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Women's Health and Their Labor Force Participation: A Panel Data Analysis

Salma Audiena Alfaizah[1], Metana Puspitasari[2]
[1]*Department of Economics Development, Universitas Muhammadiyah Surakarta, Indonesia*
[2]*Department of Medical Education, Universitas Muhammadiyah Surakarta, Indonesia*
saa800@ums.ac.id, mp844@ums.ac.id

Abstract

The main objective of this study is to analyze the effect of women's health on women's labor participation in ASEAN countries during the period 2010 to 2017. We use a panel data approach to estimate the model. The results confirm the findings in the literature that women's health has a positive and significant influence on women's labor participation. The results show that women's prevalence of HIV, women's adolescent fertility, and women's life expectancy has a significant effect on women's labor participation in ASEAN countries. Countries should pay more attention to women's health to change the women's labor supply. The existing literature shows that women's labor participation depends on women's health. However, there is no quantitative study examining the role of women's health, specifically the women's prevalence of HIV affect on FLFP in ASEAN countries.

Keywords
women's health; women's labor participation; panel data

I. Introduction

Today, the importance of health in boosting the workforce is well acknowledged. There are two distinct ways in which health affects labor supply. Having better health means that people are less likely to get sick and more likely to be able to work. Agriculture and physical labor are the most common places to see it. Healthier workers are more productive and effective because they are more likely to attend school and have access to more knowledge and training. (Bloom, et al., 2009)

The fertility rates are one of the health indicators that have an impact on the labor supply. The demographic and economics research has given considerable emphasis to the connection between the female labor force participation rate (FLFP) and fertility rate. According to Bowen and Finegan (1969), increased fertility rates might affect FLFP in two different ways. Theoretically, a rise in FLFP could result from an increase in fertility. This might happen if having small children makes the household need more money, which makes the mother need to look for work outside the home. Another theoretical theory is that lower FLFP rates result from higher fertility. Figure 1 displays trends in adolescent fertility rates among ASEAN countries.

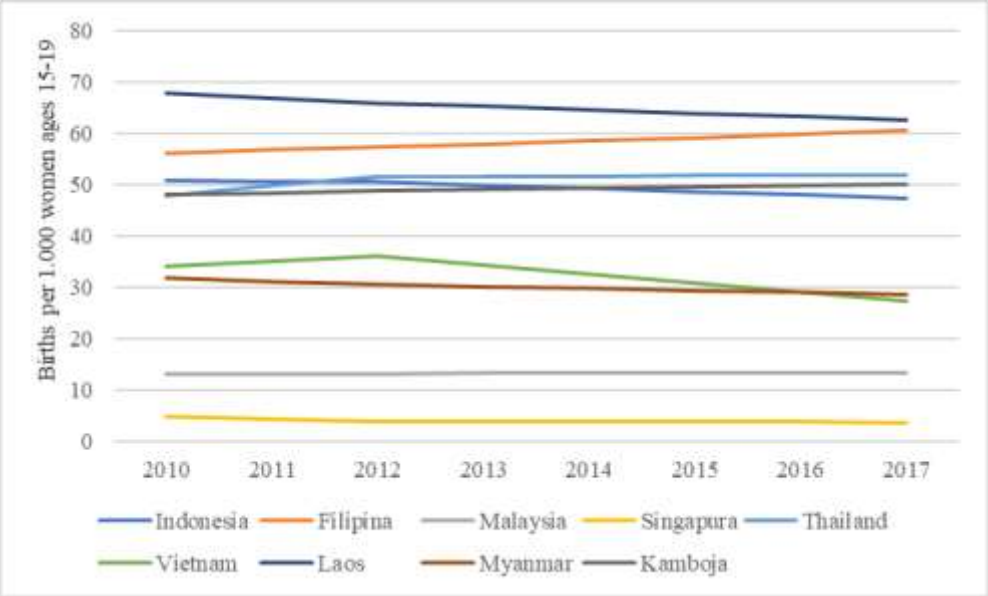

Figure 1. *Trend of adolescent fertility rate in ASEAN countries from 2010-2017*

There are at least three reasonable reasons for such a finding, all of which are in line with the role incompatibility theory, according to which the negative correlation between fertility rates and FLFP is caused by the stress that mothers and workers experience in their roles. The fact that having small children increases the burden at home and decreases the amount of time the woman has to hunt for employment outside is one explanation for why a rise in fertility may result in a reduced FLFP. Another explanation is that the mother's emotional connection to her small child prevents her from leaving him or her to enter or reenter the workforce (Lehrer & Nerlove, 1986). A third theory is that for every child a woman has, she would need to spend more on daycare if she were working and earning the same amount of money (Mishra & Smyth, 2010).

In addition to fertility rates, maternal mortality ratio, women's life expectancy, and women's prevalence of HIV are believed to be health factors that affect women's labor participation (Wobst & Arndt, 2004; Murphy & Topel, 2006; Cai, 2010; Egglestone & Fuchs, 2012; Kim, 2019; Alfaizah et al., 2022). HIV/AIDS has a disproportionately negative impact on women. 18.8 million women and girls worldwide are HIV-positive, and each year, about 870,000 more do so. More over half of all HIV-positive people are female, and young women (10–24 years) and adolescent girls (10–19 years) are twice as likely to contract HIV as men their own age. Mother-to-child transmission has historically been the primary method of HIV infection in children, and HIV/AIDS-related illnesses are the major cause of mortality in women of reproductive age (Abtew, et al., 2016). Wobst & Arndt (2004) discovered that the findings are broadly consistent with the idea that the prevalence of HIV/AIDS has detrimental effects on experience and skill levels in the employment. The high prevalence of HIV among women lowers women's participation in the labor force.

In conclusion, the field of studies suggests that women's health affects their ability to participate in the labor force. However, there isn't a quantitative study that examines at how FLFP in ASEAN countries is affected by women's health, specifically how women's HIV prevalence affects FLFP. As a result, we try to evaluate in this study how the prevalence of HIV in women, women's adolescent fertility, maternal mortality, and women's life expectancy affect women's work participation.

II. Research Method

This study examines data from nine ASEAN countries from 2010 to 2017. All of the data comes from World Bank Data. Several static panel estimation models are used in this study to investigate the effects of various independent variables on women's labor participation at the state level. The static panel estimation models are a collection of various ordinary least squares (OLS) models with widely different specifications (Salari & Javid, 2019). Then, this study uses a generalized least-squares (GLS) model, using random effects (RE), fixed effects (FE), and panel corrected standard error model estimators (Arellano & Bond, 1991). This study uses these key variables supported in previous studies, as independent variables affect on women's labor participation (Wobst & Arndt, 2004; Murphy & Topel, 2006; Cai, 2010; Mishra & Smyth, 2010; Egglestone & Fuchs, 2012; Rad et al., 2014; Gonzales et al., 2016; Kim, 2019; Alfaizah et al., 2020). Therefore, to estimate FLFP across states in this study, the static model listed below is used.

$$FLFP_{it} = \alpha + \beta_1 WPH_{it} + \beta_2 WAF_{it} + \beta_3 MM_{it} + \beta_4 WLE_{it} + \varepsilon_{it} \quad (1)$$

Given the quantity of the variables and the unit differences, regression analysis utilizing a log-linear model is required (Baum, 2008; Raymond et al., 2015; Lv and Yang, 2018). Consequently, the fundamental econometric model takes the following shape:

$$FLFP_{it} = \alpha + \beta_1 WPH_{it} + \beta_2 ln(WAF)_{it} + \beta_3 ln(MM)_{it} + \beta_4 ln(WLE)_{it} + \varepsilon_{it} \quad (2)$$

Where FLFPit is the female labor force participation in ASEAN countries between 2010 and 2017. WPHit is the women's prevalence of HIV in ASEAN countries between 2010 and 2017. lnWAFit is the log-linear of women's adolescent fertility in ASEAN countries between 2010 and 2017. lnMMit is the log-linear of maternal mortality in ASEAN countries between 2010 and 2017. lnWLEit is the log-linear of women's life expectancy 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.

III. Results and Discussion

3.1 Results

Table 1 shows OLS regression models with different specifications.

Table 1. Main Results

Variable	(1)	(2)	(3)
FLFP			
WPH	-0.099	-0.009	-0.001
	(0.026)	(0.097)	(0.094)
lnWAF	0.271	0.190	0.113
	(0.007)	(0.035)	(0.051)
lnMM	-0.233	-0.544	-0.529
	(0.483)	(0.111)	(0.235)
lnWLE	0.274	9.659	9.306
	(0.094)	(0.001)	(0.000)
Constant	4.104	10.533	10.274

	(0.009)	(0.000)	(0.000)
Adj R-square	62%	70%	97%
Prob F-statistic	0.0364	0.0031	0.0000
Number of cross section	9	9	9
Number of instruments	72	72	72

Notes: The number below the coefficient variable is the t-value. Significant at 10%.

The results of a simple static common effect model are shown in Column (1). The Adj R-square value of 62 percent for the common effect model estimator indicates that the independent variable is approved by 62 percent of the dependent variable, while other variables outside the model approve the remaining 38 percent. The F-statistic probability value is 0.0364 0. It means that all independent variables influence the dependent variable at the same time. According to the p-value of t statistics, only one variable has no significant effect on FLFP at the 10% level.

Column (2) displays the results of the fixed-effects model, which has an Adj R-square value of 70%. This means that the independent variable is supported by 70% of the dependent variables, while other variables outside the model support the remaining 30%. The F-statistic probability value is 0,0031 0,1. It means that all independent variables influence the dependent variable at the same time. According to the p-value of t statistics, only one variable has no significant effect on FLFP at the 10% level.

Column (3) displays the outcome of a straightforward static random effect specification. The random-effects model estimator has an Adj R-square value of 97 percent. This means that 97 percent of the dependent variables agree with the independent variable, while the remaining 3 percent are influenced by variables outside the model. The probability F-statistic value is 0.00000000001. It means that all independent variables influence the dependent variable at the same time. According to the p-value of t statistics, only one variable has no significant effect on FLFP at the 10% level.

The results of the Breusch-Pagan and Hausmann tests are shown in Table 2. The Breusch-Pagan test is used to determine which model, between the common-effects and random-effects models, is appropriate. The Hausman test is used to determine which model is better between the fixed effects and random effects models.

Table 2. Breusch-Pagan and Hausmann Test Results

Test	**p-value**
Breusch Pagan test	0.0000
Hausman test	0.8770

The results of Breusch-Pagan test is 0,0000 < 0,1 and Hausmann test is 0,8770 > 0,1 means that the model follows the random effect model in Column (3) from Table 1. 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 Figure 2.

Figure 2. *Map of women's health and FLFP in ASEAN countries 2010-2017*

Using the data on women's health and FLFP concentration areas in ASEAN countries, we calculated the coefficient cross section effect for each country. The fact that the coefficient effect values range across countries suggests that the cross-section random effects model is widely recognized (Alfaizah et al., 2020). Countries that have a positive impact on the model and countries that have a negative impact on the model are separated by the results. There are positive impacts on the model from countries such as Thailand, Vietnam and Laos. It's not appropriate for the model to be in countries like the Philippines, Singapore, Malaysia, and Myanmar. As a comparison to other countries, Indonesia's coefficient effect value is used in this study.The results of Breusch-Pagan test is 0,0000 < 0,1 and Hausmann test is 0,8770 > 0,1 means that the model follows the random effect model in Column (3) from Table 1.

3.2 Discussion

Once the results are known and the best model has been chosen, the random effect becomes evident. After that, we will look at the REM model's output. Based on the random effect results, an R-squared value of 97 percent indicates that the model's independent variables are capable of generating 97% of the FLFP variables' variance. The remaining 3% is explained by variables that are not included in the model. There is a relationship between the independent variables in the model and FLFP, as indicated by the estimated F-statistic. Maternal mortality appears to be the only factor that has no effect on FLFP, according to probability t-values (Alfaizah et al, 2020). A 10% increase in WPH has a negative and statistically significant impact on FLFP. lnWAF and WLE have a positive and statistically significant effect on FLFP at the 10% level, according to the findings of this study. Earlier studies (Wobst & Arndt, 2004; Murphy & Topel, 2006; Cai, 2010; Mishra & Smyth, 2010; Egglestone & Fuchs, 2012; Rad et al., 2014; Gonzales et al., 2016; Kim, 2019; Alfaizah et al., 2022) have shown that higher rates rates of female HIV prevalence, maternal mortality, and adolescent fertility reduce FLFP, while higher rates.

According to Wobst and Arndt (2004), it appears that HIV/AIDS prevalence has a negative impact on the experience and skill level of healthcare workers. There is a significant drop in female labor force participation due to the high HIV prevalence among women. Women should be educated about the dangers of HIV in order to better understand the disease. Thus, women are expected to remain productive and contribute to the labor market. Women's HIV rates increase as a result of sanctions affecting female labor participation, according to a study on the impact of sanctions on women's HIV rates (Arndt & Lewis, 2000). According to previous research, public health sanctions have a negative impact on women and the general population. All these findings suggest that policy makers need to consider more carefully the scourge of HIV/AIDS among women when formulating their policies (Kim, 2019).

There is a longer-term, granger-cause relationship between women's labor participation and total fertility, according to (Mishra & Smyth, 2010). Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual (Astuti et al, 2019).Female adolescent fertility rates contribute to lower educational aspirations, which leads to women entering the workforce with lower specific skills, increasing the educational and economic disparities as well as wage disparities that exist between the genders (Engelhardt & Prskawetz, 2004). Countries with high female fertility rates have higher levels of inequality and poverty as a result of this relationship (Gonzales et al., 2016). Women's labor supply was found to be negatively affected by the fertility rate (Rad et al., 2014) because of the time spent at home caring for newborns and children.

Men and women who are healthy are more likely to participate in the workforce, according to Cai (2010). A country's life expectancy for women increases if it has supportive health facilities and equal access to health care for men and women. Women's life expectancy will rise as a result of better health, which in turn will open up more opportunities for women to work. A better standard of living for the workforce can clearly be achieved by improving health and increasing life expectancy at birth. Increases in life expectancy will lead to an increase in the number of people in the workforce (Egglestone & Fuchs, 2012; Alfaizah et al., 2020). Of course, increased life expectancy is valuable regardless of how it relates to per capita income (Murphy & Topel, 2006; Ryu & Slotje, 2003).

IV. Conclusion

The dependent variable in this research is female labor force participation and the independent variables are women’s prevalence of HIV, women’s adolescent fertility, maternal mortality, and women’s life expectancy. The results show that only one independent variable has no significant effect on women’s labor participation namely maternal mortality, while women’s prevalence of HIV, women’s adolescent fertility, and women’s life expectancy has statistically significant effect on women’s labor participation. This result means that countries with high levels of women's health also have high levels of women’s labor participation.

Government must pay more attention to women's health. Policies that can be carried out by the government to improve the quality of women's health are: increase the number of health services, infrastructure and facilities to be more proportional to the population, equitable distribution and utilization of workforce competencies health, as well as optimizing health services in standard level and reference level health services. This effort is expected to improve women's health so that women's labor participation also increases.

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