

Financing MSMEs under Global Uncertainty: Evidence from Export-Oriented MSMEs in Indonesia

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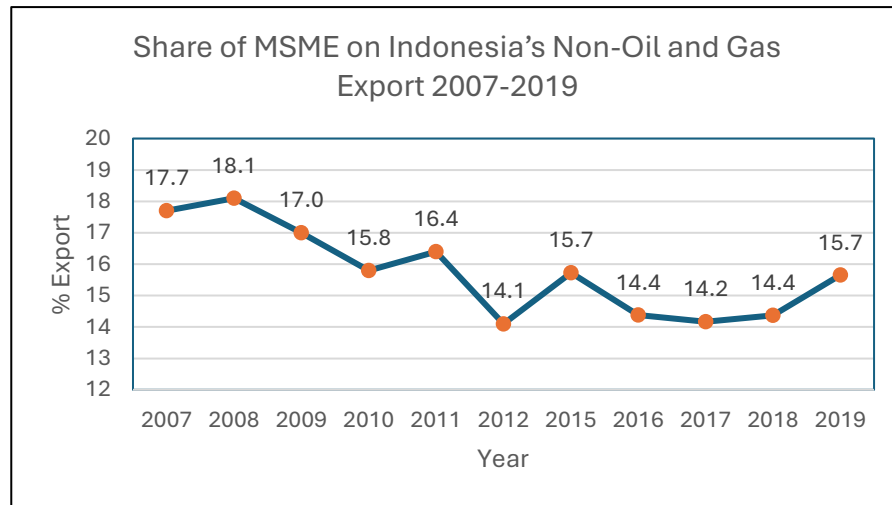
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Introduction

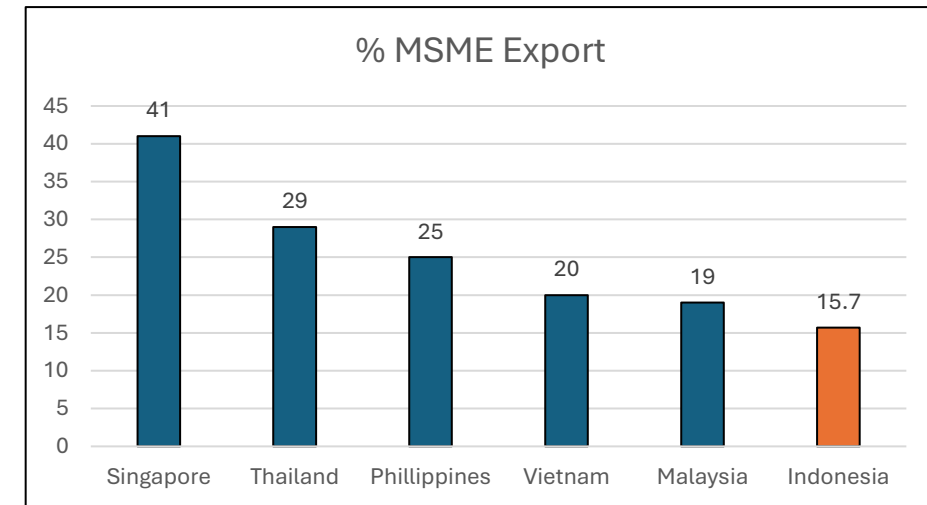
The role of MSMEs in Indonesia's economy

- Contribute 60.5% to Indonesia's GDP (2022).
- Employ 63.6% of the national labor force.
- Government of Indonesia aims to promote the MSMEs to global market.

Problem



Source: Tambunan (2024); Ministry of MSME of Republic of Indonesia (2025)



Source: Tambunan (2024); Coordinating Ministry of Economic Affairs (2024)

- Backbone of national economy yet underrepresented in global markets.
- Lagging behind its ASEAN peers.

Financing as key catalyst for MSMEs to participate in international trade

- Exporting involves longer operating cycles, larger upfront capital requirements
- Greater exposure to international risks.

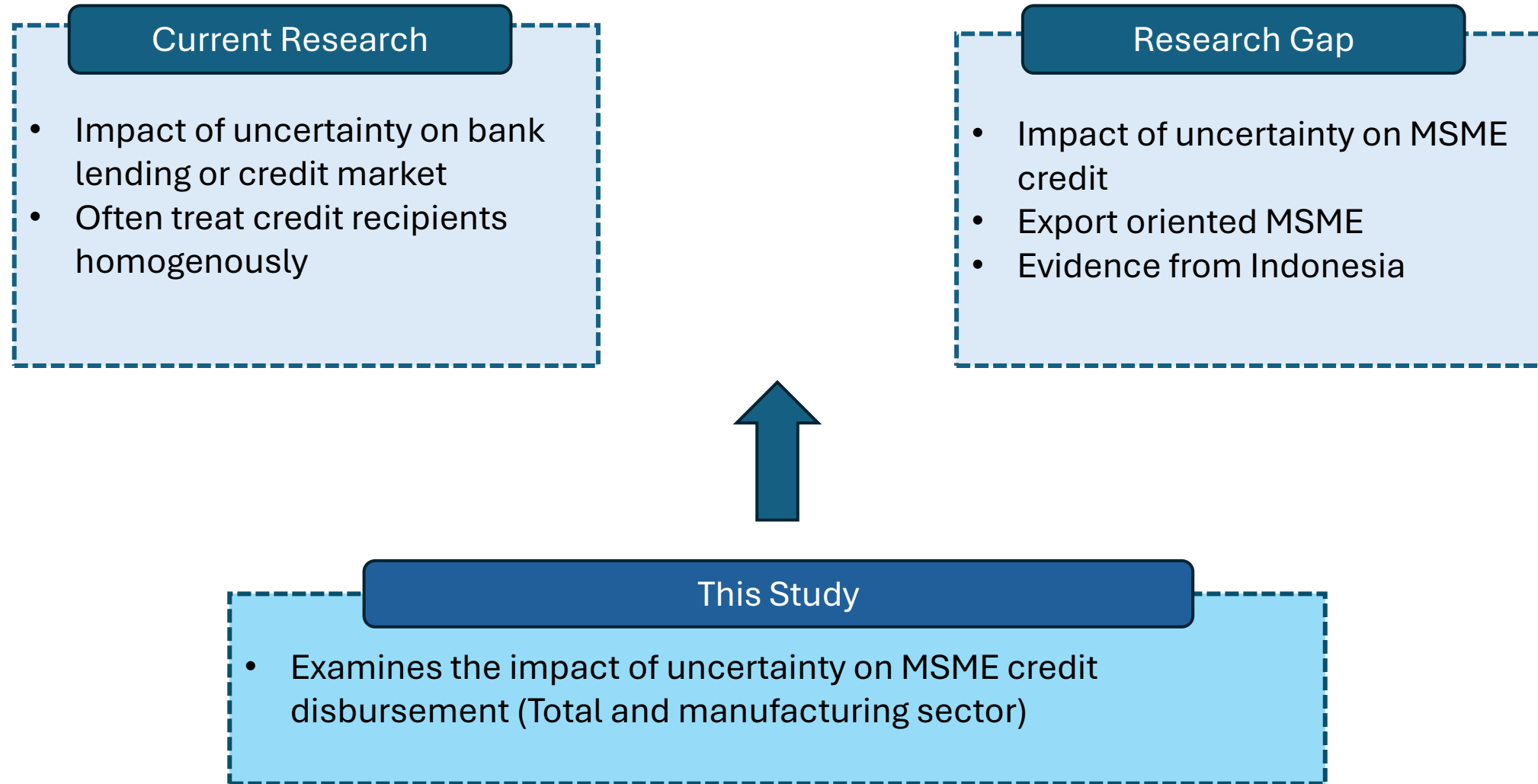
Another Problem

- MSMEs in Indonesia still face financial constraints.
- MSMEs received only 20.5% of total domestic credit disbursement (IMF, 2024)

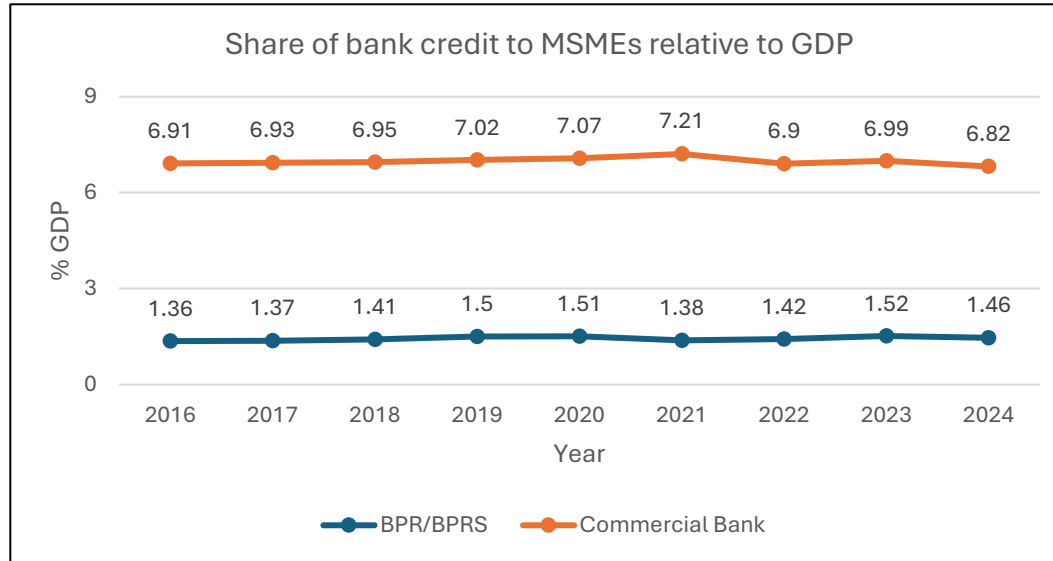
Why This Matters under Global Uncertainty

- Global shocks (pandemic, conflicts, trade wars) amplify risk perception.
- Banks tighten lending → MSMEs become even more financially constrained.

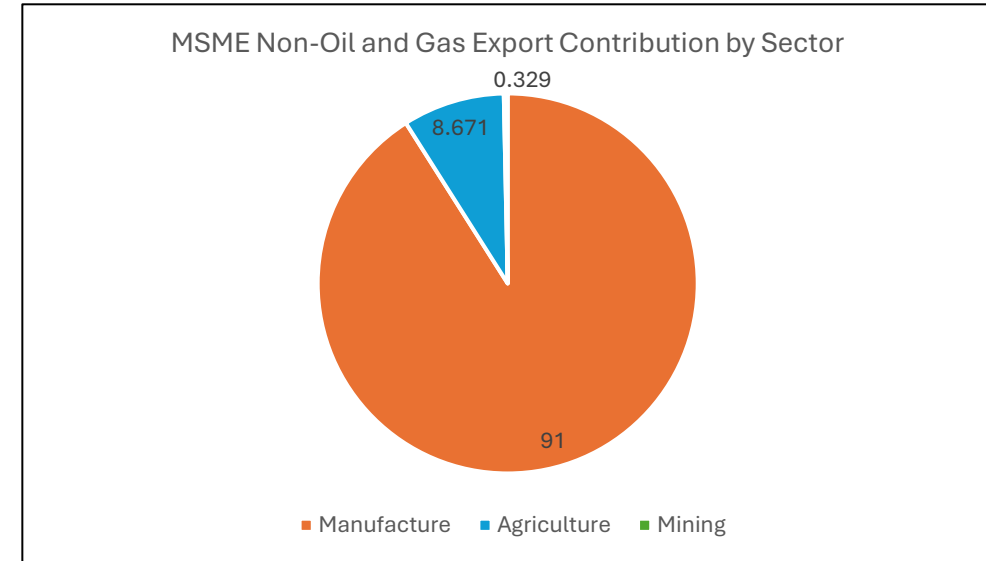
Introduction



This Study



Source: Bank Indonesia (2025)



Source: Rachbini (2021)

- Commercial banks as the primary source of credit for MSMEs.
- Manufacturing sector dominates the export of MSMEs
- **Focus of this study:**
 - Credit disbursement to MSMEs from commercial banks.
 - MSMEs manufacturing sector as proxy for export-oriented MSME

Measuring Uncertainty

- **Definition:** A global measure of policy-related economic uncertainty (Davis, 2016).
- **Origin:** Extends the Economic Policy Uncertainty (EPU) Index (Baker, Bloom & Davis, 2016).
- **Methodology:**
 - Textual analysis of newspapers (articles must include terms related to *economy + uncertainty + policy*)
 - Normalized & standardized into a monthly index.
- **Coverage:** Aggregates EPU indices from 16 major economies (US, China, Germany, UK, Japan, etc.), representing $\sim 2/3$ of global GDP.
- **Computation:**
 - Each national EPU index re-scaled to mean 100 (1997–2015 baseline).
 - GEPU = GDP-weighted average (market exchange rates or PPP).
 - Validation: Consistent with alternative measures (e.g., VIX, central bank communications).
 - Historical Spikes: Captures major crises (Asian Financial Crisis, 9/11, GFC, Euro debt crisis, Brexit).

Hypothesis Development

Previous studies

- **Bordo, Duva & Koch (2016)**: EPU ↓ bank credit growth (U.S.) → slows recovery.
- **Caglayan & Xu (2019)**: EPU ↓ credit availability; ↑ NPL & loan loss provisions (18 countries).
- **Barraza & Chivelli (2020)**: EPU ↑ → business credit supply contracts 3–5%.
- **Nguyen, Le & Su (2020)**: Domestic EPU ↓ credit growth, effect stronger in emerging markets.
- **Saputra & Hendri (2024)**: Japanese EPU ↓ credit growth in Indonesia; mixed effects from China/US.
- **Wang & Duan (2025)**: Higher EPU ↓ loan concentration in Chinese banks → diversification behavior.

Hypotheses

- H1: Increases in GEPU, as measured by the GEPU Index, negatively affect MSME credit disbursement in Indonesia.
- H2: Increases in GEPU negatively affect credit disbursement to manufacturing MSMEs in Indonesia.

ARDL(p,q₁,...,q_k) model:

$$Y_t = \alpha_0 + \sum_{i=1}^p \beta_i Y_{t-i} + \sum_{j=0}^{q_1} \delta_{1j} X_{1,t-j} + \cdots + \sum_{j=0}^{q_k} \delta_{kj} X_{k,t-j} + \varepsilon_t$$

ECM Representation:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p-1} \beta_i \Delta Y_{t-i} + \sum_{j=0}^{q_k-1} \delta_{kj} \Delta X_{k,t-j} + \lambda EC_{t-1} + \varepsilon_t$$

Where:

- Y_t : dependent variable (MSME credit, total or manufacturing sector).
- X_{kt} : explanatory variables (GEPU, BI rate, inflation, etc.).
- Δ terms $\rightarrow$ short-run effects.
- EC_{t-1} : error correction term $\rightarrow$ long-run adjustment.
- $\lambda < 0$ and significant $\rightarrow$ evidence of cointegration.

Why ARDL?

- Handles variables with mixed integration orders (I(0) & I(1)) (Pesaran, Smith & Shin, 2001)
- Allows estimation of short-run dynamics and long-run equilibrium simultaneously.
- Produces unbiased estimates even when some explanatory variables are endogenous (Harris & Tzavalis, 1999)

Data and Variables

Data

- **Period** : January 2012 – February 2025
- **Frequency** : Monthly

Variable

No.	Variable	Definition	Source
1.	Log(MSME credit)	Log of total MSME outstanding loan from commercial bank	Bank Indonesia
2.	Log(Manufacturing MSME)	Log of manufacturing MSME outstanding loan from commercial bank	Bank Indonesia
3.	Log(GEPU)	Log Global Economic Policy Uncertainty (GEPU) Index	Davis (2025)
4.	Log(Exchange rate)	Log of monthly average of Bank Indonesia's middle rate of IDR per USD, calculated as the average of buying and selling rates	Bank Indonesia
5.	Inflation (yoy)	Year-on-year inflation rate	Bank Indonesia
6.	BI-rate	Policy interest rate set by Bank Indonesia as a benchmark for lending and deposit rates	Bank Indonesia
7.	CCI	Consumer Confidence Index, an index that reflects consumer sentiment	Bank Indonesia
8.	Log(Export value)	Log of export value (IDR)	
9.	MSME NPL	Non Performing Loan ratio of MSME	Bank Indonesia

Table 1. Descriptive Statistics of The Variable

Variable	Mean	Median	Min	Max	N
Log(MSME credit)	13.73	13.79	11.04	14.23	158
Log(Manufacturing MSME)	11.46	11.48	10.78	11.92	158
Log(GEPU)	5.24	5.26	4.46	6.07	158
Log(Exchange rate)	9.50	9.55	9.11	9.70	158
Inflation (yoy)	3.91	3.46	-0.09	8.79	158
BI-rate	5.61	5.75	3.50	7.75	158
CCI	115.43	118.47	77.31	128.94	158
Log(Export value)	9.69	9.63	9.16	10.24	158
MSME NPL	4.13	4.08	3.19	4.92	158
Source: Authors' calculation					

Table 2. Unit Root Test Result

Variable	Level		1 st Difference		Integration Order
	ADF	PP	ADF	PP	
Log(MSME credit)	-4.333***	-154.158***	-8.349***	-194.856***	I(0)
Log(Manufacturing MSME credit)	-1.621	-20.911*	-5.573***	-150.58***	I(1)
Log(GEPU)	-2.696	-35.92***	-5.493***	-171.407***	I(1)
Log(Exchange rate)	-2.583	-8.202	-5.443***	-102.595***	I(1)
Inflation (yoy)	-2.819	-13.416	-4.37***	-110.862***	I(1)
BI-rate	-2.187	-5.165	-3.758**	-129.625***	I(1)
CCI	-2.133	-15.869	-5.391***	-104.549***	I(1)
Log(Export value)	-2.086	-16.934	-5.225***	-213.791***	I(1)
MSME NPL	-1.893	-18.45*	-5.234***	-175.349***	I(1)

Source: Authors' calculation

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

ADF = Augmented Dicky-Fuller

PP = Phillip-Perron

Table 3. ARDL Bound Test Estimates

K	F-Statistics	P-Value	5% lower bound	5% upper bound
Dependent variable: MSME Credit				
7	5.4837	0.0008239	2.32	3.50
Dependent variable: Manufacturing MSME Credit				
7	2.2638	0.3881	2.32	3.50

H1: Possible Cointegration

Source: Authors' calculation

Bounds Test Results

- **MSME Credit:**
 - **Evidence of cointegration** → valid long-run relationship.
- **Manufacturing MSME Credit:**
 - **No cointegration** → only short-run dynamics valid.

Table 4. Short Run Error Correction Model

Dependent Variable	MSME Credit	Manufacturing MSME Credit
Model	ARDL(4,6,0,0,0,1,0,6)	ARDL(1,0,0,1,1,1,0)
Independent Variable		
$\Delta\text{Log}(\text{GEPU})$	-0.104 (0.107)	
$\Delta\text{Log}(\text{GEPU})(-1)$	-0.612** (0.231)	
$\Delta\text{Log}(\text{GEPU})(-2)$	-0.472** (0.143)	
$\Delta\text{Log}(\text{GEPU})(-3)$	-0.350** (0.130)	
$\Delta\text{Log}(\text{GEPU})(-4)$	-0.447* (0.183)	
$\Delta\text{Log}(\text{GEPU})(-5)$	-0.258* (0.104)	
$\Delta\text{MSME NPL}$	0.286* (0.140)	-0.037** (0.013)
ΔCCI	-0.002 (0.004)	
$\Delta\text{BI-Rate}$		-0.031*** (0.006)
$\Delta\text{Log}(\text{Export value})$		0.015 (0.022)
ECT	-1.118*** (0.166)	-0.107*** (0.023)
Observations	152	157
R-squared	0.686	0.278
Adjusted R-squared	0.647	0.259

Source: Authors' calculation

ECT = Error Correction Term

Heteroskedasticity-consistent (robust) standard errors are reported in parentheses, following the HC1 estimator.

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Full regression table is available in the manuscript

- **Total MSMEs:** Global uncertainty (GEPU) reduces credit in the short run, with effects lasting 1–5 months.
- **Manufacturing MSMEs:** No short-run effect of GEPU; their credit is more sensitive to monetary policy (BI-Rate) and credit quality (NPL).
- **Both:** Negative and significant ECT: indicating that after a shock, MSME credit adjusts back toward its long-run equilibrium path.

Table 5. Long-run ARDL estimation result

Dependent Variable	MSME Credit
Model	ARDL(4,6,0,0,0,1,0,6)
Independent Variable	
Log(GEPU)	-0.104 (0.091)
Log(GEPU)(-1)	-0.052 (0.093)
Log(GEPU)(-2)	0.140 (0.124)
Log(GEPU)(-3)	0.122 (0.081)
Log(GEPU)(-4)	-0.097 (0.103)
Log(GEPU)(-5)	0.190 (0.126)
Log(GEPU)(-6)	0.258+ (0.141)
Log(Exchange rate)	1.288*** (0.201)
Inflation	-0.020+ (0.011)
BI-rate	0.055 (0.036)
Log(Export value)	0.310*** (0.068)
CCI	-0.002 (0.003)
MSME NPL	0.286+ (0.170)
Observations	152
R-squared	0.742
Adjusted R-squared	0.693

Source: Authors' calculation

Heteroskedasticity-consistent (robust) standard errors are reported in parentheses, following the HC1 estimator.

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Full regression table is available in the manuscript

- In the long run, **GEPU does not significantly affect MSME credit.**
- Credit flows are mainly **driven by domestic fundamentals:**
 - Exchange rate and export performance support credit.

Table 6. Diagnostic Checks

	Long-run		Short-run ECM	
	Statistics	p-Value	Statistics	p-Value
MSME Credit				
Breusch-Godfrey test for serial correlation*	5.981	0.425	5.809	0.445
Breusch-Pagan test for heteroskedasticity**	59.902	< 0.000	54.266	<0.000
OLS-CUSUMQ test***	1.643	0.204	1.287	0.726
Manufacturing MSME				
Breusch-Godfrey test for serial correlation*			0.906	0.341
Breusch-Pagan test for heteroskedasticity**			0.772	0.856
OLS-CUSUMQ test***			0.739	0.984

Source: Authors' calculation

*H1: There is serial autocorrelation

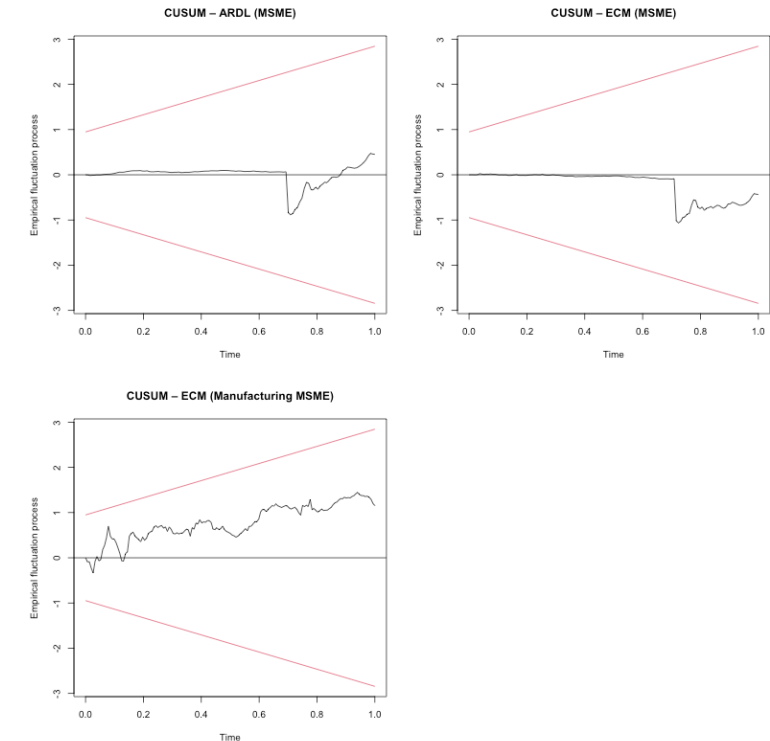
**H1: Heteroscedasticity presents

***H1: There is a structural change over time

Diagnostic Summary

- ARDL models are **robust and stable**, with no major specification problems.
- Only minor heteroskedasticity (addressed with robust SE)

Cumulative Sum of Recursive Residuals



Source: Authors' calculation

Conclusion and Policy Implications

Conclusion

- **GEPU negatively affects MSME credit in the short run**, reflecting banks' risk-averse behavior.
- **Manufacturing MSMEs show relative resilience**, no significant short-run effect.
- **Long-run impact is neutral/weak on MSME total credit**, likely cushioned by government programs (e.g., KUR) and regulatory measures.

Policy Implications

- **Policy support should be strengthened for non-manufacturing MSMEs**, which are more vulnerable to global shocks.
- **Continued facilitation for manufacturing MSMEs** is crucial to sustain export potential.
- Regulators should maintain **flexible, countercyclical policies** to safeguard MSME financing under uncertainty.

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Thank You!