Female Labor Force Contribution to Economic Growth

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Abstract

This research has examined the hypothesis that level of women participation in workforce, as measured by female labor force participation rate, has a positive effect on economic growth. Using both the classical Solow's growth model and a version of Mankiw, Romer, Weil augmented Solow's model, this paper incorporates female and male labor forces into the model as separate explanatory variables for growth. The augmented Solow's model was then used to estimate the influence of female labor force on the steady-state level of income. The Ordinary Least Squares (OLS) estimation of this equation uses cross-sectional data on 122 countries around the world. Then both models were estimated using panel data from year 1998 to 2016 for 5 groups of countries categorized by World Bank according to their income level. Since the variables do not have the same order of integration, Autoregressive Distributed Lag (ARDL) approach was employed. The behavioral variables have the expected positive signs, implying that all factors have positive contributions to growth. The coefficients of female labor force have positive signs and are significant in almost every case, confirming the hypothesis of positive contribution of female labor force on growth.

Keywords: Economics growth, women participation, women and growth, growth accounting, female labor force participation
***JEL Classification Codes*:** J, O

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1. Introduction

In the world that we all live in today, half of population are women. Women around the world are all engaging in different kinds of activities. According to the information collected by International Labor Organization (ILO) in 2013, women perform two-thirds of the hours work but receive only one-tenth of world's income, and have less than one-hundredth of the world's property registered under their names. Their existence within the labor market fall far behind men. In most countries the number of women who are economically active is substantially lower than that of men, as reported in Figure1. Even though women work longer hours as mention in ILO (2013), they are often engaged in unpaid or non-market activities such as childbearing, kitchen and house work or engaged in under-paid jobs as in an informal sector. Recent estimates by UNDP in Human Development Report (2016) show that women perform 75 percent of the world's unpaid work, though subsidizing the global economy, remains understated. The labor force participation rate of women in developed countries has increased considerably but that is not the case for the developing world. Despite the significant improvement of women education stated in Figure2, the labor force participation rate of women has remained significantly lower than that of men. ILO Report (2010) confirms that over 865 million women worldwide have potential to contribute in different aspects of labor markets in their domestic economy. Unfortunately, 94 percent (812 million) live in developing nations, with low female participation rate in labor market, facing significant barriers to full economic contribution. The difficulty of accessing to labor market, particularly in managerial position, might be due to an unequally treated of women compared to men as reported in Dolezelovz et al, 2007.

Recent economics literature shows increasing attention on the role of women in labor force towards the economic development. Some state that an increasing activities of female labor force is due to an increase in education and a dynamic of economic activities. As the size of economy expands women have easier access to labor market, leading to an increase in women participation in the productive activities. Increasing women participation in economic activities is considered necessary for many reasons; it improves their social and economic position and hence leading to an increasing in overall economic efficiency of the nations, it decreases gender gap in human capital leading to higher productivity of women in labor force hence increasing sectoral share of women employment in different sectors of the economy.

Despite recent economic development theories, the information shown in Figure1 still confirms a considerably difference between female and male labor force participation rate in paid market activities. As female's education improves, their opportunities in the market economy should be improved, but an information in Figure2 shown otherwise. Even though the level of education of female and male are almost indifferent, even higher for women considering tertiary school enrollment or higher education, an access to labor market remains harder for women compared to men. Why women are treated differently in labor market? Why men are more desirable in labor market in most of the countries? Is it due to the differences in productivity or something else? This research attempts to study a contribution of female labor force toward economic growth. Using an approach analogous to "growth accounting," this paper estimates both the directions and magnitudes of the effects of female labor force participation on income. The expected outcome would be a positive impact of female labor force on growth of a similar magnitude of male labor force. If the result is as expected, female and male labor forces are then indifferent in terms of productivity and contribution toward economic growth. The fact that men are

more desirable in labor market might be due to other factors. As reviewed in many literatures from past to present, women have always been seen as a cut-rate labor force, mostly due to social norm and tradition such as religious beliefs, ethnicities, cultures, norm of the societies, family and community structure. Other measures such as education level and economic development level of the country are also seen as the causes of differentiated wages. Well-designed government policies are crucial in promoting female participation in market activities these transferring hidden contributions of women as unpaid family worker to a contribution toward economic growth.

Economists have long paid attention on "growth accounting" in measuring the contributions of different factors to economic growth. Growth accounting decomposes the growth of total output into the increase in contributing amount of factors used. Factors in consideration such as physical capital, labor, technology, human capital are taken into account as in Solow (1956), Barro and Sala-i-Martin (2004), Grossman and Helpman (1991), Mankiw, Romer, and Weil (1992), Kim and Lau (1996). Nonetheless, emphasis on the contribution of female labor force toward economic growth is very limited.

Romer (1991) reviewed that an advancement in technology lead to higher level of productivity of the countries, higher exports hence higher economic growth. The studies of Edwards (1992), Levin and Raut (1997) realized that countries with higher human capital level would benefit more from technological transfer that comes with semi-industrial imported goods. Barro (1992) uses endogenous growth model to analyze economic growth. Wang (2011) indicates that an expenditure on health has a positive effect on growth. Mcdonald and Roberts (2004) examine the relationship between health indicators such as HIV/AIDs and malaria prevalence rates, infant mortality rate and economic growth. Agiomirgiankis et al (2002), Brunello and Comi (2003), Kwabena (2005), Oketeh (2005) and Liberto (2006) used education as a proxy of human capital and studied its contribution toward economic growth. Dash and Sahoo (2010) used Two-Stage Least Squares (TSLS) and Dynamic Ordinary Least Squares (DOLS) as a tool to investigate the relationship between infrastructure and growth in India. Beck and Levine (2004), Habullah and Eng (2006), Leitao (2010) studied how money market, capital market, and bond market affected economic growth.

When it comes to the issues of gender, most economists tend to put focus on investigating the determinants of female labor force participation. The literatures offer rich discussion on the factors and characteristics affecting female labor force participation. 0'Neil (1981), uses time series data on female wage and husband income to examine married women employment rate in the US. Iglesias (1995) found a positive relationship between level of female education and female labor force participation rate in Spain. Nanfosso (2010) uses cross-section data to explore relationship between fertility rate, health and female labor force participation in Cameroon. Forgha and Mbella (2016), using time series data and Generalized Method of Moments (GMM) estimation, observed that fertility rate, dependency ratio per capita income, male labor force are clear determinants of female labor force in Cameroon. Mazalliu and Zogjani (2015) observed a negative impact of government effectiveness, economic growth on female labor force and a positive impact of financial market development, enterprises reforms and innovation on female labor force in South Eastern European countries. Mishra and Smyth (2009) found an inverse relationship between fertility rate and female labor force participation among 28 OECD countries. Subramaniam et al (2015) also found an inverse relationship between fertility rate and female labor force participation among ASEAN-5 countries.

A rich set of papers document a U-shape relationship between female labor force participation and economic growth. For example, Tensel (2002), Lechman and Kaur (2015), Mujahid and Zafar (2012), Dogan and Akyuz (2017), Tsani et al (2013).

Self and Grabowski (2003), using time series data with Granger Causality, found a positive impact of female education on economic growth in India. Jayasuriya and Burke (2012), using panel data on 119 countries and GMM estimation, indicate that number of women in parliament has a positive effect on growth of the nations. Kimmel (2006) studied the impact of child care on women employment. The result suggesting that government should encourage woman participation in labor force by a suitable policy toward childcare. Since women with child are most likely to be skilled labors, encourage their employment will in turn encourage growth. Tsani et al investigate the relationships between female labor force participation and economic growth in the South Mediterranean countries

In term of inequality, Dursan (2015) analyses the impact of wage inequality on economic growth of 16 OECD countries. Seguino (2000) observed the positive relationship between wage inequality and economic growth in semi-industrialized export-oriented economies. Majority of female workers with lower wages are engaged in a production process of exporting goods, leading to lower cost and higher export, hence higher economic growth.

Although there are wide range of economics literatures on growth accounting, there is still not any work on the direct investigation into the contribution of female labor participation on economic growth. One can also see from above that most of the literatures related to gender focus on the determinants of female labor force participation, the U-shape relationship between female labor force participation and economic growth, and the relationship between inequality and growth. The primary goal of this research is neither an attempt to find the key determinants of female labor force participation nor the effect of wage inequality on growth. But this research will try to estimate the contribution of female labor force to economic growth using an approach analogous to "growth accounting." The paper will attempt to see how much of the cross-country variation in income can account for female labor force. The rest of the paper is organized as follows. Next section reviews the models, the employed methods, and the descriptions of data. Followed by the discussions of results. The last section concludes with some policy implications.

2. The model

In order to estimate the contribution of female labor force to economic growth, this research begins with a version of augmented Solow growth model suggested by Mankiw, Romer, and Weil in 1992. Solow's model takes the rates of saving, population growth, and technological progress as exogenous. There are 3 inputs, human capital, physical capital, and labor, which are paid their marginal products. Assuming Cobb-Douglas production function, a production at time t is given by

$$Y = AK^{\alpha}H^{\beta}L^{1-\alpha-\beta} \quad (1)$$

Where Y is output, K is physical capital, H is human capital, L is labor, and A is technology. Assume further that female and male labor force are accounted for the total labor force of an economy $(L_f + L_m = L)$. This allows us to incorporate both female and male labor force participation into the model separately as an additional explanatory variable.

The augmented production function is as follow:

$$Y = AK^{\alpha}H^{\beta}(L_f + L_m)^{1-\alpha-\beta} \quad (2)$$

Production function in per capita form;

$$\frac{Y}{L} = \frac{AK^{\alpha}H^{\beta}(L_f + L_m)^{1-\alpha-\beta}}{L}\left(\frac{L^{\alpha}}{L^{\alpha}}\frac{L^{\beta}}{L^{\beta}}\right)$$

$$y = \frac{Ak^{\alpha}h^{\beta}(L_f + L_m)^{1-\alpha-\beta}}{L^{1-\alpha-\beta}} \qquad (3)$$

$$y = Ak^{\alpha}h^{\beta}\left(\frac{L_f + L_m}{L}\right)^{1-\alpha-\beta}$$

$$y = Ak^{\alpha}h^{\beta}(f+m)^{1-\alpha-\beta}$$

Where $k = K/L$, $h = H/L$, $y = Y/L$, $f = \frac{L_f}{L}$, and $m = \frac{L_m}{L}$.

Let s_k be the fraction of income invested in physical capital and s_h in human capital. The evolution of the economy is governed by

$$\dot{k} = s_k y - (n+g+\delta)k \qquad (4)$$

$$\dot{h} = s_h y - (n+g+\delta)h \qquad (5)$$

Assume that both physical and human capital depreciates at the same rate δ. L and A are assumed to grow exogenously at rate n and g. Assume $\alpha+\beta<1$, which implies that there are decreasing returns to all capital. Equation (4), (5) imply that the economy converges to a steady state defined by

$$k^* = \left[\frac{s_k^{(1-\beta)}s_h^{\beta}}{n+g+\delta}\right]^{(1/1-\alpha-\beta)} \qquad (6)$$

$$h^* = \left[\frac{s_k^{\alpha}s_h^{(1-\alpha)}}{n+g+\delta}\right]^{(1/1-\alpha-\beta)} \qquad (7)$$

Substituting (6), (7) into the production function in (2) and taking logs we get an estimating equation as following

$$\ln y = \ln A + \frac{\alpha}{1-\alpha-\beta}\ln s_k + \frac{\beta}{1-\alpha-\beta}\ln s_h - \frac{\alpha+\beta}{1-\alpha-\beta}\ln(n+g+\delta) + (1-\alpha-\beta)\ln f + (1-\alpha-\beta)\ln\left(\frac{m}{f}+1\right) \qquad (8)$$

This augmented Solow's model can be used to estimate how these variables influence the steady-state level of income.

3. Estimating methodology

To analyze the contribution of female labor force on economic growth, the estimating equation (8) above was estimated by Ordinary Least Squares (OLS) method using cross-sectional data on 122 countries around the world. The coefficients for female labor force participation are expected to be positive because women are expected to contribute to output growth.

In order to further investigate the dynamic results of each specific income groups, we engaged the following models.

In addition to the above estimation equation, the production functions in both classical Solow model and Mankiw, Romer, Weil models, which incorporate

human capital as another explanatory variable to growth, were augmented to account for female and male labor forces separately. These 2 models have been extensively used in a series of studies concerning "growth accounting." Economists are widely agreed that although these models may not be a complete theory of growth but it certainly gives the right answers to the questions it is designed to address.

Again, assume a Cobb-Douglas production function. Follow Solow growth model, production of i country at time t is given by

$$Y_{it} = K_{it}^{\alpha} \left(L_{fit}\right)^{\beta} \left(L_{mit}\right)^{1-\alpha-\beta} \quad (9)$$

Dividing both sides by L_{it} and taking logs we get an estimating equation as

$$\ln y_{it} = \alpha \ln k_{it} + \beta \ln f_{it} + (1-\alpha-\beta) \ln m_{it} \quad (10)$$

Follow augmented Solow growth model as suggested by Mankiw et at, production of i country at time t is given by

$$Y_{it} = K_{it}^{\alpha} H_{it}^{\beta} \left(L_{fit}\right)^{\gamma} \left(L_{mit}\right)^{1-\alpha-\beta-\gamma} \quad (11)$$

Dividing both sides by L_{it} and taking logs we get an estimating equation as

$$\ln y_{it} = \alpha \ln k_{it} + \beta \ln h_{it} + \gamma \ln f_{it} + (1-\alpha-\beta-\gamma) \ln m_{it} \quad (12)$$

Then the equations (10), (12) were estimated using panel data from year 1998 to 2016 for 5 groups of countries as categorized by World Bank according to their income level. The sample countries are also categorized into 7 regions. Before estimating the panel model, this paper employs 4 of unit root tests which are Levin, Lin & Chu (LLC) test, Im, Pesaran & Shin (IPS) test, Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test to check the stationarity properties of the variance. Some of the variables are stationary at level, I(0) and some are stationary at first difference, I(1). Because the variables do not have the same order of integration, Autoregressive Distributed Lag (ARDL) approach to cointegration was used to estimate the models. Once again, the coefficients for female labor force participation are expected to be positive.

4. The Data

Data on population were taken from International labor organization (ILO) database. This database contains information on 217 countries but only193 countries have a complete data on GDP per capita, the dependent variable. From a sample of 193 countries, there are only 147 countries that have data on female labor force participation rate, male labor force participation rate, and secondary school enrollment rate. These are the explanatory variables used to estimate the models. Another explanatory variable used in estimating these models is physical capital which was obtained from the World Bank database. From a sample of 147 countries, there are only 122 countries whose data coincide with the information from World Bank database. This study therefore used data of 122 countries from year 1998 to 2016 as shown in Table 1 below:

Table 1: Data Description

Variable	Notation	Mean	Minimum	Maximum	Standard deviation	Units
GDP per capita	*y*	12,391	102	119,225	17,916	Current US$
Female labor force	*F*	41.15	8.09	55.61	8.85	% of total labor force
Male labor force	*M*	58.85	44.39	91.9	8.85	% of total labor force
Human capital	*H*	0.97	0.35	1.54	0.15	% gross
Physical capital	*K*	23.63	1.70	67.91	7.59	% of GDP

Table 2: Steady State Level of Income and Female Labor Force Participation (Augmented Solow's model as suggested by Mankiw et al, 1992)

Constant	4.690 (3.380)
ln(female labor force)	1.020** (0.398)
ln(human capital)	0.390 (0.700)
ln(physical capital)	-0.020 (0.050)
$\ln(n+g+\delta)$	3.730*** (1.035)
$\ln(\frac{m}{f}+1)$	1.490** (0.728)
Durbin-Watson stat	1.630
Log likelihood	-142.170

Dependent variable is log of per capita income. The standard errors are in parenthesis.
***, **,* represent 0.001, 0.05 and 0.1 level of significance respectively.

According to ILO, Female labor force participation is the percentage of female labor force participation to total labor force participation. Male labor force participation is the percentage of male labor force participation to total labor force participation. Human capital indexes used in his paper proxy by the percentage of secondary school enrollment. Physical capital proxy by the percentage in gross capital formation. While *n* is a population growth, *g* is technological growth, and δ is rate of depreciation. We assume that $g + \delta = 0.05$ as suggested in Mankiw et al;

reasonable changes in this have little effect on the estimates.

For a panel model, the samples are categorized into 5 income groups following World Bank criteria which are

1. Low Income consists of 16 countries
2. Lower middle income consists of 30 countries
3. Upper middle income consists of 33 ccountries
4. High income consists of 43 countries
5. World, all 122 countries in the sample

5. Discussion of Results

Table 2 contains the results from OLS estimation of equation (8), the augmented Solow's model suggested by Mankiw et al. (1992), using 2014 cross-sectional data on 122 countries around the world. This equation can be used to estimate how these variables influence the steady-state level of income. The second column in this table reports the coefficients of female labor force, human capital, physical capital, ($n + g + \delta$), and $\ln(\frac{m}{f}+1)$. The coefficients of all variables in the model have positive sign. The focus of this research is on female labor force and, as shown, the coefficient of female labor force has expected signs and is significant. The results show that female labor force participation has a positive contribution to output growth.

Table 3 contains the results summary of panel unit root tests. The results from unit root tests show that both GDP per capita and male labor participation are stationary at level, I(0), for all income groups. Female labor participation is stationary at level for all income groups except for the upper middle income group, which is stationary at first difference, I(1). Human capital is stationary at first difference for all income groups. Physical capital is stationary at level for world and high income groups but stationary at first difference for lower middle income and upper middle income groups.

Table 4 contains the results from ARDL approach of equation (10), the augmented Solow's growth model, using panel data from year 1998 to 2016 for 5 groups of countries as categorized by World Bank according to their income level. Each column reports the coefficients from each groups. The error correction model (ECM) results of all groups are significant and have negative signs. The ECM value for each group equals 0.82, -0.79, -0.82, -0.84 and -0.91 respectively, which imply that the long-run co-integration exists between dependent and independent variables for all income groups. The behavioral variables have the expected positive signs and are significant in almost every case, except for the high income group with insignificant statistics. These imply that all the factors contribute positively to growth. Among the country groups with significant statistics, the coefficients of male labor force are slightly greater than that of female labor force, implying that male has slightly higher impact on output growth.

Table 5 contains the results from ARDL approach of equation (12), the augmented Solow's model as suggested by Mankiw et al (1992), using panel data from year 1998 to 2016 for 5 groups of countries as categorized by World Bank according to their income level. Each column reports the coefficients from each groups. The error correction model (ECM) results of all groups are significant and have negative signs. The ECM value for each group equals -0.82, -0.77, -0.82, -0.83, and -0.93 respectively, which imply that long-run co-integration exists between dependent and independent variables for all income groups. The behavioral variables have the expected positive signs and are significant in almost every case, except for physical capital with insignificant statistics, implying that all the factors contribute positively to growth. Except for world and upper-middle income groups, the difference between the coefficients of female and male

labor forces are greater compared to the estimating results in table 4.

Table 3: Summary results of unit root tests

	GDP per capita	Female labor force	Male labor force	Human capital	Physical capital
World	I(0)	I(0)	I(0)	I(1)	I(0)
Low Income	I(0)	I(0)	I(0)	I(1)	I(1)
High Income	I(0)	I(0)	I(0)	I(1)	I(0)
Lower Middle Income	I(0)	I(0)	I(0)	I(1)	I(1)
Upper Middle Income	I(0)	I(1)	I(0)	I(1)	I(1)

Table 4: Income and Female Labor Force Participation (Augmented Solow's model)

	World	High income	Upper middle income	Lower middle income	Low income
Female labor force	0.57*** (0.21)	-0.18 (0.36)	1.20** (0.56)	0.14 (0.37)	0.38*** (0.56)
Male labor force	0.82*** (0.25)	1.28*** (0.37)	1.66** (0.67)	1.47*** (0.27)	0.42 (0.70)
Physical capital	0.08*** (0.02)	-0.058 (0.06)	0.15** (0.06)	0.17*** (0.05)	0.14 (0.09)
ECM	-0.82*** (0.03)	-0.79*** (0.04)	-0.82*** (0.07)	-0.84*** (0.06)	-0.91*** (0.09)
Log Likelihood	-1106.01	-321.89	-332.10	-275.62	-177.63
AIC	1.75	1.59	1.86	1.77	1.99

Dependent variable is log of per capita income. The standard errors are in parenthesis. ***, **,* represent 0.001, 0.05 and 0.1 level of significance respectively.

Table 5: Income and Female Labor Force Participation
(Augmented Solow's mode as suggested by Mankiw et al, 1992)

	World	High income	Upper middle income	Lower middle income	Low income
Female labor force	0.50** (0.22)	0.77* (0.43)	1.32** (0.51)	0.17 (0.38)	0.01* (0.61)
Male labor force	0.99*** (0.27)	2.15*** (0.45)	1.61** (0.65)	1.57*** (0.34)	0.25 (0.77)
Human capital	0.97*** (0.22)	1.72*** (0.49)	1.27** (0.52)	0.79* (0.44)	1.05* (0.61)
Physical capital	-0.03 (0.04)	-0.04 (0.07)	0.04 (0.08)	0.06 (0.08)	0.25* (0.10)
ECM	-0.82*** (0.03)	-0.77*** (0.05)	-0.82*** (0.07)	-0.83*** (0.06)	-0.93*** (0.11)
Log Likelihood	-986.77	-286.32	-298.61	-247.45	-155.07
AIC	1.76	1.62	1.86	1.79	1.95

Dependent variable is log of per capita income. The standard errors are in parenthesis.
***, **,* represent 0.001, 0.05 and 0.1 level of significance respectively.

6. Conclusion

This research has examined the hypothesis that level of women participation in work force, as measured by female labor force participation rate, has a positive effect on economic growth. Using both the classical Solow's growth model and a version of Mankiw, Romer, Weil augmented Solow's model, we incorporate female and male labor forces into the model as separate explanatory variables for growth. This augmented Solow's model then was used to estimate the influence of female labor force on the steady-state level of income. The OLS estimation of this equation uses cross-sectional data of 122 countries around the world. In the last section, both models were estimated using panel data from year 1998 to 2016 for 5 groups of countries categorized by World Bank according to their income level. Before estimating the panel model, we employ unit root tests to check the stationary properties of the variance. Since the variables do not have the same order of integration, ARDL approach was used to estimate these models.

The results of all estimations are as expected. The behavioral variables have the expected positive signs, implying that all factors have positive contributions to growth. The focus of this research is on female labor force and, as shown, the coefficients of female labor force have positive signs and are significant in almost every case. Confirming our hypothesis that female labor force has a positive contribution to growth. In terms of magnitude, the coefficients of male labor force are slightly greater than that of female labor force, implying that male have slightly higher impact on output growth.

According to suggested evidence of ILO, number of paid female workers is far lower than men despite the fact that they both have positive contribution to output

growth. Though male might have stronger effect on growth, according to the estimation results, but the gap between female and male labor force participation is far overrate. The stronger effect of male on output growth might reflect the differences in wages, the social constraints on women, and the lack of supportive services to women such as childcare and sufficient maternity leave. The quality of employment and opportunities for better jobs continue to be unequally distributed between women and men. Women tend to work in less productive jobs and earn less. Nopo (2011) found the earnings gap between men and women with similar characteristics ranges from 8% to 48% on a large sample of countries.

As one can see from figure 3, the difference between male and female labor force participation is lowest in low income countries compared to other income groups. Women in low income countries mostly work in agricultural sector, the reason to work may be driven more by poverty rather than by choice. The lower middle income group has a largest different between male and female labor force participation due to structural transformation and urbanization, resulting in a withdrawal of women from labor force and engaging more in domestic duties. For the upper-middle and high income groups with rising in women's capabilities, declining fertility rate, shifts in social constraints and other economic factors, more women have rejoined the labor force.

In conclusion, the consequent evidence suggests that women participation in labor force positively contribute to the growth of output of the economy. The female labor supply is an important driver of growth. When women enter the labor force, economies grow faster. The more labor supply, the wages fall as well as the cost of production and output prices. Reduced in prices boost consumption, export competitiveness, investment, and hence economic growth. Policymakers should encourage female labor force participation. They should facilitate women to access better jobs including access to better training programs and education, access to credit, access to supportive services such as childcare and ease the burden of domestic duties. Policy makers have to create job opportunities and safe jobs for women. In aging society, encouraging female participation in workforce can alleviate economic effects of a shrinking workforce. Promoting women's economic empowerment can be used as a tool to cope with the decrease in labor force. For instance, Japanese Prime Minister Shinzo Abe has introduced "womenomics" as a core pillar of growth strategy for Japan. He eliminated the tax deduction for dependent spouses and expand childcare. Within three years female labor force participation in Japan have reached 66 percent while national unemployment rate declines.

Economy could benefit more by encouraging women participation in labor force. Well-designed government policies in promoting female participation in market activities is essential. It will enhance the contribution of female labor force and hence greater economic growth.

Figure 1: Female and Male Labor Force Participation Rate

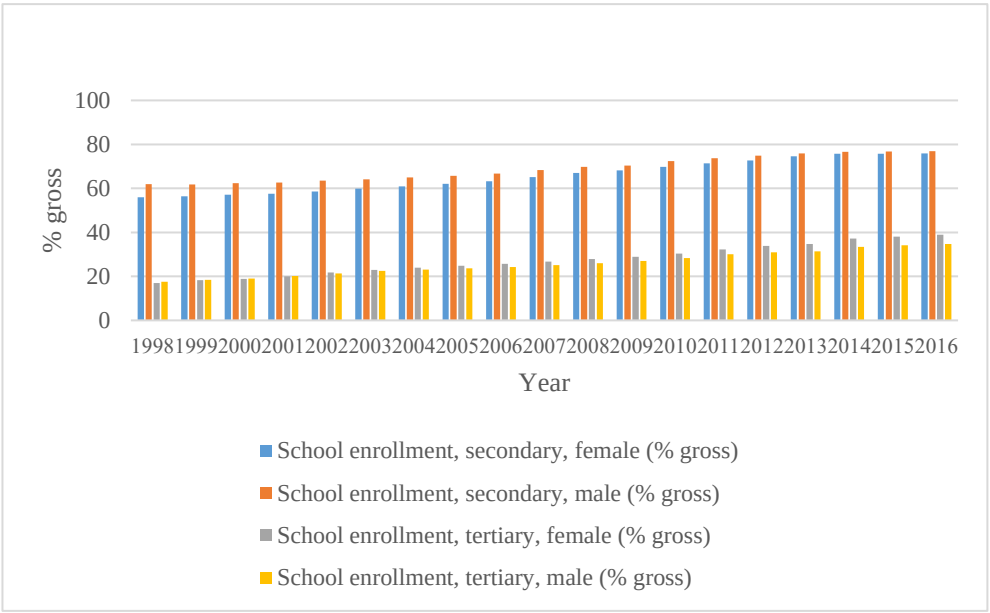

Figure 2: Female and Male School Enrollment Rate

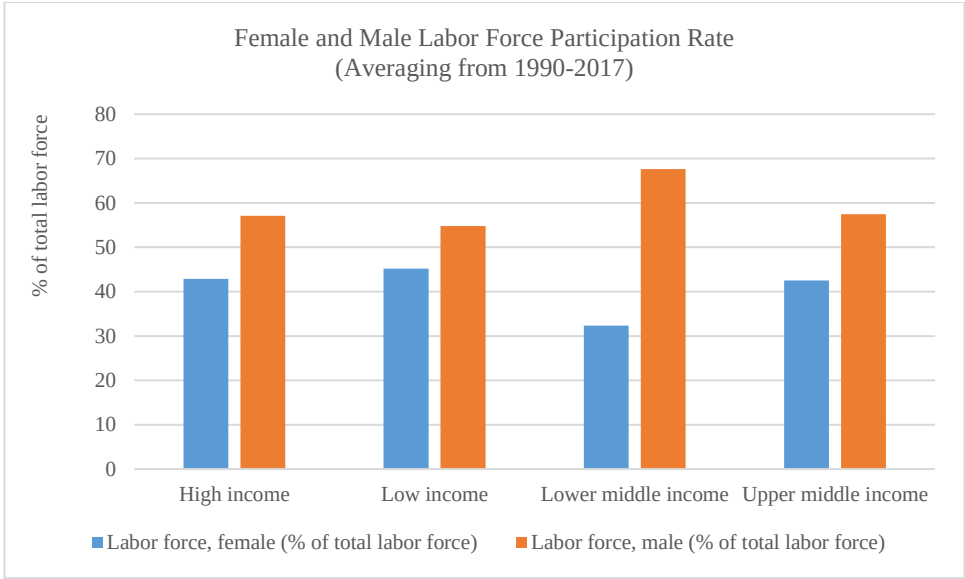

Figure 3: Female and Male Labor Force Participation Rate by Income Groups (Averaging from 1990-2017)

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Appendix: A Name of countries that are used research

High income	Argentina	Estonia	Italy	Norway	United Kingdom
	Austria	Finland	Japan	Oman	United States
	Bahamas, The	France	Korea, Rep.	Panama	Uruguay
	Belgium	Germany	Latvia	Poland	
	Brunei Darussalam	Greece	Lithuania	Portugal	
	Canada	Hong Kong	Luxembourg	Slovak Republic	
	Chile	Hungary	Macao	Slovenia	
	Cyprus	Iceland	Malta	Spain	
	Czech Republic	Ireland	Netherlands	Sweden	
	Denmark	Israel	New Zealand	Switzerland	
Low income	Benin	Niger			
	Burkina Faso	Rwanda			
	Burundi	Senegal			
	Congo, Dem. Rep.	Sudan			
	Eritrea	Tajikistan			
	Guinea	Togo			
	Malawi	Yemen, Rep.			
	Mali				
	Mozambique				
	Nepal				
Lower middle income	Angola	Honduras	Nicaragua		
	Bangladesh	India	Nigeria		
	Bhutan	Indonesia	Pakistan		
	Bolivia	Kenya	Philippines		
	Cabo Verde	Kyrgyz Republic	Swaziland		
	Cambodia	Lao PDR	Tunisia		
	Cameroon	Lesotho	Ukraine		
	Egypt, Arab Rep.	Mauritania	Uzbekistan		
	El Salvador	Moldova	Vanuatu		
	Ghana	Morocco	West Bank and Gaza		
Upper middle income	Albania	Cuba	Mauritius	Thailand	
	Algeria	Republic	Mexico	Turkey	
	Belarus	Ecuador	Montenegro	Venezuela, RB	
	Belize	Guatemala	Namibia		
	Botswana	Iran, Islamic Rep.	Paraguay		
	Bulgaria	Jamaica	Peru		
	China	Jordan	Romania		
	Colombia	Kazakhstan	Russian Federation		
	Costa Rica	Lebanon	Serbia		
	Croatia	Macedonia, FYR	South Africa		