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WOMEN IN THE INDONESIAN ECONOMY: LABOR FORCE DYNAMICS, HOUSEHOLD WELFARE, AND DEVELOPMENTAL CHALLENGES

DIAN VERAWATI PANJAITAN

DOCTORAL PROGRAM IN ECONOMICS
FACULTY OF ECONOMICS AND MANAGEMENT
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SUMMARY

DIAN VERAWATI PANJAITAN. Women in The Indonesian Economy: Labor Force Dynamics, Household Welfare, and Developmental Challenges. Supervised by NUNUNG NURYARTONO, SYAMSUL HIDAYAT PASARIBU, and JANN LAY.

The production function framework states that the accumulation of capital and labor influences output. Labor is divided into male and female labor. The primary focus of this research is on female labor. Because the labor force participation rate of women is consistently lower than that of men, even though the composition of both groups is relatively balanced in the productive age group. It reflects untapped economic potential, as women can make a significant contribution to the economy by increasing their labor-market participation.

Women's participation in the labor market is significantly influenced by productivity levels, which are determined by the accumulation of education and skills. Increased educational attainment for women has been shown to boost their productivity and their ability to enter higher-value jobs, ultimately increasing their contribution to output and aggregate economic growth. At the same time, sustainable economic growth tends to drive increased labor demand, creating greater opportunities for women to enter and remain in the workforce. Increased employment opportunities can boost household income and well-being, including for female-headed households. The presence of dual income in a household can reduce household food vulnerability. Food insecurity remains a problem in Indonesia, including for households headed by women.

However, women's decisions to work are influenced not only by economic needs but also by gender norms and family livelihood models. Within the Breadwinner theory framework, men are considered the primary earners, so women's work is supplemental and elastic to their husbands' income. Conversely, the Adult Worker or Dual Earner theory emphasizes that all adults, including women, should work and be supported by state policies that enable more stable labor force participation. The Doing Gender theory highlights that women's work decisions are also a form of negotiating feminine and masculine identities. The Double Breadwinner model shows equal roles in income but still imposes a double burden on women.

Meanwhile, the Alternative Breadwinner model features women as the primary earners, especially when their husbands are unemployed, opening opportunities for changes in domestic roles despite facing social resistance. Thus, women's decision to work results from the interaction among economic structures, state policies, and gender norms that determine women's position as additional, equal, or primary earners, while economic growth is also influenced by capital through investment that drives economic value and labor absorption.

Apart from labor, another factor that influences economic growth is capital, which is derived from investment. Investment enhances economic value, stimulates economic growth, and increases labor absorption. Thus, this dissertation comprises five articles that examine the relationship between female labor force participation, economic output dynamics, and household welfare.

The first article investigates the influence of the Female Labor Force Participation Rate (FLPR) on regional economic growth and the income convergence process in Indonesia. The analysis used data from the National Labor Force Survey (Sakernas) from 2016 to 2022, employing Pooled Least Squares (PLS) and panel data models. The second article expands the study by examining the relationship between economic development and female labor force participation in 515 regencies/cities in Indonesia from 2017 to 2023, using Sakernas data. The analysis used PLS and fixed effects methods to identify the dynamics of the relationship between these two main variables.

The third article focuses on the supply side of female labor, utilizing data from the 2017–2023 National Socioeconomic Survey (Susenas). The analysis used machine learning approaches, such as Random Forest and Shapley Additive Explanations (SHAP), to identify the primary factors influencing women's decisions to participate in the labor market. Next, the fourth article examines aspects of food security in female-headed households, utilizing 2022 Susenas data and descriptive analysis, as well as OLS and logit regression to investigate the primary determinants of food security in this household group.

The fifth article focuses on the capital aspect, specifically the impact of investment in palm oil plantations on economic mobility and non-income welfare. This study is based on a primary survey in 90 villages in West Kalimantan. It employs the Difference-in-Differences (DiD) approach to compare changes in economic mobility, as measured by motorcycle and car ownership, before and after the establishment of palm oil plantations. The non-income welfare was measured using the Asset Wealth Index (AWI), which was analyzed using descriptive statistics and PLS regression to assess its value.

The limitations of this study are primarily methodological, as it has not fully captured the causal dynamics and spatial interconnections between regions. Most analyses use static panel models (Pooled Least Squares and Fixed Effects) to identify associations within a panel data framework. However, these models do not fully address endogeneity and simultaneity between female labor force participation and regional economic performance. The use of dynamic models, such as the Generalized Method of Moments (GMM), is not feasible because the test results indicate that the instruments are invalid, potentially biasing the estimation results. Additionally, spatial relationships between regions have not been explicitly modeled, even though interactions among areas, such as labor mobility, market linkages, and commuting effects, can influence empirical results. However, the results of this study can be an important initial finding regarding the relationship between FLPR and output. To strengthen the correlation, the analysis was also conducted in reverse, examining the relationship between economic development and labor demand by islands.

On the other hand, the application of nonparametric methods, such as Random Forests and SHAP analysis, offers advantages in identifying complex patterns and non-linear relationships, but has limitations in econometric interpretability and causal inference. This method is more exploratory and predictive, so the direction of the relationship between variables cannot be determined with certainty without combining it with an inferential econometric model. Distributional approaches, such as quantile regression and longitudinal models, have not yet been implemented, so the heterogeneity of effects across

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economic groups and over time has not been fully captured. Therefore, further research is recommended to deepen the methodological foundations by integrating dynamic and spatial approaches, as well as more robust instruments, to yield more robust and comprehensive causal findings.

The results in the first article indicate that FLPR has a significant and positive impact on regional economic growth in Indonesia. However, this effect varies significantly across regions, with Kalimantan being the most notable example, where the contribution of highly educated women to economic growth is substantially greater than in Jawa or other regions. It is because Kalimantan's economic structure still relies on the primary sector, so every additional educated female worker has a significant impact on regional output.

On the other hand, limited access for women to the formal labor market on islands like Jawa, as well as the dominance of patriarchal culture, restricts the aggregate optimization of women's economic roles. Nationally, the production elasticities of female and male labor factors are higher than those of investment and human capital, indicating that improving the quality of human resources through education is key to driving economic growth. The findings of this study suggest that women with at least a high school education have a positive impact on GDP growth. In contrast, primary and middle school graduates are less effective. Additionally, the pace of economic convergence between regions in Indonesia is rapid; however, disparities in education and inequality in women's employment opportunities hinder growth and equality. The fastest convergence occurred in Kalimantan, illustrating the value of transforming the female workforce in regions with a small but elastic economic base. This refers to regions that experience rapid growth due to changes resulting from the influx of new jobs, investment, or shifts in the workforce.

The findings in the second article indicate that the relationship between Gross Regional Domestic Product (GRDP) per capita and the FLPR in Indonesia tends to form an inverted U-shaped pattern. This pattern means that in the early stages of economic growth, job opportunities and wage incentives encourage women to enter the labor market (substitution effect). However, after a certain income threshold is reached, economic pressure decreases, and social norms and domestic roles become dominant, leading to a decline in women's participation (the income effect). This phenomenon is most evident among individuals aged 25–34 and those aged 65 and over, and among women with a high school education, in regions such as Jawa, Bali, Nusa, and Sulawesi-Gorontalo.

On the other hand, in many regions such as Sumatra, Kalimantan, and Maluku-Papua, this relationship is weak or inconsistent, so socio-cultural factors and economic structures play a greater role than macroeconomic impacts. Data also shows that in some areas with high per capita GRDP, FLPR is low, reflecting structural barriers and a lack of women-friendly sectors. Significant differences emerge between urban and rural areas, where, in the early stages of growth, the development of the modern sector in urban areas or job diversification in rural areas increases participation. However, after crossing a certain threshold of well-being, family preferences, childcare costs, and social pressures cause women to leave the workforce.

The results from the third article indicate that the factors influencing women's decisions to work, enter the workforce, or choose dual roles (working and managing household responsibilities simultaneously) are the number of working family

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members, age, marital status, and the presence of young children. Women in families where many members work or who support productive family norms tend to be more motivated to work. The age of the couple also plays a role; women with more established partners have more flexible work options, while young couples who are not yet financially stable usually encourage women to seek additional income. Marital status and the presence of young children can be significant barriers, especially when there is no childcare support available.

Additionally, economic factors such as savings ownership, the household's primary source of income, and access to technology (e.g., computer use) are highly influential. Savings provide a sense of financial security, enabling women to make more informed decisions about their careers and economic futures. Mastering digital skills expands job opportunities in technology-based fields. If the family's primary income comes from transfers, investments, or pensions, women's incentive to work also increases because no other family members are earning an active income. Household dynamics, economic factors, and access to technology heavily influence women's decisions to participate in the workforce.

The results of the fourth article indicate that the average household food expenditure for female-headed households has achieved a satisfactory level of nutritional adequacy, except for fat consumption. The highest consumption is of carbohydrate-rich foods, especially rice, and despite the rising price of rice, consumption remains high. However, 40.18% of households still fall into the category of food security vulnerability. Factors that significantly influence household food security include the number of household members, education level, location of residence, type of employment, access to technology, and food availability.

Meanwhile, the results in the fifth article revealed that the presence of oil palm plantations did not significantly influence the increase in economic mobility at the village level. The ownership of two- and four-wheeled vehicles (motorcycles and cars) has increased in both the control and treatment villages, indicating increased economic mobility. However, we cannot directly attribute this growth to the presence of oil palm plantations. It suggests that the increase in income from palm oil is primarily used to meet basic needs rather than purchase productive assets, such as vehicles. Although income has increased, it is not enough to evenly distribute asset accumulation throughout society.

Another prominent finding is that wealth inequality in villages with palm oil interventions widened. In the treatment group, AWI exhibited greater wealth variation, characterized by a significantly higher number of wealthy households (outliers) compared to the control group. Economic access is indeed more open, including for women. However, the reality is that only a small fraction truly rises in wealth distribution, especially those with higher education or initial social capital and assets. Conversely, women who work as tenant farmers or laborers in the palm oil industry, rather than as landowners, tend to experience minimal improvements in their well-being. Their status as landless workers or laborers makes asset accumulation and economic mobility difficult to achieve, a stark contrast to plasma owners or palm oil business owners who experience significant asset increases.

Another aspect of inequality is also evident in the distribution of AWI by education, ethnicity, religion, and the employment sector: groups with higher education, strong social networks, and access to the non-agricultural sector tend to

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be far more advantaged. Conversely, for agricultural laborers/smallholder farmers, many of whom are women, the economic benefits of palm oil are felt only in daily wages, with no real opportunity for asset accumulation or improvement in socioeconomic status.

In general, this study concludes that the female labor force can contribute significantly and positively to national economic development if they have at least a high school education. However, this contribution is not yet optimal because the participation rate of women remains low relative to men, and most women are elementary or middle school graduates. Several factors contribute to this low participation rate, both from the demand and supply sides. On the demand side, there is still low demand for female labor. The increase in investment, as indicated by the presence of oil palm plantations in this study, has not yet had a significant impact on women, particularly with respect to the non-welfare indicator, the Asset Wealth Index. Meanwhile, on the supply side, the factors influencing women's decisions to work/become homemakers/or play dual roles are dominated by social factors (family conditions). In fact, working women can contribute to the family economy, which is important because female-headed households are often vulnerable to food insecurity. This aligns with the altruism theory.

Therefore, a strategy is needed to increase women's workforce participation by providing full opportunities and support for women to play dual roles. That support must come from all parties, including the government, society, and families. The primary goal is to provide the broadest possible access to education and employment for women, both formal and non-formal, thereby increasing their opportunities for income. It can lead to increased long-term asset accumulation for women, enabling them to support their family's economy while fulfilling their responsibilities as homemakers.

When women have their own income, they can directly contribute to the family economy, strengthen household financial resilience, and provide their children with broader opportunities to attend higher-level schooling. Additionally, women's income has also been proven to reduce family food insecurity, improve household quality of life, and strengthen children's futures through better education. Thus, empowering women economically has a dual impact: supporting family economies and accelerating the emergence of a more competitive generation.

Here is a corrected and simplified version of the paragraph for the strategy to increase women's labor force participation. The main policy recommended focuses on increasing women's labor force participation by expanding access to education and training, particularly for women in disadvantaged areas. In the short term, strengthening and making more effective the implementation of the existing 12-year compulsory education program, targeted scholarships, and job skills training for adult women are priorities. In the medium and long term, developing a lifelong learning system that emphasizes digital literacy, entrepreneurship, and women's leadership is important for strengthening competitiveness and reducing regional disparities. All these policies are aimed at ensuring women have access to decent education and employment that can improve family well-being and national economic growth.

From an economic and employment perspective, policies aim to create a more women-friendly work environment and reduce cultural and structural barriers. Recommended quick steps include rural transport subsidies, work flexibility for

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women, and social support such as childcare services and protection for informal workers. In the medium to long term, strengthening the labor law system and normalizing women's dual roles as workers and homemakers are important parts of social transformation. A gender-sensitive approach was also proposed in agrarian and regional development policies, particularly in oil palm plantation areas, to ensure women's equitable access to assets, capital, and economic participation.

Future research directions are suggested to focus on understanding the two-way relationship between economic growth and FLPR with a stronger methodological approach. The use of Instrumental Variables (IV), GMM, and spatial panel models is recommended to address endogeneity bias and capture spatial effects. Additionally, the Blinder-Oaxaca method can be used to analyze the gap in the asset wealth index between groups. From a data perspective, future research is recommended to use multidimensional indicators, such as the Household Dietary Diversity Score (HDDS), and longitudinal study designs to more accurately observe the dynamics of women's well-being and intergroup disparities over time.

Future research can use a four-category ordered logit model to estimate how the probabilities of households being in better or worse food security states change as explanatory variables vary. The model can also be extended with partial proportional odds, spatial specifications, and panel or longitudinal data to capture heterogeneous effects, spatial spillovers, and the dynamic impact of policy interventions.

Keywords: Asset Wealth Index, convergence, female, random forest

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WOMEN IN THE INDONESIAN ECONOMY: LABOR FORCE DYNAMICS, HOUSEHOLD WELFARE, AND DEVELOPMENTAL CHALLENGES

DIAN VERAWATI PANJAITAN

Dissertation

as one of the requirements for achieving Doctor in Doctoral Program in Economics, Faculty of Economics and Management

DOCTORAL PROGRAM IN ECONOMICS
GRADUATE SCHOOL
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Date of Closed defense: November, 22nd 2025
Date of Public defense: December, 24th 2025

Approval 20 JAN 2026

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ACKNOWLEDGEMENTS

I express my praise and gratitude to Allah subhanahu wa ta'ala for His blessings that enabled the completion of this dissertation. This achievement would not have been possible without the support of various individuals. Therefore, I would like to extend my heartfelt thanks to my supervisor, Prof. Nunung Nuryartono, Syamsul Hidayat Pasaribu, Ph.D., and Prof. Jann Lay for their patient supervision and guidance. I cannot imagine reaching this point without their invaluable counsel. Additionally, I wish to express my gratitude to Iman Sugema, Ph.D, Pungkas Bahjuri Ali, S.TP, MS, Ph.D., Deniey Adi Purwanto, Ph.D, Lukytawati Anggraeni, Ph.D, and Tony Irawan, Ph.D, for agreeing to serve as examiners during my closed and open defense.

Furthermore, I would like to express my gratitude to the German Institute for Global and Area Studies (GIGA) for their support and collaboration in providing the doctoral study scholarship. My appreciation extends to Daniel Giessel, who has been an excellent partner in the research field and has shared valuable insights. I also wish to convey my deep appreciation to Ade Holis, Irwan Amarullah, Deri Iswara, and Muhammad Fazri for their assistance with the econometric analysis and for their exceptional help in obtaining the Sakernas and Susenas data. Additionally, I thank Dewi Amna, Ijal, Jimmy, Deni, and all enumerators who assisted me during the survey in West Kalimantan.

Furthermore, my appreciation also extends to Dr. Sri Mulatsih, Muhammad Iqbal Irfany, Ph.D., Prof. Sri Hartoyo, Dr. Tanti Novianti, Prof. Dedi Budiman Hakim, Prof. Sahara, Dr. Widyastutik, Dr. Heni Hasanah, Dr. Adi Hadianto, and all lecturers and staffs in the Department of Economics, Faculty of Economics and Management, IPB University, for their assistance and support. I am also grateful to my wonderful friends, Sri Retno Wahyu Nugraheni and Abdul Manap Pulungan, for their unwavering support and motivation. Additionally, I would like to thank all my colleagues in the doctoral program in economics for their valuable assistance, discussions, and encouragement.

This acknowledgment would be incomplete without expressing my deepest gratitude to my husband, Tresna Aji Firmansyah, and my children, Marsya Madina Arrantisi Firmansyah, Selma Karima Almaududi Firmansyah, and Greshilda Beydhuri Albiruni Firmansyah, as well as the Panjaitan family and all its members. I would not have been able to complete my studies without their understanding, patience, and prayers. I dedicate this dissertation to them and to my beloved parents.

Bogor, January 2026

Dian Verawati Panjaitan

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