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The Effect of Micro, Small, and Medium Enterprises (MSMEs) on Gross Regional Domestic Product (GRDP): Evidence from Bandung Regency, Indonesia (2019–2023)

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) are widely recognized as the backbone of regional economic development in Indonesia, yet empirical evidence at the regency (kabupaten) level remains relatively scarce, particularly for high-population peri-urban areas. This study examines the effect of MSMEs on Gross Regional Domestic Product (GRDP) in Bandung Regency, West Java, over the five-year period 2019–2023—a window that spans the COVID-19 economic shock and the post-pandemic recovery. Adopting a quantitative explanatory design, the study analyses annual time-series data on the number of registered MSMEs and current-price GRDP, drawn from Statistics Indonesia (BPS) and the Bandung Regency Office of Cooperatives and MSMEs. Three statistical procedures were applied: Pearson Product-Moment correlation, simple linear regression, and the t-test for coefficient significance. Results show a very strong positive correlation between MSMEs and GRDP ($r = 0.961$, $p = 0.009$) and a coefficient of determination (R^2) of 0.924, indicating that approximately 92.4% of the variation in GRDP is explained by changes in the number of MSMEs. The regression coefficient ($b = 1{,}069.998$, $t = 6.052 > t\text{-}t\text{-table } 2.353$, $p < 0.05$) confirms that MSMEs have a statistically significant positive effect on GRDP. The findings reinforce the strategic role of MSMEs as a driver of regional output but also reveal a structural anomaly: the disproportionate jump in MSME registrations in 2022 (a 106.9% increase) reflects a registration-policy effect rather than organic growth, raising questions about the validity of MSME counts as proxies for productive activity. The study recommends that local governments couple MSME formalization programmers with productivity, financing, and digital-marketing support, and that future research employ quarterly or sectoral panel data to address the small-sample limitation.

Keywords: MSMEs; Gross Regional Domestic Product; Bandung Regional Economic Development; Simple Linear Regression.

Abstrak: *Usaha Mikro, Kecil, dan Menengah (UMKM) diakui sebagai tulang punggung pembangunan ekonomi regional di Indonesia, namun bukti empiris pada tingkat kabupaten masih relatif terbatas, khususnya untuk wilayah peri-urban berpenduduk padat. Penelitian ini mengkaji pengaruh UMKM terhadap Produk Domestik Regional Bruto (PDRB) di Kabupaten Bandung, Jawa Barat, selama periode lima tahun 2019–2023 periode yang mencakup guncangan ekonomi COVID-19 dan pemulihan pasca-pandemi. Menggunakan desain eksplanatif kuantitatif, penelitian ini menganalisis data deret waktu tahunan tentang jumlah UMKM terdaftar dan PDRB harga berlaku, yang bersumber dari Badan Pusat Statistik (BPS) dan Dinas Koperasi dan UMKM Kabupaten Bandung. Tiga prosedur statistik diterapkan: korelasi Pearson Product-Moment, regresi linear*

sederhana, dan uji-t untuk signifikansi koefisien. Hasil menunjukkan korelasi positif yang sangat kuat antara UMKM dan PDRB (r = 0,961, p = 0,009) serta koefisien determinasi (R^2) sebesar 0,924, yang berarti sekitar 92,4% variasi PDRB dapat dijelaskan oleh perubahan jumlah UMKM. Koefisien regresi (b = 1.069,998, t = 6,052 > t-tabel 2,353, p < 0,05) mengonfirmasi bahwa UMKM berpengaruh positif signifikan terhadap PDRB. Temuan ini memperkuat peran strategis UMKM sebagai pendorong output regional, namun juga mengungkap anomali struktural: lonjakan registrasi UMKM yang tidak proporsional pada tahun 2022 (peningkatan 106,9%) mencerminkan efek kebijakan formalisasi alih-alih pertumbuhan organik.
Kata Kunci: *UMKM; Produk Domestik Regional Bruto; Kabupaten Bandung; Pembangunan Ekonomi Regional; Regresi Linear Sederhana.*

Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute the structural backbone of the Indonesian economy. According to the Ministry of Cooperatives and SMEs (2023), MSMEs account for over 99% of all business units, absorb approximately 97% of the national workforce, and contribute around 61% to national Gross Domestic Product (GDP). This dominance has positioned MSMEs as the principal vehicle for inclusive economic growth, particularly considering repeated demonstrations of their resilience during the 1997–1998 Asian financial crisis, the 2008 global financial crisis, and most recently the 2020 COVID-19 shock (Tambunan, 2019; Sarwono & Bernarto, 2020). At the regional level, where Indonesia's decentralised governance places economic stewardship in the hands of provincial and regency governments, MSMEs are increasingly understood not merely as social safety nets but as active determinants of Gross Regional Domestic Product (GRDP).

Bandung Regency (Kabupaten Bandung), the third most populous regency in West Java, presents a strategic case for examining the MSME–GRDP relationship. Between 2019 and 2023, the regency recorded current-price GRDP growth from IDR 124.0 trillion to IDR 153.9 trillion, a cumulative nominal increase of approximately 24% (Statistics Indonesia [BPS] Bandung Regency, 2024). Over the same period, the registered MSME count rose from 14,974 in 2019 to 38,614 in 2023. A 158% increase, with a particularly sharp jump in 2022. This visible co-movement raises a fundamental empirical question: does MSME expansion in Bandung Regency translate into measurable GRDP gains, or does the relationship merely reflect parallel trends driven by other factors?

The literature on MSMEs and regional growth in Indonesia has produced mixed results. Studies in larger metropolitan areas have generally documented a positive but heterogeneous relationship. Paramita (2018) found that MSME capital and profit, rather than business count or labor, drove regional growth in Batu City. Lamazi (2020) reported a significant positive effect of MSME labour absorption on growth in South Sumatra. Rahman (2019) showed that at the national level (1997–2017), MSME labor, exports, and investment were the dominant predictors of GDP. Outside Indonesia, the regional MSME literature is similarly equivocal: while Beck

et al. (2005) highlighted the SME contribution to GDP across 45 countries, recent meta-analyses (Asongu & Odhiambo, 2019; Tambunan, 2021) emphasise that the SME–growth relationship is contingent on financial inclusion, infrastructure, and institutional quality.

Three gaps motivate the present study. First, regency-level evidence for West Java—Indonesia's most populous province—remains thin, with most studies focusing on provincial aggregates or major cities. Second, no published study has analysed the 2019–2023 window in Bandung Regency, a period that uniquely captures both the pandemic shock and the post-pandemic registration surge associated with the OSS-RBA online business licensing reform. Third, the existing regency-level literature seldom interrogates the structural validity of MSME counts as a proxy for productive activity, treating administrative registration data as if it directly measured economic contribution.

The objectives of this study are therefore threefold: (1) to describe the trajectory of MSME registration and GRDP in Bandung Regency over 2019–2023; (2) to estimate the strength and direction of the statistical relationship between the number of MSMEs and GRDP using correlation, regression, and significance testing; and (3) to interpret the findings in light of policy and structural shifts that occurred during the observation window. The hypotheses are H_0: There is no significant effect of MSMEs on GRDP in Bandung Regency. H_a: There is a significant positive effect of MSMEs on GRDP in Bandung Regency. The article proceeds as follows: Section 2 details the research method; Section 3 presents the descriptive trajectories and inferential results; Section 4 discusses the findings; and Section 5 concludes with policy implications and limitations.

Method

Research Design

This study employs quantitative explanatory design using time-series secondary data. The explanatory orientation is appropriate because the research seeks to test a causal hypothesis that MSME activity influences GRDP rather than merely describe association (Creswell & Creswell, 2018). A time-series specification was selected because both variables are reported as annual aggregates by the relevant statistical authorities, and the research question concerns change over time within a single regency rather than cross-sectional comparison across regencies.

Data Source and Variables

Two variables were operationalized. The independent variable (X) is the number of registered MSMEs in Bandung Regency, sourced from the Bandung Regency Office of Cooperatives and MSMEs (Disperindagkop) and corroborated by the Ministry of Cooperatives and SMEs registry. The dependent variable (Y) is Gross Regional Domestic Product (GRDP) at current prices, in millions of Indonesian Rupiah, drawn from the official BPS publication Bandung Regency in Figures (Kabupaten Bandung Dalam Angka) for 2019, 2020, 2021, 2022, 2023, and 2024 editions. The

decision to use current-price GRDP rather than constant-price GRDP follows the convention of regency-level Indonesian studies that emphasise nominal output magnitude (Paramita, 2018; Lamazi, 2020); a robustness check using constant-price GRDP is recommended for future research.

Population and Sample

The population analysis is the annual MSME and GRDP series for Bandung Regency. The sample consists of five annual observations (n = 5) covering the period 2019–2023. This window was chosen for three reasons. First, 2019 represents the most recent pre-pandemic baseline year. Second, 2020–2021 captures the immediate COVID-19 shock. Third, 2022–2023 reflects the post-pandemic recovery alongside the implementation of the OSS-RBA (Online Single Submission Risk-Based Approach) reform, which substantially expanded MSME registration. The use of n = 5 annual observations is acknowledged as a methodological constraint addressed explicitly in Section 5 but is consistent with comparable regency-level studies (Setiawan, 2019; Laily & Kurniawan, 2018) that rely on annual administrative series.

Data Analysis Procedures

Data was analyzed in IBM SPSS version 25 using three sequential procedures. First, Pearson Product-Moment correlation was computed to assess the strength and direction of the linear association between X and Y. The interpretation followed the convention adopted by Sugiyono (2017): r = 0.00–0.20 (no correlation); 0.21–0.40 (weak); 0.41–0.60 (moderate); 0.61–0.80 (strong); 0.81–1.00 (very strong / perfect). Second, simple linear regression of the form $Y = a + bX$ was estimated, with the coefficient of determination (R^2) reported to indicate the proportion of variance in GRDP explained by MSMEs. Third, the t-test was applied to the regression coefficient at the 5% significance level, with the decision rule that t-calculated > t-table (df = n – 2 = 3, t-critical one-tailed 5% = 2.353) implies rejection of H_0. The F-statistics from the ANOVA output was used as a corroborating overall-model significance check.

Validity and Limitations of the Approach

Three procedural safeguards were applied. First, data triangulation: MSME counts from Disperindagkop were cross-checked against the Ministry of Cooperatives and SMEs national registry, and GRDP figures were cross verified across sequential BPS publications. Second, consistency check: the 2022 surge in MSME registrations was investigated through document review of the OSS-RBA implementation guidelines to determine whether the jump reflected organic growth or a registration-policy effect. Third, statistical assumption check: the linearity assumption was visually inspected through scatterplot, and the Durbin-Watson statistic was reported to detect first-order autocorrelation. The principal limitation—small sample size—is discussed transparently in the conclusion.

Results and Discussion

Descriptive Trajectory of MSMEs in Bandung Regency, 2019–2023

The number of registered MSMEs in Bandung Regency rose substantially over the five-year observation window, from 14,974 units in 2019 to 38,614 units in 2023—a cumulative increase of 158% (Table 1). The annual growth pattern, however, was highly uneven. Modest expansion occurred in 2020 (+5.5%) and 2021 (+12.4%), broadly consistent with pre-existing trends. The 2022 figures, by contrast, show a 106.9% jump in a single year. Growth then normalised to 5.1% in 2023. This non-linear pattern is critical to the interpretation of the regression results that follow.

Table 1. Number of Registered MSMEs in Bandung Regency, 2019–2023

Year	Number of MSMEs	Annual Increase	Growth Rate (%)
2019	14,974	–	–
2020	15,793	819	5.5
2021	17,755	1,962	12.4
2022	36,739	18,984	106.9
2023	38,614	1,875	5.1

Source: Bandung Regency Office of Cooperatives and MSMEs (2024); processed by the author.

Document review confirms that the 2022 surge is largely attributable to the rollout of the OSS-RBA online business licensing reform, which simplified MSME registration through the issuance of the Business Identification Number (NIB) for micro and small enterprises (BKPM, 2022). Many enterprises that had operated informally for years were administratively absorbed into the registry, rather than being newly created. This distinction matters for interpretation: the registered count captures formal recognition, not necessarily incremental productive capacity.

Descriptive Trajectory of GRDP in Bandung Regency, 2019–2023

The GRDP series displays a different pattern (Table 2). From 2019 to 2020, current-price GRDP contracted slightly by 0.3%, a reflection of the COVID-19 economic shock, which was relatively muted in nominal terms because of price-level adjustments. Recovery began in 2021 (+5.6%), accelerated in 2022 (+9.6%), and remained robust in 2023 (+7.7%). Across the full window, current-price GRDP rose from IDR 124.0 trillion to IDR 153.9 trillion, a cumulative gain of 24.2%.

Table 2. Gross Regional Domestic Product (GRDP) of Bandung Regency at Current Prices, 2019 – 2023 (IDR Million)

Year	GRDP (IDR Million)	Annual Change	Growth Rate (%)
2019	124,001,193	–	–
2020	123,602,778	−398,416	−0.3

2021	130,476,829	6,874,051	5.6
2022	143,002,069	12,525,240	9.6
2023	153,950,741	10,948,673	7.7

Source: Statistics Indonesia (BPS) Bandung Regency (2024); processed by the author.

Pearson Product-Moment Correlation

The first inferential analysis assessed the strength and direction of the linear association between MSME count (X) and GRDP (Y). The Pearson correlation coefficient was r = 0.961 with a two-tailed significance value of p = 0.009 (Table 3). Following Sugiyono's (2017) interpretation framework, r = 0.961 falls within the 0.81–1.00 range and is therefore classified as very strong (perfect correlation). The associated p-value of 0.009 < 0.05 indicates that this correlation is statistically significant at the 1% level. The positive sign confirms that increases in MSME counts are accompanied by increases in GRDP.

Table 3. Pearson Product-Moment Correlation between MSMEs and GRDP

Variable	MSMEs (X)	GRDP (Y)
MSMEs — Pearson Correlation	1	0.961**
MSMEs — Sig. (2-tailed)	—	0.009
GRDP — Pearson Correlation	0.961**	1
GRDP — Sig. (2-tailed)	0.009	—
N	5	5

Correlation is significant at the 0.01 level (2-tailed). Source: SPSS v.25 output.

Coefficient of Determination and Regression Estimation

The simple linear regression of Y on X yielded a coefficient of determination (R^2) of 0.924 (Table 4). This implies that 92.4% of the variation in Bandung Regency's GRDP across 2019–2023 can be statistically explained by changes in the registered MSME count, while the remaining 7.6% is attributable to factors not modelled in this study. The Adjusted R^2 of 0.899 confirms that the model retains strong explanatory power even after correcting for the small degrees of freedom.

Table 4. Model Summary — Simple Linear Regression of GRDP on MSMEs

Model	R	R Square	Adj. R Square	Std. Error
1	0.961	0.924	0.899	4,186,571.475

Predictors: (Constant), MSMEs. Dependent variable: GRDP. Source: SPSS v.25 output.

The regression equation is estimated as: Y = 108,497,521.586 + 1,069.998 X (Table 5). The constant term implies that, hypothetically, with zero registered MSMEs the baseline GRDP would equal IDR 108.5 trillion, reflecting the contribution of large enterprises and the public sector. The slope coefficient of 1,069.998 indicates that each additional registered MSME is associated with an average increase of approximately IDR 1,070 (in million Rupiah units of GRDP), holding the structural baseline constant. The standardised beta coefficient of 0.961 confirms that MSMEs constitute the dominant explanatory variable in this single-predictor model.

Table 5. Regression Coefficients and T-Test Results

Variable	B (Unstd.)	Std. Error	Beta	t	Sig.
(Constant)	108,497,521.586	4,763,795.409	—	22.775	0.000
MSMEs	1,069.998	176.809	0.961	6.052	0.009

Dependent variable: GRDP. Source: SPSS v.25 output.

The t-statistic for the MSME coefficient is 6.052, which exceeds the critical value of t-table = 2.353 (df = 3, one-tailed $\alpha = 0.05$), with a corresponding p-value of 0.009. The decision rule t-calculated > t-table (6.052 > 2.353) leads to rejection of H_0 and acceptance of H_a. The corroborating ANOVA F-statistic of 36.623 (p = 0.009) confirms overall model significance. Together, these results provide statistical evidence that MSMEs exert a positive and significant effect on GRDP in Bandung Regency over 2019–2023.

Substantive Interpretation of the Findings

The very strong positive correlation (r = 0.961) and high coefficient of determination ($R^2 = 0.924$) align with prior Indonesian regional studies. Lamazi (2020) reported a significant positive MSME effect on growth in South Sumatra; Setiawan (2019) found that MSME counts and GRDP jointly determined labour absorption; Laily and Kurniawan (2018) confirmed that MSME numbers significantly influenced GRDP at the regency level. The Bandung Regency results extend this evidence base by documenting an even stronger statistical relationship within a single peri-urban regency over a recent five-year window.

Three substantive interpretations follow. First, MSMEs function as a structural driver of GRDP rather than as a residual sector. The slope coefficient of 1,069.998 implies that, on average, every additional registered MSME corresponds to roughly IDR 1.07 billion of additional GRDP—a non-trivial contribution that reflects both direct value-added and downstream multiplier effects through supply chains, household consumption, and labour income. This finding is consistent with the entrepreneurship-led growth thesis advanced by Acs et al. (2018), in which a denser stock of small enterprises generates compounding effects on regional output.

Second, the COVID-19 disruption produced asymmetric effects on the two variables. While GRDP contracted marginally in 2020 (−0.3%), MSME registration continued to grow, suggesting that displaced formal-sector workers may have entered self-employment as a coping strategy pattern documented across Southeast Asia by the OECD (2021) and ADB (2020). The recovery in 2021 onward demonstrates the bounce-back capacity that has long been attributed to the MSME sector in Indonesia (Tambunan, 2019; Sarwono & Bernarto, 2020).

Third, and most critically, the disproportionate 2022 jump in MSME registration (+106.9%) introduces an interpretive caution. As the document review established, much of this increase reflects the formalization of pre-existing informal enterprises through the OSS-RBA system, rather than the creation of new productive units. The high R^2 therefore partly captures a co-incidence of two policy-driven trajectories: registration formalization on the MSME side and post-pandemic nominal recovery on the GRDP side. This does not invalidate the substantive finding formalization itself can enhance GRDP measurement by drawing previously uncounted activity into the formal accounts—but it does qualify the strength of the causal interpretation. Policymakers reading this evidence should distinguish between MSMEs as a measured construct (registry count) and MSMEs as a productive force (value-added contribution).

From a policy standpoint, the findings reinforce the case for sustained MSME development at the regency level. However, the evidence also suggests that registration alone is insufficient. The Bandung Regency government, in coordination with the West Java provincial administration and the national Ministry of Cooperatives and SMEs, should couple formalization drives with productivity-enhancing interventions: access to working-capital financing through Sharia and conventional channels, digital marketing support via national platforms, and sector-specific upskilling. Without such complementary measures, the increase in registry count risks producing a statistical illusion of growth without genuine expansion of productive capacity.

Conclusion

This study examined the effect of Micro, Small, and Medium Enterprises (MSMEs) on Gross Regional Domestic Product (GRDP) in Bandung Regency, West Java, over the 2019–2023 period. Using annual time-series data and applying Pearson correlation, simple linear regression, and t-testing, three central findings emerged. First, the correlation between MSMEs and GRDP is very strong and positive ($r = 0.961$, $p = 0.009$). Second, the coefficient of determination indicates that 92.4% of the variation in GRDP is explained by the number of MSMEs ($R^2 = 0.924$). Third, the regression coefficient is statistically significant ($t = 6.052 > t\text{-table } 2.353$, $p = 0.009$), supporting the alternative hypothesis that MSMEs exert a positive and significant effect on regional output.

The study contributes to the regional economics literature in three ways. Theoretically, it adds regency-level evidence to the broader Indonesian debate on MSMEs and growth, complementing prior provincial and national studies. Empirically, it documents the trajectory of MSMEs and GRDP in Bandung Regency through a unique window that spans both the COVID-19 shock and the post-pandemic OSS-RBA registration reform. Methodologically, it demonstrates the importance of contextualising registration statistics: a high R^2 should not be read as a clean causal estimate when much of the variation in the independent variable reflects an administrative re-classification of pre-existing informal activity.

The study has three principal limitations. First, the sample of five annual observations is small by conventional standards and limits the statistical power and generalisability of the findings; significance results should therefore be interpreted as suggestive rather than definitive. Second, the use of current-price (rather than constant-price) GRDP means that part of the observed co-movement may reflect price-level changes, particularly during the inflationary post-pandemic period. Third, the single-predictor model omits potentially important controls such as workforce size, investment flows, and sectoral composition. Future research should pursue three directions: (1) construct a quarterly time series to expand the effective sample size; (2) apply multivariate regression incorporating MSME labour, capital, and sectoral controls; and (3) extend the analysis to a panel of West Java regencies to enable cross-sectional comparison. Such extensions would convert the suggestive findings reported here into more robust evidence for regional policy design.

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