

ANALYSIS OF LABOR ABSORPTION IN 154 DISTRICTS / CITIES ON THE ISLAND OF SUMATRA: A PANEL DATA APPROACH

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How To Cite: Asrini, Murialti, Neng., Hadi, M. Fikry. (2025). Analysis Of Labor Absorption In 154 Districts / Cities On The Island Of Sumatra: A Panel Data Approach. *Jurnal Akuntansi, Manajemen Dan Ekonomi Islam (JAM-EKIS)*, 8(2), 734-745. <https://doi.org/10.36085/jamekis.v8i2.7739>

INFORMASI ARTIKEL

Riwayat Artikel:

Diterima : 25 January 2025

Direvisi : 27 Maret 2025

Disetujui : 20 May 2025

Keywords:

District/City Minimum Wage, Domestic Investment, Foreign Investment, Labor Productivity, Labor Absorption

ABSTRACT

Labor absorption is an important factor in promoting economic growth and community welfare, especially in the island of Sumatra. This study aims to analyze the effect of labor absorption in 154 district/city on the island of Sumatra. In this study, secondary data was analyzed using panel data regression with fixed effect model approach for the period 2017-2023 using STATA 17 software. The results showed that the variables of district/city minimum wage and foreign investment together had a positive and significant effect on employment. Meanwhile, the variable of domestic investment and labor productivity together have a negative and significant effect on employment.

INTRODUCTION

The social and economic point of view was reported that labor was one of the most important and influential production factors in processing the economic system, which includes production, distribution and consumption (Rajput et al., 2023; Wahyuni et al., 2024). High labor absorption indicates that the country's economy is able to provide sufficient employment for the labor force. Conversely, low labor absorption indicates that the country's economy has not been able to absorb all of the available labor force (Mncayi & Shuping, 2021). South Africa has become the worst performing labor market in the world over the last two decades, which is influenced by very high unemployment and low employment rates, which can lead to weak economic conditions and gaps in the labor market (Habanabakize et al., 2019). Although ASEAN can make a positive contribution to economic growth, there are still many countries in the ASEAN region that

have labor problems, such as the imbalance between the number of workers and the number of job opportunities (Haq, 2024).

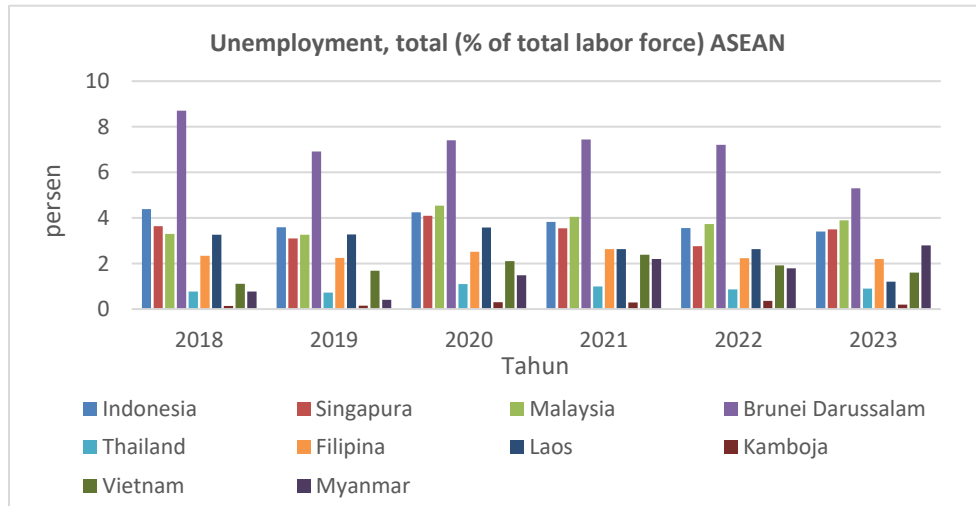


Fig 1: Unemployment, total (% of total labor force) ASEAN

Source: (World Bank, 2024) (Data Processed)

Based on the World Bank data in 2024, among the 10 ASEAN countries, the country with the most serious labor problems due to the highest unemployment rate is Brunei Darussalam and the country with the lowest unemployment problem is Cambodia. In addition, Indonesia with the 4th highest unemployment rate and reaching the 5th rank has a productivity worth \$14 per hour worked among ASEAN member countries in 2023. According to the International Labor Organization (ILO), Indonesia's labor productivity is quite high on a Southeast Asian scale. However, on a global scale, Indonesia's productivity is low, ranking only 111th out of 189 countries (Ahdiat, 2024). Therefore, effective economic policies are needed to overcome unemployment and create jobs in both the government and private sectors (Purnomo, 2021).

Indonesia's population growth continues to increase from year to year, so the number of workers also continues to increase. This creates problems in the economy and employment due to the lack of balance between labor demand and supply, where the high number of workers is often correlated with low wage levels, causing high unemployment. This is due to the limited skills and low productivity of the labor force, so there is a lack of job creation (Habanabakize et al., 2019; Hindun, 2019; Ketenagakerjaan, 2023; Setyo & Juliprijanto, 2023; Wahyuni et al., 2024). The island of Sumatra as the third largest island of the five major islands in Indonesia with an area of 475.807,63 km², has a strategic role in facing the challenges of employment. Economic and political factors influence the dynamics of employment in this island, making it one of the important focuses in national economic development (BPS, 2023).

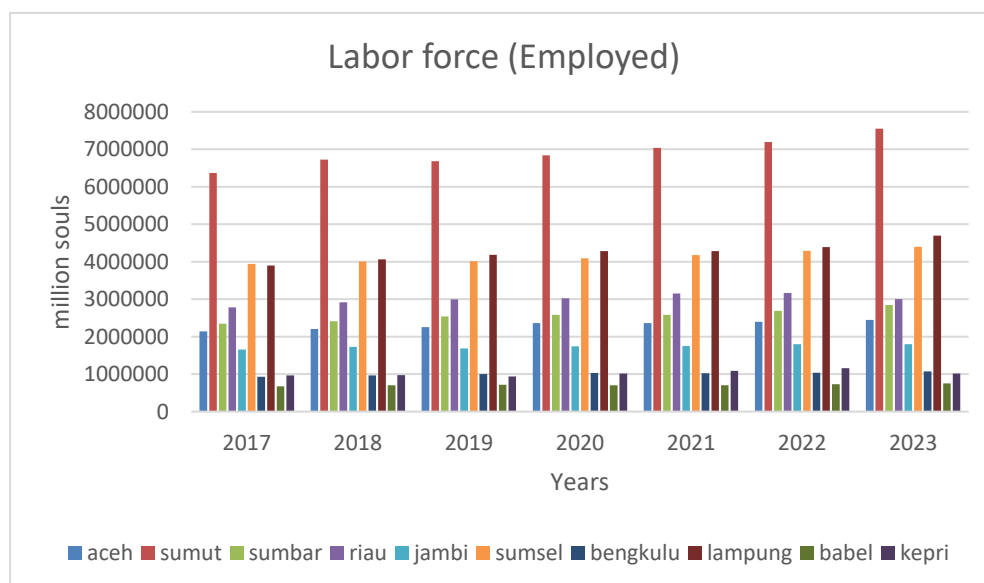


Fig 2: Labor Force in Employment

Source: (BPS, 2023) (Data Processing 2024)

Based on BPS data, labor absorption in Sumatra Island in the past seven years from 2017-2023 has fluctuated, where high labor absorption is in North Sumatra Province with an average of 6.914.380 million people, and low labor absorption is in Bangka Belitung Islands with an average of 710.289 million people. This trend reflects a period of increase and decrease, one of the causes of labor is not optimal, namely, regency/city minimum wage, domestic investment (DI), foreign investment (FDI), and Labor Productivity.

Previous research shows that minimum wage, DI, FDI, and labor productivity have a positive and significant impact on employment in Indonesia (Prihatini et al., 2020). Research (Purnomo, 2021) also found that minimum wage has a positive and significant effect on employment in Central Java Province. Meanwhile, research results (Purba, 2020) concluded that DI investment has a positive and significant effect on employment, while FDI has a negative and significant effect on employment. Based on these various findings, this study was conducted to analyze the factors affecting employment in Sumatra during 2017-2023. This study uses panel data, which includes 154 regencies/cities in Sumatra Island. Therefore, the research wants to know whether the biggest causes of non-optimal employment in Sumatra Island are regency/city minimum wage, DI, FDI, and labor productivity.

This paper is organized as follows: the next section provides the theoretical basis and a brief review of the research that has been done on the subject. The next section describes the data and research methodology, and the next section presents the empirical results. The final section presents conclusions and policy implications.

LITERATUR REVIEW

Labor Absorption

Labor absorption is defined as the number of workers who successfully obtain jobs in different sectors of the economy, which is influenced by factors such as minimum wage, investment, and labor productivity (Prihatini et al., 2020). The working-age population can be divided into two groups, namely the labor force and the non-labor force. The labor force consists of the working-age population that works (for income/profit) and is unemployed. The non-labor force, on the other hand, consists of the working-age population that neither employed nor unemployed during the reference period, including the potential labor force, people who want a job but are not looking and are not willing to work, and people who do not want to work. It can also be interpreted as the number of economically active persons in a region (BPS, 2023).

An increase in the number of workers will increase productivity. With a high level of labor absorption, it will increase income and community welfare, which in turn will reduce unemployment and poverty. Therefore, the more companies invest in the region, the more job opportunities will be created (Lembang & Siman, 2024).

Labor absorption is used as an indicator that reflects the condition of a region's labor market, including the effectiveness of investment in creating jobs. A high level of labor absorption indicates economic progress that is able to meet labor needs. Conversely, a low absorption rate may indicate a decline in economic activity or an imbalance between labor supply and demand (Purba, 2020).

District / City Minimum Wage

Minimum wage is an important aspect that needs to be considered by the government because of its impact on employment. Wages are the rights that workers receive as a result of working for the company. When the demand for goods and services increases, wages tend to rise. The increased demand encourages businesses to increase production. As a result, the need for labor also increases so that the number of workers absorbed by the company increases (Siregar & Nurbaiti, 2022).

According to G.S. Becker, when the wage level increases, labor productivity also tends to increase. With higher labor productivity, the company's output increases and the company can grow faster. This development opens up opportunities for companies to create more jobs and absorb more labor (Hidayati et al., 2022).

Domestic Investment

Domestic Investment (DI) is an investment activity to conduct business in the territory of the Republic of Indonesia carried out by domestic investment using domestic capital (DPMPTSP, 2023). DI is one of the sources of incomes for domestic investment flows. Based on Article 1 of Law No. 25/2007 on Investment, DI is an investment activity to conduct business in the territory of the Republic of Indonesia carried out by domestic investors using domestic capital. DI is carried out by individual Indonesian citizens, state-owned enterprises, state and local government. DI activities can contribute to the development of the country's economy through income distribution among the country's regions (Agustin et al., 2022).

According to the Solow theory, if there is an increase in savings, then an increase in investment will lead to an increase in capital accumulation and will increase the economic growth of a country so that it can increase employment (Y. P. Sari, 2021). Research

(Setyo & Juliprijanto, 2023) states that DI has a negative effect, indicating that any increase in domestic investment will reduce employment or vice versa, any decrease in domestic investment will increase employment.

Foreign Investment

Foreign Investment (FDI) is an investment activity to conduct business in the territory of the Republic of Indonesia carried out by foreign investors, both those using foreign capital entirely or in partnership with domestic investment (DPMPTSP, 2023). FDI is one of the drivers of economic growth because it contributes to development as a job creator. The most expected foreign investment is foreign direct investment, which is productive and able to mobilize the real sectors of the economy (Lembang & Siman, 2024).

Based on Law No. 25/2007 on Investment, FDI is an investment activity to conduct business in the territory of the Republic of Indonesia. This is done by foreign investors, either alone or together with other domestic investors. FDI is encouraged to facilitate economic growth and equity, increase the active participation of the community in economic activities, and increase the number of business opportunities and employment. With more foreign investors, this will facilitate the industrialization of a region and have an impact on the number of jobs (Saharuddin et al., 2024).

Labor Productivity

Labor productivity is the ability of labor to produce output. The calculation method is value added divided by the amount of paid labor (BPS, 2023). Labor productivity is the ratio of the amount of real output to the amount of labor used to produce that amount of output (Feriyanto, 2014). An increase in the amount of labor absorption will increase productivity. A high level of labor absorption will increase income and community welfare, which in turn will reduce unemployment and poverty. Therefore, the more companies invest in the region, the more job opportunities will be created (Lembang & Siman, 2024). Studies in developed countries have shown that job security increases productivity. This higher productivity depends on innovation and technology. However, from a negative perspective, labor and other regulations may hinder job creation. On the other hand, higher labor skills contribute to higher wage productivity, while oversupply of labor leads to lower wages (Habanabakize et al., 2019).

According to G.S. Becker, if higher labor productivity makes the company's production increase, if accompanied by demand for goods, the company will need more labor, so employment will increase (Hidayati et al., 2022).

RESEARCH METHODS

This research uses quantitative analysis using secondary data. To analyze the relationship between variables, this study uses a panel data regression analysis tool, which is a combination of time series with the period 2017-2023 and cross section with 154 districts/cities on the island of Sumatra obtained from the Central Statistics Agency (BPS), the One-Stop Integrated Investment and Service Office (DPMPTSP), and the Ministry of Investment and Downstream / BKPM. The main focus is to measure the influence of district/city minimum wage variables, domestic investment, foreign

investment, and labor productivity on employment in the island of Sumatra. The equation model in this study is as follows:

$$Y_{it} = \alpha + \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \varepsilon_{it}$$

Description:

Y: labor absorption, X1: district/city minimum wage, X3: domestic investment, X4: foreign investment, $\beta_1, \beta_2, \beta_3, \beta_4$: independent variable coefficient, i: number of observations (cross-section) 154 countries/cities, t: number of time series data (2017-2023), ε : error term.

Estimation Model Selection

The purpose of model selection is to determine the best model to be used in this study. In panel data modal analysis, there are three approaches: Pooled Least Square, Fixed Effect Model, Or Random Effect Model (Hidayat & Nurlela, 2018).

Chow Test

In the PLS and FEM models, the stages of capital selection are tested by performing the Chow test. If the prob value (F-statistic) < alpha level (0.05), then the selected model is the Fixed Effect Model (FEM). However, if the prob value (F-statistic) > 0.05, then the selected model is Pooled Least Square (PLS)

Hausman Test

The stage in model selection is testing between FEM and REM, then the hausman test in performed. If prob>chi2 = < 0.05, then the selected model is the Fixed Effect Model. On the other hand, if prob>chi2 = 0.05, then the selected model is the Random Effect Model.

Lagrange Multiplier (LM) Test

Model selection steps are tested for REM and PLS models by performing the LM test. If prob>chi2 = < 0.05, then the selected model is the Random Effect Model. Meanwhile, if prob>chi2 = > 0.05, then the selected model is Pooled Least Square.

RESULTS AND DISCUSSION

Table 1
Panel Data Regression Results

Item	FEM	REM
lumk	.3869114*** (.0328924)	.3866258*** (.0328644)
pmdn	-3.42e-12 (1.56e-11)	-3.27e-12 (.1.56e-11)
lpma	.0025551** (.0008068)	0.0026344** (.0008061)
pl	-.0026702*** (.0000968)	-.0026509*** (.0000965)

cons	6.398247*** (.4861665)	6.311476*** (.4898892)
Hausman (Prob)		0.0062
F-statistic	218.97	-
Prob (F-statistic)	0.0000	-
R ²	0.5844	0.5843
N	1078	1078
VIF	3.88	-
Heteroskedasticity	0.0000	-
Autocorrelation	0.0467	-

Source: STATA 17 (Data Processing)

Legend: * p<0.05; ** p<0.01; *** p<0.001

Notes: * at 5% confidence level

** at 1% confidence level

*** at 0.1% confidence level

In Table 1 above, after the Hausman test was performed with the results of $\text{prob} > \chi^2 = 0.0062$, < the alpha level (α) 0.05, the model chosen in this study is the fixed effect model. The next step is the classical assumption test, based on the results of data processing, it is known that it is free from multicollinearity with a VIF value of $3.88 > 1 < 10$, but not free from autocorrelation with a value of $0.0467 < 0.05$ and not free from heteroscedasticity with a value of $0.0000 < 0.05$, as a final step, a robust test is performed for this model.

Robust Regression

The standard error of corrected -White- heteroscedasticity is also known as the robust standard error (Gujarati & Porter, 2010).

Table 2
Fixed Effect Model

Fixed-effects (within) regression	Number of obs	=	1078
Group variable: code	Number of groups	=	146
R-squared:	Obs per group:		
Within = 0.5844	min =		1
Between = 0.0046	avg =		5.3
Overall = 0.0084	max =		7
	F (3,145)	=	.
Corr (u_i, Xb) = -0.1631	Prob > F	=	.

(Std. err. adjusted for 146 clusters in code)

	Coefficient	Robust std. err.	t	P>t	[95% conf. interval]
lptk					

lumk	0.3869114	0.027116	14.27	0.000	0.3333178	0.440505
pmdn	-3.42E-12	1.51E-12	-2.27	0.025	-6.39E-12	-4.41E-13
lpma	0.0025551	0.0009259	2.76	0.007	0.000725	0.0043851
pl	-0.0026702	0.0001787	-14.94	0.000	-0.0030234	-0.002317
_cons	6.398247	0.3998576	16.00	0.000	5.607944	7.188549
sigma_u	0.76410511					
sigma_e	0.08427367					
rho	0.98798215	(fraction of variance due to u_i)				

Source: STATA 17 (Data Processing)

The equation model in this study is as follows:

$$Y = 6.398247 + 0.3869114 (\text{UMK}) - 3.42\text{E-}12 (\text{PMDN}) + 0.0025551 (\text{PMA}) - 0.0026702 (\text{PL})$$

Based on the table of the test results of the coefficient of determination (R^2), the R-squared value is 0.5844, which means that the county/city minimum wage variable, domestic investment, foreign investment, and labor productivity are able to explain the effect on labor absorption by 58% and 42% is influenced by other variables outside this research model. The constant value (α) has a positive effect of 6.398247, which means that if county/city minimum wage, domestic investment, foreign investment, and labor productivity increase by 10 percent, it will increase employment by 0.6398247 million people.

The county/city minimum wage has a positive effect of 0.3869114 and is significant at $0.000 < 0.05$, which means that for every 10 percent increase in the county/city minimum wage, the employment rate increases by 3.869114 percent. This finding is consistent with G.S. Becker's wage theory, which states that when wages increase, labor productivity also increases, and when accompanied by demand for goods, firms will need more labor, so labor absorption will increase (Hidayati et al., 2022). It is also consistent with research (Hidayat & Nurlala, 2018; Prihatini et al., 2020; Purnomo, 2021; Suryadi et al., 2021), which explains that the higher the wage in a region, the higher the interest of workers who want to work in the labor market. The amount of labor absorption that occurs will support the decent life of an area.

Domestic investment has a negative effect of -3.42E-12 and significant with a value of $0.025 < 0.05$ on employment, this situation indicates that every increase in domestic investment by 10 percent can reduce employment by 34.2E-12 million people and conversely each decrease in domestic investment will increase employment. This finding is not consistent with the Solow theory which states that an increase in investment can increase a country's economic growth so that it can increase employment (Y. P. Sari, 2021) and this finding is not consistent with research (Purba, 2020; Y. A. Sari, 2023). In Sandika's research, it states that DI has no significant effect on work absorption. This is because DI, especially from the government, is more focused on infrastructure development, such as spending on public facilities (facilities and infrastructure),

education, and training. As a result, labor absorption is low and thus does not increase employment opportunities for the community. In addition, the distribution of investment is more dominant outside the region or abroad, thus less integrated with other strategic sectors that are labor intensive (Sandika et al., 2014).

Furthermore, investment has a positive effect of 0.0025551 and significant with a value of $0.007 < 0.05$ on labor absorption by 0.025551 percent. This result is consistent with the Solow theory, which states that increased investment can increase a country's economic growth so that it can increase employment (Y. P. Sari, 2021), and Y.A. Sari's research states that FDI has a negative and significant effect on labor absorption. Where capital accumulation for the purchase of modern equipment is more attractive to foreign investors. As a result, investors tend to choose capital-intensive investments to maximize profits rather than to create jobs. By using modern technology, investors can reduce labor costs, so companies reduce the number of workers to achieve operational efficiency and effectiveness (Y. A. Sari, 2023), and this finding is consistent with research (Purba, 2020; Setyo & Juliprijanto, 2023; Widyapangesti & Soelistyo, 2022). Based on research (Komariyah et al., 2017) states that FDI, which has a positive impact on employment in Indonesia, is also confirmed by the phenomenon of increasing FDI, which ultimately provides opportunities for job creation and increased productivity.

Labor productivity has a negative effect of -0.0026702 and is significant with a value of $0.000 < 0.05$ on employment, which means that if there is an increase in labor productivity by 10 percent, it will reduce employment by 0.026702 million people. This finding is not in line with the theory of G.D. Becker, which states that if labor productivity increases, it will make the company's production increase, if it is accompanied by demand for goods, the company will need more labor, so that employment will increase. Meanwhile, this finding states that if labor productivity increases, it will make production increase, but if it is not accompanied by demand for goods, the company will not need more labor, so that employment will decrease. However, this finding is in line with research (N. Sari et al., 2016), which states that increasing labor productivity can reduce production costs per unit of goods. With lower production costs, entrepreneurs can reduce the selling price of goods. This price reduction encourages an increase in public demand for these goods. The increase in demand further triggers an increase in production, which in turn increases the need for labor. This finding is consistent with research (Habanabakize et al., 2019) that shows the importance of a qualified and skilled workforce to be able to compete in the labor market. Therefore, improving the skills of the labor force is a key condition for increasing productivity while creating more jobs.

CLOSING

Conclusion

Regency/city minimum wage has a positive and significant effect on employment on the island of Sumatra in 2017-2023. Domestic investment has a negative and significant effect on employment on the island of Sumatra in 2017-2023. Foreign investment has a positive and significant effect on employment on the island of Sumatra in 2017-2023. Labor productivity has a negative and significant effect on employment on the island of Sumatra in 2017-2023.

Advice

Based on the results of the discussion above, it is recommended that policy makers can direct DI to invest more in sectors that tend to absorb more labor. In addition, the government should balance efforts to increase labor productivity with policies that support the development of economic sectors that create jobs. Suggestions for future researchers are expected to add other variable beyond those that have been studied.

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