator stems from the fact that tertiary education is the stepping stone for both men and women to take advantage of new job opportunities in the economy. High educational levels and training skills are key factors for more involvement in the new job opportunities that are associated with the transition process from agricultural to industrial and service sectors. Also, high educational attainment is an important factor for women's development in all fields: social, economic and political. It is the basic drive for the capability and empowerment of women.

While this ratio in high income countries has exceeded one, it is still relatively low in low and middle income countries. This fact could be one of the key factors responsible for the variation among countries in women's participation rates. However, Table 3.8 displays an encouraging fact that female literacy rates and the female-male enrollment ratio in tertiary education have been growing over time in both middle and low income countries. Thus, the future is optimistic for eliminating the gender-gap in education in these countries.

Table 3.9 offers the differences among different groups of countries in health expenditures and life expectancy at birth as measures of improvement in health services. This table would reflect part of the government role in the development process.

Table 3.9
Health Expenditures

Indicator Group	Health Expenditure				Health Expenditure Per Capita \$		Life Expectancy at Birth (Years)			
	Total % of GDP		Public Sector		1998	2002	Female		Male	
	1998	2002	% of GDP 2002	% of Total 2002			1990	2004	1990	2004
High Income Countries	10.0	11.1	6.6	63.3	2,515.8	3,039.3	79	82	73	76
Middle Income Countries	5.9	6.0	3.0	49.4	99.5	109.1	70	73	65	68
Low Income Countries	4.9	5.5	1.5	27.8	20.5	29.4	57	60	55	58

Source: The World Bank Group, World Development Indicators (WDI) Online.

Table 3.9 displays the huge differences among countries in these indicators. For example, in 2002 the health expenditure per capita in high income countries was \$3,039.3, while it was only \$29.4 in low income countries. Also, the public health expenditures as a percentage of GDP was 6.6 percent in high income countries as of 2002 compared to 1.5 percent in low income countries. Moreover, the average life expectancy

at birth for females in high income countries was 82 years in 2004, while it is only 60 years for females in low income countries.

As expected, high income countries have the highest health expenditures as a percentage of GDP, high health expenditure per capita, and the longest life expectancy at birth for both men and women. All these facts confirm that people in high income countries are enjoying a higher standard of health services compared to low and middle income countries. This would be reflected in a high quality of human capital which means more capability to participate in the labor force for both men and women.

Also, these differences would reflect the differences among countries regarding the role that governments might play in the development process. Mostly, high standards of health services mean a greater role of governments in developing their societies.

CHAPTER 4

THE THEORETICAL FOUNDATION

This study will examine its main hypothesis that the over time variations in female labor force participation rates across different groups of countries could be explained by inter-variations in socioeconomic, cultural, demographic and governmental factors. This chapter presents the theoretical justification and empirical evidence behind each suggested factor.

4-1 GDP Growth

Since demand for labor is a derived demand, GDP growth is a key determinant for labor demand. However, there are two arguments regarding the possible relationship between GDP growth and women's labor force participation rate. The first one stems from the direct effect of the GDP growth in creating more job opportunities in the economy. Usually, faster economic growth is associated with higher demand for labor from both men and women. Therefore, economic growth would be expected to increase the likelihood of participation for women.

Empirical evidence finds that the ultimate effect of economic growth on women's labor force participation rate depends on the stage of economic development (Perkins et al, 2001). Women in developed countries are more qualified and able to take advantage

of new job opportunities associated with the economic growth compared to women in less developed countries. Historical data as mentioned in the previous chapter have showed that most of the recent economic growth in most countries stems from the output growth in the industrial and service sectors at the expense of the agricultural sector. Thus, new styles of job opportunities will be created. However, according to the direct effect, economic growth would increase the labor force participation rate in the economy. But if there is no associated development in women's status, men would benefit more from economic growth and would have higher labor force participation rates than women.

The second one stems from the indirect effect of economic growth on women's participation in the labor market through the unemployment rate. According to the labor theory, the unemployment rate could affect labor force participation either positively or negatively depending on the magnitude of the "discouraged worker effect" and the "added worker effect" (Birch, 2005; Ehrenberg and Smith, 1991; Cullison, 1989). These effects represent the response of primary workers who are temporarily unemployed and the response of the secondary workers who are temporarily out of the labor force to the changes in unemployment rates.

During recession when the unemployment rate is mostly high, the "added worker effect" would represent secondary workers attempting to seek employment. This is because the secondary workers would start looking for jobs and entering the labor force to compensate for the income loss by the primary earner in the family who became unemployed. So, the "added worker effect" would show a positive relationship between the unemployment rate and labor force participation rate, which in turn, would lead to an increase in the size of the labor force.

On the other hand, the “discouraged worker effect” represents the reaction of unemployed workers to the increase in the unemployment rate. A high unemployment rate increases the job-search period and the difficulty of becoming employed again. Therefore, there will be a negative relationship between the unemployment rate and labor force participation rate and would decrease the size of labor force.

Therefore, there is no a priori determination for the net effect of unemployment rate on labor force participation rates when the “added worker effect” and the “discouraged worker effect” are put together.

Even though most secondary workers are women, due to their strong tie to home activities especially in the presence of children, most empirical evidence on women’s labor supply studies finds that the unemployment rate usually has a negative impact on women’s participation rates especially young ones, supporting the “discouraged worker effect” hypothesis (Ham and Buchel, 2004; Tansel, 2002; Elmeskov and Pichelmann, 1993; Jaumotte, 2003; Contreras et al, 2005; Hotchkiss, 2005). This finding could be explained by the fact that women in general have higher unemployment rates which, in turn, cause the “discouraged worker effect” to dominate over the “added worker effect”.

All in all, the final effect of economic growth on women’s labor force participation rate depends on the interaction between the direct and indirect effects. Direct effect suggests a positive impact, while indirect effect suggests a negative impact on women’s labor force participation.

4-2 GDP Per Capita

Some studies analyze the direct relationship between women's participation rates and the process of economic development by suggesting a U-shaped relationship between the two variables (Rau and Wazienski, 1999; Goldin, 1995; Mammen and Paxson, 2000; Tansel, 2002).

The explanation behind this argument is that at the early stage of economic development, the agricultural sector is dominant and the participation of women is high, often as unpaid workers. As income rises during the process of economic development and as women laborers are substituted by mechanization in the agricultural sector, women's participation rates start falling, especially for women with low levels of educational attainment. As the industrial and service sectors become more important, wage rates and income levels rise, and with the advancement in home technology and the improvement in educational attainment among women, women's labor force participation rates would rise (Rau and Wazienski, 1999; Clark et al, 1991). Simply stated, for countries on the left hand side of the U-shaped pattern, agricultural activities account for a significant share of the GDP and employ a high share of the labor force. For countries on the right hand side, industrial and service activities are dominant, while the agricultural sector is small.

Another explanation for the U-shaped pattern of women labor force participation rates during the economic development process is related to the income and the substitution effects associated with family income and wage changes (Mammen and Paxson, 2000; Killingsworth and Heckman, 1986). According to this explanation, the declining portion of the U-shaped pattern reflects the dominance of the high income

effect over the small substitution effect, while on the rising portion of the U-shaped pattern the opposite is true.

The study would support the suggested U-shaped relationship by two views. The first view is applied in the case of low income countries. This view expects a negative relationship between the two variables at this stage because higher levels of GDP per capita means less economic pressure on the family and less incentive to work, especially among secondary workers. Also this would encourage people, especially secondary workers, to demand more leisure time outside the labor market.

The second view advocates a positive relationship between two variables. It is applied at relatively high levels of income such as the case of higher income countries. Higher GDP per capita would help people in improving their quality and qualifications by investing more in themselves such as health, education and others. Higher and more qualifications would empower and enable women and increase the likelihood of their participation.

All in all, this study would expect different directions of the relationship between the GDP per capita and women's labor force participation according to the stage of economic development. The stage of development would shape the relationship between the two variables. In the case of the low income countries, this relationship is expected to be negative. Lower economic pressures would discourage women's participation. For high income countries, high GDP per capita would urge women to improve their quality which in turn increases their chances in the labor market.

4-3 Education

There is consensus in economic theory about the importance of education in women's labor force participation decisions. Empirically, education has proved to be one of the main determinants of women's participation decisions (Cameron et al, 2001; Birch, 2005; Michael, 1985; Jaumotte, 2003; Contreras et al, 2005; Tansel, 2002).

There are two strong arguments behind the positive impact of education on women's labor force participation (McElroy, 2003; Birch, 2005). On one hand, educational attainment is directly related to the productivity in the labor market and the potential wage rate. Also, education as a human capital endowment can affect women's labor force participation directly by shaping the attitudes and preferences for work and leisure. Thus, women with high levels of education would expect high potential wage rates in the labor market and would be more likely to participate in labor market. On the other hand, education as a human capital investment encourages people to join the labor market to cover the cost incurred by education and receive the future stream of benefits. However, empirical evidence suggests that women's participation rates in the labor force in the Middle East and North African countries –MENA- are growing with more educational attainment but still very low compared to the substantial growth in women's educational attainment (Roudi-Fahimi and Moghadam, 2003).

Furthermore, the feminist school believes that women's education is the first step in the process of enabling and empowering women to attain their true position in society economically, socially, and politically (McElroy, 2003; Cameron et al, 2001). The reason behind this argument is that education would increase women's opportunities in finding jobs and contributing to family income which, in turn, would enhance their ability to

participate in the family decision making process and strengthen women's status in society.

As with other studies, this study would expect a positive impact of education on women's labor force participation rates. Because of the lack of information over time at the group level about female literacy rates and enrollment ratios, especially for low and most middle income countries, the study will use the government expenditure on education per person to show how variations among countries in education spending would explain the cross country variations in women's participation rates.

4-4 Fertility

The existing literature on women's labor supply, starting with the contributions of Becker and Mincer in the 1960s, suggests a negative effect of children on women's labor force participation rates. Children as a time-intensive home commodity would increase the value of women's time in non-market activities and limit their labor market participation. According to Buddelmeyer et al, (2004), having children would affect women's labor supply directly by raising the value of non-market activities and forcing women to leave the labor market temporarily which, in turn, depreciates their human capital. Mincer (1985) documents a negative relationship between fertility and women's participation on a cross-country basis.

Empirical evidence discusses the endogenous nature of women's fertility and participation decisions within the context of household models. In essence, personal and family characteristics would affect their fertility decision together with their participation decision (Troske and Voicu, 2004; Jaumotte, 2003/2; Assaad and Zouari, 2002). The

negative relationship between these two variables can be explained mostly by the evolution in women's education and wage rate changes over time (Buddelmeyer et al, 2004; Lam and Duryea, 2000; Sprague, 1988; Lehrer and Nerlove, 1986).

Empirical cross country studies have noted a change in the direction of the relationship from a negative to a positive association between fertility and female labor force participation in OECD countries (Brewster and Rindfuss, 2000; De Laat and Sevilla-Sanz, 2003; and Del Boca et al, 2004). De Laat and Sevilla-Sanz (2003) show how the correlation between these two variables in the OECD countries has changed over time from -0.517 in 1970 to 0.714 in 1990. Del Boca et al (2004) also finds that countries with fertility rates lower than the replacement level (such as Spain, Italy, Japan, and Greece) have in general low levels of female labor force participation, while countries with higher fertility rates (such as northern European countries) have higher participation rates.

According to these studies, this directional change of correlation could be explained by the availability and improvement in the technology of home appliances, the development of supportive policies like formal child care benefits and parental leave and the increase in opportunities of part-time employment over time.

On account of the possible endogeneity between fertility and women's labor force participation rates and due to the lack of yearly fertility rates over time, this study will use the percentage of population younger than fifteen years old from total population to capture the possible impact of children as well as home responsibilities on women's labor force participation rates.

The study expects that countries with high fertility rates or a high percentage of the population under fifteen years old would have lower women's participation rates in the labor market and vice versa with some variations among countries.

4-5 Urbanization

Urbanization, the result of the growth of cities, is brought about by a population shift from small communities and rural areas to large ones, and the change from an agricultural economy to an industrial one. Urbanization is caused by the migration of people from the countryside to the city in search of better jobs and living conditions. According to the United Nations, localities with population 20,000+ and cities with population 100,000+ are classified as urban areas.

Urbanization is usually associated with industrialization and economic and social changes. It is sometimes described as a manifestation of development process (Kasarda, 1991). Urbanization could be reflected in numerous positive societal outcomes such as economic progress, technological innovation, public services and higher standards of living in general. Urbanization also would enhance the employment opportunities for both men and women especially in industrial and service sectors (Smith and Ward, 1985). According to the empirical evidence, the biggest changes in recent decades in women's labor force participation in the U.S and OECD countries have been in non-traditional jobs that were not available for women in the past (Costa, 2000).

Thus far there has not been empirical evidence at the aggregate-level on the effect of urbanization on women's labor force participation. Cameron et al (2001) does obtain some results regarding the impact of urbanization on women's participation in some

Asian countries. In South Korea, Thailand, and Indonesia, urbanization reveals a positive impact, while in Sri Lanka and Philippines urbanization has a negative impact on women's participation. This result is explained in terms of phases of economic development and cultural norms. Tansel (2000) uses urbanization to reflect spatial accessibility of jobs in which urban areas may have more paid employment opportunities than rural areas. His findings suggest a negative impact of urbanization on women's participation, arguing that rural women may participate largely in agricultural activities as unpaid family workers.

Even though it is assumed that urbanization would enhance employment opportunities and increase women's participation rates, there is sometimes the case of over-urbanization as in most of the third world countries so that urbanization is no longer associated with the required economic and social changes (Kasarda, 1991; Sovani, 1964; Davis and Golden, 1954). Furthermore, empirical evidence suggests that urbanization could be affected by the development level but it does not affect the development level (Moir, 1977).

For the purpose of this study, urbanization is measured by the ratio of the population living in urban areas -as defined by the UN- to the country's total population. However, in developed countries it is expected that urbanization would be associated with beneficial social and economic changes; thus it would have a positive impact on women's labor force participation rates, while in developing countries it would not show a significant impact on women's participation.

4-6 Role of Government

Government size represents the government's role in the economy. It is measured by the share of total government spending in the country's GDP. The sources and uses of government expenditures could explain to some extent the government public policy in the economy. Government policy and other institutional factors would indirectly affect labor supply decisions for both men and women (Birch, 2005). More precisely, government public policy would affect women's participation rates through the tax system, family policies, and labor market regulations...etc.

Even though empirical studies have agreed in general on the positive relation between government size and women's labor force participation rates, there are two contrasting arguments on the causality of the relationship between the two variables (Cavalcanti and Tavares, 2004; Gellbach, 2002; Jaumotte, 2003). Cavalcanti and Tavares (2004) provide evidence of a causal link from female labor force participation to government size. More precisely, a ten percent increase in females' participation rates leads to about an eight percent increase in government size. If women decide to enter the labor force and work outside the home they will demand more and better public services that are provided by government and financed by increased taxes. However, other empirical evidence argues that government public policy has deterred women's labor market participation (Birch, 2005; Watanabe, 2002).

The government size as measured by the percentage of government expenditures to the country's total GDP is sometimes misleading because it ignores the size of the population. If two countries have the same GDP and government expenditures but

different sizes of population, the citizens in the small population country will enjoy higher levels of public services. Therefore, this study uses the government expenditures per person to reflect the government's role in women's labor market participation.

In general, this study expects that government role, measured by government expenditures per person, would affect women's participation rates positively for two reasons. First, the public sector absorbs the largest share of the women's labor force, especially in white-collar governmental jobs such as education and health care sectors. Secondly, the government subsidizes health care, education, and childcare. Subsidies and paid maternal leaves reduce the time devoted by women to these tasks and encourages women's participation in the labor force (Jaumotte, 2003/2).

4-7 Cultural Factors

Cultural factors play an important role in women's labor force participation. Cultural factors reflect the attitudes of society as well as of the women themselves toward gender roles in the society. Despite the huge development that has been achieved over time in women's status over the world, women in most families are still considered primarily responsible for housework and child care (Blau and Kahn 2000).

Clark et al (1991) argues that cultural conditions refer to the "*shared ways of thinking, believing, perceiving, and evaluating that define a group and that are transmitted from one generation to another. In particular, culture refers to religious, political, or other highly valued commitments that distinguish one set of nations from another, most specifically through the definition of appropriate gender-role behavior*". In

some countries, gender roles are traditionally well defined, while in others they are less rigidly defined (Cameron et al, 2001).

Empirical evidence insists on the importance of cultural conditions in explaining the behavior of women's participation at micro and macro levels (Clark et al, 1991; Antecol, 2000; Antecol, 2003; Birch, 2005; Fortin, 2005). Since it is difficult empirically to quantify the effect of cultural factors on women's labor force participation, studies in women's labor supply usually devise different proxies to capture this effect, such as religion, race or ethnicity, parent's education, mother's past relation to labor market and the males' attitude towards women's work (Leibowitz and Klerman, 1995; Antecol, 2003; Waldfogel and Mayer, 1999; Lehrer, 1999; McElroy, 2003; Carliner, 1981; Buddelmeyer et al, 2004). Antecol (2003) argues that controlling for human capital characteristic and demographic factors doesn't eliminate the cross-country variation in female labor force participation rates. He tries to quantify the role of culture in gender-gap in labor force participation by using a set of questions regarding male attitude toward family and gender roles. His findings reveal that women are more likely to participate in labor market activities if men's attitudes are in favor of women's work.

Since it is difficult to quantify cultural factors and there is a lack of over time data at the group level, this study has two options to control for cultural factors. The first option is to use gender-gap in education as a proxy to reflect cultural factors. But this option would not work because there is a possibility of high correlation with other explanatory variables. Thus, this option should be dropped. The second option is to use what is called by this study "adjusted gender-gap in economic activity" as a proxy to reflect the degree of women's involvement in the labor market. This proxy can be

measured by the ratio of the gender-gap in economic activity to the gender-gap in the population. The gender-gap in economic activity is measured by the ratio of females to males' labor force participation rates. The gender-gap in the population is the ratio of females to males in the total population. However, the optimal value for this scale (ratio) should equal one and the closer to one, the more equality in labor market between genders. In reality, the regular female/male ratio in labor force – the inverse of the gender-gap in economic activity- has been growing over time but has never been one. According to the Human Development Report (2005), this ratio as of 2003 is 74, 73, and 61 percent for high, middle and low income countries respectively. Ghana, Cambodia and Vietnam have the highest value of female-male ratio in labor market, and the lowest gender-gap in economic activity. It is 98, 97, and 91 percent respectively. On the other side, Oman, Jordan and Yemen have the lowest ratios and the highest gender-gap in economic activity, which are 27, 36 and 37 percent respectively as of 2003. However, there are different justifications for using this indicator.

On one hand, the female-male ratio in labor force is not the same as women's participation. Most studies use the gender-gap in economic activity as an alternative to women's participation in the labor force which is not accurate. Although these two variables are moving in the same direction and have a high correlation, they are not the same indicators e.g. Sweden has 90 percent female-male ratio in labor force and a 62.8 percent women's participation rate, while Madagascar has 78 and 68.9 percent for both indicators respectively. At aggregate level, high income countries have a 74 percent female-male ratio in economic activity and 52.5 percent for women's participation rate

while, middle income countries have 73 and 59.5 percent for both indicators respectively as of 2003 (Human Development Report, 2005).

Policies and factors that might decrease the gender-gap in economic activity will lead to a relative increase in women's participation, but the opposite is not always true at least numerically. For example, by controlling the changes in population structure, increasing women's participation does not mean reducing the gender-gap in economic activity unless the men's participation rate is fixed or has declined. Most of the times, there are many combined economic and social factors that might increase both men's and women's participation rates but they would not significantly change the gender-gap in economic activity.

Furthermore, to explain the gender-gap in economic activity, all factors that might affect both men's and women's participation in the labor force should be controlled. But for women's participation, just the factors that might affect women's participation alone should be controlled. Thus, they are different indicators.

Also, the modification in this scale will help in showing the real differences among countries in gender-gap in economic activity. Despite the fact that female-male ratios in population are very close in most countries, they are not the same. Most countries have different female-male ratio compared to other countries. Table A2 in Appendix A exhibits the differences between the regular and the adjusted gender-gap in economic activity for selected countries.

Even with control for supply side factors that determine both men's and women's participation rates, this scale can still be affected by some demand side factors such as the degree of discrimination against women in the labor market. This reflects the inherent

social attitudes -cultural factors- that support men's work and impede women's work. Thereby, if the conditions in the labor market are in favor of men's work, men's participation will increase and the gender-gap will increase. Furthermore, part of the discrimination issue that increases the gender-gap is related to social attitudes toward women's role in the society. Discrimination affects gender-gap in economic activity directly by reducing women's employment and indirectly by discouraging them from participating in the labor market.

All in all, this scale would reflect to some extent the value placed by society and women themselves on their role in all levels of the decision making process, especially the participation decision in labor force. Also, it would reflect to what extent women are free to participate away from home activities. However, this study expects that cultural background, measured by adjusted gender-gap in economic activity, has a significant role in women's participation in all countries with some variations. More precisely, countries with a small gender-gap in economic activity would always have higher level of women's participation rates in the labor market and vice versa.

CHAPTER 5
THE EMPIRICAL STUDY: DATA SOURCE, MODEL, AND
ESTIMATIONS

5-1 Data Source, Model and Definition of Variables

The study uses panel data at aggregate-level over the period 1970-2002. It is a combination of time series and cross-sectional observations for the same countries. The total sample includes 45 countries. It is balanced panel data. For each group of low, middle, and high income countries, there are 15 countries (cross-sectional units) and 33 time periods from 1970 till 2002. So, the total panel data will be 495 observations for each group.

The main source of the aggregate-level indicators is the World Bank indicators which are available since 1960 but for limited points of time for some demographic variables such as the aggregate level of fertility rate (see Appendix B).

For panel data, the general framework of the model will be:

$$Y_{ij} = a + b X_{ij} + e_{ij}$$

Where:

i stands for country.

j stands for the year.

The dependent variable (Y_{ij}) is the Female Labor Force Participation Rate FLFPR for country i and year j measured as the ratio of female labor force (employed and unemployed females) to the total female population.

The independent variables (X_{ij}) are the explanatory variables at aggregate-level that would influence female labor force participation rate in country i at year j . The study categorizes explanatory variables into four main groups (see Appendix B for variable definitions):

- Socioeconomic factors that include GDP growth, GDP per capita, and education. Education will be expressed as the yearly expenditure on education per person in each country.

- Demographic factors include fertility rate (which is expressed by the ratio of people under 15 years old from the total population) and urbanization. Urbanization is measured by the percentage of urban population from total population according to United Nations classifications.

- Government role is represented by the yearly general government final consumption expenditures per person in each country.

- Cultural factors represent the attitudes of the society toward women's participation in labor force. Since cultural factors are hard to quantify, there is a need to use proxy to reflect their effect. As mentioned in chapter four, the study will represent cultural factors by using an adjusted scale of the gender-gap in economic activity. It is the ratio of female to male in the labor force to their ratio in the population.

According to Gujarati (2003), panel data have some advantages over cross-section or time series data. First, panel data tend to have heterogeneity among different cross-sectional units. Second, panel data give more degrees of freedom, more variability and less collinearity among variables, more efficiency and more informative data.

Estimation of panel data regression models depends on the assumptions that have been made about intercept, slope coefficients and disturbance term. For example, the OLS technique is based on a very highly restricted assumption that the intercept value and slope coefficients are all identical for all cross-sectional units (countries). This assumption is unrealistic because it ignores the unique features (individuality) of each country. Thus, the OLS technique is not recommended to analyze panel data (Gujarati, 2003).

Other techniques can be used in analyzing panel data (Gujarati, 2003). For example, the Fixed Effects Regression Model (FEM), sometimes called Least Squares Dummy Variable Model (LSDV), takes into account the individuality of each cross-sectional unit by using dummy variables i.e., it allows the intercept value and/or the slope coefficients to vary across countries.

Since we have 15 countries and eight explanatory variables this model can be expressed as the following:

$$Y_{ij} = \alpha_1 + \alpha_2 D2_i + \dots + \alpha_{15} D15_i + \beta_1 X1_{ij} + \dots + \beta_8 X8_{ij} + \mu_1 (D2_i X1_{ij}) + \dots + \mu_8 (D2_i X8_{ij}) + \mu_9 (D3_i X1_{ij}) + \dots + \mu_{16} (D3_i X8_{ij}) + \dots + \mu_{105} (D15_i X1_{ij}) + \dots + \mu_{112} (D15_i X8_{ij}) + u_{ij}.$$

Where:

i^{th} : The countries, the cross-sectional units (cross-sectional identifiers).

$i = 1, 2 \dots 15$.

j^{th} : Time period or the time identifier. $j = 1, 2 \dots 33$. (1970-2002).

And:

Y: dependent variable.

X's: independent variables.

D's: 14 dummy variables, the number of countries minus one as a base to avoid the case of perfect multicollinearity.

By using the restricted F test, which is based on the R^2 values of the restricted and unrestricted models, one can examine whether the intercept value and slope coefficients are varying across countries or not. This test would verify the validity of the restricted model – the pooled OLS model- and whether the individual country effects are statistically significant or not.

However, the FEM or LSDV technique is based on the assumption that u_{ij} follows the classical assumption $u_{ij} \sim N(0, \sigma^2)$. In panel data, there is a high possibility of heteroscedastic and/or autocorrelated disturbance term over time and/or across countries. The loss in the degrees of freedom is also one of the disadvantages of this technique.

The other technique is the Error Components Model (ECM), sometimes called the Random Effects Model (REM). This model avoids the big loss in the degrees of freedom by including all possible lacked knowledge through the disturbance term u_{ij} . This model can be expressed as the following:

$$Y_{ij} = \beta_{1i} + \beta_2 X_{2ij} + \dots + \beta_8 X_{8ij} + u_{ij}.$$

And

$$\beta_{1i} = \beta_1 + \epsilon_i \quad (i = 1, \dots, N)$$

Therefore;

$$Y_{ij} = \beta_1 + \beta_2 X_{2ij} + \dots + \beta_8 X_{8ij} + w_{ij}.$$

Where:

$$w_{ij} = \epsilon_i + u_{ij}.$$

w_{ij} : the composite disturbance term.

ϵ_i : the cross-section or individual error component.

u_{ij} : the combined time series and cross-section error component.

This model is based on the assumption that individual (country) error components are not correlated with each other and are not autocorrelated both across-section and across time series units. In reality, this assumption is hard to hold. The study is dealing with aggregate level indicators that might affect each other across countries. Most countries are considered open economies and there is a high possibility of economic interdependence among these economies. Therefore, the disturbance term may have some autocorrelation among some or all cross-sectional units for a given time. In this case, the Seemingly Unrelated Regression (SUR) modeling is recommended. This technique takes into account any possible correlation among disturbance terms across cross-sectional units.

To achieve its purposes and since it deals with panel data, this study combines two statistical techniques, the Seemingly Unrelated Regression Model technique in conjunction with the Fixed Effects Regression Model technique. The latter is for the intercept differences (individuality). Combining these two techniques would be the most appropriate method of analysis for this study. This combining process would guarantee the individuality of each country in the analysis while capturing any possible spatial autocorrelation (space correlation).

In details, the model specification is expressed as the following:

$$\begin{aligned} \text{FLFPR}_{ij} = & \alpha_1 + \alpha_2 \text{D2}_i + \dots + \alpha_{15} \text{D15}_i + b_2 \text{GDP}_g_{ij} + b_3 \text{GDP}/\text{capita}_{ij} + b_4 \text{GDP}/\text{capita}_{ij}^2 \\ & + b_5 \text{GOVE}/\text{person}_{ij} + b_6 \text{FER}_{\text{rate}}_{ij} \text{ (or } \text{POP}_{<15}_{ij}) + b_7 \text{URB}_{\text{ratio}}_{ij} + b_8 \text{EDUE}/\text{person}_{ij} + b_9 \\ & \text{GEND}_{\text{ratio}}_{ij} + u_{ij}. \end{aligned}$$

Where:

i and j are for the country and the year, respectively.

FLFPR : Female labor force participation rate.

GDP_g : GDP annual growth rate.

GDP/capita : GDP per capita.

$\text{GOVE}/\text{person}$: The role of government, the yearly general government final consumption expenditures per person.

FER_{rate} : Fertility rate. Or

$\text{POP}_{<15}$: Percentage of population under 15 years of age to the total population.

URB_{ratio} : Ratio of urban people to total population.

EDUE_{/person} : the yearly total expenditures on education per person.

GEND_{ratio} : proxy for cultural factors which is the female-male ratio in labor force to their ratio in the total population (adjusted gender-gap in economic activity).

D_i : Dummy variable for each country (i=1...14).

u_{ij} : Disturbance term.

For the purpose of cross-country comparisons and to provide aggregate level evidence on the relative importance of each of the above variables on female labor force participation rates, the above model will be estimated for each group (three groups with 15 countries in each) and for the whole sample (aggregate model that includes all 45 countries together).

Furthermore, the study will employ the regular OLS technique to estimate a model for the gender-gap analysis. It will analyze the most important sources of gender gap in economic activity over the world's countries. Cross-sectional data from the 2005 Human Development Report will be used in this analysis. The specification of the gender-gap model will be as follows:

$$\text{GENDER-GAP}_{\text{economic activity } i} = b_1 + b_2 \text{GEND}_{1i} \text{ (or } b_3 \text{GEND}_{2i} \text{)} + b_4 \text{GEND}_{3i} + b_5 \text{GEND}_{4i} + b_6 \text{GEND}_{5i} + b_7 \text{GEND}_{6i} + b_8 \text{FER}_{\text{rate } i} + u_i.$$

Where:

i stands for the country.

$GENDER-GAP_{\text{economic activity } i}$: the female economic activity rate as percentage of male rate.

$GEND_{1i}$: General gender-gap in education, ratio of female to male in terms of combined gross enrollment ratio for primary, secondary, and tertiary education. Or,

$GEND_{2i}$: Gender-gap in tertiary education, ratio of female to male in terms of the gross tertiary enrollment ratio.

$GEND_{3i}$: Gender-gap in estimated earned income, ratio of female to male estimated earned income.

$GEND_{4i}$: Gender-gap in professional and technical jobs, ratio of female to male in professional and technical jobs.

$GEND_{5i}$: Gender-gap in employment at agriculture sector, ratio of female to male employment in agriculture sector.

$GEND_{6i}$: Gender-gap in governmental top level positions, ratio of female to male in government at ministerial level.

$FER_{\text{rate } i}$: Total fertility rate , total live births per women.

u_i : Disturbance term.

5-2 The Cross-Country Analysis

By using the Lagrange Multiplier test developed by Breusch-Pagan (Baltagi, 2002), the data are pool-able for the three groups of countries. This statistic tests the stability of regression equations across countries and time. For the model choice, different statistics are used and different results have been found.

First, using the restricted F-test which is a simple Chow test, the Fixed Effect Model that gives each country its own intercept is recommended instead of the regular pooled OLS technique (Halcoussis, 2005). The null hypothesis of equal intercepts among countries is rejected. In other words, the restricted model which is the pooled OLS is rejected against the FEM.

Second, the individual error components are correlated with each other and autocorrelated across both cross-section and time series units. Thus, the regular OLS technique as well as the Error Components model (ECM)/ the Random Effects Model (REM) are inefficient methods for the analysis.

For the above reasons, the study will employ the Seemingly Unrelated Regression Model in conjunction with FEM. This method will take care of the individuality of each country and control for spatial auto correlation among the disturbances. Thus it will be the best method for panel data analysis after treating the problems of group-wise heteroscedasticity and cross-sectional autocorrelation.

Levene's test⁵ and Lagrangian Multiplier test (Green, 1997) shows that the data has encountered the problems of heteroscedasticity and cross-sectional correlation. Levene's test is used to test if groups have equal variances -homogeneity of the variance. Its null hypothesis is that all groups have the same variance. On the other hand, the Lagrangian Multiplier is used to test for the cross-country autocorrelation; the hypothesis is that the off-diagonal elements of variance-covariance matrix (Σ) are zeros.

Following Kmenta (1997), these two problems can be resolved jointly by applying the common Rho technique until convergence. Practically, the study has solved

⁵ NIST/SEMATECH e-Handbook of Statistical Methods,
www.itl.nist.gov/div898/handbook/eda/section3/eda35.htm

the problems of group-wise heteroscedasticity and cross-sectional correlation by iterating the common Rho technique until convergence. Finally, by using the adjusted R square as well as F statistics, the goodness of fit for all estimated models are found to be highly significant.

5-2-1 The Empirical Results of Cross-Country Analysis: Seemingly Unrelated Regression Model

The empirical results of the Seemingly Unrelated Regression Models are presented in Table 5.1. Based on these results, this section explains the effect of each explanatory variable on women's labor force participation in comparative way among countries.

GDP Annual Growth Rate

The coefficient of the GDP annual growth rate can be interpreted through the direct relationship between women's participation rate and GDP growth and indirectly via the relationship between unemployment rate as a reflection of the business cycle and the women's participation rate.

Statistically, the coefficient of GDP growth is significant for all groups which assure the importance of economic growth on women's participation regardless of the stage of economic development. It has been proven to have a positive effect in the case of low and high income countries as well as in the aggregate model, but it reveals a negative impact for the middle income group. High economic growth is usually associated with more job opportunities. However, this result could be interpreted by the

dominance of the “discouraged worker effect” in low and high income countries and the “added worker effect” in the case of the middle income group. Women are more likely to respond to the changes in unemployment rate as primary workers⁶ in low and high income countries, but they behave as secondary workers in the case of middle income countries. Women are basic workers on the family farm alongside men at the early stage of economic development. Most people have to work to survive regardless of their gender at this stage.

In the case of high income countries in the later stage of economic development, the economic and social autonomy or at least the economic independence of women makes them closer to labor market. However, the story is different for women in middle income countries. Women at this stage of economic development are neither economically independent nor in need for work on the family farm. Their participation decision at this stage depends mainly on the employment status of the family’s basic bread winner, mostly men. The women in middle income countries are more likely to step in and replace the unemployed primary worker in the family during periods of high unemployment rates. This means that the women would become primary workers only if the economic need exists.

Therefore, the dominance of the “discouraged worker effect” in low and high income countries could explain the positive impact of the GDP growth on women’s participation while the dominance of the “added worker effect” in the case of middle income group would explain the negative impact. Accordingly, since most of the

⁶ This means that women have the same incentives to work as men. The economic need in low income countries and the autonomy of women in high income countries make them basic income earners in their families beside men.

countries depict the dominance of the “discouraged worker effect”, it is expected that the aggregate model would exhibit the same trend.

In terms of the relative size, the high positive coefficient of the GDP growth in high income countries relative to low income countries can be explained by the fact that discouraging effect of the unemployment rate is smaller for the latter. The economic need in low income countries makes women respond less vigorously to changes in unemployment rates. For middle income countries, a one percentage point increase in GDP growth rate will result in a 0.00007 percentage point decrease in women’s participation rate, which is tiny.

GDP Per Capita and its Square

GDP per capita and its square are highly significant statistically in all models. In general, the results argue that the stage of economic development would shape the relationship between this variable and women’s participation rate within each group. This finding is contradicted to some extent with other studies -as mentioned in chapter two- which assures the U-shaped relationship between the two variables without referring to the stage of economic development.

Accordingly, the U-shaped relationship has been approved only in the case of high income countries and in the aggregate model, while the inverted U-shaped relationship dominates over the course of economic development for other groups. However, the inverted U-shaped relationship in low and middle income countries suggests the fact that economic need is the main drive for women’s work and not self-actualization. Therefore, the direction of the impact of GDP per capita on women’s

participation is changing from positive to negative at a specific point after which women's work is no longer important for the family budget. Another explanation is that the lack of parallel social and political development in women's status would deter women's ability to benefit from economic development which, in turn, reduces their participation.

In terms of the coefficient of GDP per capita alone, it reveals a negative impact on women's participation in low income countries and in the aggregate model, while it expresses a positive impact for other groups. This result would be interpreted by income and substitution effects that are associated with the changes in the family income and wages. In the case of low income countries, the negative impact supports the prevailing negative income effect at an early stage of economic development and the positive substitution effect in later stages. Higher wages and incomes at early stages of economic development mean less economic pressure on the family and less incentive for work. Therefore, this would encourage women to spend more time in home production - consume more time outside labor market- instead of working in the labor market. Accordingly, at higher stages of economic development, the opportunity cost of each unit of time outside the labor market is relatively high and would exceed the value of marginal productivity of home production. Therefore, the positive substitution effect would be dominant in the case of middle and high income groups. Also economic pressure is not the basic determinant and is relatively less important in encouraging women to participate in labor market at higher levels of income.

For the aggregate model, the U-shaped relationship can be explained by the fact that women at early stages of economic development are generally considered low-

skilled workers and still engage primarily in agricultural employment which is the dominant sector. With more economic development toward industrial and service sectors, the mechanization process would replace more women workers and decrease their participation rates. This would happen specifically for women who are not trained and skilled enough to engage in the new job opportunities. With more growth in industrial and service sectors, wages and incomes will rise. Apparently, moving to higher levels of income would enable women to invest more in their human capital and to be more qualified to take advantage of the new job opportunities. Also high income levels are usually associated with advanced home technology that would release some of the women's time in home production and enable them to spend more time in the labor market. The above facts as well as the self actualization goal would definitely enhance women's participation in the labor market at higher stages of economic development.

Moreover, the relative size of the coefficient of GDP per capita is greater in high income countries as expected compared to middle income countries. This finding suggests that women in high income countries can benefit more from the increase in income level compared to middle income countries. They have better opportunities in human capital investment. For low income countries, the negative impact of GDP per capita on women's participation is very small; a one unit rise in GDP per capita will result in a 0.0004 percentage point decline in women's participation rate.

Fertility Rate

Due to the lack of yearly data on the fertility rate over time, and in order to capture the possible casual relationship between fertility rate and women's participation

rate, the study uses the ratio of people under fifteen years old to total population to reflect the burden of child care on women's participation.

This key factor shows as expected a high and significant negative impact on women's participation in all models except for the case of low income countries. According to Becker's theory of allocation of time, raising children is one of the most important determinants of women's participation. It increases the marginal productivity of women at most time intensive home production. Therefore, it is no wonder that a high percentage of children in the population would correlate with less women's participation in the labor market. In terms of magnitude, the negative impact of this factor is stronger in the case of high income countries as compared to middle income countries. Despite the availability of day care services for children in high income countries, this finding can be explained by the effective role of family alternatives such as young daughters, sisters, even grandmothers who would help women in taking care of children in middle income countries.

However, despite the fact that some of the developed countries have recently witnessed a change in the direction of the relationship between fertility and women's participation rates, the empirical results for the high income group still support the negative direction.

The most interesting result is for low income countries. The fertility rate as measured by population younger than fifteen years old depicts a positive impact on women's participation. A one percentage point rise in this ratio will increase women's participation rate by 0.72 percentage point. This result can be explained by two facts. First, young children in low income countries are fully involved as non-paid workers on

the family farm. They are considered as an investment in home production rather than home consumption commodities. Second, because of the lack of data at the group level, the study used a too wide age limit - fourteen years old and younger- which might lead to misleading results. For example, the results would be more accurate if it is possible to use the actual fertility rate or the ratio of people younger than six years old.

However, some recent empirical studies suggest that the relationship between fertility and women's participation in labor market no longer has a clear pattern (Li and Zhang, 2006; Lim, 2006). Others support the positive impact of older children on women's participation rates. Birch (2005) explains this by two reasons in the case of Australian women. First, older children are more likely to be considered goods-intensive which in turn increases the burdens on the household budget and enhances women's participation in labor market. Second, older children would share in different home responsibilities which allow mothers to participate in market activities.

Urbanization

The urbanization factor is highly significant in all models and depicts different directions of influence according to the stage of economic development. As expected, urbanization has a positive impact for middle and high income countries, while it reveals a negative impact on women's participation in the case of low income countries. In terms of the specific impact, the positive effect of urbanization in high income countries is bigger compared to middle income countries. Urbanization is expected to bring more social and economic changes that might raise women's participation rates in high income

countries. For low income countries, a one percentage point rise in this variable will result in a 0.27 percentage point decline in women's participation rates.

In the case of low income countries, which are considered basically agricultural economies, most rural women are involved mainly in agricultural sector employment. Furthermore, the urbanization process is usually associated with industrialization and mechanization in the agricultural sector. These facts would support the negative direction of urbanization on women's participation in low income countries, thereby, supporting the argument of over-urbanization at early stages of economic development.

On the other side, women in middle and high income countries benefit from urbanization by developing their status socially, economically and politically. This would motivate their participation in the labor force. As a result of higher wages and incomes associated with the transition toward industrial and service sectors, women are more able to attain higher levels of education and training as well as health services. Therefore, women would be more qualified and capable to take advantage of the new job opportunities in industrial and service sectors. Also the availability of part-time jobs at later stages of economic development associated mostly with urbanization would enhance women's participation in the labor market. Given the above reasoning, urbanization would bring positive influences on women's participation if women get the right education and training skills required for the new employment opportunities.

Education Expenditures

As expected, education expenditures per person in all models have proved to be one of the most influential factors on women's participation in the labor force. This result

comes along with other studies' consensus on the importance of education in determining women's participation in labor market. In terms of the relative size, the positive impact of education is greater in high income countries compared to low and middle income countries. This finding can be explained by the inter-group differences in the quality of education.

The positive impact of education on women's participation can be interpreted by the following facts. First, for both men and women, higher levels of education will increase labor's marginal productivity and wages which, in turn, increases the likelihood of finding jobs and increasing the participation rate. This is the direct influence. Second: education would empower and enable women for more economic, social, and political involvement in their societies, and also it would change the attitudes of males as well as the entire society toward women's position and role in the society. This is the indirect influence. The availability of active women's movements would enhance this goal. The above reasoning explains the study's finding of the positive impact of education on women's participation.

Role of Government

The study uses government expenditures per person to reflect the role of government in women's participation in the labor market. The question is whether government expenditures over time benefit women -either directly or indirectly- and encourage their participation.

It is known in economic theory that the level of government expenditures is one of the basic driving forces for economic growth. Also, the level of government

expenditures reflects the level of public services that are provided in the economy. The larger the share of government expenditures that targets family policies, the larger is the impact on women's participation. Accordingly, government in most countries is the largest employer for women especially in white-collar jobs. So, this study expects a positive impact of government expenditures per person on women's participation.

This variable is statistically significant in all models except in the case of low income countries. Also, government expenditures per person depict a positive impact as expected on women's participation in the case of high income countries and in the aggregate model, while revealing a negative impact on women's participation in low and middle income countries. For high income countries, the positive impact is tiny implying a very small role of government; a one unit increase in this variable will result in a 0.000065 percentage point increase in women's participation rate.

For the low and middle income countries, the negative direction could be interpreted by two important facts that prevail mostly in less developed countries. First, government expenditures are not well-organized and directed and are used mostly inefficiently. The widespread corruption is one of the problems prevail in most developing countries. Second, women as well as children, as less fortunate groups, are not targeted by government policies and programs. The above reasoning would help in understanding the lack of influence of the government expenditures on women's participation in low and middle income countries. However, the specific negative impact of this variable on women's participation rates is almost the same in low and middle income countries but it is insignificant in the case of low income countries.

Cultural Factors

At the aggregate level, it is very hard to capture and magnify the possible effect of cultural factors on women's participation rate for different reasons. On one hand, there are many general indicators that should be included to reflect the role of cultural factors on women's participation such as religion, gender-gap in education, societal attitudes toward women's work...etc. On the other hand, there is a lack of required information at the aggregate level especially for low and middle income countries.

For the above reasons, the study developed a proxy that would reflect some of the end-result effect of cultural factors on women's participation in labor market. It is the "adjusted gender-gap in economic activity". It is a modified proxy for the regular gender-gap in economic activity that takes into account the ratio of females to males in the total population. It is measured by the female-male ratio in labor force compared to their ratio in population (see Table A2 in Appendix A). This scale equals one in the case of perfect fairness –optimal share- between both sexes in the labor market. This proxy would be powerful in reflecting the attitudes of the society as well as women themselves toward gender role in general and in economic activity specifically. Although this scale is affected by several supply and demand side factors as well as by the female-male ratio in population, the study acknowledges possible endogeneity between this variable and the dependent variable.

Using this proxy, the empirical results in all models exhibit a very significant and positive impact of this scale on women's participation in labor market. Again, this finding confirms along with the previous studies the importance of cultural factors in determining the level of women's participation. In other words, societies which highly

value women's role would have higher women's participation rates in the labor market and vice versa.

In terms of the specific magnitude, a one percentage point decline in the "adjusted gender-gap in economic activity" will result in an increase in women's participation rates of 3.31, 0.59, and 0.72 percentage points in high, middle, and low income countries respectively. Focusing on demand side factors such as employment opportunities and discrimination in the labor market, women in high income countries are more capable to take advantage of any improvement in the labor market circumstances. For the comparison between low and middle income countries, the economic need in low income countries encourages women to respond relatively more to any improvement in the labor market circumstances compared to women in middle income countries who behave like secondary workers as mentioned before.

Table 5-1 The Empirical Results of the Seemingly Unrelated Regression Model

Dependent Variable: Female Labor Force Participation Rate^a				
The Group of Countries	Aggregate Model	HICs	MICs	LICs
Explanatory Variables	Coefficient	Coefficient	Coefficient	Coefficient
GDP Growth	0.01198***	0.13159***	-7.4E-05***	0.00115***
GDP Per Capita	-0.00141***	0.00352***	6.3E-06***	-0.00044***
GDP Per Capita Square	3.3E-06***	4.3E-05***	-3.8E-08*	-4.7E-07***
Fertility Rate (Proxy)	-1.15872***	-4.21795*	-0.06764***	0.72458***
Urbanization	0.29214***	0.89358***	0.00159***	-0.27952***
Education Exp. (Per Person) ^a	0.00405**	0.19705***	0.00115***	0.00170***
Gov. Exp. (Per Person) ^a	0.00091**	6.5E-05**	-0.00017***	-0.00012
Cultural Factors (Proxy) ^a	2.74372***	3.31185***	0.58735***	0.71740***
	Fixed Effects: HICs-C 5.54347 MICs-C -0.10819 LICs -C -0.25965	Fixed Effects: Australia-C -1.73222 Austria-C -1.97532 Canada-C -1.94193 Denmark-C -0.64445 Finland-C -3.08617 France-C -0.75048 Ireland-C -2.76730 Japan-C -2.93056 Netherlands-C -6.79872 New Zealand-C -6.53703 Portugal-C -2.52245 Norway-C 2.69926 Spain-C -1.54793 UK-C -6.90492 U.S.A-C -1.26107	Fixed Effects: Algeria-C -0.37920 Brazil-C 0.24794 Chile-C -0.19004 China-C 0.34988 Ecuador-C 0.13612 Egypt-C -0.29930 El Salvador-C -0.02276 Guatemala-C -0.04012 Malaysia-C -0.19144 Mexico-C 0.03601 Morocco-C -0.19902 Philippines-C -0.29471 Tunisia-C -0.12336 Turkey-C 0.15662 Venezuela-C -0.29081	Fixed Effects: Cameron-C 0.70155 Cent. Africa-C 0.71276 Congo-C 0.60030 Haiti-C 0.81687 India -0.26726 Kenya-C 0.40319 Madagascar-C 3.38063 Mauritania-C 1.69420 Nicaragua-C 2.53389 Niger -1.43064 Pakistan -0.35157 Senegal-C 1.99416 Sierra Leone-C 1.07953 Togo-C 0.23886 Zambia-C 0.57869
R-Squared	0.76253	0.96421	0.99630	0.95154
Adjusted R-Squared	0.76092	0.96254	0.99613	0.94928
Durbin-Watson Stat	2.33272	2.39291	2.05724	2.28708
Log Likelihood	-4710.75	-392.086	548.401	-148.010
Sample	1970 2002	1970 2002	1970 2002	1970 2002
Included Observations	495 (33 * 15)	33	33	33
Number of Cross-Sections	3	15	15	15
Total Panel Observations	1485	495	495	495

- Source of data: World Bank Group, World Development Indicators (WDI) Online.

- ^a Computed from the same source.

- HICs: High Income Countries. MICs: Middle Income Countries. LICs: Low Income Countries.

- * Significant at 10% level, ** at 5% level, *** at 1% level.

5-2-2 The Analysis of Cross-Country Differences in Women's Labor Force Participation Rates

The above analysis investigates and explains the cross-country variations regarding the effect and the direction of each suggested explanatory variable on women's participation rate. However, this section offers how the cross-group differences in women's participation rates could be attributed to the differences in women's participation behavior for each group –the response of women's labour force participation rate to changes in explanatory variables- as well as to the differences in the average characteristics –the mean values of explanatory variables.

Tables 5.2 and 5.3 imply that there are two possible sources for the cross-country differences in women's labor force participation rates. The first one stems from the inter-group differences in average characteristics, while the other one comes from the inter-group differences in women's participation behavior.

5-2-2-1 The Inter-Group Differences in Average Characteristics

Table 5.2 offers the sample average characteristics of some related aggregate variables that might directly affect women's participation. This analysis covers the same sample used in estimating the Seemingly Unrelated Regression model in the previous section. It includes 15 countries from each level of income; low, middle and high income.

The first row shows the average GDP per capita in all groups. It is a key factor in this study by which countries are categorized under three groups: low, middle, and high income countries. Each group represents a phase of economic development i.e. early,

middle, and later stages of economic development respectively. There is a big gap in GDP per capita among the different countries. This variable has an important implication in previous empirical analysis. It shapes the relationship between women's labor force participation and some of the explanatory variables.

Table 5.2
Characteristics: The Mean Values of Explanatory Variables* 1970-2002

Group Variables	High Income	Middle Income	Low Income	Total Sample
GDP Per Capita (\$)	17824.74	2158.24	463.36	6815.45
GDP Annual Growth Rate (%)	3.06	4.63	2.64	3.36
Population Younger Than 15 Years Old. (% of Total Population)	22.02	38.81	44.38	35.07
Urbanization. (% of Total Population).	70.19	53.64	31.68	51.84
Education Expenditures. (\$ Per Person)	774.15	60.04	13.97	282.72
Government Expenditures. (\$ Per Person).	2815.27	203.77	62.64	1027.23
Cultural Factors (Proxy)	64.12	45.53	54.25	59.03

* Computed from World Bank Group, World Development Indicators (WDI) Online

The other rows in Table 5.2 show huge differences on average in the characteristics among the different groups such as the ratio of population less than 15 years old to total population, ratio of urban to total population, education and government expenditures per person, and cultural factors in favor of women's work. Besides GDP per

capita, low income countries have the lowest values in GDP annual growth rate, urbanization ratio, and education and government expenditures per person, but this group has the highest percentage of population less than 15 years. In general, high income countries have on average the most supported characteristics that might enhance women's participation, while middle and low income countries come in second and third place, respectively. However, these facts can help to some extent in understanding the cross-country variations in women's participation. Table 5.3 can provide the other part of the explanation by isolating the effect of characteristics' differences from the effect of women's participation behavior differences.

5-2-2-2 The Inter-Group Differences in Women's Participation Behavior

Women's participation behavior represents the responsiveness of women's participation rate to small changes in each suggested explanatory variable. It is measured by the values of fundamental coefficients in the regression analysis in the last section.

Differences in women's participation behaviors reflect the differences in the value that women place on time in non-market activities. The value of women's non-market time is directly related to the state of surrounding environments and factors. Therefore, the inter-group behavioral differences can be attributed to the cross-country differences in the state of other explanatory variables i.e. the stage of economic development, the level and reality of urbanization, the size and quality of education, presence and number of children as well as the related policies and services provided to children, the efficiency and fairness of government policies and expenditures...etc.

Each row in Table 5.3 shows the inter-group differences in women's participation rates after controlling for the differences in characteristics, assuming that all groups have the same set of characteristics on average, but each one has its own behavioural pattern. On the other side, each column assumes that all groups have the same behavioral pattern in terms of women's participation but each one has its own set of characteristics.

Table 5.3

Women's Participation Rates*: Cross-Country Differences

Women's Participation Behavior** Average Characteristics***	Women's Participation Behavior in High Income Countries.	Women's Participation Behavior in Middle Income Countries.	Women's Participation Behavior in Low Income Countries.
Average Characteristics for Women in High Income Countries	36.71	44.18	12.46
Average Characteristics for Women in Middle Income Countries	26.10	24.11	24.42
Average Characteristics for Women in Low Income Countries	30.73	27.91	28.15

*Calculated based on the results of Seemingly Unrelated Regressions Models for high, middle, and low income countries.

** : Using the parameters of SURE model. The responsiveness of women's participation rates to one unit change in each explanatory variable.

*** : The mean values of the explanatory variables.

Therefore, each row would answer a question such as what the cross-country differences are in women's participation rates that are attributed to differences in women's participation behavior, assuming all groups have the same set of related characteristics. Each column would answer a question such as what the cross-country

differences are in women's participation rates that are attributed to the differences in average characteristics, assuming all groups have the same behavioral pattern in women's participation.

According to the first row in Table 5.3, which assumes all groups have the same set of related characteristics on average as in high income countries, the women's labor force participation rates would be 44.18 and 12.46 percent for middle and low income countries respectively compared to 36.71 percent in high income countries. In this example, the difference of 7.47 percentage points between middle and high income groups is attributed mainly to the differences in women's behavior patterns between these two groups. Same explanation can be made for the 24.25 percentage points difference between high and low income groups. In general, women in high income countries enjoy high levels of education, GDP per capita, government expenditures...etc. However; this does not mean that women in low and middle income countries should participate more if they have the same set of characteristics as in high income countries. The pattern of participation behavior would determine the ultimate effect of these superior characteristics on their participation. In the case of middle income countries, Table 5.3 shows that women would participate more (44.18 percent) if they are enjoying the same set of characteristics as in high income countries. But this is not the case for women in low income countries. Women's participation rate in low income countries will be only 12.46 percent if they have the same set of characteristics as women in high income countries. This surprising finding can be explained by the fact that GDP per capita, urbanization and government expenditures have been found to have a negative impact on women's participation rate in low income countries, while they have a positive

impact in the case of high income countries. Thus, the pattern by which women's participation behavior would respond to changes in explanatory variables is the key factor to show the potential effect.

Accordingly, the first column in Table 5.3, which assumes all groups have the same behavior pattern in women's participation as in high income countries, the women's labor force participation rates would be 26.10 and 30.73 percent for middle and low income countries respectively compared to 36.71 percent in high income countries. The difference of 10.61 percentage points between high and middle income groups is attributed mainly to the differences in related aggregate characteristics between these two groups. The same explanation can be made for the 5.98 percentage points difference between high and low income groups.

5-3 The Analysis of the Gender-Gap in Economic Activity

Since the gender-gap in economic activity has revealed an important role in determining women's labor force participation rates, there is a need to understand how this gap across countries can be explained. Table 5.4 offers the empirical results of the analysis of gender-gap in economic activity as of 2003.

Gender-gap in economic activity is directly related to the supply side factors as well as to the demand side. Both factors that might affect women's and men's labor force participation rates should be considered in the analysis. Although there are many factors that might affect women's and men's participation and gender-gap in economic activity, this study simplifies the analysis by relating the cross-country variations in this indicator to gender-gaps in education, earning, employment, professional jobs, governmental

positions, and the variation in fertility rate. Recent data from the 2005 Human Development Report are used to analyze some possible sources of this gap.

Since there is a possible correlation between two of the explanatory variables i.e. general gender-gap in education and the gender-gap in tertiary education, the study estimates two specifications of OLS regression. The first specification includes, besides other variables, the general gender-gap in education, while the other includes the gender-gap in tertiary education.

According to the values of F-statistics and R square, the two specifications are significant. Mostly analyses of cross-sectional data encounter the problem of heteroscedasticity. Using White's general heteroscedasticity test, there is no evidence of this problem in the analysis.

In terms of the direction, both specifications in Table 5.4 provide empirical evidence that the gender-gap in economic activity is larger the larger gender-gaps are in education, estimated earned income, professional and technical jobs, employment at agriculture sector, and in governmental top level positions (ministerial positions). Accordingly, this finding argues that reducing the gender-gap in education would shrink the gender-gap in economic activity. The gender-gap in estimated income is also one of the most important sources for the gender-gap in economic activity. Holding all other things equal, higher labor income or wages for women compared to men would increase the opportunity cost for women's non-market time and raise their participation rates which, in turn, would reduce the gap between two genders.

Table 5.4
The Empirical Results of the Gender-Gap in Economic Activity.
(Method: OLS)

Dependent Variable: Gender-Gap in Economic Activity. The Ratio of Female Economic Activity Rate to Male Rate.				
Explanatory Variables	First Specification		Second Specification	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	-16.1793	-0.9351	22.9605	3.2472***
General Gender-Gap in Education†	0.3433	2.2467**	---	---
Gender-Gap in Tertiary Education	---	---	-1.6224	-0.5075
Gender-Gap in Estimated Earned Income†	0.7046	9.5879***	0.7538	9.8879***
Gender-Gap in Professional and Technical Jobs†	0.0427	1.8908*	0.0608	2.4834**
Gender-Gap in Employment at Agriculture Sector†	0.0983	3.9506***	0.0623	2.8224***
Gender-Gap in Governmental Top Level Positions †	0.0652	1.2465	0.0707	1.3793
Total Fertility Rate (Total Live Births Per Women).	-1.7084	-1.5303	-2.8291	-2.752***
R-Squared	0.8098		0.8097	
Adjusted R-Squared	0.7897		0.7900	
Log Likelihood	-207.4126		-211.2884	
Durbin-Watson Stat	2.2482		2.5973	
F-Statistic	40.4382		41.1171	
Included Observations	64		65	
Excluded Observations	87 after adjusting endpoints		86 after adjusting endpoints	

Source of data: Human Development Reports (2005). United Nations, UNDP. Most of data are as of 2003.

† Computed from the same source.

* Significant at 10% level, ** at 5% level, *** at 1% level.

Apparently, both the gender-gap in professional and technical jobs and the gender-gap in governmental high positions that reflect women's empowerment show a positive impact on women's participation rates. More access to professional and technical jobs would increase women's earned income as well as reduce their unemployment rates and raise their participation. Also, women's involvement in higher

governmental positions would help in changing the existing legislation and establishing new laws that might enhance women's participation.

Women's employment in industrial and services sectors would provide women with high labor earnings and more self actualization that definitely will raise their labor market participation. But for the agricultural sector, the role of the gender-gap in employment as a source of the gender-gap in economic activity is still questionable. Although the relative importance of the agricultural sector in terms of employment and as a share of total GDP has shrunk over time, the gender-gap in employment still reveals a positive impact on the gender-gap in economic activity. Thus, working in the agriculture sector is still an attractive opportunity for women.

On the other side, the negative sign of the gender-gap in tertiary education is due mainly to the fact that education and work are very close alternatives for most women at early stages of working age. The higher the women's enrollment ratio into college, the less likely they will be to participate in the labor force. However, this variable is statistically insignificant. Accordingly, the negative impact of fertility rate assures that more children are discouraging women's participation as expected. In other words, the higher the level of fertility rate, the lower the women's participation rate and the larger the gender-gap in economic activity. The impact of fertility rate is statistically insignificant in the first specification. This result is consistent with the findings of some recent studies that have showed there is a change in the direction of the relationship between fertility level and women's labor force participation, or at least, the negative relationship between them is no longer significant. This is due to the development of

child care services and governmental policies in favor of mothers' work, and the improvement in home technology appliances.

The gender-gap in education and the gender-gap in estimated earned income are the most important sources for gender-gap in economic activity. The gender-gap in professional and technical jobs and the gender-gap in employment in the agricultural sector are of approximately equal weight and of relatively less importance compared to education and earnings gaps. The gender-gap in governmental high-level positions in both specifications is statistically insignificant.

CHAPTER 6

WOMEN'S LABOR FORCE PARTICIPATION IN JORDAN: DESCRIPTIVE ANALYSIS

Jordan is a small country with a population of about five million people⁷. It is located in the Middle East and considered a lower middle income country⁸. Jordan has achieved a high level of human development. It is considered one of the top countries in terms of the educational attainment for both men and women. But the women's labor force participation rate is still very low compared to other countries in the same group – middle income countries. This issue still puzzles the scholars and policy makers in Jordan.

Based on this study's theoretical model, this chapter offers a descriptive analysis of women's labor force participation in Jordan in a comparative way with average middle income countries. More precisely, this chapter investigates the most recent status of Jordanian women in the labor market and relates this status to relevant aggregate economic, social, demographic, and cultural indicators as well as the government role. For comparison purposes, this chapter uses the aggregate indicators of the average middle income countries as appeared in chapter three of this study.

⁷ According to the Department of statistics, The Hashemite Kingdom of Jordan: Population and Housing Census 2004, the population size is 5.35 million as of 2004.

⁸ According to the World Bank classification, lower middle income economies are those in which 2004 GNI per capita is between \$825 and \$3,255. Middle income economies are those in which 2004 GNI per capita is between \$825 and \$10,065.

6-1 Women in the Jordanian Labor Force

Table 6.1 shows the status of Jordanian women in the labor market as of 2004. It offers important facts about their participation, employment and unemployment. Other relevant indicators are presented in this table to help in understanding the full picture of Jordanian women's participation.

According to the Department of Statistics in Jordan, the crude economic activity rate is the labor force participation rate of women between 15 and 64 years old. Different activity rates have been published from different institutions in Jordan. However, this rate of 20.7 percent is the highest one. Compared to the world and other middle income countries, this rate is considered very low. It is 20.7 percent compared to 65.1 percent for average middle income countries. Even for men, their activity rate is relatively low compared to that of the average middle income group. These two facts would explain the low participation rate of the total population in Jordan which is only 46.1 percent. However, the gender-gap in economic activity in Jordan is one of the largest in the world. Only around 29 women workers compared to 100 men workers are in the Jordanian labor force. In other words, the size of the women's participation in the labor force is only 29 percent of that for men. The result is worse when using other measures for the gender-gap in economic activity such as the ratio of women to the total labor force in Jordan; only around 22 out of 100 are women workers.

According to the study's theoretical model, the other items in Table 6.1 provide important facts that would help in explaining the low participation rate of Jordanian women in the labor force.

Table 6.1
Women in the Labor Force: Jordan 2004 (%)

Indicator	Percentage
Activity Rate (15-64)	
Total	46.1
Male	70.3
Female	20.7
Gender-Gap in Economic Activity*	29.4
Ratio of Females to Total Labor Force	21.9
Unemployment Rate	
Total	22.7
Male	17.5
Female	41.5
Ratio of Females Employment to Total Employment	16.5
Percentage of Employed Females in the Public Sector to Total Female Employment	43.9
The Employment Distribution in Public Sector	
Male	62
Female	38
Ratio of Employment in Education to Total Employment	
Total	11.1
Male	6.5
Female	34.7
Employment in Agriculture to Total Employment	
Total	4.1
Male	4.6
Female	1.4
Foreign Labor Force to the Total Jordanian Labor Force	
Total	13.2
Male	12.7
Female	14.8

*Computed from the table as the ratio of female/male activity rates.

Source: Department of Statistics, The Hashemite Kingdom of Jordan: 1-Population and Housing Census 2004. 2- Jordan in Figures 2004, issue 7, May 2005. And 3- Employment and Unemployment, Yearly Report 2004.

The unemployment rate in the Jordanian labor market is very high for both men and women compared to other countries from the same income group. It is 17.5 and 41.5

percent for men and women respectively as of 2004. In terms of women, the very high unemployment rate is one of the most significant factors in discouraging women's participation in Jordan.

In terms of employment, different relevant indicators have been selected to show the current status of women's employment in the labor market. The main one is the ratio of employed women to total employment. The very low contribution of women in employment, which is around 16.5 percent of total employment in the labor market, would confirm the fact that Jordanian women may experience job discrimination in the labor market. It is also providing reasoning for the low participation rate among Jordanian women.

The percentage of employed females in the public sector to total female employment and the employment distribution in the public sector are two indicators that would reflect the role of the government in enhancing the overall women's participation in Jordan. Employed women in the public sector constitute 43.9 percent of total female employment in Jordan. Also, women constitute 38 percent of total employment in the public sector. These two indicators provide two important facts. The first one is the role of government as the largest employer for women in Jordan and the second one is the desire of average women to work in "white collar" jobs. The high women's employment rate in the education sector, which is 34.7 percent of total female employment, supports the second fact.

The restrictions on the type and nature of jobs that are accepted by women would also provide an explanation for the low participation rate of women in the Jordanian labor

force especially with the shrinking role of the agricultural sector in employment - as a substitute for the service and manufacture sectors.

Finally, despite the fact that Jordan is a small economy and struggling with major economic puzzles such as high unemployment rate, persistent trade and budget deficits, lack of resources, and the inconvenient surrounding political situations in neighbouring countries, Jordan still hosts a large foreign labor force (guest workers), especially from Egypt and Syria. In terms of women, the non-Jordanian women make up about 15 percent of the total female labor force in Jordan. This does not mean that Jordanian women are ready to replace foreign women in the work force, but it gives an indication about the opportunity that is in front of Jordanian women to increase their participation. This topic needs more study into the type and nature of jobs occupied by foreign women and what educational and training skills are required to make Jordanian women ready and qualified for replacing the foreign women.

6-2 Economic Status and Women's Participation

Table 6.2 provides recent economic indicators over the period 2000 to 2005 on economic growth, GDP per capita, and some important facts that characterize the fiscal policy in Jordan. This section will employ this information in explaining the impact of economic growth and the role of government on women's participation in the labor force in Jordan.

Jordan has achieved high economic growth compared to other middle income countries. On average, the annual GDP growth rate over this period is about 5 percent. In 2004 and 2005, Jordan witnessed the highest economic growth rates, 8.4 and 7.2 percent

respectively. Despite this fact, Jordanian women have not benefited from this effervescent economic growth for two reasons⁹. First, the high economic growth was associated with a high inflation rate as expected without significant impact on the unemployment rate. The inflation rate has risen from 0.7 percent in 2000 to 5.6 percent in May 2005 while the unemployment rate has been kept high for the same period, increasing from 13.7 percent in 2000 to 14.8 percent in 2005. The second fact is that most of the economic growth, especially in the last two years, stems from the growth in specific sectors that do not hire many Jordanians men and women. These sectors depend to some extent on the guest work force such as the construction sector. In the first quarter of 2006, this sector grew by 18.5 percent and it is classified as one of the fastest growing sectors in the Jordanian economy.

In terms of GDP per capita, it is about average in middle income countries. In 2004, it was US\$ 2130 in Jordan compared to US\$ 2068.9 for the latter. Considering the high inflation rate, the steady rise in the level of GDP per capita over the period of 2000-2005 would deteriorate because of high living expenses and would not be sufficient to encourage people to invest more in their human capital. For the above reason, this study argues that the GDP per capita in Jordan is not enough to enhance the overall women's qualifications and enable them to participate more in the labor force.

Although the government in Jordan is the basic employer in the economy, the other indicators in Table 6.2 regarding the persistent budget deficit and the high public debt reflect the constraints that limit the government to be more involved in economic and social development. Many institutions have been established in Jordan to develop

⁹ These two facts are concluded from the Main Economic Indicators, Ministry of Planning and International Cooperation, The Hashemite Kingdom of Jordan.
<http://www.mop.gov.jo/uploads/Main%20Economic%20Indicators>.

women's status in society. But the lack of funds is always one of the factors that have impeded these institutions to enhance and enable women for more participation in public life and in the labor force. However, according to these indicators, the implementation of economic and social development plans in Jordan is constrained by foreign aid which has not been stable in terms of time and volume.

Table 6.2
Main Economic Indicators: Jordan (2000-2005)

Indicator/ Year	2000	2001	2002	2003	2004	2005
GDP Growth Rate (%)	4.2	5.3	5.8	4.2	8.4	7.2
GDP Per Capita at Current Prices (US\$)	1,725	1,809	1,883	1,954	2,130	2,325
Budget Deficit, % of GDP	3.4	3.6	4.1	2.5	1.9	5.1
Foreign Grants, % of GDP	5.6	6.8	6.3	11.0	9.9	5.1
Outstanding External Public Debt, % of GDP	84.2	78.7	80.4	76.4	67.4	55.5

Source: Ministry of Planning and International Cooperation, The Hashemite Kingdom of Jordan: Main Economic Indicators, online.

<http://www.mop.gov.jo/uploads/Main%20Economic%20Indicators>.

6-3 Demographic Characteristics and Women's Participation

Table 6.3 presents the most relevant demographic factors that would influence women's participation in the Jordanian labor force. Jordan is classified as one of the top countries in terms of fertility rate, above the average fertility rate among middle income countries. It was 3.5 in urban areas and 4.2 in rural areas as of 2004, while for the average middle income countries; it was only 2.11 for the same year. Furthermore, the high fertility rate has been reflected in high population growth rate, which is 2.6 percent in Jordan compared to 0.87 percent on average in middle income countries in 2004 and has

shaped the population structures in Jordan. This structure is characterized by a high percentage of young people in the population and a lower percentage in the working age category compared to average middle income countries. The ratio of the population under 15 years old to the total population in Jordan was 37.1% in 2004 compared to 25.45% for average middle income countries. And the ratio of the working age group to the total population in Jordan is 59.1% compared to 67.38% for the latter. Therefore, compared to other countries in the same income group, Jordan's society is characterized by a high level of fertility rate, high average household size, high population growth rate, high ratio of underage population, high dependency ratio, and a lower ratio of the population in the working age category. Therefore, according to the theoretical model of this study, mainly Becker's model of allocation of time, these unique demographic characteristics of Jordanian society have had a major influence on the low participation rate of Jordanian women in the labor force.

Finally, Jordan has a high percentage of urban population compared to the average middle income countries. In Jordan, social and economic opportunities for Jordanian women are less in rural than in urban areas. In rural areas, the largest employer is the government and the role of the government is shrinking over time because of the financial constraints and the budget deficit. Most of the private sector businesses are concentrated in the major cities such as Amman, Irbid, Zarqa, and Aquba. According to this study, the phenomenon of "over-urbanization" also would exist in the case of Jordan. Part of the high urbanization in Jordan is a matter of statistical definition and measures and not the real urbanization process associated with more social and economic development.

Table 6.3
Demographic Indicators: Jordan 2004

Indicator	Percentage
Population Growth Rate between 1994-2004	2.6
Population Structure: Population Less Than 15 Years of Age Population Age 15-64 Years Population Age 65+	37.1 59.1 3.8
Dependency Ratio	70.4
Percentage of Urban Population	82.3
Total Fertility Rate: Urban Rural	3.5 4.2
Average Household Size (Person)	5.4

Source: Department of Statistics, The Hashemite Kingdom of Jordan: Jordan in Figures 2004, issue 7, May 2005.

6-4 Education, Health and Women's Participation

According to the Human Development Report 2005, Jordan has achieved a high level of human development. Its human development index (HDI) was 0.753 and rank 90 as of 2003. In terms of adult literacy rate, combined gross enrollment ratio -for primary, secondary, and tertiary schools-, and the general education index, Jordan has made significant progress among the Arab countries and compared to the average middle income countries. For Jordan, these ratios are 89.9, 78, and 86 percent compared to 64.1, 62, and 61 percent for average Arab countries and 89.6, 73, and 84 percent for average middle income countries. Furthermore, the gender-gap in education as measured by the ratio of youth females' literacy rate to the males' rate has been eliminated in Jordan. This

ratio is 100 percent in Jordan compared to 87 and 99 percent on average for Arab countries and middle income countries, respectively.

The first part of Table 6.4 presents different educational indicators that reflect women's educational status and the role of government in 2004. The illiteracy rate has shrunk over time for both men and women but there are still about 13.6 percent of adult women who are considered illiterate compared to 6.6 percent for men. Also, the percentage of the adult population with high school education which is a primary requirement for entering labor force, is improving over time. A round 43.2 percent of adult Jordanian women have at least a high school education compared to 42.7 percent for men.

The female/ male enrollment ratios in different levels of education confirm the fact that Jordan has succeeded in overcoming the gender-gap in education. The government has played a major role in education development in Jordan. In 2004, public schools enrolled more than 70 percent of Jordanian students. The government spends about 16 percent of its budget on education, about 5.5 percent of the country's GDP, which is high compared to the average middle income countries.

The other part of Table 6.4 displays some health indicators. The female's life expectancy at birth, which is 72.4 years, is about the average for middle income countries and is above the average for the male. The 2.9 percent of government expenditures on health to country's GDP is less than the average of middle income countries. For the latter, it was around 6 percent of GDP in 2003. The infant mortality rate of 24 per 1000 live births is a positive health indicator compared to average Arab countries (48 per 1000 live births) and to the average middle income countries (29 per 1000 live births).

Table 6.4
Educational and Health Indicators: Jordan 2004

Indicator	Percentage
Part I: Educational Indicators	
Illiteracy Rate Among Population 15+ Years	
Total	10
Male	6.6
Female	13.6
Population 15+ Years with High School and Above	
Total	43
Male	42.7
Female	43.2
Female/Male Students Ratio in Secondary Education	100.0
Female/Male Students Ratio in Intermediate Diploma	155.6
Female/Male Students Ratio in University Education	100.1
Expenditures on Education, % of GDP	5.5
Expenditures on Education, % of Government Budget	15.9
Proportion of Students in Public Schools	70.3
Part II: Health Indicators	
Expenditures on Health, % of GDP	2.9
Expenditures on Health, % of Government Budget	8.5
Life Expectancy at Birth	
Male	70.6
Female	72.4
Infant Mortality Rate (Per 1000 Live Births)	24.0

Sources:

- Department of Statistics, the Hashemite Kingdom of Jordan: 1-Population and housing Census 2004, and 2- Jordan in Figures 2004, issue 7, May 2005.

- Ministry of Planning and International Cooperation, The Hashemite Kingdom of Jordan. Main Economic Indicators.
<http://www.mop.gov.jo/uploads/Main%20Economic%20Indicators>.

After the above analysis for the social background of Jordanian women, the question is why Jordanian women have not benefited from the high educational attainment over time. This issue can not be easily interpreted in this chapter, but some recommendations on this issue will be provided within the policy recommendation of this study.

6-5 Women's Participation in Public Life

Women's social and economic empowerment is one of the driving factors for more labor force participation. Table 6.5 offers some indicators that reflect the change overtime in Jordanian women's position in the decision-making process. These indicators reflect the social, political and economic status that have been achieved by women in Jordan and also would reflect the change in society's attitudes toward women's role in society.

Table 6.5
Women's Participation in Decision-Making Positions in Jordan

Indicator/ Period	1995/1997	2002/2003
GEM* value	0.22	0.30
Seats in Lower House Parliament Held by Women(as % of Total)	1.25	5.5
Female Administrators and Mangers (as % of Total)	4.6	9.9
Female Professional and Technical Workers (as % of Total)	28.7	30.1
Female Real GDP Per Capita (US\$)	1429	1247

* GEM is the Gender Empowerment Measure.

Sources: Human Development Report 2004. United Nations, UNDP.

http://www.undpjordan.org/jordan_hdr/JHDR_2004.pdf

The value of gender empowerment measure (GEM) is a reflection of the degree of participation in the decision-making process and measures the relative share of women in administrative, managerial, professional and technical positions. Although this indicator is still low compared to developed countries, it is relatively good in the region and it has made some progress over the period 1995-2003 from 22 to 30 percent which, indicates more engagement in positions of influence.

The source of the progress in GEM stems from the progress that has been made over the same period in the share of women in the lower house of the parliament, administration, managerial, professional, and technical positions. Since this progress has not been associated with more women's participation in the labor force, it is also one of the puzzles regarding the persistent low participation rate of Jordanian women.

6-6 The Characteristics of the Economically-Inactive Women in Jordan

Table 6.6 offers some characteristics of Jordanian women who are out of the labor force, the economically-inactive women. Based on Table 6.1, the ratio of inactive women is 79.3 percent to total females in the working age group 15-64 years. The amazing conclusions are that 38.4 percent of the women with a university education and around 70 percent of women with intermediate diplomas are economically inactive. So, the economically inactive women in Jordan are educated on average.

Another aspect is that about 93 percent of married women are economically inactive which is consistent with the theoretical model of this study. The responsibility of marriage and children is the main determinant for women's participation in Jordan. Around 77 percent of inactive women are classified as housekeepers.

According to Table 6.6, about 58 percent of economically inactive women believe that the unavailability of jobs is the main reason for inactivity, while about 14 percent of them believe that the inconvenience of the available jobs is the main reason for their inactivity. The first result indicates the discouraging effect of the high unemployment rate on Jordanian women's participation, while the second one indicates the high influence of cultural values on women's decisions regarding types of the jobs.

Table 6.6

Relevant Characteristics of the Economically-Inactive Women: Jordan 2004

Indicator	Percentage
Percentage of Inactive Women to Total Women with College Degree	38.4
Percentage of Inactive Women to Total Women with Intermediate Diploma	69.7
Percentage of Inactive Married Women to Total Married Women	92.7
Percentage of Housekeepers from Total Inactive Women	77.3
Percentage of Students from Total Inactive Women	21.7
The Main Reason of Inactivity According to Inactive Women:	
The Unavailability of Jobs	57.9
The Available Jobs are not Convenient	13.8

Source: Department of Statistics, The Hashemite Kingdom of Jordan: Employment and Unemployment, Yearly Report 2004.

CHAPTER 7

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

7-1 Summary and Conclusion

The empirical evidence from descriptive analysis reveals huge differences among low, middle and high income countries in women's activity rates as well as in economic, demographic, social, and cultural variables. However, controlling for the cross-country differences in these relevant factors does not completely explain the differences in women's participation rates across countries.

The empirical work in this study supports the main hypothesis that cross-country variations in women's participation rates in the labor force can be attributed to the cross-country variations in economic, social, demographic, government role and cultural factors. But the study also finds that part of the variations in women's participation is attributed to the variation in women's participation behavior in responding to the changes in the explanatory variables.

Despite the subtle differences among the different groups of countries, the study's empirical results are compatible with economic theory that stresses the importance of some aggregate level indicators such as education, fertility, GDP growth, GDP per capita, government role, urbanization, and cultural factors in determining the level of women's participation in labor force.

One of the most important findings in this study is that the stage of economic development is shaping the size and sometimes the direction of the possible impact of each of the suggested variables on women's participation rates. Examples of these variables are GDP growth rate, GDP per capita, fertility rate, government role, and urbanization ratio. These variables have shown variations in the impact and direction on women's labor force participation rates according to the stage of economic development.

The empirical findings of the aggregate model that includes all 45 countries from low, middle and high income countries have depicted a positive impact for GDP annual growth, education, government role, urbanization, and cultural factors on women's participation in labor force and a negative impact for GDP per capita and fertility rate.

For the individual groups, there are common findings that all models of low, middle and high income countries have agreed on. i.e. educational and cultural factors in favor of women's work induce more women's participation in all countries.

On the other hand, different models have depicted different results regarding other variables. As an example, GDP annual growth rate reveals a positive impact on women's participation in low and high income countries and a negative impact for middle income countries. This finding advocates the dominance of the "discouraged worker effect" in low and high income countries and the dominance of the "added worker effect" in middle income countries. The percentage of population younger than fifteen years old as the proxy of fertility has shown a negative impact only in the cases of high and middle income countries and a positive effect on women's participation in low income countries. In low income countries, the heavy participation of women in the agricultural sector and

on family farms enables them to assume dual roles as mother and worker at the same time.

The income effect as measured by the response of women's participation to the change in GDP per capita also reveals a positive impact in high and middle income countries and a negative impact in low income countries. This assures the prevalence of a negative income effect at early stages of economic development. Accordingly, the suggested U-shaped relationship between GDP per capita and women's participation rate has been proven only in the case of high income countries. In low and middle income countries, an inverted U-shaped relationship has been depicted between these two variables.

Apparently, the urbanization effect is different in the low income group compared to middle and high income groups. More specifically, urbanization shows a negative impact on women's participation in low income countries. This finding supports the hypothesis of the over-urbanization phenomenon in low income countries. This stems from the fact that the agricultural sector is still the largest employer for women in low income countries. Thus, the process of transition to industrial and service sectors without a satisfactory development in women's education and skills would reduce the job opportunities for women and then decrease their economic activity rate.

Government role as measured by the government expenditures per person does not reveal a clear impact on women's participation. As expected, it reveals a positive impact on women's participation in high income countries, while in low and middle income groups, it is negative and insignificant. In most developing countries, the policies

regarding government expenditures are not well organized and not targeted to the less fortunate people in the society such as women and children.

In terms of the main sources for the variations in women's participation rates, the empirical findings have shown how these variations can be attributed to the inter-group variations in average characteristics and to the inter-group variations in women's participation behavior.

Furthermore, the study confirms the importance of the gender-gap in education and earned income as major sources for the gender-gap in overall economic activity. Other variables that reflect women's empowerment such as the gender-gap in governmental high-level positions assume a less important role in explaining this gap, while the cross-country variations in fertility rate have shown a negative and significant role in explaining the gender-gap in economic activity.

For the special case of Jordan, the main conclusion is that despite the significant progress that Jordanian women have made in terms of education and participation in public life, their labor force participation rate is relatively low compared to the average middle income countries. The study concludes with some possible explanations for this puzzle. First, the high unemployment rate has a discouraging effect among Jordanian women. Second, the demographic characteristics of the Jordanian family are very restrictive for more women's participation. Third, possible job discrimination in the labor market against women has resulted in a low female employment rate. Fourth, the high influence of cultural factors are limiting women's job opportunities by urging them to choose specific jobs such as those in the education sector. And fifth, the negative

influence of the high competition of the foreign workers who accept low wages on the domestic participation rates for men and women.

7-2 Policy Implications

Besides the cross-country variations in relevant factors, it is obvious that the way by which women's participation behavior responds to these factors places value on non-market time and is the key factor to understanding the cross-country variations in women's participation rates. Based on the results of the empirical work, several policy implications can be drawn to encourage more women's participation in the labor force. These policy implications require a revision of each country's economic and social development plans especially in low and middle income countries. .

The budget constraint is such an important factor that it should be considered while addressing the policies implications. Two potential ways are suggested by this study to overcome this problem. First, by assuming that most developing countries are facing funds problem to implement their economic and social development plans, they should be encouraged to reallocate some of the military allowances to these beneficial plans. According to the World Fact Book¹⁰ in 2005, the top 10 countries in terms of military expenditures as a percentage of GDP are developing countries. The second potential source for more funds is the international financial support from industrial countries and international institutions such as the United Nations, the IMF and the World Bank.

¹⁰ The World Fact Book. <https://www.cia.gov/cia/publications/factbook/rankorder/2034rank.html>

In terms of the social development, education is a key factor in women's participation in the labor market. It has a direct positive impact on women's participation and in reducing the gender-gap in economic activity. Indirectly, education would help in shaping the cultural factors that reflect the society's attitudes toward more women's labor force participation. Education is a benchmark in enabling and empowering women to attain their right position in the society. Although education has shown positive impact on women's participation rates in low and middle income countries, the relative impact of this important factor is very small compared to high income countries. Thus governments in low and middle income countries are encouraged to adopt more efficient educational policies that might improve the general level of women's education -decrease the gender-gap in education- which, in turn, raise women's participation.

Most developing countries have a compulsory enrollment policy for both boys and girls in primary and secondary education, but in reality, this policy is not enforced especially for girls' education. This would explain why educational expenditures per person in low and middle income countries have not brought the expected results. Enforcing girls' education will bring long-run positive economic and social consequences. Also, a change in the quality of the existing education is recommended for more understanding of the gender role and population policies such as reducing the fertility rate.

The improvement in the society's educational level alone is not enough to change the cultural factors and the attitudes toward women's work. The recent empirical evidence argues that some countries such as Egypt, Jordan and Spain have achieved high levels of education for women and still have low women's participation rates compared to other

countries in their groups. So, for the importance of cultural factors in determining the level of women's participation in the labor force, governments as well as women's movements have a big responsibility in facilitating changes in societies' attitudes toward women's work. However, this goal needs a long time to be achieved. Women's political participation is also recommended for more women's empowerment and to strengthen democracy. The low impact of the cultural values as measured by the adjusted gender-gap in economic activity in low and middle income countries compared to high income countries requires these countries to focus more on demand side factors to enhance women's participation in the labor market.

Also, for the negative and insignificant impact of the government expenditure on women's participation rates, government policies in low and middle income countries should be modified in such a way to focus more on women and children. Government policies should support gender equality and poverty alleviation which in turn would provide solid grounds for more women's involvement in economic activities. Again, the IMF, World Bank, United Nations, and the international community have a big role in encouraging less developed countries to practice efficient and fair government policies.

In the labor market, a conducive governments' role is recommended to support women's labor market attachment or the employment continuity of married women by establishing and enforcing efficient labor market policies such as paid maternity leave, child care support, and anti-discrimination in the labor market. Also, since part-time jobs are uncommon in less developed countries, governments can use tax incentives to encourage the private sector to offer part-time jobs which are most suitable for married women.

Regardless of the positive impact of the population who are younger than fifteen years old on women's participation in low income countries, this group of countries is still experiencing high population growth rates and fertility rates compared to high income countries. For the sake of social and economic development and for the quality of human capital, both low and middle income countries should work hard in reducing fertility rates. The most efficient way to achieve this goal is by addressing this important issue through the education process at all levels.

Urbanization is not always conducive to positive social and economic changes. In the least developed countries, the over-urbanization phenomenon is a depressing factor for women's participation. Therefore, government in low income countries should devote more efforts in developing rural areas in such a way that discourages local immigration to urban areas. Also, governments should provide women in urban areas with the basic training to take advantage of the new job opportunities in the service sector.

More women's participation is usually impeded by economic, social and institutional factors. Therefore, this study recommends that less developed countries follow the successful experience of the Grameen Bank in Bangladesh. It is the most efficient and practical opportunity to encourage more women's participation. The "microfinance without collateral" principle has proven to be a successful idea that has increased women's participation and alleviated poverty. It is the idea of creating economic and social development from below. The fund sources of this project are direct loans, grants, loan guarantees, individuals, philanthropists, foundations, governments, international institutions such as the World Bank.

Based on the empirical work of this study, all countries could enhance women's participation by focusing in the first place on demand side factors and on the quality of human capital by improving the quality of education. However at each stage of economic development, policy suggestions will take a different order of importance. As an example, low income countries could also enhance women's participation by placing less importance on the negative impact of both urbanization and government's role while middle income countries should focus more on population policies beside the government's policies.

Finally and based on the results of the descriptive analysis for the case of Jordan, this study suggests several policy alternatives. i.e. more research is recommended on the effectiveness of the education process in Jordan to be more consistence with the needs of the labor market. The nature and quality of education should be revised to target the market needs. This policy would reduce the unemployment rates among Jordanian women and enhance their participation rates. Also, the role of education should be extended to change the way that people look at the different types of jobs -high and low prestige. The high concentration of the foreign work force in low prestige jobs provides evidence for this phenomenon. So, for future replacement plan as a suggestion for reducing the unemployment rate and enhancing the labor force participation rates for both women and men, the new Jordanian generations should be ready and qualified to step in and replace the foreign work force.

The high concentration of women's employment in government jobs, specifically in the education sector, raise the question of what types of jobs are convenient and accepted by economically inactive women within the context of family responsibilities

and cultural values. Therefore, more women's studies to investigate this important issue are recommended.

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APPENDIX A: RELEVANT INDICATORS

Table A1

Female Labor Force Participation Rates and Some Relevant Indicators. An Aggregate-Level Comparison: Low, Middle and High Income Countries.

Year	1962			1982			2003		
	H	M	L	H	M	L	H	M	L
Female Labour force participation rate (% of total female population)*	27.14	35.01	35.58	35.39	39.26	33.67	41.12	44.27	33.91
Female Labour force (% of total labour force)	32.52	37.96	37.55	38.82	40.60	37.18	43.15	42.29	37.64
Population ages 15-64 (% of total)	62.66	55.52	55.32	65.83	60.15	55.03	67.07	66.80	59.05
Population growth (annual %)	1.36	1.56	2.32	0.75	1.69	2.43	0.63	0.90	1.81
Urban population (% of total)	62.43	30.29	16.58	70.64	38.81	23.27	76.43	52.46	30.31
Fertility rate, total (births per woman)	2.97	5.94	6.52	1.86	3.05	5.53	1.72	2.12	3.64
Life expectancy at birth, female (years)	72.12	57.29	43.83	77.71	68.13	53.68	81.34	72.03	59.00
GDP per capita (constant 2000 US\$)	9630	673	210	17315	1252	263	27020	2019	429

Source: The World Bank Group, World Development Indicators (WDI) Online. Where **H**: High income countries. **M**: Middle income Countries. And **L**: Low income countries.

* Computed from the same source.

Table A2
The Difference between the Regular and Adjusted Gender-Gap in Economic
Activity: Selected Countries 2005

Selected Countries	Female Labor Force Participation Rate* (%)	The Regular Gender-Gap in Economic Activity* (%)	The Adjusted Gender-Gap in Economic Activity* (%)
Australia	45.74	81.48	79.49
Brazil	41.42	72.94	70.89
Canada	50.22	84.95	83.48
China	54.47	84.80	89.48
Denmark	48.56	86.07	84.33
France	39.87	80.69	76.61
Georgia	41.47	68.59	61.44
Hungary	35.93	74.74	67.93
India	23.13	41.65	43.83
Italy	32.45	63.01	59.42
Jordan	17.61	34.95	37.82
New Zealand	48.10	84.20	81.36
Oman	13.98	25.23	32.38
South Africa	31.75	59.69	57.59
Spain	38.75	67.16	64.81
United kingdom	45.76	81.36	77.73
United states	47.72	67.58	80.56
Low-Income Countries	29.13	55.41	57.11
Middle-Income Countries	43.15	73.17	73.67
High-Income Countries	41.94	75.63	73.62
World	37.89	67.58	68.27

Source: The World Bank Group, World Development Indicators (WDI) Online.

Where:

- Female labor force participation rate is the ratio of female labor force to the total female population.
- The regular gender-gap in economic activity is the ratio of females to males' labor force participation rates.
- The adjusted gender-gap in economic activity is the ratio of females to males' labor force participation rates to their ratio in population.

* Computed from the same source.

APPENDIX B: DATA SOURCES, COUNTRIES CLASSIFICATION AND VARIABLE DEFINITIONS

Data Source

Two main sources for the data used in the analyses are first, The World Bank Group, World Development Indicators (WDI) – online time series - and the 2005 version of the World Development Indicators and second, the 2005 Human Development Report.

Countries Classification

The study used the World Bank definition to classify countries under three major groups:

High income: High income group aggregate. High-income economies are those in which 2004 GNI (Gross National Income) per capita is \$10,066 or more.

Middle income: Middle income group aggregate. Middle-income economies are those in which 2004 GNI per capita is between \$824 and \$10,065.

Low income: Low income group aggregate. Low-income economies are those in which 2004 GNI per capita is \$825 or less.

However, there are only 95 countries that have a complete or satisfactory series of online indicators until 2002. 26 high income countries, 37 middle income countries and

32 low income countries. There are 45 countries that have been chosen randomly for the study sample, 15 in each group. These countries are:

High income countries are Australia, Austria, Canada, Denmark, Finland, France, Ireland, Japan, Netherlands, New Zealand, Portugal, Norway, Spain, United Kingdom, and U.S.A.

Middle income countries are Algeria, Brazil, Chile, China, Ecuador, Egypt, El Salvador, Guatemala, Malaysia, Mexico, Morocco, Philippines, Tunisia, Turkey, and Venezuela.

Low income countries are Cameron, Central Africa, Congo, Haiti, India, Kenya, Madagascar, Mauritania, Nicaragua, Niger, Pakistan, Senegal, Sierra Leone, Togo, and Zambia.

Variable Definitions

Here are the definitions of the variable used in the cross-country analysis of the differences in women's labor force participation rates. The starred variables are compute from the same data source, the World Development Indicators (WDI) Online.

FLFPR*: Female labor force participation rate. It is the ratio of female labor force (employed and employed females) from the total female population.

GDP growth: it is the annual growth rate in GDP.

GDP per capita: GDP per capita. Total GDP divided by total population.

Per person government expenditures*: It is the general government final consumption expenditures divided by total population.

Fertility rate: It is the total live births per women. The alternative is the percentage of population under 15 years of age to the total population.

Urbanization ratio: Ratio of urban people to total population. According to the United Nation classifications, localities with 20,000+ population and large cities with 100,000+ populations are considered urban areas.

Per person educational expenditures*: It is the total expenditures on education per person.

The cultural factors proxy*: It is the female-male ratio in labor force to their ratio in total population.

For the gender-gap analysis, different gender-gaps are computed depending on data from 2005 Human development Report. The starched variables are computed from the same source. The used variables are defined as following:

Gender-gap in economic activity: it is the female economic activity rate as a ratio of male's rate (15-64).

GEND₁*: General gender-gap in education: it is the ratio of female to male in terms of combined gross enrollment ratio for primary, secondary, and tertiary education.

GEND₂: Gender-gap in tertiary education. It is the ratio of female to male in terms of the gross tertiary enrollment ratio.

GEND₃*: Gender-gap in estimated earned income. It is the ratio of female to male in terms of the estimated earned income.

GEND₄*: Gender-gap in professional and technical jobs. It is the ratio of female to male in professional and technical jobs.

GEND₅*: Gender-gap in employment at agriculture sector. It is the ratio of female to male in terms of employment in agriculture sector.

GEND₆*: Gender-gap in governmental top level positions. It is the ratio of female to male in government at ministerial level.