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The effect of mismatch on labor income in Indonesia

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Abstract

Problems that often arise in the mismatch phenomenon and the impact of mismatches received by workers tend to emphasize the wage gap or the difference in income between individuals who meet the qualifications and individuals who do not meet the qualifications. In 2018, the workforce experienced undereducation of 4.6% and overeducation of 27.9%. Meanwhile, field of study mismatch occurs in 68.4% of the workforce in Indonesia. This research aims to analyze the vertical mismatch phenomenon that occurs in Indonesia and the influence of mismatch in the workforce on differences in workforce income. This research was conducted in Indonesia because it used SAKERNAS Micro data. The independent variables in this research are education level, age, gender, working hours, work location and employment status. The dependent variables in this research are income and productivity as intervening variables. The method used in collecting this data is non-participant observation. The analysis technique used in this research is SMART PLS. The results of the analysis show that education level has a significant effect on labor income in Indonesia. Age has a significant effect on labor income in Indonesia. Gender has a significant effect on labor income in Indonesia. Working hours have a significant effect on labor income in Indonesia. Location of work has a significant effect on labor income in Indonesia. Education level, age, gender, working hours and working location together have a significant effect on labor income in Indonesia in 2021. Productivity has a significant effect on labor income in Indonesia. Productivity mediates the influence of the variables Educational Level, age, gender, working hours and location of work on labor income in Indonesia in 2021.

Keywords: Mismatch; Labor; SAKERNAS; Income

1. Introduction

Economic growth and development are one of the benchmarks for a country's development and are a very important concern. Therefore, economic growth and development are a priority for all countries (Todaro and Smith, 2011). The objectives of economic development include increasing national income and increasing productivity levels both in the macro and micro sectors (Adisasmita, 2013). The factors that influence a country's economic development consist of two factors, namely economic and non-economic factors. Economic factors that influence economic growth and development include natural resources, human resources, capital resources, and expertise. While non-economic factors include socio-cultural conditions in society, political conditions, institutional structures, and systems that develop and apply in society (Yannisa, 2017). Education is a basic key to forming a more productive generation of human resources to build the country's economy by contributing using the abilities possessed by the individual (Borjas, 2016). Open access to information on various sources of knowledge in Indonesia and the world can increase the number of people attending school in general. The increasing number of people who receive education will change the structure of the Indonesian workforce. Where the number of educated workers will increase (Hasibuan and Handayani, 2021). Figure 1 shows changes in the structure of the workforce in Indonesia, comparing the educational structure of the workforce in 2010 and 2022.

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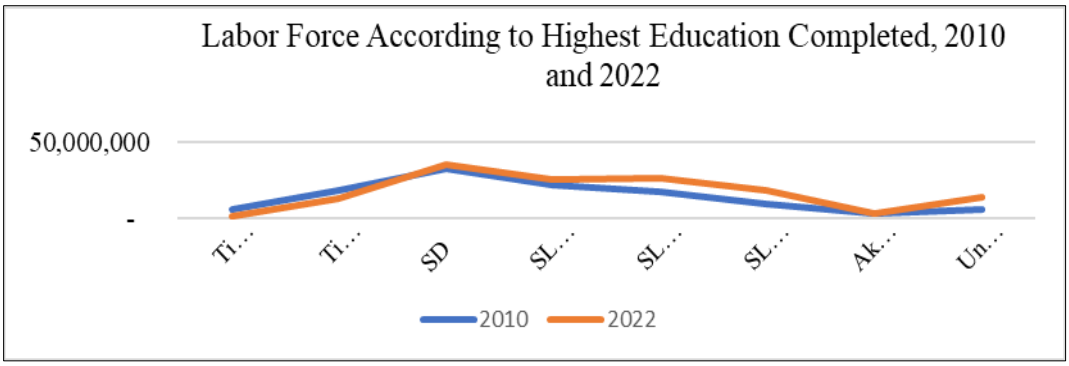
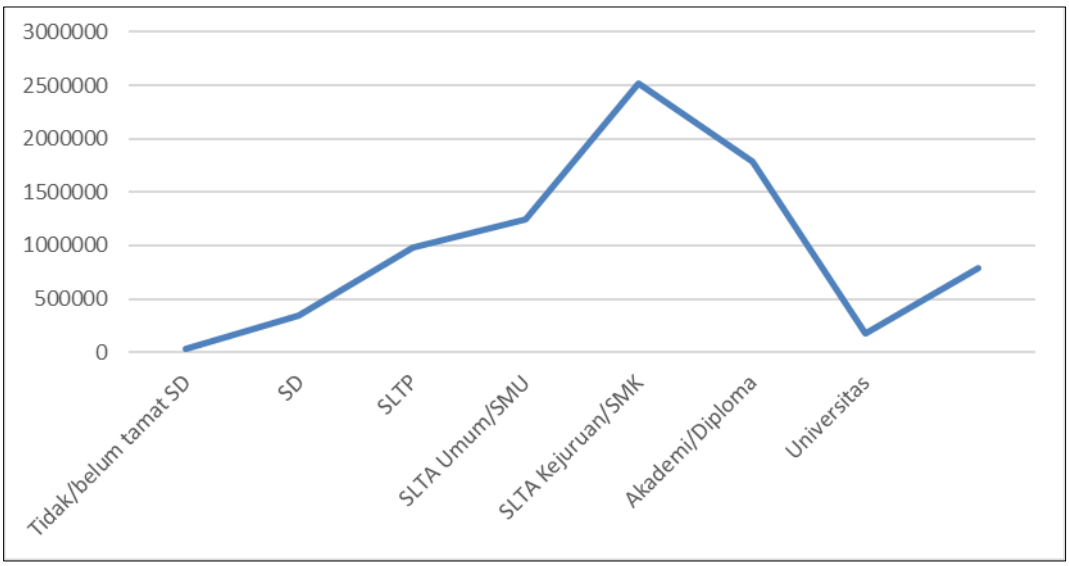


Source: Badan Pusat Statistik (2022)

Figure 1 Labor Force According to Highest Education Completed

Through Figure 1. shows the changes in the structure of the workforce education in Indonesia. The striking difference that occurred in 2010 and 2022 lies in the level of education that did not attend school and did not finish elementary school which is decreasing and the increase in the workforce that completed junior high school to university level. This shows that the number of educated workers has increased in the last 12 years. The increase in the educational attainment of the workforce can indicate that the human capital they have is getting higher. With the increasing ability and skills of the workforce, it is expected to increase workforce productivity and the rate of return on investment in education (Becker, 1975; Schultz, 1961).



Source: Badan Pusat Statistik (2024)

Figure 2 Latest Education Completed by Unemployed in Indonesia, 2023

There is an issue in the structural change of the workforce that is increasing every year. The level of education possessed by workers will be a signal for employers who are looking for jobs with appropriate skills. Mismatch of educational qualifications indicates a mismatch between the availability of knowledge and skills with what is needed (Allen and de Weert, 2007). The difficulty of the process of adjusting the demand and supply of labor causes a skills gap. Mismatch is a gap between the number of workers according to the highest level of education completed with the need for workers for certain types of jobs and levels of education (skills) in the labor market. Mismatch can occur vertically or horizontally (Dilly and Papuling, 2021). Vertical mismatch is a mismatch due to the educational qualifications or skills possessed by workers being lower or higher than those required. When the educational qualifications possessed are higher, the workforce experiences overeducation, conversely if the educational qualifications possessed are lower, it is called undereducation. Facts from the Organisation for Economic Co-operation and Development (OECD) state that in most developed countries there is increasing concern about the potential for over-investment in education because individuals with high levels of education can be employed in jobs with lower requirements.

The increase in the quality of the workforce offered is not followed by an increase in demand for workers who require high skills, which can cause a mismatch. Indications of mismatch in the labor market as in Figure 2 show that in 2024, which shows high unemployment at the high school level of 2,514,481 to universities or colleges of 787,973, where this phenomenon is a very serious problem. Fathkul (2013) stated that unemployment rates can be used as an indicator to show the needs of the labor market with the education completed by the unemployed, where Figure 1.2 shows an indication of a mismatch between the level of education and the job structure in Indonesia. Although in Figure 1 there is an increase in educated workers, it is not supported by an increase in jobs that are in accordance with qualifications. The population is a large capital to increase national production if there are sufficient jobs available, but if many people are unemployed due to the unavailability of jobs, it will result in a decrease in the level of community welfare.

Problems that often arise in the phenomenon of mismatch and the impact of mismatch received by the workforce tend to emphasize the wage gap or the difference in income between qualified individuals and unqualified individuals. Research conducted by Hartog (2000) states that what happens in the phenomenon of labor mismatch shows that highly educated individuals tend to receive lower wages and are less satisfied with their jobs than their educated and matched colleagues but interest in analyzing the impact of labor mismatch goes beyond individual effects because these negative outcomes can spread to companies and the economy as a whole; in fact, some works show that lower wages or lower levels of job satisfaction can lead to lower productivity at the aggregate level (Lazear 2000; Böckerman and Ilmakunnas 2012). .

Safuan and Nazara (2005) showed that overeducated workers are negatively correlated with their income, while undereducated workers are positively correlated with their income. This is in line with the OECD facts where workers who work in jobs that do not match their educational qualifications will receive lower wages (wage penalty) compared to workers with the same qualifications and have suitable jobs (Béduwé and Giret, 2011; Dolton and Silles, 2008; Nordin et al., 2010) In a study conducted in Brazil, Reis (2017) stated that vertical mismatch, which means a mismatch due to the educational qualifications or skills possessed by workers being lower or higher than those required, has different wage effects (Sitorus and Wicaksono, 2020). Workers with a higher level of education than their job requires (overeducation) will receive excess wages (wage premium), while workers with a lower level of education (undereducation) will receive a wage penalty or the effect of lower income (Friska and Damayanti, 2021).

Companies that employ workers with higher educational qualifications than needed can increase the productivity of the workforce (Sabarofek and Anggraeni, 2022). However, on the other hand, workers cannot use all their abilities, causing dissatisfaction at work and resulting in decreased productivity (Allen and van der Velden, 2001; Battu et al., 1999; Sam, 2019). Dissatisfaction and wage effects experienced by workers can encourage them to try to find other jobs (Allen and van der Velden, 2001; Béduwé and Giret, 2011; Zakariya, 2017). This can increase employee turnover in the company. The high turnover rate is a loss for the company because the company will need additional costs for recruitment and retraining. In addition, new employees are not yet able to work effectively, resulting in lower productivity (Urbancova and Linhartova, 2011). Prabowo (2014) stated that mismatch within the individual can cause a decrease in productivity due to stress that arises because work does not match the individual's interests and the wage penalty effect which is quite a burden on the workforce.

The micro mismatch effect does not only stop at individuals, but the company's internal will be affected if there is a mismatch between work and type of work. Wulandari (2021) stated that the effect of workforce mismatch on companies is low productivity and the risk of workforce turnover which also contributes to the decline in the company's productivity. The difference in company or sectoral human capital and low-skilled human resources will have an impact on the training costs incurred by the company (Mavromaras and Sloane, 2015). If this happens on a macro scale, it will certainly affect the productivity of a country or region, which is supported by the statement from the International Labor Organization (2018) namely that mismatch affects economic growth through the reduction or non-utilization of human capital. Research related to the mismatch phenomenon in Indonesia is still very little. Therefore, research related to mismatch, especially vertical mismatch, needs to be carried out considering that the impact greatly affects the quality of the workforce. Through the analysis of macroeconomic and microeconomic impacts caused by labor mismatch, it can reduce labor productivity due to wage penalties and feelings of displeasure in doing work that does not match academic qualifications (Ghaffarzadegan, et al, 2017). Supported by the fact that the phenomenon of qualification mismatch is quite emphasized on income differences.

In 2018, the workforce experienced undereducation of 4.6% and overeducation of 27.9%. Meanwhile, the field of study mismatch occurred in 68.4% of the workforce in Indonesia. The results of research by Hasibuan and Handayani, 2021 showed that there was a wage premium of 5.24% -6.24% for workers who experienced undereducation, a wage penalty of 6.26% - 7.505 was obtained by workers who experienced overeducation, while those who experienced field of study mismatch were 5.89% -6.80%. As with the research of Enawati et al. (2021) conducted in Indonesia related to

qualification mismatch where the results showed that there was a wage premium of 5.24% - 6.24% for workers who experienced undereducation and a wage penalty of 6.26% - 7.50% was obtained by workers who experienced overeducation. Meanwhile, Hersch and Xiao (2016) stated that mismatch has different wage impacts between genders. Different research results were also found in research conducted by Suryono and Pitoyo (2020) which stated that higher education graduates are absorbed in types of jobs that match the worker's education level. This study will further discuss the impact of mismatch on wages earned by workers in Indonesia.

2. Research methods

The research design used in this study is a quantitative research design in the form of associative. This study was conducted in Indonesia because it uses SAKERNAS Micro data. The subjects of this study were from households in villages and cities from each village and city listed in the Micro Data provided by the Sakernas institution. The object of this study is mismatch, and various characteristics that affect labor mismatch in Indonesia. The Independent Variables in this study are: Variable of Interest, namely education level (X1). Control Variable (Xi), namely various characteristics that affect Mismatch, namely, Age, Gender; Working Hours; Work Location; Employment Status the Dependent Variable in this study is Income ln (Y2). The Intervening Variable in this study is Productivity (Y1). The method used in collecting this data is by means of non-participant observation. Data analysis in this study uses the Partial Least Square (PLS) approach.

3. Results and discussion

Table 1 Validity Testing based on Outer Loading

	Working hours	**Gender**	**Department of Education**	**Work Location**	**Labor Income**	**Productivity**	**Level of education**	**Age**
Working hours	1.000							
Gender		1.000						
Department of Education			1.000					
Work Location				1.000				
Labor Income					1.000			
Productivity						1.000		
Level of education							1.000	
Age								1.000

Source: Processed data, 2025

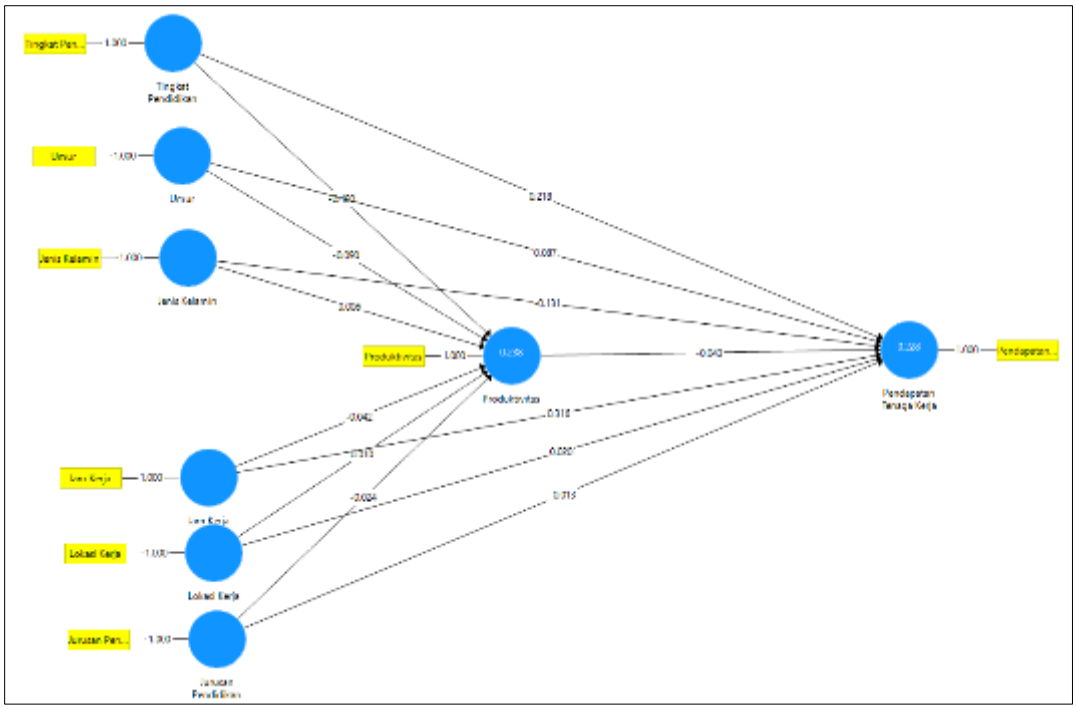


Figure 3 Validity Testing based on Outer Loading

Based on the outer loading validity test in Table 1 and Figure 3, it is known that all outer loading values are > 0.7, which means that they have met the validity requirements based on the outer loading value. Furthermore, validity testing is carried out based on the average variance extracted (AVE) value, and reliability based on Cronbach's alpha (CA) and composite reliability (CR).

Table 2 Validity Testing based on Average Variance Extracted (AVE); Reliability based on Cronbach's Alpha (CA) and Composite Reliability (CR)

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Working hours	1.000	1.000	1.000
Gender	1.000	1.000	1.000
Department of Education	1.000	1.000	1.000
Work Location	1.000	1.000	1.000
Labor Income	1.000	1.000	1.000
Productivity	1.000	1.000	1.000
Level of education	1.000	1.000	1.000
Age	1.000	1.000	1.000

Source: Processed data, 2025

The recommended AVE value is above 0.5. It is known that all AVE values are > 0.5, which means that they have met the validity requirements based on AVE. Furthermore, reliability testing is carried out based on the composite reliability (CR) value. The recommended CR value is above 0.7. It is known that all CR values are > 0.7, which means that they have met the reliability requirements based on CR. Furthermore, reliability testing is carried out based on the Cronbach's alpha (CA) value. The recommended CA value is above 0.7. It is known that all CA values are > 0.7, which means that they have met the reliability requirements based on Cronbach's alpha. Furthermore, discriminant validity testing is carried out using the Fornell-Larcker approach. Table 4.3 presents the results of the discriminant validity test.

Table 3 Discriminant Validity Testing: Fornell and Larcker

	Working hours	**Gender**	**Department of Education**	**Work Location**	**Labor Income**	**Productivity**	**Level of education**	**Age**
Working hours	(1.000)							
Gender	-0.258	(1.000)						
Department of Education	0.038	0.023	(1.000)					
Work Location	0.518	-0.303	-0.009	(1.000)				
Labor Income	0.399	-0.221	0.096	0.227	(1.000)			
Productivity	-0.107	0.017	-0.222	-0.005	-0.180	(1.000)		
Level of education	0.128	-0.008	0.407	-0.043	0.257	-0.477	(1.000)	
Age	0.074	0.009	0.017	0.140	0.068	0.005	-0.203	(1.000)

Note: The values between "()" are the square roots of AVE.; Source: Processed data, 2025

In discriminant validity testing, the AVE square root value of a latent variable is compared with the correlation value between the latent variable and other latent variables. It is known that the AVE square root value for each latent variable is greater than the correlation value between the latent variable and other latent variables. So, it is concluded that it has met the requirements of discriminant validity.

Table 4 Discriminant Validity Testing: HTMT

	Working hours	**Gender**	**Department of Education**	**Work Location**	**Labor Income**	**Productivity**	**Level of education**
Gender	0.258						
Department of Education	0.038	0.023					
Work Location	0.518	0.303	0.009				
Labor Income	0.399	0.221	0.096	0.227			
Productivity	0.107	0.017	0.222	0.005	0.180		
Level of education	0.128	0.008	0.407	0.043	0.257	0.477	
Age	0.074	0.009	0.017	0.140	0.068	0.005	0.203

Source: Processed data, 2025

Based on the results of the discriminant validity test using the HTMT approach, it is known that all values are <0.9, which means that it is concluded that the discriminant validity requirements based on the HTMT approach have been met.

Table 5 Path Coefficient Test and Significance of Influence

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	R-Squares	SRMR
Working Hours -> Productivity	-0.042	-0.042	0.003	15.917	0.000	0.238	0.000
Gender -> Productivity	0.006	0.006	0.002	3.076	0.001		
Education Department -> Productivity	-0.024	-0.024	0.003	7.320	0.000		
Work Location -> Productivity	0.010	0.010	0.002	4.234	0.000		
Education Level -> Productivity	-0.480	-0.480	0.003	181.233	0.000		
Age -> Productivity	-0.090	-0.090	0.002	46.206	0.000		
Working Hours -> Labor Income	0.316	0.318	0.014	22.728	0.000	0.228	
Gender -> Labor Income	-0.131	-0.132	0.006	21.680	0.000		
Education Major -> Labor Income	-0.013	-0.013	0.003	5.125	0.000		
Lokasi Kerja -> Pendapatan Tenaga Kerja Work Location -> Labor Income	0.020	0.021	0.003	6.479	0.000		
Productivity -> Labor Income	-0.043	-0.044	0.004	11.086	0.000		
Education Level -> Labor Income	0.218	0.220	0.011	20.662	0.000		
Age -> Labor Income	0.087	0.088	0.003	26.600	0.000		

Source: Processed data, 2025

Based on the results in Table 5. the results obtained Working Hours have a significant effect on Productivity, with a P-Value = 0.000 <0.05, this means the hypothesis is accepted, there is a significant effect of working hours on productivity. Gender has a significant effect on Productivity, with a P-Value = 0.001 <0.05, this means the hypothesis is accepted, there is a significant effect of gender on productivity. Educational Major has a significant effect on Productivity, with a P-Value = 0.000 <0.05, this means the hypothesis is accepted, there is a significant effect of educational major on productivity. Work Location has a significant effect on Productivity, with a P-Value = 0.000 <0.05, this means the hypothesis is accepted, there is a significant effect of work location on productivity. Education Level has a significant effect on Productivity, with a P-Value = 0.000 <0.05, this means the hypothesis is accepted, there is a significant effect of education level on productivity. Age has a significant effect on Productivity, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of age on productivity. Working Hours have a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of working hours on labor income. Gender has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of gender on labor income. Educational Major has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of educational major on labor income. Work Location has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of work location on labor income. Productivity has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of productivity on labor income. Education Level has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant

effect of education level on labor income. Age has a significant effect on Labor Income, with a P-Value = 0.000 <0.05, this means that the hypothesis is accepted, there is a significant effect of age on labor income.

The R-Squares value of Productivity is 0.238, which means that Education Level, Age, Gender, Working Hours, Work Location, Education Major are able to explain or influence Productivity by 23.8%. The R-Squares value of Labor Income is 0.228, which means that Education Level, Age, Gender, Working Hours, Work Location, Education Major, Productivity are able to explain or influence Labor Income by 22.8%. It is known based on the results of the SRMR goodness of fit test, the SRMR value = 0.000 <0.1, so it is concluded that the model has FIT.

Table 6 Mediation Test

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Hours Worked -> Productivity -> Labor Income	0.002	0.002	0.000	9.237	0.000
Gender -> Productivity -> Labor Income	0.000	0.000	0.000	2.929	0.002
Education Department -> Productivity -> Labor Income	0.001	0.001	0.000	6.119	0.000
Work Location -> Productivity -> Labor Income	0.000	0.000	0.000	4.021	0.000
Education Level -> Productivity -> Labor Income	0.021	0.021	0.002	11.019	0.000
Age -> Productivity -> Labor Income	0.004	0.004	0.000	10.721	0.000

Based on the results of the mediation test in Table 6, namely Productivity significantly mediates the relationship between Working Hours and Labor Income, with P-Values = 0.000 <0.05, this means that the hypothesis is accepted. Productivity significantly mediates the relationship between Gender and Labor Income, with P-Values = 0.002 <0.05, this means that the hypothesis is accepted. Productivity significantly mediates the relationship between Educational Major and Labor Income, with P-Values = 0.000 <0.05, this means that the hypothesis is accepted. Productivity significantly mediates the relationship between Work Location and Labor Income, with P-Values = 0.000 <0.05, this means that the hypothesis is accepted. Productivity significantly mediates the relationship between Education Level and Labor Income, with P-Values = 0.000 <0.05, this means that the hypothesis is accepted. Productivity significantly mediates the relationship between Age and Labor Income.

Based on the results of the data analysis, it was found that the level of education has a significant effect on labor income in Indonesia, indicating that education plays an important role in determining the level of individual income in the labor market. Higher education tends to provide individuals with access to jobs with higher skills and higher incomes. Increasing skills and knowledge through education allows individuals to be more productive in their jobs, which in turn can increase income. This is in line with economic theory which states that the level of education is directly proportional to labor productivity (Becker, 1993). In addition, education also plays a role in increasing social mobility, which allows individuals to achieve higher social status and jobs with higher incomes (Sen, 1999). Therefore, the results of this study provide important implications for education policies that aim to reduce socio-economic inequality by improving the quality and accessibility of education across all levels of society.

Based on the results of data analysis showing that age has a significant effect on labor income in Indonesia, this means that age or work experience plays a significant role in determining an individual's income level. In general, the relationship between age and income often describes a pattern related to the length of work experience and the responsibilities held by individuals in their jobs. Older individuals with more experience tend to earn higher incomes because they have more mature skills and broader experience, which increases their productivity value in the workplace.

Based on the results of the data analysis showing that gender has a significant effect on labor income in Indonesia, this means that gender differences are still a factor that influences individual income levels in the labor market. In general, income differences based on gender, often referred to as the gender pay gap, can be explained through several social, economic, and cultural mechanisms. These findings indicate the need for more proactive policies in addressing gender gaps in the workplace, for example through strengthening fair wage regulations, implementing gender equality policies in the workplace, and a more inclusive approach in providing equal opportunities for women and men in achieving positions with higher incomes. Overall, despite progress, gender income inequality shows that there is still work to be done to achieve true gender equality in the labor market.

Based on the results of data analysis showing that the level of education has a significant effect on labor income in Indonesia, this means that education has an important role in increasing the level of individual income in the labor market. Theoretically, this phenomenon can be explained through several interrelated economic and social mechanisms. Individuals with higher levels of education usually have better skills and knowledge, which makes them more competitive and able to obtain jobs with higher salaries. This study provides a clear picture that education is one of the factors that greatly influences labor income, and increasing access and quality of education can play an important role in reducing income inequality and encouraging more inclusive economic growth.

Based on the results of data analysis showing that the location of work has a significant effect on the income of workers in Indonesia, this means that the geographical factor or location where someone works has a significant impact on the level of income received. This phenomenon can be explained through several structural and economic factors related to differences between one region and another, both in terms of access to the labor market, availability of jobs, and the economic conditions of the area. Location can also affect the types of jobs available. In big cities, the jobs available are more varied and more often require higher education and technical skills, which tend to be accompanied by higher salaries. Conversely, in rural areas or areas with economies that are more based on the agricultural or informal sector, job opportunities with high salaries are relatively limited.

Based on the results of the data analysis showing that education level, age, gender, working hours, and work location together have a significant effect on labor income in Indonesia, this means that a combination of individual factors and work contexts play an interrelated and complex role in determining income levels. This phenomenon indicates that labor income is not only influenced by one variable, but by the interaction of various factors that influence each other. The results of this analysis show that labor income in Indonesia is not only influenced by a single factor, but by a combination of various factors that interact with each other. Therefore, to increase income evenly, the policies taken need to include the development of more inclusive education, the elimination of gender disparities, and increasing access to quality employment throughout the region. In addition, fair working hour arrangements and improving the quality of life in various regions also need to be considered to reduce income disparities.

Based on the results of data analysis showing that productivity has a significant effect on labor income in Indonesia, this means that the level of individual productivity is one of the main factors that influences the level of income received by the workforce. In general, productivity refers to the ability of individuals or groups to produce output in a certain period of time, and this is closely related to how skills, knowledge, and work efficiency affect the results achieved. The results of this study highlight the importance of policies that can increase overall labor productivity. Policies such as developing education and skills training, implementing more efficient technology, and improving the work environment can contribute to increased productivity. In addition, it is important for the government and the private sector to create conditions that encourage increased productivity in all levels of the workforce, both in the formal and informal sectors.

Based on data analysis showing that productivity can mediate the influence of variables of education level, age, gender, working hours, and work location on labor income in Indonesia in 2021, this means that productivity is not only a factor that directly influences income, but also acts as a mediator that bridges the relationship between individual factors and work contexts with the level of income received by the workforce. The results of this analysis show that productivity is a key factor that can explain how other factors such as education, age, gender, working hours, and work location affect labor income. Thus, productivity is an important variable in the development of labor policies. Policies that encourage increased productivity, either through skills training, improving the quality of education, or improving working conditions, will be very effective in increasing labor income in Indonesia.

4. Conclusion

Based on the discussion that has been done, it can be concluded that the level of education has a significant effect on labor income in Indonesia. Age has a significant effect on labor income in Indonesia. Gender has a significant effect on labor income in Indonesia. Working hours have a significant effect on labor income in Indonesia. Work location has a

significant effect on labor income in Indonesia. Education level, age, gender, working hours, and work location together have a significant effect on labor income in Indonesia in 2021. Productivity has a significant effect on labor income in Indonesia. Productivity mediates the influence of the variables Education Level, age, gender, working hours, and work location on labor income in Indonesia in 2021.

4.1. Suggestions

Based on the conclusions that have been explained, several suggestions can be given to practitioners and further researchers who are involved in the field of labor and economy in Indonesia. Offering more specific skills training based on industry needs can help improve the skills of the workforce and in turn their productivity and income. Age-Based Skills Training and Development, Promoting Gender Equality in the Workplace, Optimizing Working Hours and Work-Life Balance, Improving Infrastructure and Access to Jobs in Remote Areas, Focusing on Labor Productivity Further research can explore other socio-economic factors that affect labor income, such as family status, employment status (informal or formal), or more specific government policies, in order to enrich the understanding of the dynamics of labor income in Indonesia.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Abel, J. R., and Deitz, R. (2015). Agglomeration And Job Matching Among College Graduates. Regional Science And Urban Economics, 51, 14–24. Https://Doi.Org/10.1016/J.Regsciurbeco.2014.12.001

[2] Allen, J., and De Weert, E. (2007). What Do Educational Mismatches Tell Us About Skill Mismatches? A Cross-Country Analysis. European Journal Of Education, 42(1), 59–73.

[3] Allen, J., and Van Der Velden, R. (2001). Educational Mismatches Versus Skill Mismatches: Effects On Wages, Job Satisfaction, And On-The-Job Search. Oxford Economic Papers, 53(3), 434–452. Https://Doi.Org/10.1093/Oep/53.3.434

[4] Angrist, J. D., and Pischke, J.-S. (2008). Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.

[5] Battu, H., Belfield, C. R., and Sloane, P. J. (1999). Overeducation Among Graduates: A Cohort View. Education Economics, 7(1), 21–38. Https://Doi.Org/10.1080/09645299900000002

[6] Becker, G. (1975). Human Capital: A Theoretical And Empirical Analysis, With Special Reference To Education, Second Edition. National Bureau Of Economic Research, Inc.

[7] Becker, G. S. (1962). Investment In Human Capital: A Theoretical Analysis. Journal Of Political Economy, 70(5, Part 2), 9-49.

[8] Becker, G. S. (1993). Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. University of Chicago Press.

[9] Béduwé, C., and Giret, J. F. (2011). Mismatch Of Vocational Graduates: What Penalty On French Labour Market? Journal Of Vocational Behavior, 78(1), 68–79. Https://Doi.Org/10.1016/J.Jvb.2010.09.003

[10] Choi, S. K., and Hur, H. (2020). Does Job Mismatch Affect Wage And Job Turnover Differently By Gender?. Education Economics, 28(3), 291-310.

[11] Di Gropello, E., Kruse, A., and Tandon, P. (2011). Skills For The Labor Market In Indonesia. In Skills For The Labor Market In Indonesia. Https://Doi.Org/10.1596/978-0-8213-8614-9

[12] Dilly, A., and Papuling, G. (2021). Analisis Dampak Mismatch Kualifikasi Pendidikan Dan Pekerjaan Pada Kualitas Kerja Karyawan Di Halmahera Utara.

[13] Dolton, P. J., and Silles, M. A. (2008). The Effects Of Over-Education On Earnings In The Graduate Labour Market. Economics Of Education Review, 27(2), 125–139. Https://Doi.Org/10.1016/J.Econedurev.2006.08.008

[14] Duncan, G. J., and Hoffman, S. D. (1981). The Incidence And Wage Effects Of Overeducation. Economics Of Education Review, 1(1), 75–86. Https://Doi.Org/10.1016/0272-7757(81)90028-5

[15] Gaigné, C., and Sanch-Maritan, M. (2019). City Size and The Risk of Being Unemployed. Job Pooling Vs. Job Competition. Regional Science And Urban Economics, 77(May), 222–238. Https://Doi.Org/10.1016/J.Regsciurbeco.2019.05.002

[16] Glaeser, E. L. (2011). The Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier. Penguin Press.

[17] Gujarati, Damodar N, (2004). Basic Econometrics, Fourth Edition, Singapore. Mcgraw-Hill Inc.

[18] Hasibuan, E., and Handayani, D. (2021). Pengaruh Qualification Mismatch Terhadap Upah Tenaga Kerja Di Indonesia. Jurnal Ekonomi Dan Pembangunan, 29(1), 1-16.

[19] Imam Ghozali. (2011). Aplikasi Analisis Multivariate Dengan Progran IBM SPSS 19. Semarang : Badan penerbit Universitas Diponegoro.

[20] Kuncoro, Mudrajat. (2003). Metode Riset Untuk Bisnis Dan Ekonomi. Erlangga: Jakarta.

[21] Kupets Olga (2006). Determinants of Unemployment Duration in Ukraine. Journal of Comparative Economics, 34(2):228-247 Https://doi.org/10.1016/j.jce.2006.02.006

[22] Montt, G. (2017). Field-Of-Study Mismatch And Overqualification: Labour Market Correlates And Their Wage Penalty. IZA Journal Of Labor Economics, 6(1). Https://Doi.Org/10.1186/S40172-016-0052-X

[23] Nordin, M., Persson, I., and Rooth, D. O. (2010). Education-Occupation Mismatch: Is There An Income Penalty? Economics Of Education Review, 29(6), 1047–1059. Https://Doi.Org/10.1016/J.Econedurev.2010.05.005

[24] OECD. (2020). Education at a Glance 2020: OECD Indicators. OECD Publishing. https://doi.org/10.1787/69096873-en

[25] OECD. (2020). Regions at a Glance 2020. OECD Publishing. https://doi.org/10.1787/4c68d5d3-en

[26] OECD. (2020). The Future of Work: Employment Outlook 2020. OECD Publishing. https://doi.org/10.1787/6b2d4f1b-en

[27] OECD. (2020). The Future of Work: Employment Outlook 2020. OECD Publishing. https://doi.org/10.1787/6b2d4f1b-en

[28] OECD. (2020). The Gender Pay Gap in Indonesia. OECD Economic Surveys: Indonesia 2020. OECD Publishing. https://doi.org/10.1787/3fc25131-en

[29] Pholphirul, P. (2017). Educational Mismatches And Labor Market Outcomes Evidence From Both Vertical And Horizontal Mismatches In Thailand. Education And Training, 59(5), 534–546. Https://Doi.Org/10.1108/ET-11-2016-0173

[30] Prabowo, S. (2014). Hubungan Antara Skill Mismatch Dengan Stres Kerja Pada Karyawan Pt X. Psikodimensia, 13(2).

[31] Rees Hedley, Shap Anup. (1986). An Empirical Analysis of Self-employment in the U.K. Journal of Applied Econometrics Volume 1. 95-108 https://doi.org/10.1002/jae.3950010107

[32] Sen, A. (1999). Development as Freedom. Oxford University Press.

[33] Sziraczki Gyorgy and Reerink Annemarie. (2004). Report of survey on the school to work transition on Indonesia. ISBN92-2-815575-2. Ogranisasi Perburuhan Internasional

[34] Todaro, Michael P. Dan Stephen C. Smith. (2011). Pembangunan Ekonomi Edisi Kesebelas Jilid 1. Jakarta: Erlangga.

[35] World Bank. (2018). The World Bank Gender Data Portal. https://data.worldbank.org/topic/gender

[36] Wulandari, H., and Damayanti, A. (2021). Qualification Mismatch Dan Upah Di Indonesia. Jurnal Ekonomi Dan Kebijakan Publik Indonesia, 8(1), 45-57.