Economics Development Analysis Journal Vol. 13 (2) (2024)

Economics Development Analysis Journal

http://journal.unnes.ac.id/sju/index.php/edaj

Labor Supply Analysis: Case Study of Married Women Workers

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Article Information

History of Article
Received January 2024
Accepted March 2024
Pusblished May 2024

Keywords:
Labor Supply, Married Women Workers, Wages, Logit Regression, Labor Market

Abstract

Women in the labor market contribute to labor as part of the production factors in economic activities. Women's participation in the labor market cannot be separated from their role and status in the family. Personal characteristics, socio-economic conditions, and demographics influence women's decisions to work. The research aim is to analyze the supply of married women workers in Indonesia. The data used is secondary data originating from Sakernas February 2022. The method used is Logit Regression. The variables used in this research are the supply of married women workers, location, household members, women's age, women's education, employment status, wages, working hours, and training. The research results show that the variables of women's age, education, working hours, and training positively and significantly influence the supply of married women workers. The variables location, number of household members, employment status, and wages negatively and significantly influence the supply of married women workers. In general, the tendency of married women to work is higher among married women who live in rural areas, have few household members, are older, have a higher level of education, formal employment status, low wages, working hours are high, and have training experience.

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ISSN 2252-6560

INTRODUCTION

Women have a significant contribution to economic growth and development. Women's role is expanding in the family, social, political, and employment sectors. As time progresses and women's education levels increase, there is a shift in the perception of women's roles in the family and society. Women can actively support the family's economy and assist their husbands while still fulfilling their responsibilities as homemakers by managing household tasks such as child care, laundry, cooking, and other domestic duties. In the labor market context, women contribute as part of the labor force in economic activities.

Conversely, women are entrusted with nurturing and educating children within the family sphere. The study by Shittu & Abdullah (2019) shows negative and positive connections between fertility and labor force participation, with a causal relationship starting from labor force participation to birth rates. Additionally, there is a connection between education and labor force participation, but without a causal relationship.

Data from BPS-Statistics Indonesia (2023) shows that women's participation in the labor force is significantly lower than that of men. In 2022, men's involvement in the labor market was 83.87%, whereas women's participation was 53.41%. Women's participation in the labor market is closely linked to their roles and status within the family. Personal characteristics, socio-economic conditions, and demographics influence women's decisions to work. Frtgrgt4Economic and demographic factors that affect married women's entry into the labor market include wage levels, age, education, husband's wage levels, non-wage income, presence of young children, presence of other household members, and location. This aligns with the research by Yeni et al. (2022), which explains that the husband's income, husband's work in the tertiary sector, women's age, women's education, women's employment in the formal sector, the number of household members under five years old, age at marriage, and regional location in Java and Bali significantly influence the likelihood of women working after marriage and becoming homemakers.

More job opportunities are usually available in urban areas or industrial centres, especially in sectors that may appeal to married women. The availability of diverse jobs can encourage women's participation in the job market. Factors such as good public transportation and easily accessible child-care facilities can influence the ability of married women to work outside the home. This aligns with the study by Halim (2019), which explains that an increase in child-care facilities by one per 1,000 children in Indonesia raises mothers' labor force participation by 7.4%. Adequate infrastructure can facilitate women's access to workplaces and help overcome mobility and child-care challenges.

In contrast, rural areas are often associated with agricultural jobs. Jobs in the agricultural sector are generally more flexible compared to industrial sectors. Many married women work on farms to supplement family income without neglecting their household responsibilities. This flexibility allows married women to balance their time between work and household duties more efficiently.

Based on data from BPS-Statistics Indonesia (2023), most women workers work in the service sector, where the trend is increasing yearly. Namely, in 2017, it was 54.51% and reached 58.09% in 2021. The sector with the lowest demand is the agricultural sector, which in 2017 was 16.66% and fell to 15.91% in 2021. A decrease in the proportion of agricultural sector workers can also limit women's employment opportunities. Before the development of agricultural technology, as is known today, agricultural activities from planting to harvesting were very dependent on women. However, considering technological developments in the agricultural sector, there is a risk that women workers will be forced to lose their jobs. This is especially true in rural areas. The well-being condition of the economy in rural areas is low, pushing more women in rural areas to be involved in activity economic production to get income addition for households. This is done,

though, with relative wages being low. Besides the well-being of the household, factor characteristics such as the chance of working in rural areas are also crucial as to why women in rural areas tend to be quickly involved in work compared to women in urban areas. Married women in urban areas tend to be more selective in choosing work according to education that has been finished, partially extensive location urban participation in the labor market work as workers (Zhu, 2023).

In August 2022, the labor force participation rate for the 15 - 19 year age group reached 28.83%. The low participation rate in this age group may indicate that a significant number of individuals are still attending school and not yet entering the labor market. The labor force participation rate in August 2022 continues to increase with age, peaking at 81.93% in the 45-49 year age group and then declining in older age groups. This decreasing pattern may indicate a workforce that becomes less productive with increasing age. According to the International Labor Organization (ILO), clear general patterns are observed worldwide based on participation rates of prime-age women and men in the labor force. Prime-age women who live alone have a high participation rate, almost equal to that of prime-age men who live alone. This narrow participation gap widens for prime-age women and men who live with their partners and widens for those who live with children. Marriage lowers female labor force participation rates, and having children further reduces these rates, while the opposite trend is observed for men.

The number of women aged 15 years and over who worked for an entire week, based on their primary employment status, shows that the highest percentage is in the category of laborers/employees, with figures of 33.01% in 2020, 34.62% in 2021, and 33.94% in 2022. In contrast, the lowest participation rate is paid workers assisted by non-permanent laborers, with figures of 1.64% in 2020, 1.58% in 2021, and 1.62% in 2022 (BPS-Statistics Indonesia, 2023).

From 2012 to 2021, over 30% of all women participating in the labor market chose to work part-time (BPS-Statistics Indonesia, 2023). This phenomenon indicates that women still take jobs that allow them to fulfil their roles as mothers, with responsibilities to raise and care for children.

One of the factors that significantly influences a married woman's decision to work is the presence of children. Ismail and Sulaiman (2014) revealed that the presence of children negatively affects the participation rate of married women in the labor market. Meanwhile, Francesconi (2002) found the opposite, suggesting that the presence of children positively influences the work participation of married women. Research by Siah and Lee (2015) in Malaysia did not find sufficient evidence regarding the influence of children on married women's participation in the labor market

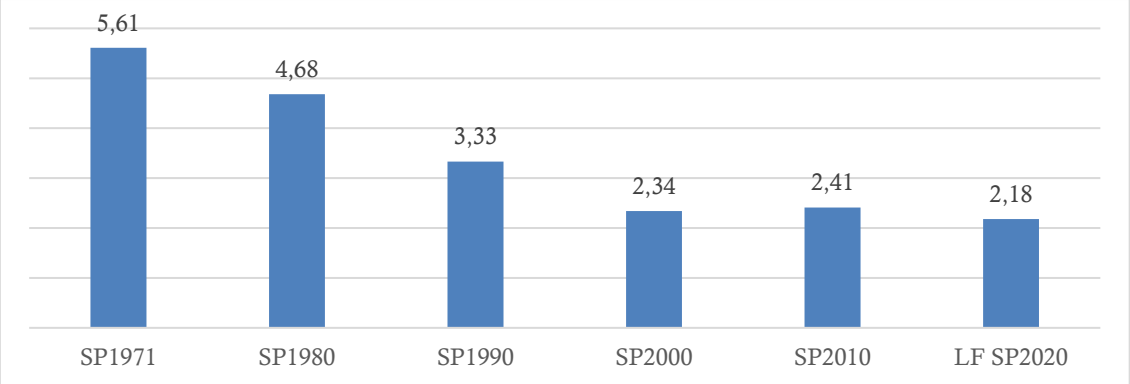

Figure 1. Indonesia's Total Birth Rate (Births per Women) 1971-2020
Source: BPS-Statistics Indonesia, 2023 (Processed)

Total birth rate data published by (BPS-Statistics Indonesia, 2023) illustrates that over the last decade, Indonesia has experienced a significant decline in TFR from 2.41 in 2010 to 2.18 in 2020. The relationship between the level of women's participation in the labor market, known as Female Labor Force Participation (FLFP), and the total birth rate of women, referred to as the Female Total Fertility Rate (FTFR), is a common issue in both developed and developing countries. Generally, FLFP levels tend to decrease after mothers give birth because, traditionally, mothers with young children are considered to have low levels of work engagement. Kenjoh (2005) investigated that among OECD member countries, only Scandinavian countries show that the majority of women continue to work throughout their lives.

However, recently, there has been a change in this situation, and today, there are other OECD countries where women work continuously throughout their lives or only with short breaks during childbirth. As Kenjoh (2005) explains, the increase in maternal labor force participation is one of the most striking developments in the current labor market in OECD countries. Researchers like Amador et al. (2013) and Tam (2011) investigate the enhancement of the Female Total Fertility Rate (FTFR) from two aspects, namely negative and positive mutually exclusive influences. On the negative side, an increase in the number of children can result in enhanced household work, thereby reducing opportunities for mothers to seek employment in the market and supporting the hypothesis of role nonconformity. However, on the positive side, an improvement in the number of children can also increase household income, which may encourage mothers to seek work outside the home.

The effect of birth rates on women's labor supply is likely to vary according to the child's age. On the one hand, when children are still small, the need to care for them limits a mother's opportunity to work and earn an income. In line with this reasoning, the empirical study by Kusharyono (2009) tends to find that children aged 0-6 years reduce the chances of married women entering the workforce.

On the other hand, a child's age has a substitution effect concerning the time required to care for the child and directly impacts income, as older children tend to be more expensive than younger children. For example, the older a child is, the more calories they need. Additionally, parents must finance educational expenses and buy better-quality clothes for their children. A study by Harsoyo & Sulistyaningrum (2018) shows that adjusting the birth rate by considering the number of children and the sex of the child reduces women's labor supply. The impact on the working-age group is significant: the labor force participation rate will decrease by about 52 to 54%, and total working hours will decrease by about 23 hours per week.

According to the International Labor Organization (ILO), women in households with only one member generally have higher participation rates than women in other households. The presence of children reduces the labor force participation of women and increases the labor force participation of men, with the same proportion in percentage. This finding demonstrates that the reality for women differs from that for men, depending on their household type. Women who assume economic independence (as mothers in a family) or take on more economic responsibilities (single mothers) follow the household's needs.

According to the Neoclassical Theory of Labor Supply, the basic trade-off model between consumption and leisure time explains the main characteristics of labor supply. Specifically, it shows that the labor supply is not always a monotonous function of wages. An individual's choice to work is determined by balancing working hours with leisure time, which depends on their preferences, wages, and income (Hotchkiss, 1999). This demonstrates that the supply of labor increases when wages are low and then decreases when wages are sufficiently high. Furthermore, the study of the trade-off between consumption and leisure informs the factors that determine participation in the labor market.

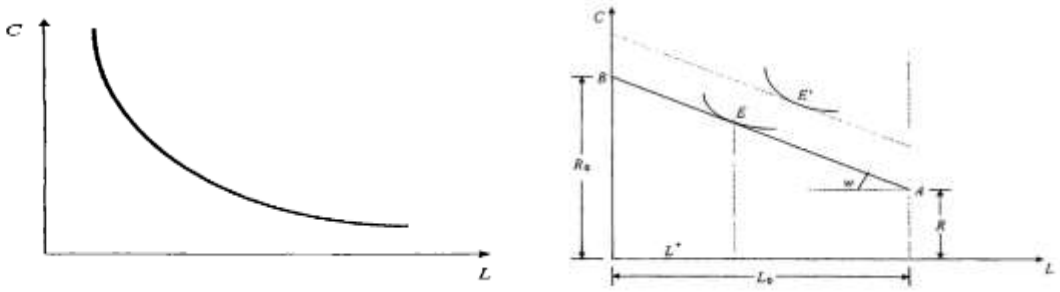

Figure 2. An Indifference Curve and the Trade-off of consumption & leisure
Source : Cahuc (2016)

A trade-off between consumption and leisure time is illustrated by an individual's utility function, U(C,L), where C and L denote consumption goods and leisure time, respectively. Figure 3 shows that the optimal solution lies at the tangent point between the budget line AB, whose slope is w, and the indifference curve, which represents the consumer's utility level. In comparative statics models, each increase in w results in a clockwise rotation of line AB around point A, with absciss L0 and ordinate R. An increase in non-wage income corresponds to a shift in the budget line.

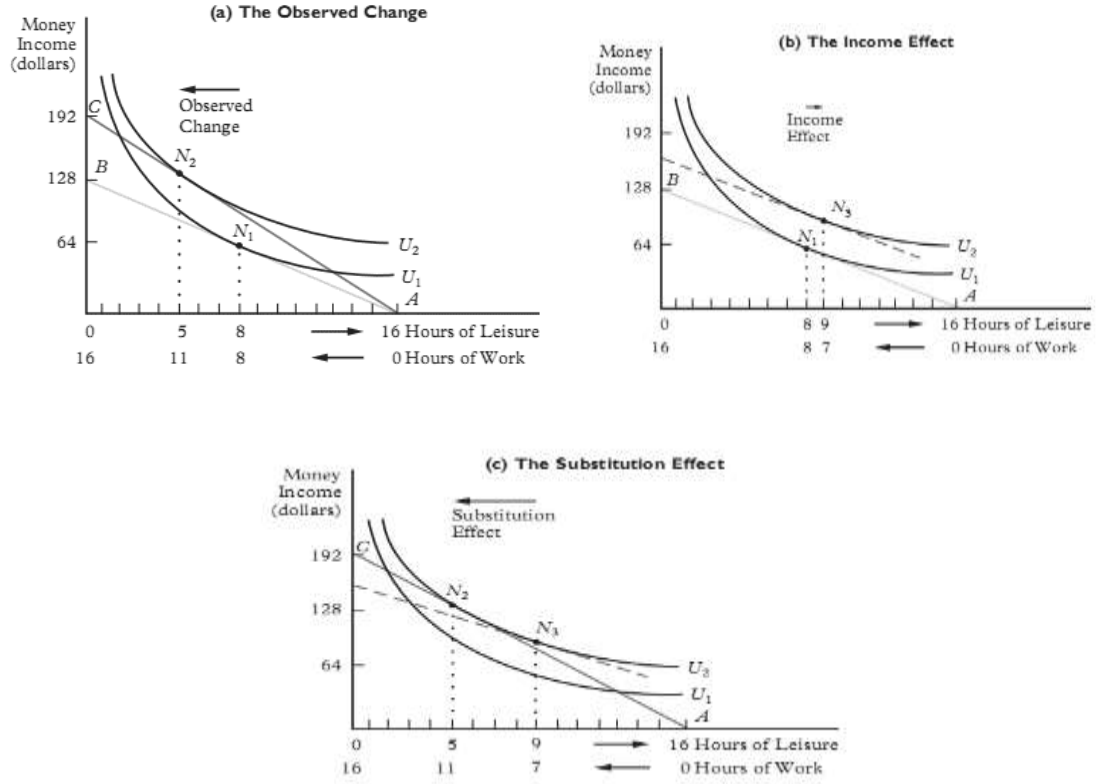

Figure 3. Income and Substitution Effect
Source: Ehrenberg (2009)

One of the factors affecting the labor supply in the labor market is wages. Changes in wages in the labor market and their influence on the number of working hours offered will cause a substitution effect and an income effect. Ehrenberg (2009) states that market wages are usually hypothesized to correlate positively with labor supply. As market wages (w) increase, the unit price of leisure (L) becomes expensive. Therefore, the demand for leisure units decreased, and the labour supply increased. This connection is often called the substitution effect.

On the other hand, an increase in wages also increases total income. The total income earned if there is no leisure, meaning all leisure is used for working in the market. Assuming leisure is a normal good, an increase in total income increases the units of leisure demanded. As a result, the units of labor supplied decrease. This phenomenon is called the income effect. According to the definition, the income effect is a change resulting from the choice between consumption and leisure time due to a price change. The substitution effect results from the substitution between consumption and leisure time due to a price change.

Table 1. Wages of Men and Women Based on Education Level (Rupiah)

Education	Men	Women
Elementary school	2,117,361	1,280,826
Junior high school	2,357,497	1,658,672
Senior high school	3,099,936	2,115,726
Vocational school	3,059,119	2,288,670
Diploma	4,414,594	2,930,465
University	5,436,083	3,701,652

Source: National Labor Force Survey February 2020 (Processed)

Currently, the income gap between women and men still exists at every level of education. Women who graduated from elementary school experienced the highest gap, with wages 39.5% lower than men's wages at the same level of education. (Pirmana, 2006) clearly shows significant gender inequality in wages in Indonesia. Using data from the National Labor Force Survey (Sakernas) in 1996, 1999, 2002, and 2004, as well as the Oaxaca-Blinder decomposition method, the results of this income gap decomposition indicate that the factors causing the income gap between genders are approximately 41.6% due to differences in characteristics and about 58.4% due to unobserved and unexplained factors. This indicates that most of the wage gap in Indonesia is caused by unobserved and unexplained factors, which are indicated as discrimination.

Many characteristic factors are thought to cause the differences in wages received by men and women. Women's lower wages are attributed to women's lower investment in human capital, such as education, training, and work experience, compared to men (Jacobsen, 1994). Women's preferences in choosing types of work are also one of the causes of wage differences, as women tend to prefer jobs that are comfortable and not risky, such as nursing and teaching. The number of hours worked can also contribute to income differences, as it is common in most countries for women to be responsible for household work and child care. This condition is natural if women work fewer hours in the labor market than men because they spend more time caring for the family. This makes women's incomes lower than men's (Becker, 1965).

One factor that greatly influences a married woman's decision to work is the presence of children. Ismail and Sulaiman (2014) revealed that the presence of children negatively affects the participation rate of married women in the labor market. Meanwhile, Francesconi (2002) found the opposite, showing that the presence of children positively influences the work participation level of married women. Research by Siah and Lee (2015) in Malaysia did not find sufficient evidence regarding the influence of children on married women's participation in the labor market. In this study, researchers highlight factors that influence married women's decisions to work, including location, number of household members, age of women, education of women, employment status, wages, working hours, and training, using Sakernas February 2022 data. This dataset covers all provinces in Indonesia, which differs from previous research that used 2006 Susenas data, focusing only on analysis at the Central Java provincial level. Additionally, previous research employed the OLS and 2SLS methods, whereas this study uses the Logit Regression method.

Based on the previous explanation and supported by prior research, a question arises: "What factors influence a married woman's decision to work?" This question forms the basis

for the author's research. Therefore, this study is titled "Labor Supply Analysis: A Case Study of Married Women Workers".

RESEARCH METHODS

In this research, an analytical method is also needed to see how well the model used can correctly predict categories or groups from a number of individuals. Besides that, a variable-dependent shaped dummy can be said to be a natural binary qualitative. So, The Logit Regression is adopted the by the model constructed by Wooldridge (2016).

According to Kuncoro (2004), logit regression is more flexible than other techniques. It does not assume the normality of the independent variables used in the model. This means the explanatory variables do not need to be normal, linear, or have the same variance across groups. The independent variables in logit regression can be a mix of continuous, discrete, and dichotomous variables. Logit regression is particularly useful if the response distribution on the dependent variable is expected to be nonlinear with one or more variables.

The regression model used in this study is a logit model with two frequent choices, called binary logit regression. The logit is a regression model that analyses a dependent variable with outcomes between 0 and 1 (Winarno, 2009). In this research, the dependent variable has two options: married women who work are given the number 1, and married women who do not work are given the number 0. The binary dependent logit model emerges from the function cumulative normal distribution in analyzing variables. Logit model equations, in general as follows (Gujarati & Porter, 2013):

$$\text{Pi} = \text{E}(\text{Y} = 1 \mid \text{Xi}) = \frac{1}{1+e^{-(a+\beta_1 X_1)}} \quad \text{.....(1)}$$

Then the equation above can be simplified to:

$$\text{Pi} = \text{E}(\text{Y} = 1 \mid \text{Xi}) \frac{1}{1+e^{-Z}} = \frac{e^Z}{1+e^Z} \quad \text{.....(2)}$$

With $Z_1 = \alpha + \beta_1 X_1$, so the function is known with the function cumulative logit distribution (cumulative logit distribution function). Based modelling defines Pi as the logit model. Pi lies between 0 and 1 because Z_1 lies between - ∞ and ∞. If Z →∞, then Pi = 1, whereas if Z →- ∞, then Pi = 0 (Gujarati & Porter, 2013). The form of the logit model is:

$$\text{Pi} = \text{E}(\text{Y} = 1 \mid \text{Xi}) = \frac{1}{1+e^{-(a+\beta_1 X_1)}} = \frac{e^Z}{1+e^Z} \quad \text{..... (3)}$$

Where *Pi = E(Y = 1 | Xi)* is the probability that something event/incident will be successful, the probability of incident. This is a strong possibility of married women for work shown with percentage probability, so the value is between 0% and 100%. While 1- Pi is the probability of married women not working.

$$1 - \text{Pi} = \frac{1+e^{(a+\beta_1 X_1)}}{1+e^{(a+\beta_1 X_1)}} - \frac{e^{(a+\beta_1 X_1)}}{1+e^{(a+\beta_1 X_1)}} = \frac{1+e^Z}{1+e^Z} - \frac{e^Z}{1+e^Z}$$

$$= \frac{1}{1+e^Z} \quad \text{..... (4)}$$

Where $[\frac{\text{Pi}}{1-\text{Pi}}]$ is the odds ratio *of* the possibility of a married woman not working. Therefore, $[\frac{\text{Pi}}{1-\text{Pi}}]$ which describes the probability of women married to work, can be written as follows:

$$[\frac{\text{Pi}}{1-\text{Pi}}] = \frac{1}{1+e^Z} - \frac{e^Z}{1+e^Z} \text{x} \frac{1+e^Z}{1} = e^Z \quad \text{..... (5)}$$

From the model above, logit analysis can be used as follows:

$$Li = \text{Ln}\,[\frac{Pi}{1-Pi}] = Zi \quad \text{..... (6)}$$

The following is a logit regression model:

$$Li = \ln\,[\frac{Pi}{1-Pi}] = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu_i \quad \text{..... (7)}$$

Where, Li is the dependent variable or dummy dependent variable; it has a value of 1 if a married woman works and a value of 0 if a married woman does not work, $\text{Ln}[\frac{Pi}{1-Pi}]$ is logarithmic form of probability married women working devided by 1 – probability of married woman working; α is a constant, $\beta_{1...}\beta_8$ is the regression coefficient of each dependent variable or independent variable, X_1 is location; X_2 is household members; X_3 is women's age; X_4 is women's education; X_5 is employment status; X_6 is wages; X_7 is working hours, X_8 is training, and μi is an error (other variables not observed in the model).

Table 2. Operational Definition Variable

Variable	Operational definition	Unit	Data source
Married women work (Y)	The variable that indicates whether a married woman is working or not working.	Dummy variables, namely (1) working and (0) not working	BPS-Statistics Indonesia
Location (X_1)	The variable that indicates where married women live.	Dummy variables, namely (1) urban and (0) rural	BPS-Statistics Indonesia
Household members (X_2)	Variables that indicate the number of household members.	Person	BPS-Statistics Indonesia
Women age (X_3)	The variable that indicates the age at which a woman gets married is measured using units.	Year	BPS-Statistics Indonesia
Women's education (X_4)	The variable indicates the length of formal education that married women have completed.	Elementary, middle school, high school, diploma or bachelor's degree	BPS-Statistics Indonesia
Employment status (X_5)	Variables that indicate status/position in work.	Dummy variables, namely (1) informal workers and (0) formal workers	BPS-Statistics Indonesia
Wages (X_6)	The variable that indicates the wife's wages earned if a married woman works for one month.	Rupiah then changed and became log natural	BPS-Statistics Indonesia
Working hours (X_7)	Variable that indicates the number of working hours from married women workers during a week (on working days).	Hours	BPS-Statistics Indonesia
Training (X_8)	The variable that indicates the participation of married women workers at training.	The dummy variable, namely (1), has training experience, and (0) does not have training experience.	BPS-Statistics Indonesia

Source: Data Processed, 2023

The goodness of fit test was conducted to see how well a model can explain the connection between variables dependent on its independence. Alternatively, the model can explain the variation from variable dependent. In Logit regression, the parameter seen in the Goodness of Fit Test is Pseudo R^2, the artificial R-square used because no possible equivalent exists to replace R^2 OLS in the logit model.

A simultaneous test is done to inspect whether the independent effect is significant in a way, whole or simultaneously to the dependent variable. Simultaneous test is done with see prob value > chi2 and p-value.

The partial test done for the test is variable, independent own effect significant in a way partial with method compare Wald test statistics with standard normal distribution with level significant (α) of 0.05, or with method compare the p-value with (α) of 0.05.

Marginal Effect tells how the dependent variable changes when the independent variable changes. Meanwhile, covariates other considered fixed and constant. If results dy/dx show results negative, then the variable independent of the own trend is negative to variable the dependent. On the other hand, if results dy/dx show results positive, then the independent variable the own trend positive to the dependent variable.

RESULTS AND DISCUSSION

Based on data from the National Labor Force Survey (Sakernas) February 2022, the total observations (women married workers) after customized with weighing (weight), the amount become amounting to 21,735,896 which was before customized the amount amounting to 20,829 observations.

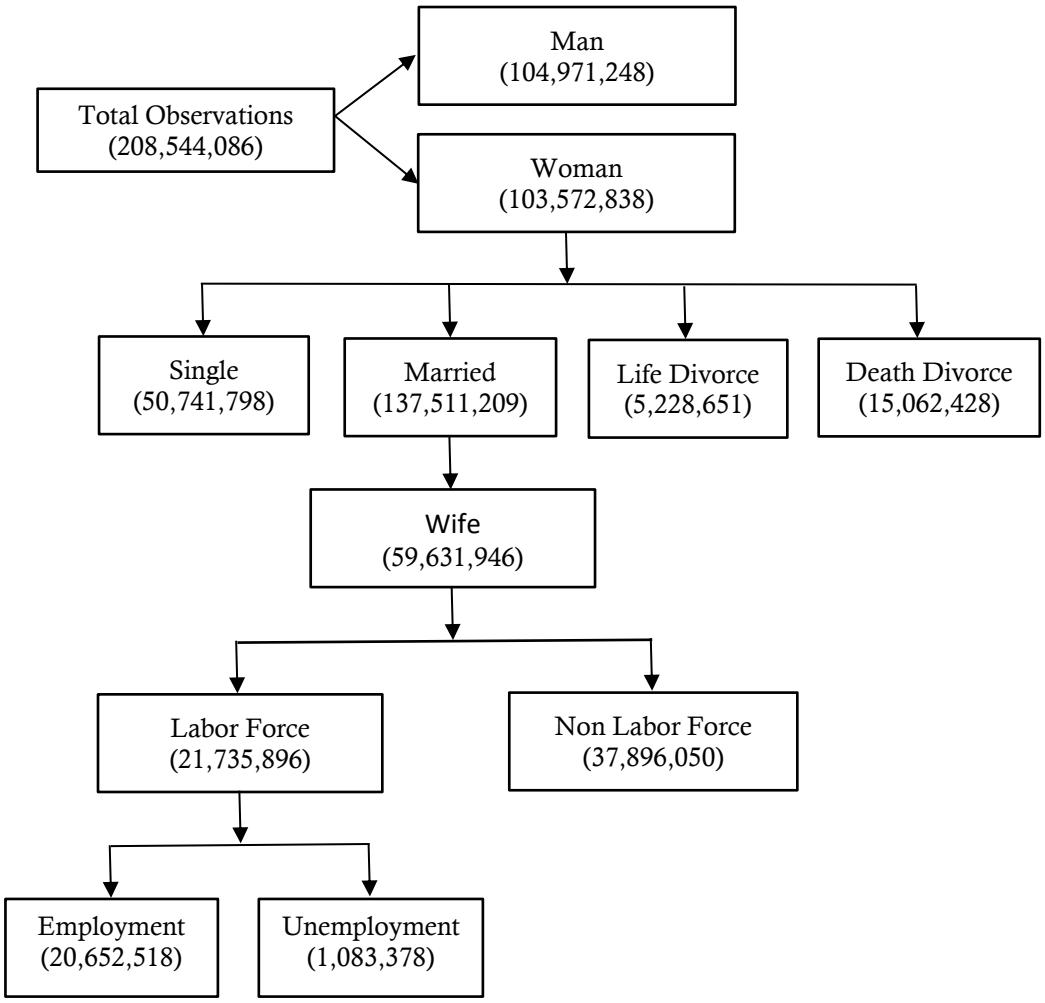

Figure 4. Scheme of Research Variable
Source: Statistics Indonesia, 2023 (Data Processed)

Table 3. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Married women workers (Y)	0.95015	0.21762	0	1
Location (X_1)	0.5992	0.4900	0	1
Household members (X_2)	3.8558	1.2714	2	24
Women age (X_3)	41.9054	10.9007	17	98
Women's education (X_4)	4.02598	2.6190	1	12
Employment status (X_5)	0.56589	0.4956	0	1
Ln_wages (X_6)	14.0049	0.9823	9.9034	18.1975
Working hours (X_7)	37.3611	20.1609	0	147

Variable	Mean	Std. Dev.	Min	Max
Training (X_8)	0.0085	0.0922	0	1
Number of obs		**21,735,896**		

Source: BPS-Statistics Indonesia, 2023 (Processed)

It is known that married women predominate, numbering 68,434,391, while women who are unmarried, divorced, or widowed number 35,138,447. Thus, 66.08% of the women are married. The number of observations in urban areas amounts to 13,024,907, and in rural areas, it amounts to 8,710,989, indicating that the number of observations in urban areas is greater than in rural areas by a difference of 4,313,918 people.

The average household size ranges from 2 to 4 members, with a total frequency of 16,056,975 households. Regarding age, the youngest respondents are 17 years old, numbering 850, while the oldest respondents are 98 years old, numbering 1,701. The predominant education level is senior high school, with 5,453,940 respondents, while the least common is those who have not yet graduated from elementary school, totalling 2,617,648.

Most women in employment hold informal positions, totalling 12,300,261 or approximately 46.53% of all married women who work. The lowest wage is IDR 20,000, earned by 2,768 workers, while the highest is IDR 80,000,000, earned by 2,976 workers. The average wage for married women workers is IDR 1,934,149.

The variables used from the Sakernas data for February 2022 include location, household members, women's age, education, employment status, wages, working hours, and training. The hypothesis to be tested in this research is:

1. H_0: $\beta_1 = 0$
   The location variable does not affect the supply of married women workers.
   H_1: $\beta_1 < 0$
   Location variable has a negative influence on the supply of married women workers.
2. H_0: $\beta_2 = 0$
   The household members variable does not affect the supply of married women workers.
   H_1: $\beta_2 < 0$
   There is a negative influence of the variable number of household members on the supply of married women workers.
3. H_0: $\beta_3 = 0$
   The women's age variable does not affect the supply of married women workers.
   H_1: $\beta_3 > 0$
   The women's age variable positively influences the supply of married women workers.
4. H_0: $\beta_4 = 0$
   The women's education variable does not affect the supply of married women workers.
   H_1: $\beta_4 > 0$
   The women's education variable positively influences supply married women workers.
5. H_0: $\beta_5 = 0$
   The employment status variable does not affect supply married women workers.
   H_1: $\beta_5 < 0$
   The employment status variable negatively influences supply married women workers.
6. H_0: $\beta_6 = 0$
   The wage variable does not affect the supply of married women workers.
   H_1: $\beta_6 < 0$
   There is a negative influence of the wage variable on the supply of married women workers.
7. H_0: $\beta_7 = 0$
   The working hours variable does not affect the supply of married women workers.
   H_1: $\beta_7 > 0$
   The variable of working hours positively influences supply married women workers.
8. H_0: $\beta_8 = 0$
   The training variable does not affect the supply of married women workers.
   H_1: $\beta_8 > 0$
   The training variable positively influences the supply of married women workers

Table 4. Estimation Results with the Binary Logit Regression Model

Variable	Coefficient	Robust Std. Errr.	z	P>|z|	*Odds* Ratio
Location (X_1)	-0.2277	0.00202	-112.38	0,000	0.79633
Household Members (X_2)	-0.0495	0.00072	-67.94	0,000	0.9516
Women Age (X_3)	0.0072	0.00009	77.29	0,000	1.0072
Women Education (X_4)	0.0615	0.00048	127.68	0,000	1.0635
Employment Status (X_5)	-0.4204	0.00262	-160.00	0,000	0.6567
Wages (X_6)	-0.2092	0.00121	-171.78	0,000	0.8112
Working Hours (X_7)	0.0806	0.00014	547.09	0,000	1.0839
Training (X_8)	0.1824	0.01192	15.30	0,000	1.2001
Constant	3.7522	0.01566	239.48	0,000	42.6155
Number of obs	21,735,896				
Pseudolikelihood log	-3520372				
LR chi^2	1568936.94				
Prob > chi^2	0,000				
Pseudo R^2	0.1822				
Wald chi^2	680007.27				

Source: BPS-Statistics Indonesia, 2023 (Processed)

From the estimation results above, the following equation can be written:

$$Li = \ln\left[\frac{Pi}{1-Pi}\right] = 3.7522 - 0.2277X_1 - 0.0495X_2 + 0.0072X_3 + 0.06157X_4 - 0.4204X_5 - 0.2092X_6 + 0.0806X_7 + 0.1824X_8 + \mu_i \quad \text{.....(8)}$$

Where Li is the dependent variable or dummy dependent variable; it has a value of 1 if a married woman works and a value of 0 if a married woman does not work, $\text{Ln}[\frac{Pi}{1-Pi}]$ is Ln is then probability if working married female / 1-working married female; α is a constant, $\beta_{1\ldots}\beta_8$ are the regression coefficient of each dependent variable or independent variable, X_1 represents the location; X_2 represents household members; X_3 represents the woman's age; X_4 represents women's education; X_5 represents employment status; X_6 represents wages; X_7 represents hours worked, X_8 represents training, and μi is an error term (representing other variables not observed in the model).

The test results show that the pseudo-R² value of 0.1822 indicates that location, household members, women's age, education, employment status, and wages can explain 18% of the supply of married women workers. However, a small pseudo-R² value does not make a model considered flawed. This is because the pseudo-R² value, which ranges from 0 to 1, is not a natural interpretation but an imitation to replace the OLS R² in the logit model (Greene, 2003). This is supported by Gujarati (2004), who believes that in the logit regression model, the main aspects to consider are the model significance indicators, the significance of the independent variables, and the direction of the coefficients of these variables. Meanwhile, the pseudo-R² quantity is not prioritized. Additionally, using cross-sectional data in this research implies that a low R² value does not necessarily indicate a poor model. If the Z-stat test results show significant outcomes and align with the direction of economic theory, the model can still be classified as statistically feasible (Gujarati, 2004).

The above output shows that prob > chi2 is 0.0000, with a p-value < 0.05. With these results, a decision can be made that H_0 is rejected and H_1 is accepted, which means that location, household members, women's age, education,

employment status, wages, working hours, and training simultaneously influence the supply of married women workers.

The Wald chi^2 test value is 680007.27 with Prob > chi^2 of 0.000, indicating that simultaneously, the independent variables (location, household members, women's age, women's education, employment status, wages, working hours, and training) in the model can explain the dependent variable (married women's labor supply).

In this research, it turns out that location is one of the variables that influences the supply of married women workers. The significance value from the variable location is 0,000 where results are smaller than significance 0.05, so H_0 rejected and H_1 accepted. The coefficient on a location variable is negative and is as big as -0.2277 means that the variable location is influential, negative, and significant to the variable offer of married women workers. From the negative coefficient, it can also be concluded that married women living in urban areas tend to have a lower labor supply than those in rural areas. As is known, work in rural areas is dominated by the agricultural sector, which can be done without requiring special skills, making it easier for married women workers to join the work. This is in line with the result, which states that married women who live in villages tend to have lower working hours than married women who live in cities. The location of labor force participation is rural and often involves various activities, including work in agriculture, activities business, and outside work agriculture, which may also include migration. One field job in rural areas is the PT (company), which tends to recruit more married women workers than men. Remember, women are considered more diligent in doing jobs and wages offered in rural areas are lower than in urban areas (Kusharyono, 2009).

On the other hand, women married in urban areas tend to be more selective in choosing work based on the education that has been finished. Partially, prominent urban residents participate in the energy market work as workers (Zhu, 2023). Research by Schaner & Das (2016) also shows that labor force participation among young women in the city has experienced enhancement over several years. Lastly, dominated by work wages, the participation of young women in the village in the temporary labor force has experienced a decrease, and they tend to choose to go out from informal work and not be paid.

The significance value for the household member variable is 0.000, which is smaller than the significance level of 0.05. Thus, H_0 is rejected, and H_1 is accepted. The coefficient for the household member variable is negative, at -0.0495, indicating that the number of household members significantly negatively affects the supply of married women workers. Specifically, this negative coefficient means that an increase in household members corresponds to a decreased opportunity for married women to work. The presence of household members, particularly young children, can hinder married women from participating in the labor market, as caring for young children requires substantial time and attention.

Consequently, a mother with young children may prioritize domestic responsibilities over employment. This finding aligns with the research by Ismail & Sulaiman (2014), which revealed that the presence of children negatively impacts the participation rate of married women in the labor market. Additionally, a study by Halim (2019) shows that an increase in the number of children per 1,000 can slightly improve the participation of Indonesian mothers in work conditions by 7.4 percentage points. Mothers often take on informal work, such as laborers and farmers, which aligns with the trend of preschool operations being limited to part-time schedules.

The significance value for the age of women variable is 0.000, which is smaller than the significance level of 0.05. Therefore, H_0 is rejected, and H_1 is accepted. The coefficient for the age of women variable is positive, at 0.0072, indicating that the age of women has a positive and significant effect on the supply of married women workers. This positive coefficient means that as women age, their work opportunities

increase. Fewer married women are employed at a younger age (under 20 years), whereas more married women enter the workforce as they age. This finding aligns with research entitled "Analysis of factors that influence the participation of women workers in the city of Medan", which explains that age positively influences women's participation in the labor market (Simbolon, 2010). In addition, the other research results show that the age at which women marry positively impacts their participation in the workforce (Bachtiar, 2018).

The significance value for the women's education variable is 0.000, smaller than the significance level of 0.05. Therefore, H_0 is rejected, and H_1 is accepted. The coefficient for the women's education variable is positive, at 0.0615, indicating that education has a positive and significant effect on the supply of married women workers. This positive coefficient suggests that higher levels of education increase the opportunity for married women to work. This finding aligns with the research by Tansel (2002), which indicates that education affects the duration of women's participation in the labor market. Specifically, higher education increases potential wages/income and makes leisure time more costly, leading to a longer time allocation in the job market.

For women with higher education, working is not only for wages but also as a form of self-actualization. For them, unemployment is a choice, meaning they are willing to be involved in the workforce if they feel that the wages offered in the job market are commensurate with the education they have completed. Here, the substitution effect applies. Namely, if education is considered a normal consumption good, then the wages obtained from work must be able to replace the costs incurred to pursue that education. With high education, they can easily enter and exit the job market (Kusharyono, 2009).

The significance value from the employment status variable is 0.000, which is smaller than the significance level of 0.05; therefore, H_0 is rejected, and H_1 is accepted. The coefficient on the employment status variable is negative, at -0.4204, indicating that the employment status variable has a negative and significant influence on the supply of married women workers. The negative value of the coefficient for the employment status variable implies that married women have fewer opportunities to work if their employment status is informal. The limited opportunities for married women to work in the informal sector align with the characteristics of informal work, which include self-employment at their own risk, self-employment with the help of temporary workers, and unpaid work that assists someone in earning income or profit without receiving wages or salaries in money or goods. Such jobs typically have irregular working hours, whereas jobs in the formal sector usually have a standard of 8 hours per day. Research by Yeni et al. (2022) indicates that women living in Java and Bali and working in the formal sector are more likely to leave the labor market after marriage than women working in the informal sector.

The significance value for the wage variable is 0.000, which is smaller than the significance level of 0.05; therefore, H_0 is rejected, and H_1 is accepted. The coefficient for the Ln_wages variable is negative, at -0.2092, indicating that the Ln_wages variable has a negative and significant influence on the supply of married women workers. The negative wage coefficient means that the higher the wage, the smaller the opportunity for married women to work. Generally, as wage levels increase, individuals tend to work more because higher wages provide an incentive to work more. However, there are instances where individuals reach a point where they decide to reduce the number of hours they work even if their wages increase. This concept is typically related to jobs with specific characteristics, such as those requiring significant physical energy or having inflexible work schedules. This phenomenon, known as the backwards-bending labor supply curve (Marshall, 1890), explains that individuals may choose to reduce their working hours despite higher wages. Lower wages offered to women will significantly affect the costs of raising

children (Budig, 2011; Anderson, 2003; Budig, 2014).

The significance value for the working hours variable is 0.000, which is smaller than the significance level of 0.05; therefore, H_0 is rejected, and H_1 is accepted. The coefficient for the working hours variable is positive, at 0.0806, indicating that the working hours variable has a positive and significant influence on the supply of married women workers. The positive coefficient for the working hours variable means that the higher the working hours, the greater the opportunity for married women to work. A person's working hours are also influenced by individual preferences from the market's supply side, especially in the long term. The workforce can incorporate their preferences regarding working hours when deciding whether to participate in the labor market full-time or part-time or even to work more than one job (Ehrenberg, 2009). This aligns with the concept explained theoretically, which posits a close relationship between the number of working hours and income; as income levels rise, the cost of time increases, prompting some individuals to increase their working hours to earn higher wages (Bellante, 1990). Research provides detailed evidence of this gap based on work using combined data for 2011-2014. They find that workers in support services, food preparation, and administrative roles (more commonly held by women) have the fewest working hours, while those in legal and management positions have the most working hours (Boushey, 2016).

The significance value from variable training is 0,000 where results are smaller than significance 0.05, so H_0 rejected and H_1 accepted. The coefficient on variable training is positive, as big as 0.1824, which means variable training is influential and significant in offering married women workers. The coefficient of the training variable is positive, which means that training increases married women's opportunities to work. This is related to the training aspect, which influences women's time to look for work. The more training they get, the faster women get a job. In addition, training can increase women's ability to obtain better jobs or increase their wages, thereby increasing their incentives to engage in the labor market more or extend their working hours. One study said that someone who does not have training is less likely to get a job compared to someone who has training. From the side request power work, giver work tends to choose power educated and already working trained for zoom out cost training that will be issued by the company in practice employee new (Mahlwele, 2009).

Table 5. Marginal Effect

Variable	dy /dx	Std. Errr.	z	P>|z|
Location (X1)	-0.0046	0.00004	-106.31	0,000
Household members (X2)	-0.0010	0.00002	-66.55	0,000
Women age (X3)	0.0001	0.00000	76.02	0,000
Women's education (X4)	0.0012	0.00001	128.16	0,000
Employment status (X5)	-0.0086	0.00007	-131.45	0,000
Wages (X6)	-0.0043	0.00002	-188.95	0,000
Working hours (X7)	0.0016	0.00000	827.39	0,000
Training (X8)	0.0035	0.00021	16.68	0,000

Source: BPS-Statistics Indonesia, 2023 (Processed)

The coefficient value (Marginal Effect) for the location variable is -0.0046, indicating that the location will reduce the probability of a married woman worker being offered by 0.46%. The coefficient value (Marginal Effect) for the number of household members is -0.0010, meaning that an increase in the number of household members will reduce the probability of a married woman worker being offered by 0.10%. The coefficient value (Marginal Effect) for the age variable is 0.0001, which implies that a woman's age will increase the probability of a

married woman worker being offered by 0.01%. The coefficient value (Marginal Effect) for the education variable is 0.0012, suggesting that higher educational attainment will increase the probability of the supply of married women workers by 0.12%.

The coefficient value (Marginal Effect) for the employment status variable is -0.0086, indicating that employment status will reduce the probability of a married woman worker being offered by 0.86%. The coefficient value (Marginal Effect) for the Ln_upah variable is -0.0043, meaning that Ln_upah will reduce the probability of a married woman worker being offered by 0.43%. The coefficient value (Marginal Effect) for the working hours variable is 0.0016, which implies that increased working hours will increase the probability of a married woman worker being offered by 0.16%. Finally, the coefficient value (Marginal Effect) for the training variable is 0.0035, suggesting that additional training will increase the probability of a married woman worker being offered by 0.35%.

CONCLUSION

Based on the estimation results from the Sakernas data analysis of February 2022, the following conclusions can be drawn: Generally, married women are more likely to work if they live in rural areas, have fewer household members, are older, possess a higher level of education, hold formal employment status, have lower wages, work longer hours, and have attended training.

Married women who have recently given birth may experience a reduction in productive work time. When re-entering the job market, these women tend to choose lower-skilled positions. In rural areas, companies that recruit more married women than men offer many such positions, as women are perceived as more diligent. Wages in rural areas are often lower compared to urban areas due to the lower skill requirements for these jobs.

The general conditions in rural areas, characterized by jobs that do not require specialized skills, create more opportunities for married women to enter the labor market. This is facilitated by the greater flexibility that married women have in managing their time when they are not responsible for child-rearing. Additionally, parental support in rural areas positively influences married women's employment decisions, leading to higher employment rates than in urban areas.

In contrast, urban areas typically have more demanding job criteria, such as the need for specific skills or educational qualifications. For example, many urban jobs require at least a high school diploma and particular skills, such as computer proficiency. Consequently, married women in urban areas tend to be more selective in their job choices, focusing on acquiring the necessary skills and education.

From the results of this research, the following policy recommendations are proposed: To address the impact of household members on married women's work opportunities, it is necessary to provide child-care programs or facilities. Such programs would allow married women to work more comfortably while ensuring their children are cared for. With child-care support, women can better balance their professional and familial responsibilities.

Family planning programs should also be intensified, as managing household size can enable married women to participate more fully in the labor market. Moreover, improved education for women in rural and urban areas is crucial. Enhanced education will better prepare women to participate more productively in the labor market. It is recommended that employers review and adjust wages to align with regional minimum wage standards, as wages significantly impact married women's employment opportunities.

The study has limitations: the variables used are limited, and the analysis relies solely on Sakernas data from February 2022. Future research should incorporate additional variables and use updated data to provide more relevant policy recommendations. Challenges include the lack of per capita household expenditure data in Sakernas and the exclusion of other working

household members, which may influence the supply of married women workers. This research did not account for non-labor income variables, which could impact married women's employment opportunities (Ehrenberg, 2009).

Despite its lack of wage data, future research should address these limitations by incorporating household expenditure variables and exploring additional data sources, such as Susenas. Combining Sakernas and Susenas data or other relevant sources and using alternative analytical methods could enhance the robustness of the study's results. Furthermore, employing the latest Sakernas data and alternative analytical methods could provide a more comprehensive understanding of the factors affecting the supply of married women workers.

REFERENCES

Amador, D., Bernal, R., & Peña, X. (2013). The Rise in Women Participation in Colombia: Fertility, Marital Status or Education? *Ensayos Sobre Politica Economica*, *31* (71), 54–63. https://doi.org/10.1016/S0120-4483(13)70010-1

Anderson, Deborah J., Melissa Binder, and Kate Krause. "The Motherhood Wage Penalty Revisited: Experience, Heterogeneity, Work Effort, and Work-Schedule Flexibility." Industrial and Labor Relations Review 56, no. 2 (January 2003): 273–94.

Asiati, D. (2004). Married Women's Labor Supply in Indonesia (Susenas Data Analysis 2002). University of Indonesia. Depok.

Bachtiar. 2018. Analysis of Factors that Influence Married Women's Offer Participation for Work in Indonesia.

Becker, G.S. (1965). A Theory of the Allocation of Time. In *Source: The Economic Journal* (Vol. 75, Issue 299).

Blau, D. M., & Robins, P. K. (1988). Child-Care Costs and Family Labor Supplies. In *Source: The Review of Economics and Statistics* (Vol. 70, Issue 3). https://www.jstor.org/stable/1926774

Borjas, G. J. (2016). *Labor Economics* (Seventh). New York: McGraw-Hill.

Boushey, Heather and Bridget Ansel. "Overworked America: The Economic Causes and Consequences of Long Working Hours." Washington Center for Equitable Growth (May 16, 2016), equitablegrowth.org, accessed July 1, 2016.

Budig, Michelle J. and Paula England. "The Wage Penalty for Motherhood." American Sociological Review 66, no. 2 (April 2011): 204-225.

Budig, Michelle J. "The Fatherhood Bonus & the Motherhood Penalty: Parenthood and the Gender Gap in Pay." Reports. Third Way (September 2, 2014), www.thirdway.org

Cahuc, P. (2016). *Labor Economics* . *4* (1), 1–23.

Connelly, R. (1992). *The Effect of Child Care Costs on Married Women's Labor Force Participation* (Vol. 74, Issue 1). https://www.jstor.org/stable/2109545

Ehrenberg, R.G., & S.R.S. (2009). *Modern Labor Economics*.

Francesconi, M. (2002). A Joint Dynamic Model of Fertility and Work of Married Women. In *Journal of Labor Economics* (Vol. 20, Issue 2, pp. 336–380). https://doi.org/10.1086/338220

Greene, W. H. (2003). *Econometric Analysis*. Prentice Hall.

Gujarati. (2004). *Basic Econometrics: Vol. Fourth Edition*. New York: McGraw-Hill.

Gujarati, D. N., & Porter, D. C. (2013). *Basics of Econometrics Book 2* (RC Mangunsong, Ed.; 5th Edition). Jakarta: Salemba Empat.

Halim, D.Z, J.H.C, & P.E (2019). *Preschool Availability and Women Labor Force Participation: Evidence from Indonesia*.

Harsoyo, A., & Sulistyaningrum, E. (2018). *Influence Fertility to Women's Labor Force Participation*.

International Labor Organization. 2024. General Pattern Women and Male Labor Force Participation Rates.

Ismail, R., & Sulaiman, N. (2014). Married Women Labor Supply Decision in Malaysia. *Asian Social Science*, *10* (3), 221–231. https://doi.org/10.5539/ass.v10n3p221

Kaufman, B. E., & Hotchkiss, J. L. (1999). *The Economics of Labor Markets* (Fifth Edition).

Kenjoh, E. (2005). New Mothers' Employment and Public Policy in the UK, Germany, the Netherlands, Sweden, and Japan. *Labor, 19(S1), 5-49. Http://Dx.Doi.Org/10.1111/j.1467-9914.2005.00322.x.*

Kuncoro, M. (2006). Development Economics: Theory. *Issues, and Policy, Edition*, *4*.

Kusharyono. 2009. The Influence of the Presence of Children 0-6 Years and Other Household Members on the Supply of Married Women in Labor in Central Java (Susenas Data Analysis 2006). University of Indonesia Thesis.

Mincer, J., Brady, D.S., Becker, G.S., Griliches, Z., Leiserson, M., Nelson, P.J., & Zupnick, E. (1962). *Labor Force Participation of Married Women: A Study of Labor Supply*.

Pirmana, Viktor. 2006. Earnings Differential Between Male-Women in Indonesia: Evidence from Sakernas Data. Working Paper in Economics and Development Studies.

Sarwono. 2006. Research Methods Quantitative and Qualitative. Science House. Yogyakarta.

Schaner, S., & Das, S. (2016). *Women Labor Force Participation in Asia: Indonesia Country Study*. www.adb.org

Siah, A.K.L, & Lee, G.H.Y (2015). *Women Labor Force Participation, Infant Mortality and Fertility in Malaysia*.

Shittu, W.O., & Abdullah, N. (2019). Fertility, Education, and Women Labor Participation: Dynamic Panel Analysis of ASEAN-7 countries. *International Journal of Social Economics*, *46* (1), 66–82. https://doi.org/10.1108/IJSE-11-2017-0559

Symbolon. (2010). *Analysis of Influencing Factors Participation Women Workers in Medan City* (Thesis, University of North Sumatra).

Sipayung, I.T, & Waridin. (2013). Analysis Women's Decision to Marry to Work (Case Study of Surakarta City, Central Java). Dipenogoro Journal of Economics, 2(4), 1-6. Statistics Indonesia. (2022). National Labor Force Survey (SAKERNAS) 2022. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Labor Force Participation Rates in Indonesia According to Gender 2018-2022. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Indonesia's Total Birth Rate 1971-2020. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Women Workers in 3 Main Sectors in Indonesia. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Percentage of the Labor Force to the Working Age Population by Age Group. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Open Unemployment Rate Based on Education Level. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Women Aged 15 Years and Over Who Worked During the Past Week According to Main Job Status. Jakarta: Statistics Indonesia.

Statistics Indonesia. (2023). Percentage of Women Aged 15 Years and Over in the Part-Time Worker Category. Jakarta: Statistics Indonesia.

Tansel, A. (2002). *Economic Development and Women Labor Force Participation in Turkey: Time-Series Evidence and Cross-Province Estimates*.

Tam, H. (2011). U-shaped Women Labor Participation with Economic Development: Some Panel Data Evidence. *Economics Letters*, *110* (2), 140–142. https://doi.org/10.1016/j.econlet.2010.11.003

Winarno. (2009). Analysis Econometrics and Statistics with Eviews. Second Edition. Yogyakarta: UPP STIM YKPN.

Wooldridge, J. M. (2016). *Introductory Econometrics*. MIT Press.

Yeni, I., Marta, J., Satria, D., Adry, MR, Putri, DZ, Sari, YP, Akbar, UU, & Putra, HS (2022). Opportunities for Working Women Go out from the Labor Market after Married. Indonesian *Journal of Economics and Development*, *22* (1), 131–148. https://doi.org/10.21002/jepi.2022.08

Zhu, M., Xing, C., & Li, Y. (2023). Husbands' Wages and Married Women's Labor Supply in Urban China. *China Economic Review, 82, 102069*