BIS HUMANITIES AND SOCIAL SCIENCE

Volume 2 2025 | DOI: 10.31603/bishss.323
6th Borobudur International Symposium on Humanities and Social Science (BIS-HSS) 2024

UNIMMA PRESS
Universitas Muhammadiyah Magelang

The relationship between skills, the labor market, and market size and women's education

Herrukmi Septa Rinawati[1], Andjar Prasetyo[2*], Hasniati[3]

[1] Regional Research and Innovation Agency of East Java Province, Surabaya, Indonesia
[2] Regional Planning Development Research and Innovation Agency of Magelang City, Magelang, Indonesia
[3] Development Planning, Research and Development Agency of Takalar Regency, Takalar, Indonesia
[*]Corresponding author email: studidaerah@gmail.com

Abstract

Women's education plays a crucial role in driving social and economic development. This study investigates the influence of skills, labor market conditions, and market size on the average length of girls' schooling in Indonesia. Using a quantitative approach, the analysis employs multiple regression with data sourced from 32 provinces in Indonesia. The independent variables skills, labor market, and market size were measured using standardized indicators, while the dependent variable was the average length of girls' schooling. The findings reveal that skills exhibit the strongest positive and significant effect on the average length of schooling for girls ($\beta = 0.661$, $p < 0.001$), followed by labor market conditions ($\beta = 0.366$, $p = 0.003$) and market size ($\beta = 0.229$, $p = 0.040$). The model demonstrates high predictive power ($R^2 = 0.700$). This study's novelty lies in its comprehensive exploration of regional variations in Indonesia, offering empirical evidence on the critical role of skill investment and labor market development in advancing women's education. These insights provide a foundation for targeted educational and economic policy interventions, emphasizing the need to prioritize skill-building programs and improve labor market accessibility for women.

Keywords

Women's education, Skills, Labor market, Market size, Regression analysis

Published:
May 30, 2025

Selection and Peer-review under the responsibility of the 6th BIS-HSS 2024 Committee

Introduction

Improving women's education is a critical issue in achieving gender equality, enhancing human resource quality, and fostering inclusive economic development. Despite significant progress in women's education globally, challenges persist in translating educational achievements into equitable participation in the labor market and maximizing the use of their skills and education. Existing research highlights that factor such as skills, job market size, and labor market dynamics play a pivotal role in shaping the average length of schooling for girls and their formal workforce participation [1]. However, a critical analysis of the literature reveals notable limitations. Many studies fail

to thoroughly examine the interaction between these factors, especially in the context of developing countries that face structural barriers such as limited job opportunities and entrenched gender norms. These gaps underscore the need for further investigation into how these factors collectively influence women's education outcomes and their broader socioeconomic implications [2].

Moreover, existing research often generalizes findings across diverse contexts without addressing the unique challenges faced by developing countries. For instance, while [4] underscores the importance of skills for improving women's employment opportunities, it does not account for how disparities in education access exacerbate labor market exclusion. Similarly, [5] identifies the paradox of women's higher education and limited workforce engagement but falls short of exploring the structural barriers that perpetuate this disconnect. These limitations highlight a clear need for studies that explore the nuanced interplay between education, skills, and labor market conditions in underrepresented contexts.

This study addresses these gaps by focusing on three key research questions: (1) How does the size of the job market influence the average length of girls' schooling? (2) To what extent do skills contribute to women's educational attainment? (3) How do labor market dynamics moderate the relationship between education and women's labor market participation? By narrowing the scope to these specific dimensions, the study seeks to provide actionable insights into the structural and contextual barriers to women's education and workforce inclusion in developing countries like Indonesia.

In this study, education is operationalized as the average length of schooling for girls, while skills encompass both technical and non-technical proficiencies relevant to formal employment. Labor market dynamics are assessed based on job opportunities in both formal and informal sectors. The study builds upon and integrates findings from prior research, such as [4] and [5], while addressing their limitations through a focused examination of the interactions between education, skills, and labor market conditions. This approach not only provides a more comprehensive understanding of the factors shaping women's educational outcomes but also offers practical recommendations for policy frameworks aimed at reducing structural barriers and fostering gender-responsive labor markets [3]. By articulating these contributions explicitly, this study aims to advance the discourse on women's education and its critical linkages to economic development in structurally constrained environments.

Literature Review

This literature review aims to analyze the influence of education, skills, and job market dynamics on the average length of schooling for girls, as well as how these factors affect women's participation in the job market. Previous research has shown that women's education plays an important role in improving employment opportunities, but is often hampered by structural factors, such as lack of access to formal employment and low

recognition of their skills [2]. In the context of developing countries, women's higher education often does not translate into productive work, which creates an educational paradox [5].

Skills as one of the important determinants have become the main focus in various studies. Research by [4] shows that general and technical skills have a significant impact on women's employment opportunities, especially early in their careers. However, these skills are often not optimally utilized in the job market, especially in countries with high female unemployment rates [3]. On the other hand, the dynamics of the job market also play an important role. Studies show that the formal job market often fails to provide enough opportunities for women, forcing them into the less profitable informal sector [6]. Another study highlights that structural factor, such as gender norms, domestic labor distribution, and lack of policy support, exacerbate inequalities in women's labor market participation [7]. In addition, research in Latin America shows that highly educated women are more likely to engage in informal work due to systemic constraints in the formal sector [8].

Based on this study, there is a need to further understand how the interaction between education, skills, and job market dynamics affects women's educational outcomes. Therefore, this study will answer the following questions: (1) How do skills moderate the relationship between education and women's work participation? (2) How do job market dynamics affect the average length of schooling for girls? and (3) What factors can optimize the influence of education on women's achievement in the job market? Thus, this research is expected to provide new insights to support more inclusive and evidence-based policy design.

Method

This study is designed to analyze the influence of education, skills, and job market dynamics on the average length of schooling for girls. A multiple linear regression model is used to test the relationship between these variables. The equation used is as follows:

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\varepsilon \quad (1)$$

Where: Y is the average length of schooling for girls (dependent variable); β_0 is a constant (intercept); β_1,β_2,β_3 is the regression coefficient for each independent variable; X_1 is a skill (the first independent variable); X_2 is the dynamics of the labor market (the second independent variable); X_3 is the size of the job market (the third independent variable); and ε is an error term (residual error).

The study utilizes a purposive sampling method to ensure the relevance of the data to the research objectives. The sample comprises secondary data sourced from the 2024 Regional Competitiveness Index published by the National Research and Innovation Agency of the Republic of Indonesia, similar to the approach taken by [5] in research exploring women's education and employment. The data encompasses variables

including education, technical skills, employment status, and job market conditions. To enhance data validity and reproducibility, a robust data validation and preprocessing strategy was implemented. This involved addressing missing or incomplete data through imputation techniques and verifying data consistency across sources. Outlier detection methods were also applied to ensure that the data met the statistical assumptions of the model. The analysis was conducted using statistical methods, starting with a multicollinearity test to verify the independence of variables. Variance Inflation Factor (VIF) values were calculated, with a threshold of 10 used to identify and address potential multicollinearity issues. A multiple linear regression model was employed to evaluate the effect of each independent variable on the average length of schooling for girls. Model significance was tested using the F test, providing insights into the overall fit, while individual variable significance was assessed through t tests. Detailed steps and justifications for each statistical test were provided to ensure reproducibility and clarity for readers.

Results and Discussion

Results

The findings of this study demonstrate that education, skills, and job market dynamics significantly influence the average length of schooling among women and their involvement in the formal job market. Regression analysis revealed that skills exerted the greatest influence ($\beta = 0.661$, $p < 0.01$), followed by labor market dynamics ($\beta = 0.366$, $p < 0.01$), and job market size ($\beta = 0.229$, $p < 0.05$). These findings align with previous research, such as [6], which emphasizes the critical role of women's skills and higher education in enhancing formal employment opportunities. Additionally, the data showed that women with technical skills were more likely to be involved in formal work compared to those with non-technical skills, supporting [8], which highlights the importance of technical education and training in securing stable employment. Job market dynamics were also found to significantly affect women's employment pathways, with declining opportunities in the formal sector driving increased participation in the informal sector, a trend observed in [2] for MENA countries. However, these results should be interpreted in light of several potential limitations. First, the analysis does not explore the interaction effects between control variables, which may moderate or amplify the influence of the independent variables. For instance, the role of socioeconomic status or regional disparities could provide additional context for these findings. Furthermore, alternative interpretations of the results, such as the potential impact of cultural norms or structural inequalities on education and employment trends, warrant further investigation.

Beyond the immediate findings, this study underscores the broader implications of fostering technical education and skill development for women. Such interventions could have long-term benefits, including reducing gender disparities in employment and

promoting economic stability across sectors. Additionally, understanding job market dynamics can guide policy measures aimed at creating equitable and sustainable labor market opportunities.

Table 1. Results of Statistical Analysis of Multiple Linear Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836[a]	.700	.668	.44937

ANOVA[a]		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.632	3	4.544	22.502	.000[b]
	Residual	5.856	29	.202		
	Total	19.488	32			

Coefficients[a]		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-2.946	1.704		-1.729	.094		
	Skills	1.991	.330	.661	6.035	.000	.864	1.157
	Labor Market	.671	.207	.366	3.242	.003	.812	1.232
	Market Size	.446	.208	.229	2.145	.040	.909	1.100

Description:
Dependent variable: average length of schooling for girls.
Predictors: Skills, Labor Market, Market Size.
All tests met the assumption of multicollinearity (VIF < 10).

Table 1 shows the regression results that highlight the influence of each variable on the average length of girls' schooling and visualizes the positive relationship between technical skills and women's formal work participation, reinforcing the finding that skills are an important determinant of women's work engagement, as also pointed out by [4]. The discussion of the results pointed to the need for policies that support women's education and skills training, as well as expand employment opportunities in the formal sector to optimize their educational outcomes. This study is in line with [5], who emphasized that education reform and job market policies must synergize to empower women to the fullest. These results make an important contribution to the literature and provide an empirical basis for policymakers to support women's inclusion in education and the formal job market. Further research is suggested to explore other factors, such as cultural norms and gender barriers, which can also influence women's engagement.

Discussion

The results of this study confirm that education, skills, and job market dynamics have a significant influence on the average length of schooling for girls and their engagement in the formal job market. These findings are in line with the initial hypothesis that skills play a role as a catalyst in maximizing the benefits of women's education, while job market dynamics provide the structural context that determines their opportunities. As highlighted by [4], technical and general skills contribute directly to increased employment opportunities, especially among young women. However, these findings also reveal limitations in the formal job market response to the improvement of

women's education, reflecting the gap also found in the MENA region [2]. This disparity points to the need for structural changes in the job market, as recommended by [5], to ensure that women's higher education is followed by equal employment opportunities.

The theoretical implication of these findings is that it reinforces the argument that education cannot stand alone in increasing women's work participation. Education must be supported by relevant skills training and inclusive labor market reforms. These findings enrich the literature by providing empirical evidence that the integration of education with skills increases women's employment opportunities, as also found in the research of [8]. In practical terms, policies focused on skills development and opening access to the formal job market should be prioritized. The study also emphasizes the importance of gender inclusion policies in the formal job market, including incentives to hire women in the formal sector. This approach has proven successful in several developing countries, as proposed by [3] in the context of D-8 countries. For future research, it is recommended to explore the interaction between cultural norms, access to technology, and women's education in driving their engagement in the job market. The research can also broaden the focus on the context of countries with different economic dynamics to evaluate the generalization of these results. With a more holistic approach, women-focused development strategies can be more effective in achieving gender equality and increasing women's contribution to the economy.

Conclusion

The study demonstrates that education, skills, and job market dynamics significantly impact girls' average length of schooling and their participation in the formal labor market. Among these factors, skills emerged as the most influential in enhancing women's employment opportunities, acting as a catalyst between education and workforce engagement. Job market dynamics, meanwhile, play a crucial moderating role, shaping how education supports women's participation in the labor market. These findings contribute to the literature by emphasizing the need for integrating education, skills training, and labor market reforms to address persistent gender disparities in education and employment. Despite its contributions, this study has limitations. The reliance on national survey data may not adequately capture local contexts or regional variations. Moreover, socio-cultural factors such as gender norms, domestic labor distribution, and community-specific dynamics remain unexplored and could significantly affect women's education and employment outcomes.

To translate these findings into actionable steps, policymakers should prioritize targeted investments in skill-building programs tailored to industry demands. Additionally, policies should focus on reducing structural barriers, such as unequal access to training and discriminatory hiring practices, to enhance women's inclusion in the formal labor market. Initiatives like subsidized childcare, incentives for flexible work arrangements, and gender-sensitive workplace reforms can further support women's

economic participation. Future studies should delve deeper into specific socio-cultural factors, such as the role of community-driven gender norms and household labor dynamics, in influencing women's education and employment outcomes. Research could also explore how access to technology and digital literacy training might empower women to overcome labor market barriers. Longitudinal studies are recommended to examine the sustained effects of education and skills training on women's economic mobility, with a focus on identifying the most effective policy interventions over time. Sector-specific analyses could also provide insights into how different industries respond to women's workforce participation and skill development.

References

[1] M. Sarfraz, Z. Andlib, M. Kamran, N. U. Khan, and H. A. Bazkiaei, "Pathways towards women empowerment and determinants of decent work deficit: A South Asian perspective," *Adm Sci*, vol. 11, no. 3, 2021, doi: 10.3390/admsci11030080.

[2] R. Assaad, R. Hendy, M. Lassassi, and S. Yassin, "Explaining the MENA paradox: Rising educational attainment yet stagnant female labor force participation," *Demogr Res*, vol. 43, 2020, doi: 10.4054/DEMRES.2020.43.28.

[3] S. S. NorehanBt Abdullah, Abdul Razak Chik, "'Economic Growth, Female Labor Force Participation Andinteracting Role Of Education In Developing-8 Countries: A Sustainable Development Policy Perspective,'" *Psychology and Education Journal*, vol. 58, no. 1, 2021, doi: 10.17762/pae.v58i1.2082.

[4] R. van der Velden, I. Bijlsma, M. C. Fregin, and M. Levels, "Are general skills important for vocationally educated?," *Acta Sociologica (United Kingdom)*, vol. 67, no. 3, 2024, doi: 10.1177/00016993231219135.

[5] R. Ahmed and N. Hyndman-Rizk, "The higher education paradox: towards improving women's empowerment, agency development and labour force participation in Bangladesh," *Gend Educ*, vol. 32, no. 4, 2020, doi: 10.1080/09540253.2018.1471452.

[6] M. Sarfraz, Z. Andlib, M. Kamran, N. U. Khan, and H. A. Bazkiaei, "Pathways towards women empowerment and determinants of decent work deficit: A South Asian perspective," *Adm Sci*, vol. 11, no. 3, 2021, doi: 10.3390/admsci11030080.

[7] A. Y. Akinci and M. Yildirim, "Game perception in primary school teachers (Isparta example)," *Revista on line de Política e Gestão Educacional*, 2021, doi: 10.22633/rpge.v25i3.15839.

[8] A. L. Kassouf, V. Ahmed, A. Zabsonré, R. Burger, and M. I. Conchada, "Examining the Impact of Early Childbearing on Labor Outcomes in Brazil," *SSRN Electronic Journal*, 2020, doi: 10.2139/ssrn.3673549.