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Research paper

Examining GDP Growth, Unemployment, and Inflation Shocks to Entrepreneurial Activity in The Philippines

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Abstract

This study examines the shocks of key macroeconomic indicators—GDP growth, unemployment, and inflation—on entrepreneurial activity in the Philippine context. Employing a Vector Error Correction Model (VECM) framework, the analysis draws on annual time-series data to assess both long-run equilibrium relationships and short-run adjustment dynamics. The Augmented Dickey-Fuller (ADF) test results reveal a mixed order of integration, justifying the use of Johansen cointegration analysis. The cointegration results confirm the existence of a long-run relationship among the variables, validating the application of VECM. The long-run estimates reveal that GDP growth exerts a statistically significant and positive effect on entrepreneurship, supporting the hypothesis that economic expansion facilitates business formation and development. Conversely, unemployment does not have a statistically significant long-run effect, suggesting that labor market fluctuations do not directly translate into entrepreneurial activity in the Philippine setting. Notably, inflation demonstrates a statistically significant positive effect in the long run, contrary to traditional theoretical expectations. This indicates a context-dependent relationship where moderate inflation, possibly under accommodative monetary conditions, may incentivize entrepreneurial behavior. Short-run dynamics reveal that GDP growth and inflation play key roles in adjusting toward long-run equilibrium, while entrepreneurship itself has limited corrective power. Impulse response functions further illustrate the differentiated impacts of macroeconomic shocks: GDP shocks temporarily boost entrepreneurship, inflation shocks suppress it in the short to medium term, and unemployment shocks show no significant effect.

Keywords: *Entrepreneurial Activity; GDP Growth; Impulse Response Function; Inflation; Unemployment; Vector Error Correction Model.*

1. Introduction

Entrepreneurship is increasingly acknowledged as a vital engine of structural transformation, innovation, and economic development, particularly within developing and emerging market economies (Naudé, 2010; Acs et al., 2018; Neumann, 2021). In the Philippine context, entrepreneurial intention remains high (GEM, 2013); however, translating this intent into sustainable and growth-oriented enterprises continues to be a persistent challenge (GEM, 2015–2016; Soriano, 2023). This disparity highlights the importance of examining the broader macroeconomic and structural determinants that shape the country's entrepreneurial ecosystem.

At the microeconomic level, longstanding barriers such as limited access to finance, burdensome regulatory requirements, inadequate infrastructure, and deficits in entrepreneurial skills constrain business formation and expansion (Aldaba, 2012; Raquiza, 2021). These challenges are exacerbated by the Philippines' heightened exposure to macroeconomic volatility, driven by external shocks, global commodity price fluctuations, and frequent natural disasters (Llanto, 2016). Macroeconomic instability, in particular, plays a critical role in shaping entrepreneurial decision-making by altering the risk-reward calculus, which affects both the willingness and capacity of individuals to engage in entrepreneurial ventures (Galindo & Méndez, 2014; Manzoor et al., 2021).

The relationship between macroeconomic conditions and entrepreneurship is inherently complex and context-specific. Economic growth, for instance, is often associated with opportunity-driven entrepreneurship by expanding demand, improving access to capital, and enhancing consumer confidence (Doran et al., 2018; Elmonshid & Sayed, 2024). Conversely, unemployment may act either as a "push" factor encouraging necessity-based entrepreneurship or as a deterrent due to income uncertainty and constrained financing (Parker et al., 2012; Huang et al., 2023). Inflation further complicates this relationship. While typically viewed as a deterrent due to increased uncertainty, rising input costs, and reduced purchasing power (Chowdhury et al., 2024; Belanová, 2023), moderate inflation, under accommodative monetary conditions, may coincide with investment and innovation (Sayed & Abedelrahim, 2024).

Although global studies have examined these relationships, much of the empirical literature focuses on developed economies or relies on cross-country panel analyses. While useful, such studies may obscure national-level heterogeneity and limit applicability to specific institutional contexts. In the Philippine setting, limited empirical work has explored the dynamic and time-dependent relationships between

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macroeconomic shocks and entrepreneurial outcomes (Gozun & Rivera, 2021). Moreover, existing research tends to overlook the temporal aspects of how shocks unfold and affect entrepreneurship over time.

This study addresses this gap by examining the dynamic interactions of macroeconomic variables - specifically GDP growth, unemployment, and inflation - and entrepreneurial activity in the Philippines. The study employs a Vector Error Correction Model (VECM) framework, complemented by impulse response function (IRF) analysis, to assess both the long-run equilibrium relationships and short-run adjustment mechanisms. The model estimates not only the nature and magnitude of macroeconomic effects on entrepreneurship but also the speed and persistence of adjustments following economic shocks.

This study seeks to answer several key questions: (1) What are the macroeconomic determinants of entrepreneurship in the Philippine context? (2) How do entrepreneurial responses to macroeconomic shocks unfold over time? (3) How can time-series methodologies such as VECM and IRFs enhance our understanding of entrepreneurship in emerging markets? (4) In what ways can empirical findings inform evidence-based policy aimed at fostering entrepreneurial resilience amid macroeconomic volatility?

2. Literature Review and Hypotheses Development

2.1. The Philippine entrepreneurial landscape

The Philippines demonstrates a high level of entrepreneurial intention, characterized by strong perceptions of individual capability and opportunity recognition (GEM, 2013). However, this entrepreneurial potential has not consistently translated into sustainable, growth-oriented enterprises. Many ventures encounter challenges related to profitability, limited access to capital, and early exit, suggesting a disconnect between entrepreneurial ambition and long-term viability (GEM, 2015–2016). Despite periods of steady economic growth, the overall environment remains constrained by structural barriers, including complex regulatory frameworks, inadequate access to finance, limited entrepreneurial education, and infrastructure deficiencies (Aldaba, 2012; Raquiza, 2021; Soriano, 2023).

Beyond these structural challenges, the entrepreneurial landscape is shaped by macroeconomic volatility, including exposure to external economic shocks, natural disasters, and fluctuations in remittance inflows (Llanto, 2016). These factors exacerbate perceived risks, particularly for micro, small, and medium enterprises (MSMEs), which form the backbone of the Philippine entrepreneurial sector. Nonetheless, entrepreneurship remains central to employment generation and inclusive growth (Naudé, 2010), underscoring the need for macroeconomic stability. Variations in GDP growth, inflation, and unemployment significantly affect entrepreneurial outcomes (Neumann, 2021).

Addressing these challenges requires effective policy support. Gozun and Rivera (2021) emphasize the moderating role of external conditions on entrepreneurial performance. Recent reforms, such as the CREATE Act (Reuters, 2024), aim to improve the business environment, though their long-term impact merits further empirical evaluation 8. References

2.2. The interactions of GDP growth and entrepreneurial activity

The relationship between economic growth and entrepreneurship is complex and mutually reinforcing. Economic expansion promotes entrepreneurial activity by increasing market demand, expanding investment opportunities, and improving access to financial resources (Manzoor, 2021; Elmonshid & Sayed, 2024; Galindo & Méndez, 2014). Conversely, entrepreneurship contributes to economic growth through innovation, technological advancement, and productivity gains (Acs et al., 2018; Doran & O'Connor, 2018). Entrepreneurial ventures also exert competitive pressures on incumbent firms, encouraging efficiency and innovation, which ultimately benefit consumers through lower prices and product diversification (Ordeñana et al., 2024; Sagar, 2024).

In developing economies such as the Philippines, micro, small, and medium enterprises (MSMEs) play a critical role in employment generation and GDP contribution (Mendoza & Tadeo, 2024; Tadeo et al., 2024). Recent economic growth has fostered conditions conducive to entrepreneurship by stimulating household consumption and business optimism (DOF, 2025; DTI, 2023). Increased consumer spending particularly supports MSMEs in retail, services, and related sectors. However, during economic downturns, entrepreneurial activity declines due to diminished demand, uncertainty, and financing constraints. These dynamics highlight the importance of sustained and stable economic growth in maintaining a robust and resilient entrepreneurial ecosystem in the Philippines.

2.3. The interactions of unemployment and entrepreneurial activity

Unemployment demonstrates a dual relationship with entrepreneurship, acting as both a "push" and "pull" factor depending on prevailing economic conditions. High unemployment may compel individuals to engage in self-employment out of necessity - a phenomenon known as necessity entrepreneurship (Lim et al., 2024; Xu, 2022; Alam et al., 2021; Parker et al., 2012; Faria et al., 2010). Conversely, in contexts of low unemployment and labor market stability, entrepreneurship is more likely driven by innovation and market opportunities, referred to as opportunity entrepreneurship (Huang et al., 2023; Laffineur et al., 2017).

In the Philippines, this relationship is further complicated by the prevalence of underemployment and the significant role of remittances from OFWs. Underemployment, characterized by part-time or inadequately matched employment, can encourage entrepreneurship as individuals seek supplemental income or more meaningful work (Eugenio, 2023). Meanwhile, remittances serve as a vital source of startup capital, reducing financial constraints for aspiring entrepreneurs (Taylor, 2024). These factors help buffer the negative impacts of unemployment shocks, particularly for remittance-receiving households.

Understanding these labor market dynamics is essential for determining whether entrepreneurship in the Philippines is primarily necessity- or opportunity-driven. Persistent youth unemployment remains a critical concern (Angara, 2022), and entrepreneurship offers a potential solution if accompanied by access to training, mentorship, and capital support (Sheppard, 2023).

Government initiatives such as the Pondo sa Pagbabago at Pag-asenso (P3) and MSME support programs are vital in promoting business formation and employment generation (Morales et al., 2019; Abu et al., 2025; Satpathy et al., 2025). Targeted, inclusive interventions remain essential for fostering entrepreneurial resilience and addressing labor market gaps.

2.4. The interactions of inflation and entrepreneurial activity

Inflation has traditionally been perceived as a macroeconomic threat associated with price instability, higher production costs, and erosion of purchasing power. However, emerging empirical and theoretical evidence highlights that moderate and well-managed inflation can generate positive long-run effects, particularly in fostering entrepreneurship, market expansion, and industrial development. Kubičková et

al. (2024) demonstrated that in Central Europe, inflation is positively correlated with entrepreneurial activity, as it incentivizes the establishment of new businesses. Their findings reveal that inflationary pressures may serve as market signals encouraging opportunity-seeking behaviors among entrepreneurs, particularly in Germany, where the correlation was strongest. The authors further reported a bidirectional relationship, wherein inflation stimulates firm entry, and increased entrepreneurial activity contributes to inflationary dynamics through heightened market participation. These results suggest that inflation, when maintained within tolerable bounds, can promote competition, stimulate innovation, and support long-term entrepreneurial expansion.

This notion is reinforced by Agarwal (2025), who employed an Agent-Based Computational Economics (ACE) model to explore the interaction between inflation, entrepreneurial expectations, and investment decisions in emerging markets. The study found that credible inflation-targeting frameworks help shape optimistic profitability expectations, enabling entrepreneurs to coordinate investment strategies more effectively. In such environments, inflation encourages firms to reallocate idle liquidity into productive ventures to avoid losses due to declining real monetary value. As a result, moderate inflation can drive capital accumulation, enhance innovation, and support long-term macroeconomic stability. Agarwal further argued that predictable inflation may reduce real interest rates and promote reinvestment in physical and human capital, particularly among financially capable enterprises, thus acting as a catalyst for sustained economic dynamism.

Complementary results are evident in industrial performance analyses. Chowdhury et al. (2024), using Johansen cointegration and a VECM model based on monthly data from Bangladesh, found that inflation exerts a statistically significant long-run influence on industrial development. While inflation, coupled with rising SME lending rates, negatively impacted total industrial production in the short term, lending rates in the large industry (LI) sector had a positive long-run effect. This suggests that inflation, when combined with favorable credit conditions for capital-intensive industries, can support large-scale industrial expansion through resource mobilization and production scaling. Such findings support the argument that inflation can act as a macroeconomic signal that facilitates sectoral reallocation and stimulates industrial growth under conducive financial conditions.

Despite these potential benefits, inflation also introduces uncertainty that can adversely affect entrepreneurial decision-making. Rising prices increase production costs for inputs such as labor, energy, and raw materials, thereby compressing profit margins, particularly for micro, small, and medium enterprises (MSMEs) (Binder et al., 2025; Chowdhury et al., 2024). MSMEs, which often operate with limited financial buffers, typically face greater difficulty passing rising costs onto consumers who become more price-sensitive during inflationary episodes (Sayed & Abedelrahim, 2024; Belanová, 2023). In addition, elevated inflation frequently triggers contractionary monetary responses from central banks, such as increased policy interest rates, which raise the cost of borrowing and limit investment opportunities, disproportionately affecting financially constrained MSMEs (Waheed et al., 2025).

In the Philippine context, inflationary pressures are often driven by external shocks, particularly fluctuations in global oil prices, given the country's dependence on fuel imports. These cost-push dynamics substantially increase operational expenses in transportation, logistics, and distribution sectors, directly affecting entrepreneurial viability (Fernández, 2018). However, the impact of inflation is not uniform across sectors. Firms providing essential goods or services may experience relative demand resilience, while non-essential sectors often face reduced consumer spending and constrained access to credit. Such sectoral heterogeneity suggests potential nonlinear effects, where moderate inflation may create opportunities for entrepreneurship by encouraging firms to innovate, adjust pricing strategies, or capture market niches created by shifting consumer demand. Inflation-induced uncertainty can also drive lender risk aversion, tightening financing conditions that disproportionately affect MSMEs (Zhou, 1997; Zheng et al., 2024). Yet, in some cases, moderate inflation may incentivize entrepreneurs to mobilize internal resources efficiently or pursue alternative financing mechanisms, thereby stimulating entrepreneurial activity despite broader macroeconomic pressures (Harrison et al., 2022; Mao et al., 2023). These dynamics highlight that the relationship between inflation and entrepreneurship may be nonlinear, contingent on sectoral characteristics, market opportunities, and the adaptive capacity of firms.

2.5. Hypotheses development

This literature review examined the complex relationships between macroeconomic variables and entrepreneurial activity. GDP growth fosters entrepreneurship by expanding opportunities, while entrepreneurship contributes to economic development (Manzoor, 2021; Elmonshid & Sayed, 2024). Unemployment influences entrepreneurship both as a necessity-driven response in downturns and an opportunity-based choice in stable markets (Xu, 2022; Parker et al., 2012). Inflation poses challenges through cost pressures and uncertainty, yet moderate inflation, under accommodative monetary policy, may stimulate entrepreneurial investment (Binder et al., 2025; Sayed & Abedelrahim, 2024). Thus, we hypothesized:

H1: In the long run, GDP growth promotes entrepreneurial activity.
H2: In the long run, unemployment reduces entrepreneurial activity.
H3: In the long run, inflation reduces entrepreneurial activity.

Besides determining the existence of a long-run equilibrium, VECM can also model the speed at which the system adjusts back towards this equilibrium. Thus, we hypothesized:

H4: Short-run adjustments to equilibrium are driven by key macroeconomic variables rather than entrepreneurial activity.

Furthermore, the use of the VECM framework provides a more comprehensive understanding of the relationships between the variables, capturing short-run dynamics. Thus, we hypothesized:

H5: In the short run, GDP growth promotes entrepreneurial activity.
H6: In the short run, unemployment reduces entrepreneurial activity.
H7: In the short run, inflation reduces entrepreneurial activity.

Impulse response functions, which are derived from the estimated VECM model, illustrate how a shock to one specific variable propagates through the system. Thus, we hypothesized:

H8: A positive shock to GDP growth leads to an increase in entrepreneurial activity.
H9: A positive shock to unemployment leads to a decrease in entrepreneurial activity.
H10: A positive shock to inflation leads to a decrease in entrepreneurial activity.

3. Research Methodology

This study examines the macroeconomic shocks on entrepreneurial activity in the Philippines using a Vector Error Correction Model (VECM) and Impulse Response Function (IRF) analysis. The VECM framework is appropriate for analyzing cointegrated, non-stationary

time series, capturing both long-run equilibrium relationships and short-run dynamics. IRFs simulate the system's temporal response to exogenous shocks, revealing the transmission mechanisms and persistence of effects across entrepreneurial activity, GDP growth, inflation, and unemployment. Furthermore, the Impulse Response Function (IRF) was used to assess the dynamic effects of macroeconomic shocks on entrepreneurial activity. Graphical representations of the IRFs were used to analyze how entrepreneurship reacts to macroeconomic shocks.

Before proceeding with model estimation, the Augmented Dickey–Fuller (ADF) test and Johansen cointegration test were performed. The optimal lag length was selected using the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC), ensuring a balance between model accuracy and parsimony. Moreover, diagnostic tests were employed for the statistical soundness of the VECM model. As Table 1 shows, this study draws on yearly data covering the 1991 – 2023 period. Data on the self-employed used as a measure for entrepreneurial activity, GDP growth, inflation, and unemployment were gathered from World Bank Development Indicators, BSP, and PSA.

Table 1: Description of the Variables

Symbol	Variables	Description	Frequency
ENTREP	Entrepreneurial activity	Self-employed, total (% of total employment)	Yearly
GDP	GDP growth	GDP growth (annual %)	Yearly
UNEMP	Unemployment	Unemployment, total (% of total labour force)	Yearly
INF	Inflation	GDP growth (annual %)	Yearly

Sources: World Bank Development Indicators, BSP, and PSA.

4. Results and Discussion

The ADF test examines the stationarity properties of ENTREP, GDP, UNEMP, and INF. Table 2 suggests a mixed order of integration depending on the chosen test specification. Under the Intercept and Intercept & Trend models, GDP and INF are stationary at levels (I(0)), while ENTREP and UNEMP require first differencing to achieve stationarity (I(1)). However, under the None model, except UNEMP, all variables appear stationary at levels (I(0)).

Table 2: ADF Unit Root Test

Intercept						
Variable	Levels	Prob.	Conclusion	First Diff.	Prob.	Conclusion
ENTREP	0.54	0.98	Not Stationary	-5.18	0.00	Stationary
GDP	-5.26	0.00	Stationary	-6.39	0.00	Stationary
UNEMP	-1.80	0.38	Not Stationary	-6.64	0.00	Stationary
INF	-6.08	0.00	Stationary	-8.05	0.00	Stationary
Intercept and Trend						
Variable	Levels	Prob.	Conclusion	First Diff.	Prob.	Conclusion
ENTREP	-1.96	0.60	Not Stationary	-5.46	0.00	Stationary
GDP	-5.31	0.00	Stationary	-4.16	0.01	Stationary
UNEMP	-2.47	0.34	Not Stationary	-6.59	0.00	Stationary
INF	-6.36	0.00	Stationary	-8.45	0.00	Stationary
None						
Variable	Levels	Prob.	Conclusion	First Diff.	Prob.	Conclusion
ENTREP	-2.14	0.03	Stationary	-4.57	0.00	Stationary
GDP	-2.33	0.02	Stationary	-6.47	0.00	Stationary
UNEMP	-1.70	0.07	Not Stationary	-6.52	0.00	Stationary
INF	-3.36	0.00	Stationary	-8.15	0.00	Stationary

Rejection at 5% level of significance.

Table 3 confirms the presence of a long-run equilibrium relationship among entrepreneurial activity, GDP growth, unemployment, and inflation. The Johansen cointegration test rejects the null hypothesis of no cointegration at the 5% significance level, supported by trace and maximum eigenvalue statistics with p-values near 0.00 in most test iterations. The diagnostic results indicate four distinct cointegrating vectors, suggesting robust long-term associations among the variables. This implies that shocks to one variable are systematically transmitted to others over time. These findings validate the application of VECM to capture both short-run adjustments and long-run equilibrium dynamics.

Table 3: Johansen Cointegration Test

Hypothesized No. of CE(s)	Trace Statistic	Prob.	Max-Eigen Statistic	Prob.
None	105.26	0.00	49.82	0.00
At most 1	55.44	0.00	29.51	0.00
At most 3	25.93	0.00	15.88	0.03
At most 4	10.42	0.00	10.04	0.00

Rejection at the 5% level of significance.

The VECM estimation results were examined to evaluate H1, H2, and H3 regarding the long-run determinants of entrepreneurial activity, which is formally specified as follows:

$$ENTREP_{t-1} = 7.68GDP_{t-1} - 1.82UNEMP_{t-1} + 6.70INF_{t-1} - 12.31 \quad (1)$$

Std. error = (1.87) (1.63) (2.32)

t-statistics = (4.10) (1.12) (2.87)

The empirical results provide strong support for H1, which posits that GDP growth positively influences entrepreneurial activity in the long run. The statistically significant and positive coefficient for GDP ($\beta = 7.68$, $t = 4.10$) suggests that economic expansion enhances

entrepreneurship by broadening market opportunities, improving access to capital and resources, and reinforcing business confidence. These findings are consistent with existing literature that highlights a mutually reinforcing relationship between economic growth and entrepreneurial dynamism (Acs et al., 2018; Manzoor, 2021; Elmonshid & Sayed, 2024; Galindo & Méndez, 2014). Within the Philippine context, sustained GDP growth has been linked to higher household consumption, particularly benefiting MSMEs engaged in retail and services. Moreover, growth-driven increases in consumer demand, credit access, and investor optimism contribute to a favorable environment for business formation and expansion (Mendoza & Tadeo, 2024; DOF, 2025; DTI, 2023). These results underscore the importance of macroeconomic stability in nurturing a resilient and growth-oriented entrepreneurial sector (Ordeñana et al., 2024; Sagar, 2024).

In contrast, H2, which hypothesizes a negative relationship between unemployment and entrepreneurship, is not empirically supported. Although the coefficient for unemployment is negative (β = -1.82), it is statistically insignificant (t = 1.12). This finding suggests that unemployment does not exert a significant long-run influence on entrepreneurial activity. The literature indicates that unemployment can both push individuals into self-employment due to a lack of job opportunities and discourage entrepreneurship by limiting access to financial and human capital (Parker et al., 2012; Xu, 2022). In the Philippine setting, this ambiguity is further complicated by high underemployment and the prominent role of remittances from OFWs (Eugenio, 2023). While underemployment may encourage individuals to pursue entrepreneurship to supplement income, remittances can act as a financial buffer and source of startup capital (Taylor, 2024). Persistent youth unemployment also positions entrepreneurship as a potential alternative, provided that sufficient training, financial support, and institutional assistance are available (Angara, 2022; Sheppard, 2023). Government programs such as Pondo sa Pagbabago at Pagasenso (P3) aim to address these gaps, yet their long-term effectiveness requires further evaluation (Morales et al., 2019; Abu et al., 2025; Satpathy et al., 2025).

The findings for H3, which hypothesized a negative effect of inflation on entrepreneurship, revealed an unexpected yet statistically significant positive relationship (β = 6.70, t = 2.87). While traditional perspectives emphasize that inflation suppresses entrepreneurial activity by raising production costs and weakening consumer purchasing power (Binder et al., 2025; Chowdhury et al., 2024), the positive outcome observed in this study aligns with recent literature suggesting that inflation may foster entrepreneurial dynamism when maintained within a manageable threshold. As highlighted by Kubičková et al. (2024), inflation can function as a market signal that encourages opportunity-seeking behavior, facilitating new firm creation in environments where entrepreneurial actors anticipate future profitability. Similarly, Agarwal (2025) demonstrated that when inflation is aligned with credible monetary policy, it stimulates investment coordination by incentivizing firms to reallocate idle liquidity into productive ventures. This may explain how entrepreneurs operating in adaptable sectors strategically adjust pricing mechanisms and capitalize on inflation-driven demand expectations. Moreover, Chowdhury et al. (2024) illustrated that inflation's long-run impact may become favorable in capital-intensive sectors with stronger financial capacity to absorb inflationary shocks, reinforcing the idea that inflation can contribute to economic expansion under supportive institutional and financial structures. In the Philippine context, this positive effect may indicate that entrepreneurs leverage moderate inflation to justify price adjustments, expand market participation, or benefit from temporary liquidity circulation, particularly when monetary conditions remain accommodative. However, literature also cautions that this favorable relationship is contingent upon inflation remaining within tolerable limits, as elevated or volatile inflation—especially driven by global oil price shocks—can increase operational burdens, tighten monetary policy, and restrict MSME financing access (Fernández, 2018; BSP, 2022; Zheng et al., 2024). Thus, the long-run positive effect identified in this study likely reflects a threshold-based, context-dependent relationship, wherein moderate inflation incentivizes entrepreneurial expansion, but excessive inflation poses risks to firm sustainability and growth (Zhou, 1997; Mao et al., 2023; Waheed et al., 2025).

The ECM estimates presented in Table 4 provide empirical support for H4, which posits that short-run adjustments to equilibrium are primarily driven by macroeconomic variables rather than entrepreneurial activity. The coefficient for D(ENTREP) is negligible (0.00) and statistically insignificant (t = 0.24), indicating minimal influence on short-term equilibrium restoration. In contrast, D(GDP) is positive and statistically significant (0.17, t = 2.97), confirming that short-term GDP fluctuations contribute meaningfully to equilibrium adjustment. While D(UNEMP) is negative, it remains statistically insignificant (t = -1.30). D(INF) shows a modest yet significant effect (0.06, t = 2.06), suggesting a stabilizing role for inflation. Overall, GDP growth and inflation are the dominant short-run adjustment mechanisms in the system.

Table 4: Short-Run Error Correction Mechanism

Variable	ECM	t-statistic	Significance
D(ENTREP)	0.00	0.24	Not Significant
D(GDP)	0.17	2.97	Significant
D(UNEMP)	-0.03	-1.30	Not Significant
D(INF)	0.06	2.06	Significant

The short-run coefficients presented in Table 5 provide insight into how macroeconomic fluctuations shape entrepreneurial activity with varying immediacy and intensity. The positive but statistically insignificant coefficient for the lagged first difference of entrepreneurial activity (D(ENTREP(-1)) = 0.14) indicates modest path dependency, suggesting that recent entrepreneurial decisions exert only a weak influence on immediate future outcomes. This limited short-term persistence implies that entrepreneurial responses to macroeconomic shifts may require time to materialize due to planning horizons, capital requirements, and institutional procedures such as registration, financing access, and regulatory compliance.

Although H5 posited that short-run GDP growth would stimulate entrepreneurship, this hypothesis was not directly supported, as the short-run coefficient for lagged GDP growth was statistically insignificant (0.09). However, the GDP equation exhibits moderate persistence (coefficient = 0.21), indicating that temporary expansions may gradually create conditions conducive to entrepreneurial entry through improved liquidity, increased consumer confidence, and better creditworthiness. This aligns with studies highlighting that GDP-driven entrepreneurial responses often emerge through indirect channels such as improved access to credit, capital accumulation, and rising domestic demand over time (Manzoor, 2021; Elmonshid & Sayed, 2024; DOF, 2025; Mendoza & Tadeo, 2024). In the short run, however, these enabling mechanisms—such as financial intermediation efficiency, MSME support programs, or credit guarantee schemes—may not immediately translate into firm creation, explaining the muted short-term impact.

Similarly, H6 suggested that unemployment would significantly affect entrepreneurship, consistent with theories of necessity-based entry. However, the small and statistically insignificant coefficient for lagged unemployment (D(UNEMP(-1)) = 0.06) suggests that short-term labor market shocks do not immediately drive entrepreneurial responses. In the Philippine context, this can be attributed to high levels of underemployment, extensive informal sector participation, and the stabilizing role of remittances from Overseas Filipino Workers (OFWs), which provide a consumption cushion and reduce pressure for immediate entrepreneurial entry as a survival strategy (Eugenio, 2023; Taylor, 2024). Furthermore, weak labor market signals in informal economies may fail to trigger rapid business formation, underscoring the lagged and context-dependent nature of unemployment-induced entrepreneurship.

Regarding H7, the statistically insignificant short-run impact of inflation on entrepreneurship (0.03, t = 0.23) indicates that inflationary fluctuations do not exert immediate uniform pressure on entrepreneurial activity. This aligns with literature emphasizing that short-run inflation effects are mediated by sectoral resilience, pricing adaptability, and policy responses (Binder et al., 2025; Sayed & Abedelrahim, 2024). In particular, the significant positive short-run effect of inflation on GDP (0.93, t = 2.42) suggests that moderate inflation may initially stimulate aggregate demand or signal expansionary conditions, which may later translate into entrepreneurial opportunities over a longer horizon (Waheed et al., 2025). Institutional mechanisms such as the Bangko Sentral ng Pilipinas' inflation-targeting framework and policy rate adjustments play a central buffering role by shaping credit access, liquidity availability, and investor sentiment. Additionally, short-run inflation sensitivity differs across industries, with essential goods sectors often maintaining demand while discretionary sectors face constraints, leading to muted aggregate effects on entrepreneurship (Fernández, 2018; Zheng et al., 2024).

Overall, the weaker short-run relationships suggest that entrepreneurship reacts less to immediate macroeconomic shocks and more to medium- to long-term expectations shaped by institutional support structures, credit access stability, regulatory flexibility, and sustained economic signals. These mediating factors delay the transmission of macroeconomic fluctuations into entrepreneurial outcomes, resulting in stronger long-run rather than short-run effects.

Table 5: Short-Run Coefficients for the Lagged Differences

	D(ENTREP)	D(GDP)	D(UNEMP)	D(INF)
D(ENTREP(-1))	0.14	-0.50	0.32	-0.46
Std. error	0.26	0.82	0.35	0.44
t-statistics	0.53	-0.61	0.91	-1.04
D(GDP(-1))	0.09	0.21	-0.20	0.40
Std. error	0.11	0.33	0.14	0.18
t-statistics	0.83	0.63	-1.40	2.27
D(UNEMP(-1))	0.06	-0.08	-0.16	0.23
Std. error	0.16	0.52	0.22	0.28
t-statistics	0.34	-0.16	-0.73	0.84
D(INF(-1))	0.03	0.93	-0.08	-0.38
Std. error	0.12	0.38	0.16	0.21
t-statistics	0.23	2.42	-0.46	-1.83
R-squared	0.10	0.59	0.24	0.56
F-statistic	0.26	3.17	0.71	2.81

The goodness-of-fit statistics indicate varying levels of explanatory power across equations. The GDP and inflation equations exhibit relatively high R-squared values, 0.59 and 0.56, respectively, suggesting strong responsiveness to the included macroeconomic variables. In contrast, the entrepreneurship equation shows a low R-squared (0.10) and F-statistic (0.26), indicating limited explanatory capacity. The unemployment equation reflects moderate explanatory strength (R-squared = 0.24; F-statistic = 0.71), suggesting partial adequacy in capturing short-term fluctuations.

Based on the impulse response functions (IRFs) presented in Figure 1, the dynamic responses of entrepreneurship (ENTREP) to macroeconomic shocks—specifically from GDP growth, unemployment, and inflation—offer meaningful insights into the structural interactions of the Philippine economy. These IRFs, derived using a Cholesky decomposition of one standard deviation shocks and standard percentile bootstrapping with 999 repetitions, reveal differentiated patterns of influence that align with theoretical and empirical literature on entrepreneurial dynamics in developing economies. The empirical results derived from the impulse response functions (IRFs) provide evidence that supports or refutes the stated hypotheses regarding the impact of macroeconomic shocks on entrepreneurial activity.

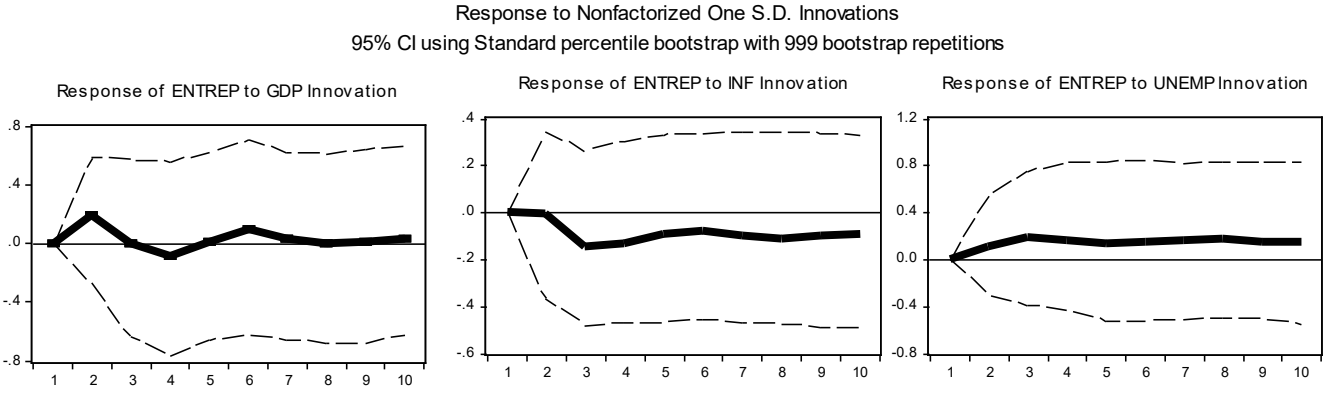

Fig. 1: Impulse Response Function.

The impulse response function (IRF) results provide robust empirical support for Hypothesis 8. The analysis indicates that entrepreneurship responds positively and significantly to a one standard deviation shock in GDP growth, particularly in the short term. This outcome aligns with theoretical perspectives suggesting that economic expansion stimulates entrepreneurial activity by improving market conditions, encouraging investment, and broadening access to resources (Manzoor, 2021; Galindo & Méndez, 2014). Philippine-based studies corroborate this finding, highlighting that GDP growth—through increased household consumption and enhanced business sentiment—positively affects micro, small, and medium enterprises (MSMEs) (Mendoza & Tadeo, 2024; DTI, 2023). Although the effect tapers over time, the initial positive response confirms the hypothesis that entrepreneurship is catalyzed by economic growth.

In contrast, the IRF evidence does not support Hypothesis 9. Entrepreneurial activity shows a statistically insignificant and near-zero response to unemployment shocks across all periods. This suggests that unemployment does not meaningfully reduce entrepreneurial activity in the Philippine context. Such results may reflect complex labor market dynamics, where high levels of underemployment, remittance inflows, and informal employment cushion the effects of unemployment on entrepreneurial decisions (Eugenio, 2023; Taylor, 2024). Therefore, the expected negative causal link between unemployment and entrepreneurship posited in Hypothesis 9 is not confirmed.

Hypothesis 10 receives strong empirical backing from the IRF results. Entrepreneurship responds negatively and significantly to inflationary shocks in the short to medium term, confirming that higher inflation constrains business activity by increasing operational costs,

reducing consumer demand, and heightening economic uncertainty (Binder et al., 2025; Sayed & Abedelrahim, 2024). In the Philippine setting, where MSMEs often have limited financial buffers and rely on stable prices and credit access, inflation acts as a major deterrent to both new business entry and growth (Chowdhury et al., 2024; Fernández, 2018). These findings validate the hypothesized inverse relationship between inflation and entrepreneurship.

Overall, the IRF analysis reveals that entrepreneurship in the Philippines reacts modestly and with a lag to macroeconomic shocks. Interestingly, moderate inflation shocks produce a gradual positive response in entrepreneurial activity, consistent with long-run evidence that well-managed inflation—such as under the Bangko Sentral ng Pilipinas' inflation-targeting regime—can encourage opportunity-driven entrepreneurship through price-based incentives and increased liquidity. GDP shocks, however, generate only a weak and temporary rise in entrepreneurship, suggesting that short-term economic expansions alone are insufficient to trigger significant business creation without complementary mechanisms such as efficient credit transmission, stronger market confidence, and accessible MSME financing through institutions like the Small Business Corporation, LandBank, or Development Bank of the Philippines. The negligible response to unemployment shocks reflects structural conditions in the Philippine labor market, including high informal employment and remittance-based income, which reduce the necessity-driven push toward entrepreneurship. The rapid dissipation of shocks to entrepreneurship also indicates weak short-term persistence, implying that entrepreneurial momentum requires sustained macroeconomic support.

From a policy perspective, these findings highlight the importance of proactive government measures to convert macroeconomic improvements into tangible entrepreneurial gains. Key strategies include maintaining inflation within opportunity-enhancing thresholds, expanding financial inclusion and credit availability for MSMEs, and enhancing institutional support. Reducing regulatory barriers, investing in entrepreneurial skills development programs (e.g., DTI's Negosyo Centers or Go Lokal initiatives), and strengthening MSME financing channels can increase the responsiveness of entrepreneurship to positive economic signals and foster long-term resilience in the Philippine entrepreneurial ecosystem.

Table 6 highlights the differential impacts of macroeconomic shocks on entrepreneurship. While GDP growth catalyzes entrepreneurial activity in the short run, inflation poses a significant constraint, and unemployment appears to have no substantial influence. From a policy perspective, fostering sustained economic growth and maintaining price stability emerge as critical components in creating an environment conducive to entrepreneurship. Efforts aimed at stimulating entrepreneurial activity may therefore benefit from macroeconomic stability, particularly through pro-growth and anti-inflationary measures.

Table 6: Summary

Innovation Variable	Short-run Response of ENTREP	Long-run Effect	Statistical Significance
GDP	Positive	Dissipates	Significant (short-run)
UNEMP	Neutral	Neutral	Not significant
INF	Negative	Persistent	Significant (short- & medium-run)

Table 7 presents the residual diagnostic test results for the estimated Vector Error Correction Model (VECM). The results from the Serial Correlation LM Test, with an LRE statistic of 17.48 and a Rao F-statistic of 1.13, both yielding a p-value of 0.36, suggest that there is no evidence of serial correlation in the residuals. Similarly, the Portmanteau Test for Autocorrelation reports an adjusted Q-statistic of 25.76 with a p-value of 0.59, further confirming the absence of autocorrelation. These findings indicate that the residuals are independently distributed over time, thereby satisfying a key assumption for the reliability of the VECM estimates.

Table 7: Residuals Diagnostic Test Results

Serial Correlation LM Test		Prob.
LRE Stat	17.48	0.36
Rao F-stat	1.13	0.36
Portmanteau Test for Autocorrelation		
Adj. Q-stat	25.76	0.59
Jarque-Bera Normality Test		
Joint	55.17	0.00
Heteroskedasticity Test		
Chi-square	158.08	0.88

The heteroskedasticity test, which produced a chi-square statistic of 158.08 with a p-value of 0.88, fails to reject the null hypothesis of homoskedasticity. This implies that the variance of the residuals is constant, satisfying another important requirement for efficient estimation in time series models. However, the Jarque-Bera test for normality yields a joint test statistic of 55.17 with a p-value of 0.00, indicating a significant departure from the assumption of multivariate normality. While this non-normality may affect certain inferential procedures, it does not critically undermine the model's validity, particularly when the sample size is sufficiently large, as the central limit theorem may mitigate its effects. Thus, the residual diagnostic tests provide strong evidence that the VECM satisfies the assumptions of no serial correlation, no autocorrelation, and homoskedasticity.

The impulse response function (IRF) results provide robust evidence that entrepreneurship in the Philippines responds positively and significantly to short-term GDP growth shocks, supporting Hypothesis 8. This finding aligns with theoretical perspectives and Philippine-based studies indicating that economic expansion—through increased household consumption and improved business sentiment—stimulates micro, small, and medium enterprises (MSMEs) (Manzoor, 2021; Galindo & Méndez, 2014; Mendoza & Tadeo, 2024). In contrast, the response of entrepreneurial activity to unemployment shocks is statistically insignificant, suggesting that labor market conditions, including high informal employment and remittance inflows, mitigate any negative effect on entrepreneurship (Eugenio, 2023; Taylor, 2024), thus not supporting Hypothesis 9. Inflation shocks generate a significant short- to medium-term decline in entrepreneurial activity, confirming Hypothesis 10 and highlighting the constraining effect of higher operational costs, reduced demand, and economic uncertainty on MSMEs (Binder et al., 2025; Sayed & Abedelrahim, 2024; Chowdhury et al., 2024; Fernández, 2018). Nevertheless, moderate and well-managed inflation, such as under the Bangko Sentral ng Pilipinas' inflation-targeting framework, can encourage opportunity-driven entrepreneurship through liquidity effects and price-based incentives.

The VECM stability analysis further validates these findings. Although the residuals deviate from normality, all roots have moduli smaller than one and remain within the unit circle (Figure 2), indicating that the model is stable and statistically robust for analysis and forecasting. This stability confirms that the IRF responses reflect genuine dynamics between macroeconomic shocks and entrepreneurial activity in the Philippines.

These results have important policy implications. To translate macroeconomic improvements into entrepreneurial gains, it is essential to maintain inflation within opportunity-enhancing thresholds, expand credit access and financial inclusion for MSMEs, and strengthen institutional support. Moreover, reducing regulatory barriers and investing in entrepreneurship development programs—such as DTI's Negosyo Centers and Go Lokal initiatives—can enhance the responsiveness of entrepreneurship to positive economic signals, fostering long-term growth and resilience within the Philippine entrepreneurial ecosystem.

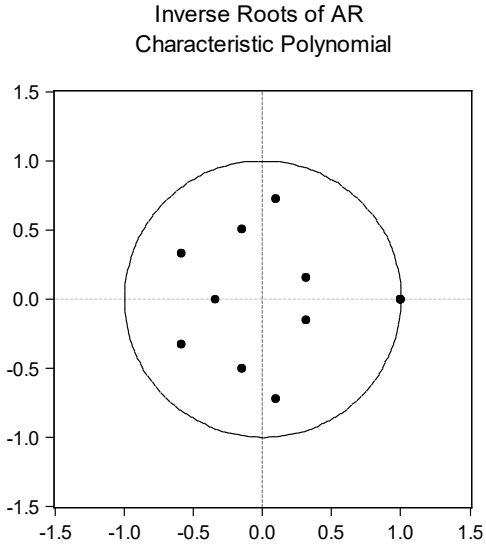

Fig. 2: Residual Stability Check.

5. Conclusion

This study provides a comprehensive empirical assessment of the dynamic interactions between entrepreneurial activity and key macroeconomic indicators—namely, GDP growth, unemployment, and inflation—within the Philippine context. Utilizing a combination of unit root testing, Johansen cointegration analysis, Vector Error Correction Model (VECM), and impulse response functions (IRFs), the research identifies both long-run equilibrium relationships and short-run adjustment dynamics that shape the entrepreneurial environment in a developing economy.

The Johansen cointegration and VECM results establish the presence of a stable long-run relationship among the variables under investigation. In particular, GDP growth exerts a statistically significant and positive influence on entrepreneurship in the long run, confirming the hypothesis that economic expansion facilitates entrepreneurial activity. This is consistent with theoretical expectations and previous empirical findings, which emphasize that sustained economic growth enhances market demand, broadens access to financial and productive resources, and fosters a climate of business optimism—conditions especially salient for micro, small, and medium enterprises (MSMEs) in the Philippines.

On the other hand, while the long-run coefficient for unemployment is negative, it is statistically insignificant, indicating an absence of a systematic relationship between unemployment shocks and entrepreneurial activity. This finding suggests that the conventional notion of necessity-driven entrepreneurship in response to rising unemployment may not fully apply in the Philippine setting, where structural factors such as underemployment, informal labor markets, and remittance inflows serve as alternative income sources and may buffer the effects of labor market volatility. Consequently, the motivational dynamics driving entrepreneurship in the country appear to be more complex than simple push–pull mechanisms.

Interestingly, the long-run results also indicate a statistically significant and positive relationship between inflation and entrepreneurship, diverging from mainstream theoretical expectations. While inflation is typically viewed as detrimental to entrepreneurship due to its adverse effects on input costs, purchasing power, and financial planning, this study finds evidence suggesting that under certain conditions—such as moderate inflation and accommodative monetary policy—entrepreneurial activity may increase, possibly due to improved access to credit and the pursuit of profit opportunities in a changing price environment. Nevertheless, this relationship appears to be context-dependent and potentially nonlinear.

The short-run dynamics captured by the error correction model reveal that adjustments toward long-run equilibrium are primarily driven by short-run variations in GDP growth and inflation. Entrepreneurship itself does not significantly contribute to restoring equilibrium in the short run, indicating its passive role in macroeconomic stabilization. Moreover, the short-run coefficients suggest limited immediate responsiveness of entrepreneurship to fluctuations in macroeconomic variables, with statistically insignificant short-term effects of GDP growth, unemployment, and inflation on entrepreneurial activity.

Impulse response analyses further reinforce these findings. A positive GDP shock produces a statistically significant but temporary increase in entrepreneurial activity, underscoring the importance of sustained growth to maintain entrepreneurial momentum. Unemployment shocks have negligible and statistically insignificant effects, supporting the conclusion that labor market volatility does not directly influence entrepreneurship in the Philippine setting. In contrast, inflation shocks yield a negative and statistically significant response in the short to medium term, highlighting the vulnerability of entrepreneurs—particularly MSMEs—to rising prices, input cost volatility, and inflation-induced uncertainty.

The findings highlight the asymmetric and temporally varied impacts of macroeconomic shocks on entrepreneurship in the Philippines. GDP growth emerges as a key enabling factor, inflation constitutes a significant constraint, and the influence of unemployment remains inconclusive. These results underscore the importance of maintaining macroeconomic stability—particularly through pro-growth and anti-inflationary policies—to foster a conducive environment for entrepreneurial activity. Policymakers are therefore encouraged to implement inclusive and targeted interventions that enhance MSME resilience, address structural labor market challenges, and sustain a stable macroeconomic environment.

However, these conclusions are based on aggregate, annual data spanning 1991 to 2023, which may mask short-term fluctuations, seasonal effects, and firm-level heterogeneity. Using more granular data, such as quarterly economic indicators or firm-level datasets, could provide a more concrete understanding of how macroeconomic shocks differentially affect entrepreneurial behavior across sectors, regions, and firm sizes. Such detailed analyses would allow future research to capture dynamic responses to economic shocks, identify temporal lags in entrepreneurial adjustment, and inform more precise, evidence-based policy interventions tailored to the needs of specific entrepreneurial groups.

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Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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