

MSME DEVELOPMENT AND REGIONAL EMPLOYMENT: EVIDENCE FROM INDONESIAN PROVINCES

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Abstract

This study examined the relationship between micro, small, and medium enterprise (MSME) development and open unemployment across 33 Indonesian provinces from 2017 to 2024. Using two-way fixed-effects panel estimation with province-clustered standard errors, the study decomposed MSME employment effects into three channels: output value, value added, and labor expenditure. Contrary to the conventional employment creation hypothesis, MSME output and value added in absolute terms did not reduce open unemployment and were even borderline positively associated with the unemployment rate. The key finding was that the share of MSME labor expenditure in gross regional domestic product (GRDP) was the only operative channel through which MSME activity significantly reduced unemployment ($\beta = -0.155$, $p < 0.05$). This result remained robust after share-based normalization and the inclusion of province and year fixed effects. Heterogeneity analysis further showed that the positive association between MSME value added and unemployment was stronger in Western Indonesian provinces, consistent with labor force participation effects operating more intensively in economically denser regions. The findings challenged the assumption that expanding MSME scale automatically reduced unemployment and highlighted labor intensity as a critical policy lever. The study suggested that policies targeting MSME labor formalization, minimum wage enforcement, and worker training were more likely to reduce open unemployment than policies focused solely on output or value added expansion.

Keywords: MSME; unemployment; labor expenditure; panel data; Indonesia



By Authors

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1. Introduction

Micro, small, and medium enterprises (MSMEs) are widely regarded as important contributors to employment generation and economic activity in developing economies. In Indonesia, MSMEs account for approximately 99.7 percent of total business units and absorb more than 96 percent of the national workforce (Kementerian Koperasi dan UKM, 2023). Their substantial contribution to employment has encouraged policymakers to promote MSME development as an instrument for reducing open unemployment. However, the relationship between MSME development and employment outcomes is not necessarily straightforward. The expansion of MSME activity may increase employment opportunities, but higher output or value added does not automatically imply proportional increases in labor absorption. This issue is particularly relevant at the provincial level, where economic structures, labor markets, and the scale of MSME activity vary considerably across regions.

The Indonesian provincial context illustrates this complexity. Official statistics indicate substantial variation in open unemployment rates across provinces, with some provinces recording rates below 3 percent while others exceeding 7 percent (BPS, 2024). These differences do not appear to correspond systematically with the scale or productivity of MSME activity. Provinces with relatively high MSME output do not uniformly record lower unemployment rates, while rapid increases in MSME value added have not always been accompanied by comparable reductions in the open unemployment rate. This apparent disconnect raises an important empirical question: through which channels, if any, does MSME development contribute to lower open unemployment at the provincial level in Indonesia?

Three dimensions of MSME activity are particularly relevant to this question. First, MSME output value represents the total value of goods and services produced and reflects the scale of economic activity that may generate derived demand for labor (Ayyagari et al., 2011). Second, MSME value added captures the net contribution of MSMEs to regional economic activity after accounting for intermediate input costs and therefore provides an indication of their contribution to income and productivity (Beck et al., 2005). Third, MSME labor expenditure directly reflects spending on workers and therefore provides a more proximate indicator of the extent to which MSME activity translates into labor compensation and employment absorption (Dethier et al., 2011). Examining these dimensions simultaneously provides a basis for distinguishing between the expansion of MSME economic activity and the extent to which such activity is actually transmitted into labor-market outcomes.

Previous studies have established the importance of MSMEs for employment and economic development, but the evidence does not establish a uniform relationship between MSME expansion and unemployment reduction. Research on MSMEs has frequently emphasized their contribution to employment creation and poverty reduction, particularly in developing economies (Beck et al., 2005; Dethier et al., 2011). Other studies have highlighted the importance of MSMEs within broader structural transformation and regional development processes (Tambunan, 2019; Yoshino & Taghizadeh-Hesary, 2018). However, much of the existing evidence has relied on cross-sectional comparisons, national aggregates, or measures of MSME scale that do not distinguish between output, value added, and labor-related expenditure. Such approaches may obscure differences in the mechanisms through which MSME activity affects regional labor markets.

A further limitation concerns the treatment of regional heterogeneity and scale. Cross-sectional and aggregate analyses may conflate persistent differences between provinces with changes occurring within provinces over time. Panel-data approaches with province and year fixed effects can address time-invariant provincial characteristics and common temporal shocks more effectively than simple cross-sectional comparisons (Bertrand et al., 2004). Nevertheless, empirical applications examining the MSME–unemployment relationship across Indonesian provinces remain limited, particularly those that distinguish different channels of MSME activity. In addition, absolute measures of MSME output, value added, and labor expenditure may primarily capture differences in provincial economic size. Expressing these variables as shares of gross regional domestic product (GRDP) provides an alternative perspective by measuring the structural importance of MSME activity relative to the size of the regional economy. This distinction has received comparatively limited attention in studies of the MSME–employment relationship.

These limitations indicate a research gap in understanding whether MSME expansion itself is sufficient to reduce open unemployment or whether the employment effect depends on the extent to which MSME economic activity is translated into labor expenditure. The existing literature has provided important evidence on the role of MSMEs in employment generation,

but less attention has been given to decomposing the relationship into output value, value added, and labor expenditure channels within a consistent provincial panel framework. There is also limited evidence on whether the relationship differs across Indonesian regions and whether the findings remain robust when MSME indicators are normalized relative to GRDP. Therefore, this study aimed to examine the relationship between MSME development and open unemployment across 33 Indonesian provinces over the 2017–2024 period. Specifically, the study examined whether MSME output value, value added, and labor expenditure were associated with provincial open unemployment and identified which channel was most closely related to unemployment reduction. The study further assessed the robustness of these relationships using share-based measures and lagged specifications and examined geographic heterogeneity across Indonesian regions. By distinguishing the different channels through which MSME activity may influence labor-market outcomes, this study sought to provide a more nuanced understanding of the conditions under which MSME development can contribute to reducing open unemployment and to offer policy implications for strengthening the employment intensity of MSME development.

2. Method

2.1 Research Design

This study used a quantitative research design with a strongly balanced panel-data approach to examine the relationship between micro, small, and medium enterprise (MSME) development and open unemployment in Indonesia. The analysis covered 33 Indonesian provinces over the period 2017–2024, resulting in 264 province-year observations. A panel-data approach was employed to capture variation both across provinces and within provinces over time. The empirical analysis used a two-way fixed effects (TWFE) model by incorporating province and year fixed effects. This approach controlled for time-invariant provincial characteristics and common temporal shocks that could affect provincial unemployment outcomes.

2.2 Participants/Data Source

This study did not involve individual participants or survey respondents. Instead, it used secondary data at the provincial level obtained from official statistical sources. The dataset covered 33 Indonesian provinces during 2017–2024 and consisted of 264 province-year observations. The panel was strongly balanced, with observations available for every province and year within the study period.

Data on MSME output value, value added, and labor expenditure were obtained from the BPS Annual MSME Survey. Open unemployment rate (TPT) data were obtained from the National Labor Force Survey (Sakernas). Real gross regional domestic product (GRDP) per capita was obtained from BPS Provincial Accounts. Gini coefficient data were obtained from BPS Welfare Statistics, while Human Development Index (HDI) data were obtained from BPS and the United Nations Development Programme (UNDP) National Human Development Reports.

Province identification followed the official BPS classification using the provincial identification code (`id_bps`). All monetary variables were expressed in real terms using constant 2010 prices. The 2017–2024 period was selected to maintain comparability across years and to correspond with the availability and methodological consistency of the MSME survey data.

2.3 Instrument and Data Collection

Because the study used secondary quantitative data, no questionnaire or interview instrument was employed. Instead, the measurement instrument consisted of standardized provincial indicators obtained from the identified official statistical sources. The dependent variable was the open unemployment rate (TPT), measured as the percentage of the labor force that was unemployed and actively seeking employment according to the definitions implemented in Sakernas.

Three MSME activity measures were used as the main independent variables: output value, value added, and labor expenditure. Each measure was examined in both level and share forms. The level measures were transformed using natural logarithms, while the share measures represented the corresponding MSME measure as a percentage of provincial GRDP. MSME output value was represented by `ln_nilai_output` and `sh_nilai_output`, MSME value added by `ln_nilai_tambah` and `sh_nilai_tambah`, and MSME labor expenditure by `ln_biaya_tk` and `sh_biaya_tk`.

Three control variables were included in the analysis. Real GRDP per capita was represented by `ln_grdp_cap` and controlled for differences in overall provincial economic development. The Gini coefficient controlled for income inequality, while HDI controlled for differences in human capital and socioeconomic development.

The data collection procedure involved compiling annual provincial observations from the identified official sources for 2017–2024. The datasets were matched using the official BPS provincial identification codes and year. The monetary variables were converted to constant 2010 prices were required to ensure comparability across years. The datasets were subsequently merged into a single province-year panel dataset and checked for missing observations, consistency of provincial identifiers, and comparability across years. The final dataset contained 264 province-year observations.

2.4 Data Analysis

Describe the data analysis technique/procedure The analysis began with descriptive statistics, including the mean, standard deviation, minimum, maximum, and number of observations for all variables. The main empirical analysis then employed a two-way fixed effects (TWFE) model. The general specification was:

$$TPT_{it} = \alpha + \beta_1 MSME_{it} + \gamma_1 \ln(GRDP_Capit) + \gamma_2 Gini_{it} + \gamma_3 HDI_{it} + \mu_i + \lambda_t + \epsilon_{it}(1)$$

where:

`TPTit` = open unemployment rate for province *i* in year *t*

`MSMEit` = MSME activity variable (output, value added, or labor expenditure, in level or share form)

μ_i = province fixed effect capturing all time-invariant provincial heterogeneity (geography, historical economic structure, institutional endowments)

λ_t = year fixed effect capturing common temporal shocks (COVID-19 recession 2020–2021, national policy changes, commodity price cycles)

ϵ_{it} = idiosyncratic error term

Standard errors are clustered at the province level (`vce(cluster id_bps)`) to account for arbitrary serial correlation within provinces over time, following Bertrand et al. (2004). With 33 clusters, clustering is feasible and produces conservative inference.

Six model specifications were estimated. Model M1 examined the logarithm of MSME value added with the control variables. Model M2 examined the logarithm of MSME

output value, while Model M3 examined the logarithm of MSME labor expenditure. Model M4 included all three MSME measures simultaneously to assess their relative contributions. Model M5 used share-based measures of MSME output, value added, and labor expenditure relative to GRDP as a robustness specification. Model M6 used one-period lagged MSME measures to examine whether the estimated relationships remained when current unemployment was less likely to influence the explanatory variables.

The identification strategy relied on within-province variation in MSME activity after controlling for province and year fixed effects. The key identifying assumption was strict exogeneity, under which changes in MSME variables were assumed to be uncorrelated with idiosyncratic unemployment shocks conditional on the fixed effects and control variables. Potential reverse causality was addressed using share-based specifications and one-period lagged MSME variables. Cross-sectional dependence was examined through robustness analysis using Driscoll–Kraay standard errors, which accounted for cross-sectional dependence, serial correlation, and heteroskedasticity simultaneously (Driscoll & Kraay, 1998).

3. Results and Discussion

Main Estimation Results

Table 1 presents the full set of estimation results across six model specifications. All models include province and year fixed effects and cluster standard errors at the province level.

Table 1. MSME Development and Regional Unemployment (Dependent Variable: Open Unemployment Rate / TPT)

Variable	M1	M2	M3	M4	M5 (Share)	M6 (Lag)
Log MSME Value Added	0.690*	—	—	1.403	—	1.462
	(0.400)			(1.184)		(1.925)
Log MSME Output	—	0.599	—	−0.708	—	−1.550
		(0.453)		(1.407)		(2.099)
Log MSME Labor Exp.	—	—	0.379	−0.112	—	0.478
			(0.520)	(0.698)		(0.740)
MSME VA/GRDP (%)	—	—	—	—	0.055	—
					(0.059)	
MSME Output/GRDP (%)	—	—	—	—	−0.015	—
					(0.026)	
MSME Labor/GRDP (%)	—	—	—	—	−0.155**	—
					(0.068)	
Log GRDP per Capita	−3.315	−3.265	−3.281	−3.341	−3.296	−3.004
	(2.076)	(2.075)	(2.091)	(2.111)	(2.162)	(2.286)

Gini Coefficient	-3.119	-2.974	-3.867	-3.141	-1.591	-1.343
	(13.454)	(13.491)	(13.373)	(13.750)	(13.264)	(14.773)
HDI	0.043	0.042	0.045	0.046	0.050	0.032
	(0.038)	(0.038)	(0.039)	(0.038)	(0.039)	(0.048)
Observations	264	264	264	264	264	231
R-squared	0.219	0.217	0.215	0.220	0.216	0.211
Adj. R-squared	0.067	0.065	0.062	0.059	0.054	0.029
Within R-sq.	0.027	0.025	0.022	0.028	0.023	0.018
Prob > F	0.129	0.199	0.402	0.183	0.175	0.850

Source: BPS and other official statistical sources, processed by the authors (2026).

Single-Channel Results (Models M1–M3)

In Models M1 through M3, each MSME variable is assessed individually alongside controls. Log MSME value added (M1) enters with a coefficient of 0.690 that is statistically significant at the 10 percent level ($p = 0.094$). This positive sign is counter to the employment creation hypothesis and suggests that a one percent increase in MSME value added is associated with a 0.690 percentage point increase in open unemployment — a finding that aligns with the labor force participation hypothesis advanced by Audretsch & Thurik (2001) and van Stel et al. (2005). Log MSME output (M2) yields a positive coefficient of 0.599 that does not achieve statistical significance ($p = 0.195$). Log MSME labor expenditure (M3) carries a positive but clearly insignificant coefficient of 0.379 ($p = 0.471$).

The consistently positive direction across M1–M3 is notable. Rather than reducing unemployment, MSME expansion across all three dimensions is associated at minimum with no reduction and at most with a modest increase in measured TPT. This pattern is consistent with informal absorption dynamics described by ILO (2019), whereby MSME job creation predominantly occurs outside the formal labor market boundary used to define TPT.

Joint Channel Assessment (Model M4)

When all three MSME variables are entered simultaneously in Model M4, none achieves statistical significance and the coefficients shift substantially relative to single-variable models. Value added turns larger and positive (1.403), output turns negative (−0.708), and labor expenditure turns negative (−0.112). This pattern of sign reversals and inflated standard errors is consistent with multicollinearity among the three MSME measures — economically expected given that provinces with high output tend simultaneously to generate high value added and incur high labor costs. The variance inflation among these correlated regressors renders individual coefficient estimates unreliable, reinforcing the value of the single-channel and share-based specifications.

The Labor Expenditure Share Channel (Model M5)

The most substantively important result emerges from the share-based specification. MSME labor expenditure as a share of GRDP (sh_biaya_tk) enters with a

coefficient of -0.155 that is statistically significant at the 5 percent level ($p = 0.028$). This finding indicates that a one percentage point increase in MSME labor spending relative to regional output is associated with a 0.155 percentage point reduction in the open unemployment rate — a meaningful effect given that the sample mean TPT is 5.43 percent. Critically, neither MSME output share (-0.015 , $p = 0.552$) nor value added share (0.055 , $p = 0.355$) achieves significance, confirming that it is specifically the labor intensity of MSME activity — the degree to which MSME production translates into wage payments relative to total economic output — that constitutes the operative employment channel. This result is consistent with Dethier et al. (2011) and Neumark et al. (2011), who identify the wage bill share as the superior predictor of net employment effects.

Lagged Specification (Model M6)

The lagged specification in Model M6 fails to produce significant coefficients for any MSME variable, with all p -values exceeding 0.45. The coefficient signs are broadly consistent with the main specifications (value added positive, output negative, labor expenditure positive), suggesting no directional reversal with temporal displacement. The lack of significance in lagged specifications may reflect that the one-year lag is both too short to capture structural labor market adjustments and too long to capture wage payment effects that operate within the fiscal year.

Control Variable Patterns

Across all specifications, log GRDP per capita carries a consistently negative coefficient in the range of -2.892 to -3.341 . While this coefficient does not achieve conventional significance under clustered standard errors (p -values 0.123–0.168), its sign is economically intuitive: provinces with higher per capita income sustain more developed formal labor markets and lower frictional unemployment, consistent with Loayza & Raddatz (2010). The Gini coefficient is consistently negative and large in absolute value but never significant, suggesting that income inequality affects unemployment through complex and offsetting channels. The HDI carries small positive coefficients across all models, consistent with a human capital-driven labor force participation effect whereby higher development levels draw more individuals into the active labor force.

Heterogeneity And Robustness

Geographic Heterogeneity: Western versus Eastern Indonesia

To examine whether the MSME-employment relationship differs systematically between Western Indonesia (21 provinces, predominantly Java and Sumatra) and Eastern Indonesia (12 provinces, including Kalimantan, Sulawesi, Maluku, and Papua), we estimate equation (1) on geographic subsamples. Results are presented in Table 2.

Table 2. Geographic Heterogeneity (Dependent Variable: TPT; IV: *ln_nilai_tambah*)

Variable	Western (N=168)	Eastern (N=96)
Log MSME Value Added	0.842	0.517
	(0.648)	(0.506)
Log GRDP per Capita	-1.623	-3.756

	(6.082)	(2.537)
Gini Coefficient	2.520	−15.211
	(20.309)	(20.958)
HDI	0.027	0.070*
	(0.066)	(0.036)
Observations	168	96
Within R-sq.	0.010	0.089

Source: BPS and other official statistical sources, processed by the authors (2026)

Neither subgroup coefficient achieves statistical significance, largely reflecting reduced statistical power from smaller samples (21 and 12 clusters respectively). However, the larger magnitude of the coefficient in Western provinces (0.842 vs. 0.517) is consistent with the labor force participation hypothesis being stronger in densely populated, labor-abundant Western provinces, where labor market information flows faster and expectations adjust more rapidly to signals of MSME prosperity (Audretsch & Thurik, 2001). In Eastern provinces, the negative Gini coefficient (−15.211, $p = 0.483$) suggests that more equal income distribution may moderate unemployment, though this result is imprecise.

Political Alignment Heterogeneity

We examine whether political alignment between provincial governments and the national ruling party moderates the MSME-employment relationship, through differential access to central government MSME support programs and fiscal transfers (Ciani et al., 2021). Results show no significant MSME coefficient in either aligned ($N=152$) or non-aligned ($N=112$) subsamples, suggesting that the relationship is not systematically mediated by political economy factors within the study period.

Driscoll-Kraay Robustness

We re-estimate the baseline model using Driscoll-Kraay standard errors with a bandwidth of 2 lags, which are consistent in the presence of cross-sectional dependence, serial correlation, and heteroskedasticity simultaneously (Driscoll & Kraay, 1998). Under this specification, the coefficient on $\ln_nilai_tambah$ remains positive (0.690) but the standard error increases to 0.784 ($p = 0.408$), confirming that the borderline significance observed in clustered specifications does not survive cross-sectional dependence correction. The share-based labor expenditure result from M5 represents the most robust finding that is directionally consistent across all estimation approaches.

DISCUSSION

The MSME Employment Paradox

The consistently positive or null association between MSME scale variables and open unemployment, combined with the negative and significant effect of the MSME labor expenditure share, constitutes what we term the MSME employment paradox in Indonesian provinces. Three complementary interpretive lenses reconcile these findings.

The informal absorption lens argues that MSME employment creation in Indonesia predominantly occurs in the informal sector — piece-rate, seasonal, and unregistered

arrangements — that are systematically excluded from the TPT numerator (ILO, 2019; BPS, 2022). As MSMEs expand output and value added, they absorb workers in ways that BPS Sakernas does not classify as formal employment. The net effect on measured TPT is therefore negligible or positive, as MSME expansion occurs simultaneously with increased formal labor market reporting.

The labor force participation lens argues that visible MSME prosperity signals economic opportunity, drawing previously discouraged workers back into the active labor force (Audretsch & Thurik, 2001; van Stel et al., 2005). This increases the denominator of TPT — the active labor force — without necessarily increasing formal employment, mechanically elevating the measured unemployment rate in the short to medium run.

The labor intensity threshold lens explains why the MSME labor expenditure share, but not scale variables, reduces unemployment. Only when MSME labor intensity reaches a threshold level relative to regional economic output — captured by *sh_biaya_tk* — does the direct wage payment effect dominate the participation and informality effects. This threshold behavior is consistent with structural transformation theory, whereby a critical mass of MSME labor market engagement is required before employment creation becomes visible in formal labor market statistics (Santarelli & Vivarelli, 2007).

Policy Implications

The finding that MSME labor expenditure share is the operative unemployment reduction channel has direct implications for MSME development policy in Indonesia. Policies that increase MSME output or value added without increasing labor intensity — such as capital equipment subsidies, technology adoption grants, or productivity enhancement programs — may fail to reduce open unemployment. Conversely, policies that increase MSME labor cost relative to total output, including minimum wage enforcement, employment formalization incentives, worker training programs tied to MSME participation, and social security extension for MSME workers, may generate larger unemployment reductions.

For Eastern Indonesian provinces, where MSME labor markets are thinner and more geographically dispersed, targeted programs that increase the MSME wage bill as a share of regional output — potentially through MSME cluster development in high labor intensity subsectors such as agro-processing, fisheries, and handicrafts — may be particularly impactful (Tambunan, 2019; Klapper et al., 2006).

Table 1 presents the descriptive statistics of the variables used in the empirical analysis. The dataset contained 264 province-year observations for the main variables, covering 33 Indonesian provinces over the 2017–2024 period. The mean open unemployment rate was 5.43 percent, while the mean shares of MSME value added, output, and labor expenditure relative to GRDP were 12.34 percent, 18.76 percent, and 2.81 percent, respectively. The descriptive statistics indicate substantial variation across provinces in both MSME activity and labor market outcomes.

4. Conclusion

This paper examines the relationship between MSME development and open unemployment across 33 Indonesian provinces over 2017–2024 using two-way fixed effects panel estimation with province-clustered standard errors. Three MSME activity dimensions — output value, value added, and labor expenditure — are examined in both absolute and share-based specifications.

The central finding is that MSME scale variables (output and value added) do not reduce open unemployment and are even positively associated with TPT in some specifications. The single robust finding is that the share of MSME labor expenditure in GRDP significantly reduces unemployment ($\beta = -0.155$, $p < 0.05$), while output and value added shares have no significant effect. This pattern is consistent with the labor force participation hypothesis and informal absorption dynamics: MSME expansion draws more workers into the labor force than it absorbs into formal employment, unless the expansion is sufficiently labor-intensive relative to regional economic output.

These results challenge the conventional policy presumption that expanding MSME scale automatically reduces unemployment. They call for a reorientation of MSME policy toward measures that increase the labor intensity and formalization of MSME employment, rather than simply expanding production volumes or value added targets.

Limitations and future directions: The MSME survey data may undercount the informal MSME economy. The seven-year panel may be insufficient to capture long-run labor market adjustments. Future research employing sector-level MSME data, instrumental variable strategies, and longer panels would strengthen causal identification.

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