

Women's Literacy Rate and Women's Labor Participation in ASEAN

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Abstract

Women have an essential contribution to economic growth and development. However, according to data, the Gender Inequality Index (GII) is still relatively high in developing countries, so special attention should be paid to aspects of women's empowerment, health, and participation in the labor market as an indicator in measuring GII. In women's empowerment, women's education and women's literacy are thought to affect women's labor force participation. This study aims to examine and analyze the effect of women's literacy rates on female labor force participation in ASEAN countries from 2010-2017. The method used to analyze the effect on the model is the static panel data method. The results show that countries with high female literacy rates also have high female labor participation rates. The results help economists and policymakers evaluate measures to optimize women's labor market decisions and empower women by improving women's literacy rates.

Keywords: women's literacy rate, women's labor participation, panel data

JEL classification: A1, C5, J8

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1. Introduction

Women have an essential contribution to economic growth and development. One of the goals of sustainable development is gender equality. However, according to the data, the Gender Inequality Index (GII) is still relatively high in developing countries, so special attention should be paid to women's empowerment, health, and participation in the labor market (Alfaizah et al., 2020). Today, there is a wealth of literature on the determinants of female labor participation (Bussmann, 2009; Mishra and Smyth, 2010; He and Zhu, 2016), and many empirical studies investigating the relationship between GDP and FLPR around the world in different regions (Pample and Tanaka, 1986; Tam, 2011; Tsani et al., 2013; Lahoti and Swaminathan, 2016). See GII trends in ASEAN countries in Figure 1.

Researchers have long seen participation as an essential factor in enabling poor, vulnerable, and marginalized groups to influence institutions and decisions that significantly impact their lives. Lv and Yang (2018) use national panel data to investigate whether women's political participation affects female labor force participation (FLPR). The analysis suggests that countries characterized by high female participation in politics are associated with higher levels of FLPR. Swamy et al (2001) found that countries with higher female participation in politics show less corruption. A cross-country analysis by Ergas and York (2012) showed that countries with higher female political status had less air pollution. In addition, Lv and Yang (2018) also find a U-shaped link between economic development and FLPR. Goldin (1995) examines

the income and substitution effects that contribute to such a U-shaped pattern. FLPR is high when income is low and certain types of agriculture dominate. Tam (2011) shows that the U-shaped relationship between the feminization of the workforce and real GDP per capita remains an intertemporal relationship.

Most empirical studies have shown that women's education is a powerful variable determining female labor participation. For example, according to an international data survey of Cameron et al (2001), higher-educated females are 49% more likely to be employed in the labor market than uneducated females. Liu and Zheng (2010) report that higher-educated women are more likely to enter the labor market and have more experience (Aznin and Norehan, 2011). In short, the higher the level of education, the more likely to get a good job and a high salary (Tan and Subramaniam, 2013).

In addition to women's education, it turns out that the level of women's literacy also influences the level of women's labor force participation. Literacy refers to the proportion of women aged 15 and older who can read and understand a brief, simple summaries of daily life

compared to the population of this age group. In general, literacy includes "mathematics," which can perform simple arithmetic calculations. We hypothesize a priori that this variable will have a positive impact, as women's literacy will give them more opportunities to access the labor market according to the previous research Aboohamidi and Chidmi (2013) found the results of the random-effects model indicate that literacy and urbanization rates have a positive and significant effect on female labor participation. Ince and Demir (2006) also found a significant correlation between the female workforce on human development goals such as enrollment rate, literacy rate, and total fertility rate.

In summary, existing literature shows that female labor force participation depends on the women's literacy rate. However, there are no quantitative studies investigating the role of women's literacy rate's role in influencing FLPR in ASEAN countries. Therefore, in this paper, we would like to analyze the effects of women's literacy rate in ASEAN countries from 2010 to 2017, partially and simultaneously, on women's labor participation.

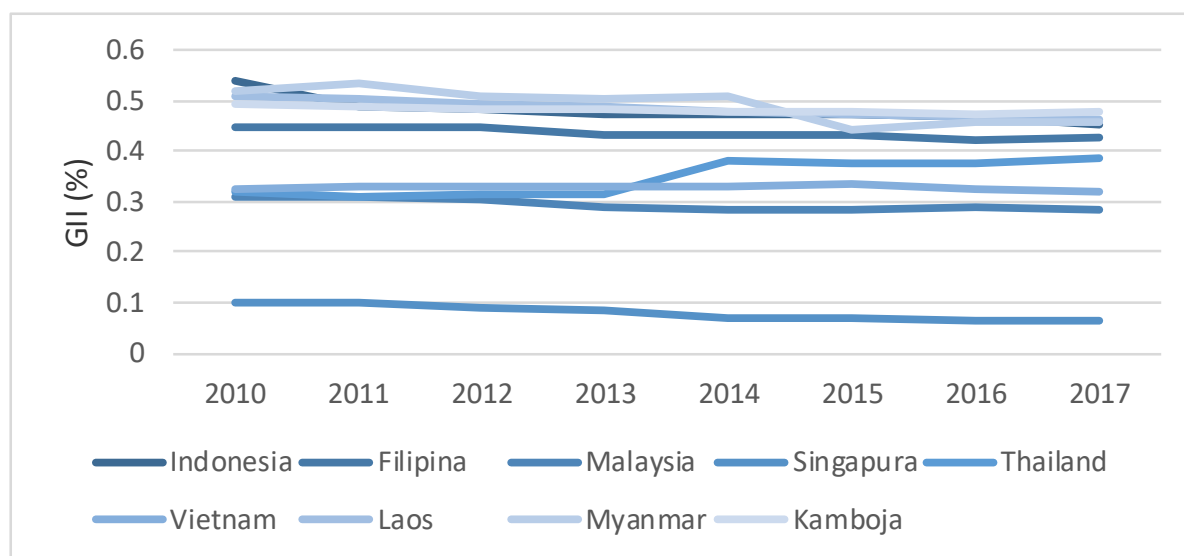


Figure 1. The trend of GII in ASEAN countries from 2010-2017

2. Research Method

This study uses samples from ASEAN 9 countries, including data from 2010 to 2017. Brunei Darussalam was excluded from the primary sample because the complete dataset was unavailable. The dependent variable for this analysis is FLPR. Use the FLPR dataset edited by the International Labor Organization (ILO). FLPR is defined as the number of females aged 15-64 years divided by the total number of females of the same age group (15-64 years), including women working and looking for a job. Workforce participation is defined as the sum of employed (paid and unpaid families) and unemployed (actively looking for a job).

To measure women's literacy rate, we use the data of adult females (% of females ages 15 and above) developed by UNESCO (2021). The adult literacy rate is the percentage of people ages 15 and above who can read and write with understanding a short simple statement about their everyday lives. In addition, we also gathered data for the following variables that the literature has identified as having a role in determining FLPR: wage, politic, education, income, young women married, and the data of all these control variables are obtained from World Development Indicators.

This study uses several static panel estimation models to investigate the effects of various independent variables on the estimation of female labor force participation at the state level. The static panel estimation models are various ordinary least square (OLS) models with different specifications (Salari and Javid, 2019). This study uses several statistical models related to state-specific effects to find the best statistical inference model. The section-pooled OLS model is used when there are no state-specific effects. This study then uses a generalized least-squares (GLS) model, using random effects (RE), fixed effects (FE), and panel corrected standard error model estimators (Arellano and Bond, 1991). This study uses these key variables supported in previous studies, as many independent variables can affect women's participation in the labor market (Lv and Yang, 2018; Salari and Javid,

2019; Tam, 2011; Aboohamidi and Chidmi, 2013; Alfaizah et al., 2020) and those data are available at the state level. Therefore, this study uses the following static model to estimate FLPR across states.

$$FLPR_{it} = \alpha + \beta_1 WLR_{it} + \beta_2 WWS_{it} + \beta_3 WEA_{it} + \beta_4 WPR_{it} + \beta_5 WIP_{it} + \beta_6 YWM_{it} + \varepsilon_{it} \quad (1)$$

There are unit differences and the magnitude of the variables in the equation, it is necessary to perform regression using a log-linear model (Baum, 2008; Raymond et al., 2015; Lv and Yang, 2018). Therefore, the basic econometric model has the following form:

$$FLPR_{it} = \alpha + \beta_1 WLR_{it} + \beta_2 WWS_{it} + \beta_3 WEA_{it} + \beta_4 WPR_{it} + \beta_5 (\ln WIP_{it}) + \beta_6 YWM_{it} + \varepsilon_{it} \quad (2)$$

Where $FLPR_{it}$ is the female labor participation rate in ASEAN countries between 2010 and 2017. WLR_{it} is the women's literacy rate in ASEAN countries between 2010 and 2017. WWS_{it} is the women's wage and salary in ASEAN countries between 2010 and 2017. WEA_{it} is the women's education attainment in ASEAN countries between 2010 and 2017. WPR_{it} is the women's political representation in ASEAN countries between 2010 and 2017. WIP_{it} is the women's income per capita in ASEAN countries between 2010 and 2017. $\ln WIP_{it}$ is the log-linear of women's income per capita. YWM_{it} is young women marriage in ASEAN countries between 2010 and 2017. In this model, i indicated cross-section and t indicated time series; therefore, it showed the panel data in the country of i and the year of t . β in these models represented the coefficients. α is a parameter to be estimated. ε represents the error term with the usual properties.

3. Result And Discussion

3.1 Result

This section shows the empirical results of various estimation models. Table 1 shows a static model that contains OLS with different specifications in the model.

Table 1. Main Results.

Variable	(1)	(2)	(3)	(4)
FLPR				
WLR Literacy	-0.252 (0.007)	0.279 (0.000)	0.279 (0.000)	
WWS Wage	-0.405 (0.001)	-0.020 (0.444)	-0.020 (0.441)	
WEA Education	-0.336 (0.000)	0.453 (0.000)	0.453 (0.000)	
WPR Politic	0.757 (0.000)	0.098 (0.074)	0.098 (0.069)	
lnWIP Income	-0.000 (0.727)	0.000 (0.000)	0.000 (0.000)	
CWM Marriage	90.663 (0.002)	-92.854 (0.003)	-92.854 (0.002)	
Constant	47.116 (0.000)	108.687 (0.000)	99.855 (0.000)	
Adj R-square	67%	70%	70%	
Prob F-statistic	0.0000	0.0000	0.0000	
Number of cross section	9	9	9	
Number of instruments				72
Breusch Pagan test p-value				0,0000
Hausman test p-value				0.1670

Notes: The following are OLS regression models with different specifications. The number below the coefficient variable is the t-value. The Breusch-Pagan test is used to determine which model is appropriate between the common-effects model and the random-effects model. The Hausman test is used to determine which model is appropriate between the fixed effects model and the random-effects model. Significant at 10%.

Column (1) shows the results of a simple static common effect model. The Adj R-square value for the common effect model estimator is 67% means that the independent variable is approved by 67% of the dependent variable and other variables outside the model approve the remaining 33%. The probability F-statistic value is 0,0000. It means that all independent variables affect the dependent variable simultaneously. Based on the p-value of t statistics, one variable has no significance at 10% level, it is the women's income per capita. Other variables partially have a significant effect on FLPR at 10% level.

Column (2) shows the results of the fixed-effects model estimator with an Adj R-square value of 70%. This means that the independent variable is approved by 70% of the dependent variables

and other variables outside the model approve the remaining 30%. The probability F-statistic value is 0,0000. It means that all independent variables affect the dependent variable simultaneously. Based on the p-value of t statistics, one variable has no significant effect on FLPR at 10% level, it is the women's wage and salary. Other variables partially have a significant effect on FLPR at 10% level.

Column (3) shows the result of a simple static random effect specification. The Adj R-square value for the random-effects model estimator is 70%. This means that 70% of the dependent variables approve the independent variable, and the remaining 30% are placed by other variables outside the model. The probability F-statistic value is 0,0000. It means that all independent variables

affect the dependent variable simultaneously. Based on the p-value of t statistics, one variable has no significant effect on FLPR at 10% level, it is the women's wage and salary. WLR has a positive and statistically significant effect at the 10% level on FLPR. Another variable displays the expected signs and is statistically significant in several cases. The coefficients and p-value of women's income, women's political representation, women's educational attainment, young women marriage are statistically significant at the 10% level. As expected, high women's literacy rate, women's income, women's political representation, women's education increase FLPR, and the high number of young women married reduce FLPR. Column (4) shows the results of the Breusch-Pagan test is $0,0000 < 0,1$ and Hausmann test is $0,1670 > 0,1$ means that the model follows the random effect model in Column (3).

After conducting the Hausman test and the Breusch-Pagan test, the Random Effect estimation model was selected. Furthermore, a cross-section effect test was conducted to see the effect of the model on each object under study. By looking at the coefficient values in nine countries in ASEAN, it can represent the condition of the concentration area for female labor force participation in ASEAN. The cross-section effect coefficient values from nine countries in ASEAN are shown in Table 2.

Table 2. Cross Section Random Effect Test Results

Code	Country	Coef.Effect
_cons	Indonesia	101.419
2	Filipina	-12.031
3	Malaysia	-0.238
4	Singapura	11.793
5	Thailand	18.087
6	Vietnam	8.277
7	Laos	14.943
8	Myanmar	-3.685
9	Kamboja	28.265

Column (3) in Table 2. shows the value of coefficient cross section effect that is different from each country. This indicates that the cross section random effects model is accepted because there are differences in the coefficient effect values between countries (Alfaizah et al., 2020). The results divide countries based on two criteria: countries with a positive effect on the model and countries with a negative effect on the model under study. Singapore, Thailand, Vietnam, Laos, and Kamboja positively affect the model. Filipina, Malaysia, and Myanmar have a negative effect on the model. In this study, the coefficient effect value used as a comparison for other countries is Indonesia.

3.2 Discussion

Based on the random effect results, 70% R-square means that the variance of the independent variables in the model can generate 70% of the variance of the FLPR variables. Other variables outside the model explain the remaining 30%. The estimated F-statistic indicates that the model used exists, which means that the independent variables in the model act on FLPR at the same time. Probability t-values indicate that some of the variables significantly impact FLPR. Based on the results of this study, women's literacy rate, women's educational attainment, women's income per capita, women's political representation, and young women marriage have a significant effect on FLPR, according to previous studies (Aboohamidi and Chidmi, 2013; Lv and Yang, 2018; Lechman and Kaur, 2015; Tam, 2011; Alfaizah et al., 2020).

When women have a good level of literacy, their chances of being able to participate in the workforce are more significant than women with low literacy skills because literacy rate refers to the proportion of women aged 15 and older who can read and understand brief, simple summaries of daily life compared to the population of this age group. In general, literacy includes "mathematics," which is the ability to perform simple arithmetic calculations (Aboohamidi and Chidmi, 2013). Literacy skills such as reading, writing, and processing and understanding information make a person absorb a lot of

knowledge, express ideas and think critically, and have problem-solving skills. Improving women's literacy culture is not an easy task. However, increasing their motivation can increase women's literacy rate, which will increase women's labor force participation.

Based on the proportion of female labor force participation in ASEAN, which is dominated by developing countries rather than developed countries, ASEAN is dominated by men (in the case of the formal sector) and is also preferred by men under certain conditions (such as unskilled workers). This finding suggests that the gender gap in ASEAN developing countries remains high. From the political point of view, when women are politically empowered to mobilize their voices and influence, they may tend to take steps or regulations, such as the area of sex work discrimination, to guarantee women's rights. This can contribute to increasing FLPR (Lv and Yang, 2018). Per capita income is a measure used to describe the standard of living. People with high per capita income usually have a higher standard of living. Differences in income reflect differences in quality of life. Wealthy people (expressed by high per capita income) have a better quality of life (expressed by life expectancy, health level, and education level). Therefore, the income reflected in the standard of living can determine a person's decision whether to participate in the workforce (Tam, 2011; Lechman and Kaur, 2015; Gaddis and Klasen, 2014; Glick and Sahn, 2005).

4. Conclusion

This article aims to fill the literature gap by answering research questions: do women's literacy rate affect women's labor participation? Our study provides strong evidence that women's literacy rate benefit FLPR. After estimating the panel data regression using the model selected as the random-effects model, our results show that WLR has a positive and statistically significant effect on FLPR. This result means that countries with high levels of women's literacy rate also have high levels of female labor participation. National policymakers can use this result to decrease the gender gap (GII) by empowering women, especially on improving women's literacy rate.

Policies that the government can take in increasing the literacy level of women, for example, by conducting socialization about the important role of women in increasing literacy. The active role of women is very decisive. Especially in an important sphere, namely the family. The family is the smallest unit of society but plays a significant role in the progress of a nation. The family is the starting point for a person's life, and the role of women is very large in the family. Women who understand their important role in reviving the literacy culture in their environment will be increasingly motivated to improve literacy skills for themselves to be passed on to others.

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