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Education, Income, and the Dynamics of Formal Business Entry in the Philippines: An ARDL Analysis

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Abstract

Formal business entry—the registration of new enterprises as legally distinct entities—is a widely used indicator of an economy's entrepreneurial dynamism and institutional quality, yet empirical evidence on its determinants in the Philippines specifically remains limited, with existing macro-entrepreneurship literature drawing largely on cross-country panels that average over substantial between-country heterogeneity. This study examines the short-run and long-run macroeconomic and structural determinants of formal business entry in the Philippines using annual data drawn from the World Bank's World Development Indicators (WDI), covering new business density (new limited liability company registrations per 1,000 working-age population), GDP per capita, tertiary enrollment, and domestic credit to the private sector. Given the constraints of a single-country annual time series, the study employs an Autoregressive Distributed Lag (ARDL) bounds-testing framework, appropriate for regressors of mixed order of integration and for the modest sample sizes typical of national-level annual macroeconomic data. The fitted model, estimated over 2009–2023 ($n = 15$) after automated lag-order and variable selection reduced an initially over-parameterized specification, retained GDP per capita and tertiary enrollment as significant predictors; domestic credit could not be included without violating basic estimability constraints. GDP per capita showed a sign reversal across the lag structure—positive contemporaneously, negative at a one-year lag—while tertiary enrollment showed a robust positive association with formal business entry in both the short run and the estimated long-run relationship. A Pesaran-Shin-Smith bounds test indicated evidence of a long-run equilibrium relationship among the variables, though this result, along with an atypically large error-correction coefficient, should be interpreted cautiously given the study's small sample. The findings suggest that higher education and formal entrepreneurial registration are positively associated in the Philippine context, with implications for how tertiary-education and entrepreneurship-promotion policies are jointly framed, while leaving the credit-access channel as an open question for future research using longer or more granular national data sources.

Keywords: *formal business entry; new business density; ARDL bounds testing; Philippines; tertiary enrollment; GDP per capita; World Development Indicators*

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1. Introduction

Formal business entry—the rate at which new enterprises are registered as legally distinct entities—is widely treated in the entrepreneurship and development economics literature as a leading indicator of an economy's dynamism, its capacity to absorb labor, and the institutional quality of its business environment. Institutional theory

positions formal registration as a response to structural conditions—governance quality, financial-sector depth, income level, and human capital—rather than to individual entrepreneurial motivation alone, and a substantial body of work distinguishes formal entry conceptually and empirically from informal or necessity-driven entrepreneurial activity, which responds to a different combination of macroeconomic factors entirely.

For the Philippines specifically, existing evidence on business formation is concentrated in descriptive and reform-evaluation studies—assessments of the Business One Stop Shop rollout, the Barangay Micro Business Enterprise Act, and one-to-four-person stock corporation registration—that document positive associations between specific regulatory reforms and registration outcomes at the local or program level. What this literature does not yet offer is a national-level, dynamic macroeconomic account of formal business entry: evidence on whether structural conditions such as income growth, credit availability, and educational attainment translate into new business formation within the same year, with a measurable delay, or only through a gradual, long-run equilibrium adjustment process. This is a meaningful gap, because policymakers responsible for MSME development, credit-access programs, and tertiary-education planning require evidence about the timing and durability of these relationships, not only their existence.

The problem this paper addresses, then, is the absence of dynamic, time-series evidence on the determinants of formal business entry in the Philippine economy. National agencies tasked with improving the ease of doing business, expanding MSME credit access, or aligning tertiary education with labor-market needs require evidence calibrated to how these relationships unfold over time within the Philippine economy specifically—evidence a cross-sectional or purely descriptive study cannot supply, since it cannot distinguish a contemporaneous effect from a lagged one, or a stable long-run relationship from a coincidental short-run correlation.

This study accordingly asks whether GDP per capita, tertiary enrollment, and domestic credit to the private sector—structural and macroeconomic variables with established theoretical links to entrepreneurial entry—show measurable short-run and long-run associations with formal business entry in the Philippines, and what the dynamic character of those relationships looks like once a time-series framework capable of distinguishing immediate from delayed effects is applied. In pursuing this question, the study aims to establish whether these variables retain explanatory relevance at the national level, to determine whether their effects operate contemporaneously or with a lag, and to test whether a stable long-run equilibrium relationship exists between these structural fundamentals and business entry in the Philippine economy.

The paper's contribution is to supply the first ARDL-based dynamic evidence on formal business entry determinants specific to the Philippines, complementing a Philippine entrepreneurship literature that has so far been either descriptive or reform-specific. For scholars, it offers a methodological demonstration of how macro-entrepreneurship hypotheses can be tested at the single-country level using techniques suited to short, non-stationary annual macroeconomic series. For practitioners and policymakers within the Philippine entrepreneurship ecosystem, it offers evidence about the timing and durability of the relationships between income, education, and formal business formation—evidence directly relevant to sequencing and calibrating national policy interventions.

2. Review of Related Literature

2.1 Theoretical Foundations of Formal Business Entry

The theoretical case for treating formal business registration as a response to structural economic conditions rests on institutional theory, which frames laws, regulations, and government policy as constraints that shape entrepreneurial entry decisions independently of individual motivation (Uriarte et al., 2023; Galdino et al., 2022). An institutional context that reduces the perceived risk of starting a venture and facilitates resource acquisition is understood to stimulate new business activity broadly, with the relevance of any single institutional factor varying by a country's socioeconomic conditions (Sendra-Pons et al., 2022). This configurational view—that institutional quality

operates as an interacting bundle rather than a set of independent levers—has direct implications for the present study's specification, since population density, credit depth, income level, and human capital are not expected to operate as isolated causes but as structurally interdependent conditions shaping the environment in which registration decisions occur (Sendra-Pons et al., 2022; Goletsis et al., 2024). Comparable Philippine macro-level work likewise treats governance integrity and economic resilience as mutually reinforcing dimensions of domestic capability, supporting the view that institutional conditions shape the credibility and predictability of the environment in which enterprises operate (Atento, 2025b).

A further theoretical distinction—between formal and informal entrepreneurial entry—is essential to justifying new business density (registered limited liability companies) as the dependent variable rather than a broader measure of entrepreneurial activity. Laing et al. (2021) find that formal and informal entrepreneurship respond to markedly different combinations of macroeconomic factors, moderated strongly by country income level, with the ease of doing business and governance quality exerting influence specifically on formal—not informal—entry. Estrin et al. (2024) extend this distinction by proposing a four-type typology (formal-opportunity, informal-necessity, formal-necessity, informal-opportunity) that better captures entry heterogeneity than the conventional conflation of necessity with informality and opportunity with formality; formal entry, in their account, is disproportionately attractive to opportunity-based entrepreneurs precisely because it avoids the scale and growth restrictions embedded in informal operation. Because relatively few informal enterprises subsequently transition to formal status (Laing et al., 2021), the formal-entry channel this study examines is best understood as conceptually and empirically distinct from Philippine informal or micro-enterprise activity, rather than as a subset of it.

Two implications follow for the present study's design. First, because economic conditions at the founding stage create an imprinting effect that interacts with concurrent factor markets and institutional quality to shape formalization likelihood well after those founding conditions change (Galdino et al., 2022), the dynamic (lagged) specification pursued through ARDL is theoretically motivated, not merely a statistical convenience. Second, because institutional deterioration has been shown to weigh more heavily on entrepreneurial entry than institutional improvement of equivalent magnitude (Mickiewicz et al., 2021), asymmetries in the Philippine results—where a negative shock to a structural predictor produces a larger effect than an equivalent positive shock—would be consistent with, rather than anomalous to, the theoretical literature. Within the Philippine formal-entry context, a WDI-based time-series study found that a multidimensional women's empowerment index was positively associated with new business density, suggesting that inclusion-related institutional conditions may form part of the broader enterprise ecosystem even when causal interpretation remains unwarranted (Menez & Atento, 2026).

2.2 Credit Access and Financial-Sector Depth as Entry Determinants

The relationship between domestic credit to the private sector and new business formation is best characterized as positive on average but conditional, rather than as a settled, uniformly linear effect. The most directly comparable evidence comes from Gani (2026), whose 85-country panel finds domestic credit to the private sector significantly and positively correlated with new business density after controlling for regulatory quality, growth, and urbanization. Regional evidence from South Asia offers partial corroboration: Khan et al. (2025) report that a 1% increase in domestic credit is associated with a 1.6% rise in new business registration under FMOLS estimation, although the same relationship loses significance under DOLS estimation, and the authors attribute the inconsistency to credit flowing disproportionately toward already-established firms rather than new entrants.

Evidence from the economic-growth literature—credit's more commonly studied proximate outcome—is more decisively mixed, and this matters for a single-country ARDL design because it bears on lag-structure choices. Chettri (2022), studying financial depth in Nepal within an ASEAN+3 comparative frame, finds that domestic credit's contemporaneous effect on growth is significantly negative but reverses to significantly positive at a one-year lag—a sign reversal across the horizon rather than a simple monotonic delay. Abdulkarim's (2023) ARDL analysis of Nigeria reports a parallel but inverted pattern: current-year private credit is associated with a 10.72% increase in current

growth, while the one-year lag of that same credit measure is associated with a 10.46% decrease. Abid (2025), applying ARDL to the United States, similarly finds a negative short-run effect alongside slow long-run equilibrium adjustment. Conversely, Vo and Ho (2025) find private credit negatively associated with growth across ASEAN-5 economies over 1986–2023 when credit is misallocated toward unproductive sectors, and Gizaw et al. (2024) report analogous negative long-run effects in Ethiopia tied to sectoral misallocation.

Two design implications follow. First, the recurring finding of sign reversal or delayed onset across lag horizons (Chettri, 2022; Abdulkarim, 2023; Abid, 2025) provides direct empirical precedent for testing both short-run and long-run coefficients within the Philippine ARDL specification, rather than assuming a single contemporaneous effect. Second, adjustment-speed estimates from comparable ARDL studies—Islam (2022) reports short-run disequilibria in Bangladeshi private-sector credit correcting at approximately 41% per year, and Kharel et al. (2024) find roughly 40% of the prior year's imbalance in Nepal's credit-growth relationship attributable to long-run elasticities—offer a plausible benchmark range against which any Philippine error-correction term can be evaluated for economic, not merely statistical, reasonableness. At the individual level, Philippine evidence also indicates that monetary-policy awareness and perceptions are positively associated with saving and investment behavior, illustrating how financial knowledge may condition the capacity to use formal financial channels even though the study does not address firm entry directly (Espelita et al., 2025).

2.3 Income Growth, GDP per Capita, and Entrepreneurial Dynamics

The relationship between GDP per capita and business entry is not adequately summarized as a single positive or negative effect; the literature distinguishes at least three separable channels relevant to interpreting a Philippine coefficient. The first is a necessity-reduction channel: at the country level, poorer contexts are associated with more necessity-oriented entrepreneurial entry, driven by poverty, unemployment, and the absence of wage-employment alternatives, such that higher income is associated with less necessity entrepreneurship specifically rather than with lower entrepreneurship overall (Moreno-Adalid et al., 2026; Martinez-Rodriguez et al., 2021). The second is a formalization channel operating in the opposite direction: Laing et al. (2021) find that in low-income settings, theory and evidence both predict positive income effects on formal entrepreneurship and negative effects on informal entrepreneurship, with formal entry rising as GDP per capita increases—though the authors note the pattern is not perfectly consistent across countries.

The third channel—nonlinearity—complicates any expectation of a stable linear effect across the full income range. Nguyen et al. (2021) report an inverted-U relationship between economic complexity and entrepreneurship density, with gains at lower levels of development giving way to weaker entry beyond a threshold as uncertainty in more complex economies rises. Khyareh and Amini (2021) and Sendra-Pons et al. (2022) similarly find that institutional and development effects on entrepreneurship vary by a country's developmental stage and institutional configuration, such that an identical GDP increase can correspond to different entry outcomes depending on whether an economy is factor-, efficiency-, or innovation-driven—a classification under which the Philippines is characterized in the ASEAN entrepreneurial-intention literature as a factor-driven economy (Virasa et al., 2022). Tran et al. (2025), studying a panel of developing countries, find that GDP per capita loses statistical significance entirely once growth, education, R&D, and unemployment are jointly controlled, which argues against treating income as an independent linear driver in a fully specified model.

For the Philippine case, the most defensible reading of this literature is that GDP per capita growth is more plausibly associated with a compositional shift toward formal, opportunity-based entrepreneurship than with a uniform rise in all business activity, and that this effect should be expected to be contingent on the country's developmental stage and institutional configuration rather than mechanically linear across the full estimation window. Related WDI-based work across four ASEAN economies documents pronounced country-specific variation in how macroeconomic buffers translate into labor and social outcomes, reinforcing the need to avoid treating regional averages as uniform national effects (Quinto & Atento, 2025).

2.4 Human Capital, Tertiary Enrollment, and the Opportunity-Cost Literature

The relationship between tertiary enrollment and formal business entry is theoretically ambiguous and finds substantial grounding in the opportunity-cost literature on education and self-employment. Tamvada et al. (2022) articulate the underlying mechanism directly: education simultaneously expands an individual's knowledge base and raises the opportunity cost of self-employment, because returns to salaried employment tend to rise faster than returns to entrepreneurship during earlier stages of economic development, giving educated individuals more “to lose” by choosing entrepreneurial entry as per capita income grows. Huang et al. (2021), using causal evidence from China, report that more educated individuals are less likely to enter self-employment relative to wage employment—but critically, they also find that this negative relationship is specific to self-employment and individual business ownership, while education is positively associated with large-business ownership, where managerial ability and capital access dominate the opportunity-cost effect. This distinction is directly relevant to the present study, since new LLC registrations sit closer to the “large-business ownership” pole of this typology than to informal self-employment.

Development stage further moderates the relationship. Tamvada et al. (2022) find that university education reduces the likelihood of transitioning into self-employment over time in developing-country contexts generally, but that educated individuals become more likely to return to self-employment as regional development advances. Sector-specific Southeast Asian evidence adds a distinct dimension: Masatoshi (2025) argues that the Philippines, alongside Indonesia, exhibits high tertiary enrollment alongside sluggish productivity gains attributable to weak curriculum-industry alignment and applied-skills formation rather than to enrollment levels per se, suggesting that the enrollment measure available in WDI data may proxy imperfectly for the labor-market-relevant human capital that actually governs entrepreneurial opportunity cost. Hara (2023) adds a complementary, entry-side friction specific to the Philippines: time-consuming business-registration procedures involving repetitive document checks constrain formal entry independently of the human-capital channel. In the Philippine higher-education setting, management curricula delivered through e-learning have been found to emphasize SDG 4 and SDG 8 unevenly, underscoring that expanding enrollment does not by itself guarantee systematic formation of economically relevant and development-oriented capabilities (Atento, 2025a).

Notably, Virasa et al. (2022) find that entrepreneurial intention is higher in the Philippines than in five other ASEAN economies, with strong perceived behavioral control and attitude toward entrepreneurship—yet in factor-driven ASEAN economies including the Philippines and Vietnam, only subjective norms and perceived behavioral control predict entrepreneurial intention, not attitude. This suggests that a high stated intention to engage in entrepreneurship among the more educated Philippine population need not translate straightforwardly into formal registration rates, and that the direction of any tertiary-enrollment coefficient in the Philippine data remains an open empirical question rather than a foregone theoretical conclusion.

2.5 Philippine Business Climate, Regulatory Reform, and Institutional Context

Philippine-specific literature on business registration is dominated by descriptive and local case evidence rather than causal national-level evaluation, a limitation the present study's data and methodology cannot fully overcome but should explicitly acknowledge. Several reform-specific studies report positive associations between formalization initiatives and registration outcomes. Barro and Espiritu (2025) evaluate the introduction of one-to-four-person stock corporations against SEC registration data and case studies, finding the reform lowered legal and compliance barriers and was associated with increased registrations. Tomas (2025) reports that all nineteen Barangay Micro Business Enterprises (BMBEs) registered in a Cauayan City study attributed positive business effects to registration under the BMBE Act, which was designed specifically to reduce registration cost and administrative burden. Arzagon and Paclibar (2025) find the Business One Stop Shop (BOSS) program in Tacurong rated as well implemented and strongly associated with client satisfaction in permit registration and renewal.

Beyond registration-specific reforms, Philippine MSME literature identifies administrative burden, weak financing access, and limited digitalization as recurring constraints on business formation and growth (Tomas, 2025), while comparative ASEAN work positions the Philippines among factor-driven economies in which entrepreneurial activity is shaped more by subjective norms and perceived behavioral control than by individual attitudes toward entrepreneurship (Virasa et al., 2022). Broader comparative MSME research across five ASEAN states identifies GDP conditions, capital access, legal environment, and competitiveness support as central determinants of business formation (Mendoza & Tadeo, 2023; Anggadini et al., 2023). An adjacent Philippine case study of a dominant pharmacy retailer shows that regulatory reform, digital disruption, and changing consumer expectations can compel established firms to reconfigure legacy capabilities, illustrating that business-climate effects continue after registration and shape the viability of formal enterprises (Atento & Atento, 2025). Similarly, a family-owned SME case demonstrates how value innovation, digital touchpoints, and sustainability features can support differentiation within saturated local markets, indicating that formal entry must be accompanied by adaptive strategic capacity if new firms are to remain viable (Teodosio et al., 2025).

Regional evidence outside the Philippines corroborates the general direction of these findings while cautioning against assuming the Philippine effect size matches regional averages. Causal reform studies in other emerging economies report substantially larger registration gains than the Philippine descriptive literature has yet documented: Camino-Mogro and Bravo (2022) find an approximately 12% increase in new firm registrations following an Ecuadorian red-tape-reduction reform, and Camino-Mogro (2024) reports a 14–18% short-run increase following the same country's transition to an electronic business registry. At the ASEAN panel level, Othman et al. (2025) find that negative GDP shocks reduce business registrations and that inflation effects on entrepreneurial resilience vary by country—reinforcing the premise that Philippine-specific macro-entrepreneurship dynamics should not be inferred mechanically from pooled regional estimates.

2.6 Synthesis of Literature

Across the five themes, the literature converges on a structural, institutionally-mediated account of formal business entry in which credit depth, income level, and human capital operate through distinguishable and sometimes offsetting mechanisms rather than through a single uniform channel. Institutional theory establishes formal entry as conceptually distinct from informal entrepreneurial activity, justifying the dependent variable's specificity (Laing et al., 2021; Estrin et al., 2024), while also predicting that founding-stage conditions imprint onto formalization outcomes with a delay (Galdino et al., 2022)—a claim the credit literature independently corroborates through repeated evidence of lagged and sometimes sign-reversing credit effects (Chettri, 2022; Abdulkarim, 2023; Abid, 2025). The income literature similarly resists a simple linear reading: GDP per capita is more defensibly associated with a compositional shift toward formal, opportunity-based entry than with entrepreneurship in the aggregate, and this shift is itself contingent on developmental stage (Laing et al., 2021; Nguyen et al., 2021; Tran et al., 2025). The education literature frames the direction of a tertiary-enrollment effect as theoretically ambiguous rather than settled, resting on an opportunity-cost mechanism that can point either way depending on whether formal entry in a given economy skews toward credentialed, large-business ownership or toward small-scale self-employment (Tamvada et al., 2022; Huang et al., 2021). Finally, the Philippine-specific institutional literature, while methodologically limited to descriptive and local evidence, consistently associates registration-easing reforms with formalization gains (Barro & Espiritu, 2025; Tomas, 2025; Arzagon & Paclibar, 2025). Most directly, an ASEAN linear mixed-effects analysis using WDI data found that population density, domestic credit, and GDP per capita were positively associated with new business density, whereas tertiary enrollment was negatively associated, while substantial between-country heterogeneity remained (Atento, 2026).

2.7 Gaps in the Literature

Three gaps directly motivate the present study's design. First, despite the availability of regional mixed-effects evidence on ASEAN formal business entry, no identified study estimates the dynamic, lagged structure of these determinants for the Philippines specifically using time-series methods appropriate to non-stationary macroeconomic data; existing Philippine evidence is either cross-sectional and descriptive (Barro & Espiritu, 2025; Tomas, 2025; Arzagon & Paclibar, 2025) or embedded within pooled cross-country panels that average over country-specific dynamics by construction (Othman et al., 2025). Second, while the broader credit-entry and credit-growth literature documents lag structures and occasional sign reversals across several emerging-market and ASEAN+3 contexts (Chettri, 2022; Abdulkarim, 2023; Abid, 2025), no comparable ARDL evidence exists for the credit-to-formal-entry relationship in the Philippines specifically. Third, the tertiary-enrollment literature explains plausible mechanisms in both directions theoretically but has not been tested against Philippine formal-entry data directly; existing Philippine evidence on education relates to entrepreneurial intention (Virasa et al., 2022) or macro-level skills mismatch (Masatoshi, 2025) rather than to registered business formation as an outcome, leaving the direction of this relationship an open empirical question at the country level this study examines.

2.8 Contribution of the Present Paper

This study's contribution is both methodological and empirical. Methodologically, it applies an Autoregressive Distributed Lag (ARDL) bounds-testing framework—well suited to short, non-stationary annual macroeconomic series—to the question of formal business entry determinants in the Philippines, an approach not previously applied to this outcome at the national level. Empirically, it supplies dynamic, time-series evidence on how income growth, tertiary enrollment, and financial-sector depth relate to formal business entry, addressing a gap in a Philippine literature that has so far relied on descriptive, reform-specific, or cross-country pooled evidence, none of which can identify country-specific lag structures or long-run equilibrium relationships. For Philippine policymakers and MSME development agencies, the paper offers evidence about the timing of these relationships—whether policy-relevant shifts in income, education, or credit conditions translate into formal business entry immediately, with a delay, or only through gradual convergence toward equilibrium—directly relevant to sequencing national entrepreneurship and education policy.

3. Methodology

3.1 Research Design

This study employs a quantitative, macro-level time-series design to examine the short-run and long-run determinants of formal business entry in the Philippines. The analytical approach is the Autoregressive Distributed Lag (ARDL) bounds-testing procedure developed by Pesaran, Shin, and Smith (2001). ARDL is appropriate to this setting for three reasons: it accommodates regressors that are integrated of different orders— $I(0)$ and $I(1)$, though not $I(2)$ —without requiring all series to share the same order of integration; it performs comparatively well in small-to-moderate annual samples, which is a binding constraint given WDI's national-level annual reporting; and it jointly estimates short-run dynamics and a long-run equilibrium relationship within a single error-correction framework.

3.2 Data Source and Sample

Data are drawn entirely from the World Bank's World Development Indicators (WDI) database, restricted to the Philippines, for the longest continuous annual window for which all study variables are jointly available without missing values. The dependent variable's coverage in the World Bank Entrepreneurship Database begins in 2006, and after accounting for isolated missing values in population density (2024) and tertiary enrollment (2007), the fully continuous estimation window is 2008–2023 (16 annual observations), reduced to 15 usable observations once one-period lags are incorporated.

3.3 Variables

The dependent variable is new business density (new limited liability company registrations per 1,000 working-age population, ages 15–64). An initial specification considered seven structural and macroeconomic predictors—population density, domestic credit to private sector by banks, GDP per capita, tertiary enrollment, inflation, unemployment, and internet usage—drawn from the theoretical literature reviewed in Section 2. This specification proved unidentifiable at the available sample size (negative degrees of freedom under a full one-lag structure) and was reduced, following automated Akaike Information Criterion (AIC)-based selection, to GDP per capita and tertiary enrollment. Population density was excluded a priori due to severe multicollinearity with GDP per capita and domestic credit (pairwise $r = 0.95\text{--}0.97$), reflecting its smoothly interpolated, near-linear trend within WDI over the estimation window. Domestic credit was excluded by the automated selection procedure under the sample's degrees-of-freedom constraints; its exclusion reflects an estimation limitation rather than a substantive finding about its irrelevance.

3.4 Analytical Procedure

The estimation proceeded in five stages. First, each series was tested for stationarity and order of integration using the Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. Second, lag order was selected via the Akaike Information Criterion (AIC), constrained by the small-sample degrees-of-freedom limits inherent to annual Philippine data. Third, the Pesaran et al. (2001) bounds test was applied to test the null hypothesis of no long-run cointegrating relationship among the dependent variable and its retained determinants. Fourth, conditional on evidence of cointegration, both the long-run coefficients and the short-run error-correction model were estimated. Fifth, model diagnostics—the Breusch-Godfrey test for serial correlation, the Breusch-Pagan test for heteroskedasticity, and the Jarque-Bera test for residual normality—were run to assess result validity.

3.5 Validity, Reliability, and Limitations

Data validity rests on WDI's status as a compiled, internationally standardized source; no primary data collection occurred, and no figure was estimated, interpolated, or substituted outside the WDI-extracted values. Several limitations are disclosed explicitly rather than concealed: the sixteen-year (fifteen-observation) annual sample is small even by the standards of ARDL applications, which tolerate small samples better than panel or VECM methods but still require adequate degrees of freedom; stationarity test results for domestic credit were inconclusive at this sample size, a limitation of test power rather than a resolved classification; and the reported bounds-test critical values, calibrated primarily for larger samples, should be read as suggestive rather than confirmatory at $n = 15$. As with any observational macro time-series design, all relationships identified are associative rather than causal.

4. Results

4.1 Stationarity Diagnostics

ADF and KPSS tests were applied to each series in levels and first differences. Results were partially conflicting for domestic credit (ADF failed to reject a unit root even after first-differencing, $p = 0.976$, while KPSS indicated stationarity post-differencing), symptomatic of limited test power at $n = 16$ rather than evidence of a genuinely higher-order integrated process. GDP per capita and tertiary enrollment showed the theoretically expected pattern: non-stationary in levels (ADF $p = 0.928$ and $p = 0.835$ respectively), stationary after first-differencing (ADF $p = 0.002$ and $p < 0.001$)—consistent with $I(1)$ processes. Given this evidence and the ARDL framework's tolerance for a mix of $I(0)/I(1)$ regressors, estimation proceeded on the working assumption that all retained series are, at most, $I(1)$.

4.2 Model Specification and Short-Run Results

The final estimating model retained GDP per capita (entering at lag 0 and lag 1) and tertiary enrollment (entering at lag 0 only), over the sample 2009–2023 ($n = 15$).

Variable	Coefficient	Std. Error	p-value
Constant	-0.1185	0.0596	0.070
GDP per capita (t)	0.000227	0.000061	0.003
GDP per capita (t-1)	-0.000193	0.000058	0.006
Tertiary enrollment (t)	0.009517	0.002145	0.001

$R^2 = 0.878$, Adjusted $R^2 = 0.845$, $n = 15$, residual $df = 11$. Source: Author's estimation from World Bank WDI data, Philippines 2009–2023.

4.3 Diagnostic Tests

The fitted model passed all three diagnostic checks at conventional significance levels: Jarque-Bera (statistic = 0.548, $p = 0.760$) found no evidence against residual normality; Breusch-Pagan (statistic = 4.177, $p = 0.243$) found no evidence of heteroskedasticity; and Breusch-Godfrey at lag 1 (statistic = 0.050, $p = 0.824$) found no evidence of residual serial correlation. These results should be read with appropriate caution given that diagnostic tests have limited power at $n = 15$.

4.4 Bounds Test for Cointegration

The Pesaran-Shin-Smith bounds test, estimated via the unrestricted error-correction representation, produced an F-statistic of 6.583, with associated interpolated p-values rejecting the null of no cointegration at both the lower bound ($p = 0.0003$) and upper bound ($p = 0.0023$), constituting statistical evidence of a long-run equilibrium relationship. This result requires an important caveat: bounds-test critical value surfaces are generated by Monte Carlo simulation calibrated primarily for sample sizes well above $n = 15$, and the result should be read as suggestive rather than confirmatory.

4.5 Error-Correction Term and Long-Run Coefficients

Term	Coefficient	p-value	Interpretation
Error-correction term (ECT)	-1.0536	0.0016	Significant; magnitude exceeds 1
Long-run GDP per capita	0.000034	—	Derived (Bardsen transformation)
Long-run tertiary enrollment	0.009397	0.036	Significant

Source: Authors' estimation from World Bank WDI data, Philippines 2009–2023.

The error-correction term is negative and statistically significant, consistent with convergence toward a long-run equilibrium following short-run deviations. Its magnitude (-1.054), however, exceeds the conventional -1 to 0 range typically associated with smooth monotonic adjustment; a coefficient below -1 implies an oscillating (overshoot-and-correct) adjustment path rather than gradual convergence. Given the small sample, this atypical magnitude is reported as a finding requiring cautious interpretation.

4.6 Summary of Key Findings

Two results anchor the study's contribution. First, GDP per capita's effect on formal business entry reverses sign across the lag horizon—positive and significant contemporaneously, negative and significant at a one-year lag—a dynamic pattern that a static or cross-sectional specification could not detect, though broadly consistent with sign-

reversal dynamics documented elsewhere in the credit-growth literature (Chettri, 2022; Abdulkarim, 2023). Second, tertiary enrollment shows a robust positive association with formal business entry, both contemporaneously and in the estimated long-run relationship—a finding consistent with the view that, in the Philippine context, formal LLC-type registration draws disproportionately on credentialed founders for whom higher education supports rather than substitutes for entrepreneurial entry (Huang et al., 2021). Domestic credit to the private sector could not be retained in the final specification under the sample's degrees-of-freedom constraints; this reflects a limitation of what could be estimated at $n = 15$, not a substantive finding about credit's irrelevance to Philippine business formation.

5. Discussion of Findings

The Philippine time-series evidence offers a dynamic, national-level account of formal business entry determinants that existing descriptive and reform-specific Philippine literature has not yet supplied. The positive association between tertiary enrollment and formal business entry—both contemporaneously and in the long run—is best read through the opportunity-cost framework developed in Section 2.4: education tends to suppress small-scale, self-employment-type entry by raising the returns to wage employment, but this effect reverses for large-business or LLC-type ownership, where managerial ability and access to formal credit dominate the wage-employment alternative (Tamvada et al., 2022; Huang et al., 2021). If new business density in the Philippines is disproportionately composed of professionally credentialed founders leveraging tertiary training toward formal registration—rather than school leavers weighing entrepreneurship against wage work—a positive coefficient is theoretically expected rather than anomalous, and is consistent with the broader Philippine finding that entrepreneurial intention is comparatively high among the country's more educated population (Virasa et al., 2022).

The GDP per capita result offers a complementary insight into dynamic structure. The contemporaneous-positive, one-year-lag-negative pattern is consistent with a plausible economic story: an income gain may support formal registration in the same year through improved access to startup capital and reduced necessity-driven entry pressure, while the following year's adjustment could reflect labor being reabsorbed into wage employment as growth strengthens, tempering the entry response the following period. This interpretation should be held loosely; with only fifteen usable observations, a single influential year could be driving the lag-1 coefficient, and the result is better treated as a hypothesis for future work with longer time series than as an established feature of the Philippine growth-entrepreneurship relationship.

The study's inability to estimate a domestic credit effect at all is itself a substantive methodological finding about the limits of applying a full multi-predictor specification to single-country annual time series bound by WDI's 2006 start date for business-registration data. This is not evidence that credit access is unimportant to Philippine formal business entry—prior cross-country and South Asian evidence generally supports a positive credit-entry relationship (Gani, 2026; Khan et al., 2025)—but evidence that confirming or disconfirming that relationship at the Philippine country level will require either a longer observation window than WDI currently offers or a more targeted identification strategy than the present study could support.

For theory, the central implication is that formal-entry determinants documented in the broader institutional and entrepreneurship literature do not transfer to a single-country dynamic setting in any guaranteed or uniform way; the timing and even the direction of these effects depend on the compositional and institutional characteristics of the specific economy under study, reinforcing the caution raised by Sendra-Pons et al. (2022) and Khyareh and Amini (2021) that institutional and developmental configurations moderate entrepreneurship-determinant relationships rather than operating as fixed, universal parameters.

For Philippine policymakers and MSME-development agencies, the practical implication is that tertiary education and formal entrepreneurship promotion appear complementary rather than competing objectives at the national level observed here, and that the timing of income-related policy interventions matters: a contemporaneous boost to income may support formal entry in the short run, but the following year's dynamics warrant closer monitoring

rather than an assumption of continued positive effect. The credit-access channel remains a genuinely open question for the Philippines specifically and should not be assumed to mirror findings from other national or pooled studies without further country-level investigation using more granular data.

Two conclusions bound what this analysis can and cannot establish. It can establish that, within the observed 2009–2023 Philippine window, GDP per capita and tertiary enrollment show statistically detectable short-run and apparent long-run associations with formal business entry. It cannot establish causation in any of these relationships, given the observational and heavily lag-constrained nature of the design; it cannot speak to domestic credit's role at all, given estimation constraints; and it cannot claim the reported cointegrating relationship or the atypical error-correction magnitude are stable features of the Philippine economy rather than artifacts of an unusually short annual sample.

6. Conclusions and Recommendations

This study examined the short-run and long-run determinants of formal business entry in the Philippines using WDI-sourced annual data (2009–2023) and an ARDL bounds-testing framework. Two structural predictors—GDP per capita and tertiary enrollment—showed statistically significant associations with new business density, and evidence from the bounds test suggested a long-run equilibrium relationship among these variables, though this result should be read cautiously given the constraints of a fifteen-observation annual sample. GDP per capita's effect operated with an unusual sign reversal across the estimation horizon: positive in the same year, negative at a one-year lag. Tertiary enrollment showed a robust positive association with formal business entry, both contemporaneously and in the long run, suggesting that in the Philippine context, higher education and formal entrepreneurial registration move together rather than in opposition. Domestic credit to the private sector, despite its theoretical and empirical relevance elsewhere in the literature, could not be included in the final specification without violating basic degrees-of-freedom requirements, leaving its role in Philippine formal business entry an open empirical question rather than a settled negative.

These findings support several measured recommendations, offered with the explicit caveat that none should be read as establishing causal policy levers. First, given the positive association between tertiary enrollment and formal business entry observed here, policies that treat higher-education expansion and entrepreneurship promotion as competing uses of public investment may be working from an unsupported premise, at least at the aggregate national level this study observes; further disaggregated research—by field of study, by sector of registration, by founder age—would help clarify whether this association reflects credentialed founders directly, or a broader compositional shift in the economy that happens to move alongside both variables. Second, the inconclusive treatment of domestic credit points toward a concrete data and research priority rather than a policy prescription: a longer or more granular Philippine business-registration series—potentially drawn from the Securities and Exchange Commission or the Philippine Statistics Authority rather than WDI's harmonized cross-country compilation—would allow credit's role to be tested with adequate statistical power. Third, the atypical error-correction magnitude identified in the results merits replication once additional annual observations accumulate.

Future research extending this study would benefit most directly from three additions: a longer time series as more WDI business-registration years become available, alternative Philippine-specific data sources capable of supporting a fuller regressor set including credit and population-related variables without the collinearity constraints encountered here, and disaggregation of new business density by sector or firm size to test whether the tertiary-enrollment finding reflects a genuine shift in the composition of Philippine entrepreneurship or a statistical artifact of the aggregate measure. Taken together, the evidence developed here offers an initial, methodologically transparent account of how structural macroeconomic conditions relate to formal business entry within the Philippine economy specifically—an account constrained by data availability at every step, but one that identifies clear, testable directions for the country-level research this question ultimately requires.

References

- Abdulkarim, Y. (2023). A systematic review of investment indicators and economic growth in Nigeria. *Humanities and Social Sciences Communications*, 10, 1-13. <https://doi.org/10.1057/s41599-023-02009-x>
- Abid, I. (2025). The interplay of entrepreneurship, investment, credit, and market capitalization in shaping sustainable economic growth: An ARDL approach for the United States. *Scientific Annals of Economics and Business*. <https://doi.org/10.47743/saeb-2025-0038>
- Anggadini, S. D., Luckyardi, S., & Surtikanti, S. (2023). Development of micro small-medium business in Asian countries (Indonesia, Malaysia, Philippines, and Thailand): A comparison in accounting behavior. *Journal of Eastern European and Central Asian Research*, 10(3). <https://doi.org/10.15549/jeecar.v10i3.1300>
- Arzagon, S. B., & Paclibar, R. P. (2025). Business One Stop Shop (BOSS) program and the level of clients' satisfaction in the City of Tacurong. *International Journal of Science, Architecture, Technology and Environment*. <https://doi.org/10.63680/vjyny08988757dfgh>
- Atento, A. G., & Atento, R. G. (2025). A case study of Mercury Drug Corporation: Strategic adaptation to universal healthcare and digital disruption in the Philippines. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/zhw7dd39>
- Atento, R. G. (2025a). Exploring e-learning for sustainable development: Integrating SDGs in management education at Philippine higher education institutions. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/2qcjx561>
- Atento, R. G. (2025b). The credibility imperative 2025: Governance integrity, economic resilience, and strategic adaptability in Philippine diplomacy. *International Journal of Health and Business Analytics*, 1(2). <https://doi.org/10.65166/6amaz997>
- Atento, R. G. (2026). Macroeconomic and structural determinants of formal business entry in ASEAN: Evidence from a linear mixed-effects model using World Development Indicators. *Journal of Enterprise Strategy and Management Innovation (JESMI)*, 1(1). <https://doi.org/10.65166/bh0gx302>
- Barro, W., & Espiritu, M. (2025). The launching of the registration of one to four (1-4) person stock corporations in the formation of the small enterprises. *Psychology and Education: A Multidisciplinary Journal*. <https://doi.org/10.70838/pemj.370105>
- Camino-Mogro, S. (2024). From the paper age to the electronic age: An electronic business registry reform in Ecuador. *Economics of Innovation and New Technology*, 34, 163-185. <https://doi.org/10.1080/10438599.2024.2317303>
- Camino-Mogro, S., & Bravo, G. A. (2022). Red tape reduction, more new firms? Saving time and money: Evidence from an Ecuadorian reform. *The Journal of Development Studies*, 59, 691-715. <https://doi.org/10.1080/00220388.2022.2154149>
- Chettri, K. K. (2022). Financial institutions depth and growth in Nepal: Sensitivity to the choice of depth proxy. *Cogent Economics & Finance*, 10. <https://doi.org/10.1080/23322039.2022.2087288>
- Espelita, C. A. M., Atento, R. G., Rao, L. J., & Tian, Y. (2025). Understanding monetary policy: Student awareness, perceptions, and financial behaviors in the Philippine context. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/f7eayj47>

- Estrin, S., Guerrero, M., & Mickiewicz, T. (2024). A framework for investigating new firm entry: The (limited) overlap between informal-formal and necessity-opportunity entrepreneurship. *Journal of Business Venturing*. <https://doi.org/10.1016/j.jbusvent.2024.106404>
- Galdino, K. M., Molina-Sieiro, G., Lamont, B., & Holmes, R. M. (2022). Factor markets, institutional quality and firm formalisation: The contingent effect of economic conditions at the founding stage. *International Small Business Journal*, 41, 432-461. <https://doi.org/10.1177/02662426221101021>
- Gani, A. (2026). Domestic credit effect on new business density in the high- and middle-income countries. *Journal of Financial Economic Policy*. <https://doi.org/10.1108/jfep-10-2025-0441>
- Gizaw, T.-A., Getachew, Z., & Mancha, M. (2024). Sectoral allocations of domestic credit and their effects on economic growth in Ethiopia. *Cogent Economics & Finance*, 12. <https://doi.org/10.1080/23322039.2024.2390949>
- Goletsis, Y., Christogeorgou, K., & Mylonidis, N. (2024). Exploring the effect of institutions on entrepreneurial ecosystems: A meta-analysis. *Journal of Small Business Management*, 63, 936-984. <https://doi.org/10.1080/00472778.2024.2363845>
- Hara, M. (2023). Fostering academic entrepreneurship for economic development: Challenges, frameworks, and strategies in ASEAN. *Journal of Economics, Finance and Management Studies*. <https://doi.org/10.47191/jefms/v6-i12-35>
- Huang, B., Tani, M., & Zhu, Y. (2021). Does higher education make you more entrepreneurial? Causal evidence from China. *SSRN Electronic Journal*. <https://doi.org/10.1016/j.jbusres.2021.06.044>
- Islam, D. (2022). Determinants of domestic bank credit to private sectors in Bangladesh: An empirical investigation. *Journal of Economic Impact*. <https://doi.org/10.52223/jei4022208>
- Khan, K. A., Akhtar, M. A., & Jain, A. K. (2025). Financing start-ups in SAARC nations: The role of FDI, domestic credit access, and bank expansion. *Journal of Business Sectors*. <https://doi.org/10.62222/csrx9963>
- Kharel, K. R., Poudel, O., Upadhyaya, Y. M., & Nepal, P. (2024). Effect of private sector credit on economic growth in Nepal. *Financial Markets, Institutions and Risks*. [https://doi.org/10.61093/fmir.8\(1\).142-157.2024](https://doi.org/10.61093/fmir.8(1).142-157.2024)
- Khyareh, M. M., & Amini, H. (2021). Governance quality, entrepreneurship and economic growth. *Journal of Competitiveness*. <https://doi.org/10.7441/joc.2021.02.03>
- Laing, E., Van Stel, A. J., & Storey, D. (2021). Formal and informal entrepreneurship: A cross-country policy perspective. *Small Business Economics*, 59, 807-826. <https://doi.org/10.1007/s11187-021-00548-8>
- Martinez-Rodriguez, I., Quintana-Rojo, C., Gento, P., & Callejas-Albinana, F. E. (2021). Public policy recommendations for promoting female entrepreneurship in Europe. *International Entrepreneurship and Management Journal*, 18, 1235-1262. <https://doi.org/10.1007/s11365-021-00751-9>
- Masatoshi, H. (2025). Higher education for economic development: Contexts of escaping low-and-lower-middle-income trap in ASEAN. *Discover Education*, 4. <https://doi.org/10.1007/s44217-025-00744-8>
- Mendoza, X., & Tadeo, J. (2023). Analysis of micro, small, medium enterprises: The cases of Singapore, Malaysia, Philippines, Thailand and Vietnam. *Journal of Management, Economics, and Industrial Organization*. <https://doi.org/10.31039/jomeino.2023.7.1.1>
- Menez, N., & Atento, R. G. O. (2026). Women's empowerment and enterprise dynamism in the Philippines: A WDI-based index and time-series evidence (2006-2022). *Journal of Enterprise Strategy & Management Innovation*, 1(1). <https://doi.org/10.65166/7v64f412>

- Mickiewicz, T., Stephan, U., & Shami, M. (2021). The consequences of short-term institutional change in the rule of law for entrepreneurship. *Global Strategy Journal*. <https://doi.org/10.1002/gsj.1413>
- Moreno-Adalid, A. M., Cid Moreno, D., Rodriguez-Iglesias, I., Lopez Perez, R., & Tolosa, I. J. (2026). Entrepreneurial initiative and perceived control: Behavioral drivers and macroeconomic moderation across countries. *International Entrepreneurship and Management Journal*, 22. <https://doi.org/10.1007/s11365-026-01193-x>
- Nguyen, C. P., Nguyen, B., Tung, B. D., & Su, T. D. (2021). Economic complexity and entrepreneurship density: A non-linear effect study. *Technological Forecasting and Social Change*, 173, 121107. <https://doi.org/10.1016/j.techfore.2021.121107>
- Othman, K., Fuad, H. A., Omar, H., & Laidin, J. (2025). Entrepreneurial resilience amid economic shocks: A panel data analysis of ASEAN countries. *International Journal of Asian Social Science*. <https://doi.org/10.55493/5007.v15i9.5541>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326. <https://doi.org/10.1002/jae.616>
- Quinto, L., & Atento, R. G. (2025). Economic growth and developmental equity in four ASEAN economies: Linking macroeconomic trends to employment and child nutrition (1999–2024). *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/nq75nv94>
- Sendra-Pons, P., Comeig, I., & Mas-Tur, A. (2022). Institutional factors affecting entrepreneurship: A QCA analysis. *European Research on Management and Business Economics*. <https://doi.org/10.1016/j.iedeen.2021.100187>
- Tamvada, J., Shrivastava, M., & Mishra, T. (2022). Education, social identity and self-employment over time: Evidence from a developing country. *Small Business Economics*, 59, 1449-1468. <https://doi.org/10.1007/s11187-021-00583-5>
- Teodosio, G. M., Atento, R. G., Boa, R. A., Malijan, A., Malolos, Q. A., Merciales, P. A., & Ricablanca, P. J. (2025). Creating a Blue Ocean for family-owned SMEs: Value innovation, digital transformation, and sustainability in the case of Ivan Color Paint Center. *International Journal of Health & Business Analytics*, 1(2). <https://doi.org/10.65166/x4kqee91>
- Tomas, S. D. (2025). Empowering grassroots entrepreneurs: An assessment of the Barangay Micro Business Enterprise Act (RA 9178). *International Journal of Science and Management Studies*, 8(2). <https://doi.org/10.51386/25815946/ijsms-v8i2p120>
- Tran, K. T., Pham, V. K., Luong, M.-H., Pham, T.-T., & Phan, T. T. (2025). Exploring the macro conditions for national entrepreneurship: A panel data-based analysis in developing countries. *Entrepreneurial Business and Economics Review*. <https://doi.org/10.15678/eber.2025.130402>
- Uriarte, S., Espinoza-Benavides, J., & Ribeiro-Soriano, D. (2023). Engagement in entrepreneurship after business failure. Do formal institutions and culture matter? *International Entrepreneurship and Management Journal*, 19, 941-973. <https://doi.org/10.1007/s11365-023-00829-6>
- Virasa, T., Sukavejworakit, K., & Promsiri, T. (2022). Predicting entrepreneurial intention and economic development: A cross-national study of its policy implications for six ASEAN economies. *Heliyon*, 8. <https://doi.org/10.1016/j.heliyon.2022.e09435>

Vo, T. K. A., & Ho, N. (2025). The impact of private credit and foreign direct investment on economic growth: Evidence from ASEAN-5 countries. *Cogent Economics & Finance*, 13.
<https://doi.org/10.1080/23322039.2025.2578342>