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Unpacking Institutions: How Governance Quality Moderates the Entrepreneurship-Growth Relationship

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Unpacking Institutions: How Governance Quality Moderates the Entrepreneurship-Growth Relationship †

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Abstract

This article examines the relationship between entrepreneurship and economic performance in Latin America and the Caribbean and how this relationship is embedded in the institutional and productive environment of the region. The analysis builds on an augmented Ramsey–Cass–Koopmans framework in which entrepreneurial knowledge operates as a Romer-style externality that increases productive capacity, with formal business entry serving as an empirical proxy for this mechanism. Institutions, labor informality, exports, foreign direct investment, and the cost of capital characterize the broader environment in which productive activity takes place. Using an unbalanced panel of 17 countries over 2002–2025, the empirical strategy gives primary weight to country and year fixed-effects specifications and complements them with alternative measures of entrepreneurship, institutional indicators, growth and labor-productivity equations, and additional robustness exercises. The strongest evidence arises in the growth specifications using the growth in new registered firms and new-business density is positively associated with real GDP per capita growth. Exports also emerge as a recurrent positive correlate of economic performance, while labor informality is associated with weaker income and productivity outcomes across several complementary specifications. Overall, the findings suggest that formal business creation can accompany stronger economic performance, but that its economic relevance should be understood within the broader productive and institutional environment in which firms operate. Entrepreneurship is therefore better viewed as one component of a wider development process than as an automatic or standalone driver of economic growth. (*JEL*: O17, O43, O47, L26, C23).

Keywords: entrepreneurship; informality; institutions; economic growth; productivity; Latin America; panel data.

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1 Introduction

Latin America is an entrepreneurial region, but not necessarily a region in which entrepreneurship consistently generates productivity and economic growth. Business ownership, self-employment, and the creation of new firms are widespread across its economies, and governments have increasingly placed entrepreneurship at the center of their productive-development strategies. Nevertheless, most firms remain small, productivity growth has been persistently weak, and relatively few businesses develop the innovative capabilities required to scale or compete internationally. This coexistence of abundant entrepreneurial activity and limited productive transformation constitutes one of the region's central development puzzles. As Lederman et al. (2014) argue, Latin America does not suffer from a shortage of entrepreneurs so much as from a shortage of firms able to innovate, expand, and raise aggregate productivity.

Over the past two decades, Latin American and Caribbean governments have introduced a broad range of measures intended to promote entrepreneurship and small-business development. These include simplified registration procedures, credit guarantees, seed-capital programs, business incubators, entrepreneurship training, innovation agencies, and initiatives facilitating access to technology and international markets. Yet the existence of these instruments has not produced uniform results. The quality of implementation, coordination among public agencies, availability of financing, and capacity to evaluate programs vary substantially across countries. Recent comparative evidence shows that, although the region has strengthened its policy frameworks for SMEs and innovation, major differences remain in institutional capacity, program coverage, and the resources available to support young and innovative firms (OECD et al., 2024). Moreover, entrepreneurship policies have frequently been more successful at encouraging business creation than at enabling firms to survive, innovate, increase productivity, and enter export markets. The relevant development issue is therefore not simply how many businesses are created, but what kinds of businesses emerge and whether the surrounding economic environment allows them to become productive.

Institutions are central to this transformation. Entrepreneurship does not operate independently of the rules and incentives governing economic activity. Secure property rights, predictable regulation, contract enforcement, access to finance, administrative capability, and confidence in public institutions influence both the decision to establish a business and the activities toward which entrepreneurial effort is directed. The supply of entrepreneurs may be relatively stable, while the institutional structure determines whether their effort becomes productive, unproductive, or destructive (Baumol, 1990). Similarly, North (1990) emphasizes that institutions shape the incentives underlying investment, exchange, and innovation. Where these institutions function effectively, entrepreneurship can facilitate the commercialization of knowledge, the reallocation of resources, and the emergence of new products and markets. Where they are weak or unpredictable, entrepreneurial activity may instead remain concentrated in low-productivity businesses with limited incentives to invest and expand. The empirical literature consequently finds that the contribution of entrepreneurship to growth depends on the institutional environment and the type of entrepreneurial activity being generated (Aparicio et al., 2016; Urbano et al., 2019, 2020).

This institutional mechanism is particularly important in Latin America because entrepreneurship coexists with pervasive labor and business informality. Informality is not a marginal feature of the region's economies; it shapes how firms enter markets, hire workers, accumulate capital, and interact with the state. For some individuals, informal entrepreneurship provides a source of income when formal employment opportunities are unavailable, reflecting both exclusion from formal markets and

voluntary exit from costly or ineffective institutions (Perry et al., 2007). It may therefore perform an important short-run employment and income-smoothing function. At the same time, persistent informality can restrict access to formal credit, technology, skilled labor, legal protection, public procurement, and international markets. Informal firms are typically smaller and less productive and rarely make a sustained transition toward the formal sector (La Porta and Shleifer, 2014). More recent work also shows that informality operates along different margins: firms may avoid registration altogether, while formally registered firms may continue hiring workers outside the formal labor system (Ulyssea, 2018, 2020). Evidence for Latin America further indicates that stronger property rights and more effective formal institutions are associated with lower levels of informal entrepreneurial activity (Salinas et al., 2023).

These characteristics help explain why a rise in entrepreneurial activity need not produce a proportional increase in economic growth. The creation of a registered, potentially scalable firm is economically different from own-account employment generated by necessity, and neither is equivalent to innovative entrepreneurship. Counting all these activities as manifestations of the same underlying phenomenon can conceal the channels through which entrepreneurship affects economic performance. Formal business entry may expand the productive base, intensify competition, and facilitate the diffusion of knowledge, but its aggregate contribution will remain limited if new firms lack the institutional support, productive capabilities, or incentives required to survive and grow. Conversely, policies that increase the number of businesses without addressing informality, financing constraints, regulatory uncertainty, and weak market access may generate additional entry without producing lasting productivity gains.

The relationship between entrepreneurship and growth has a well-established theoretical foundation. Endogenous-growth theory emphasizes that knowledge generates social returns extending beyond those captured by individual firms (Romer, 1986, 1990). The knowledge-spillover theory of entrepreneurship develops this mechanism further by describing entrepreneurs as agents who identify and commercialize knowledge that incumbent organizations do not fully exploit (Acs et al., 2009). However, the empirical relationship is heterogeneous. Entrepreneurship contributes more consistently to growth when it is innovative or opportunity-driven and when institutions allow productive firms to accumulate capabilities and scale. In developing economies, where necessity entrepreneurship and informality are more prevalent, a high rate of business ownership may coexist with low productivity and limited structural transformation.

Despite the relevance of this debate, the evidence for Latin America remains comparatively fragmented. Existing studies have examined entrepreneurial activity, competitiveness, institutions, and economic performance using different samples and definitions of entrepreneurship. For Peru, León-Mendoza (2019) documents a positive relationship between the number of firms and economic growth across 24 departments during 2007–2017. At the regional level, previous studies show that institutional conditions influence opportunity entrepreneurship and that the contribution of entrepreneurial activity differs across stages of development (Acs and Amorós, 2008; Aparicio et al., 2016). More recent evidence also confirms that the relationship between entrepreneurship and growth in South America depends on how entrepreneurial activity is defined (Munyo and Veiga, 2024). Nevertheless, relatively little research jointly examines formal business creation, institutional quality, and labor informality within a common empirical framework covering a broad group of Latin American and Caribbean economies over an extended period.

This article seeks to address that gap by examining whether the expansion of formal business entry is associated with improved economic performance in 17 Latin American and Caribbean countries over 2002–2025, after accounting for the institutional and productive characteristics of the region. The central expectation is that greater formal business entry is positively associated with real income and economic growth, conditional on institutional quality and labor informality. Institutional quality and informality are not introduced as detached explanations competing with entrepreneurship. Instead, they define the environment within which new firms attempt to transform entrepreneurial initiative into productive activity. This approach makes it possible to distinguish the contribution of registered business creation from the broader prevalence of business ownership and necessity-driven economic activity.

The empirical analysis is organized around a two-way fixed-effects specification, which controls for persistent country characteristics and common annual shocks. New registered firms constitute the primary measure of entrepreneurship, while new-business density provides the closest robustness measure. The employers' share and an innovative entrepreneurship index are retained as complementary indicators capturing different dimensions of entrepreneurial activity. The Worldwide Governance Indicators provide the principal measure of institutional quality, with V-Dem used as an alternative institutional indicator. Random-effects, conditional-convergence, labor-productivity, and dynamic-panel estimates are treated as complementary exercises. Because the available information forms an unbalanced observational panel, the coefficients are interpreted as conditional associations and not as definitive causal effects.

The results reveal a relationship that is positive but neither automatic nor uniform. In the preferred fixed-effects specifications using the Worldwide Governance Indicators, new registered firms and new-business density are positively associated with real income per capita and contemporaneous economic growth. The result is not reproduced across every entrepreneurship proxy, institutional indicator, or estimator: the employers' share and innovative entrepreneurship index do not display equally robust effects, and the findings are weaker when institutional conditions are measured using V-Dem. Informality emerges more consistently as a direct constraint on income and labor productivity than as a stable moderator of the entrepreneurship–growth relationship. Exports provide the most robust positive association with economic performance, whereas the evidence concerning foreign direct investment is more limited. Taken together, the results suggest that formal business creation can accompany economic growth, but the number of new firms alone is insufficient to ensure productive transformation.

The article makes three contributions. First, it places the entrepreneurship–growth relationship within the specific development context of Latin America, where business dynamism coexists with persistent informality, heterogeneous institutions, and uneven productive capabilities. Second, it develops an augmented Ramsey–Cass–Koopmans framework in which entrepreneurship operates as a knowledge externality, while institutions and informality enter the total-factor-productivity block governing the environment in which entrepreneurial knowledge is converted into output. The theoretical model is used to organize the empirical relationships rather than to claim structural identification. Third, the article distinguishes formal business entry from broader measures of entrepreneurial activity and evaluates the relationship using a transparent hierarchy of evidence: a principal fixed-effects model followed by alternative measures, outcomes, institutional indicators, and estimators.

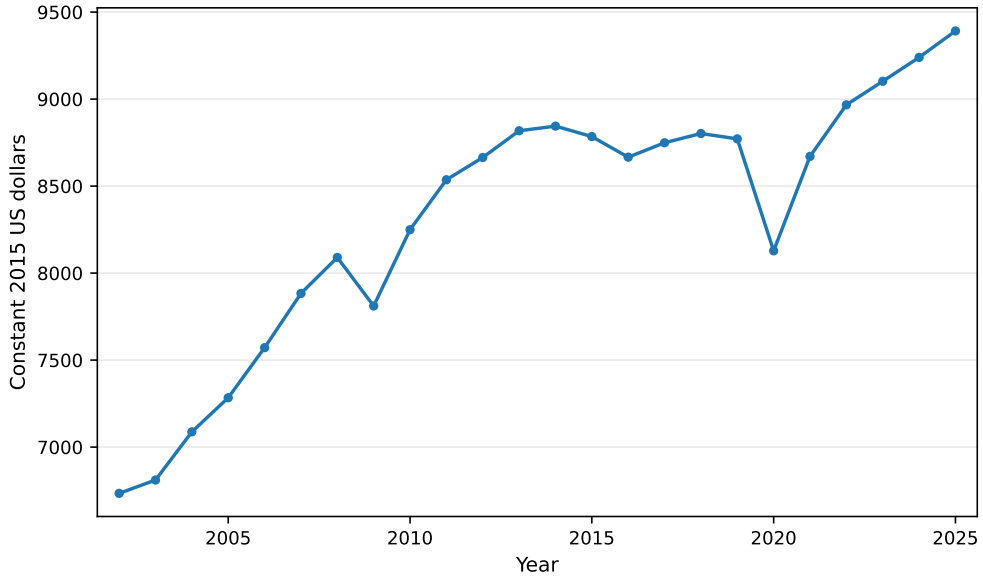
The remainder of the article is organized as follows. Section 2 presents the principal stylized facts on entrepreneurship, institutions, informality, and economic performance in Latin America. Section 3 reviews the relevant literature and develops the augmented theoretical framework. Section 4 describes the data and the empirical strategy. Section 5 reports the main results and complementary estimations. Section 6 interprets the findings in relation to the institutional and productive characteristics of the region and discusses their policy implications. Section 7 concludes.

2 Stylized Facts for Latin America and the Caribbean

Against this background, the recent trajectory of Latin American and Caribbean economies reveals an important coexistence. Over 2002–2025, regional income generally increased and formal business creation expanded, yet economic growth remained volatile and uneven across countries. These developments unfolded amid persistent labor informality and institutional conditions that did not improve uniformly throughout the region. Considered together, these patterns suggest that the economic relevance of entrepreneurship depends not only on the number of firms created, but also on the environment in which those firms operate and attempt to become productive. The stylized facts presented below trace this relationship and establish the regional context for the empirical analysis.

The evolution of real GDP per capita provides the starting point for examining this relationship. Figure 1 presents regional real GDP per capita in constant 2015 US dollars, weighted by population. Unlike a simple average across countries, this measure more closely approximates the income of the average person living in the economies included in the sample. The series displays a clear long-run upward trend, interrupted most visibly by the contraction of 2020. The region therefore experienced a general improvement in average income over the period, although this aggregate trajectory does not reveal how consistently that improvement was shared across countries or sustained over time.

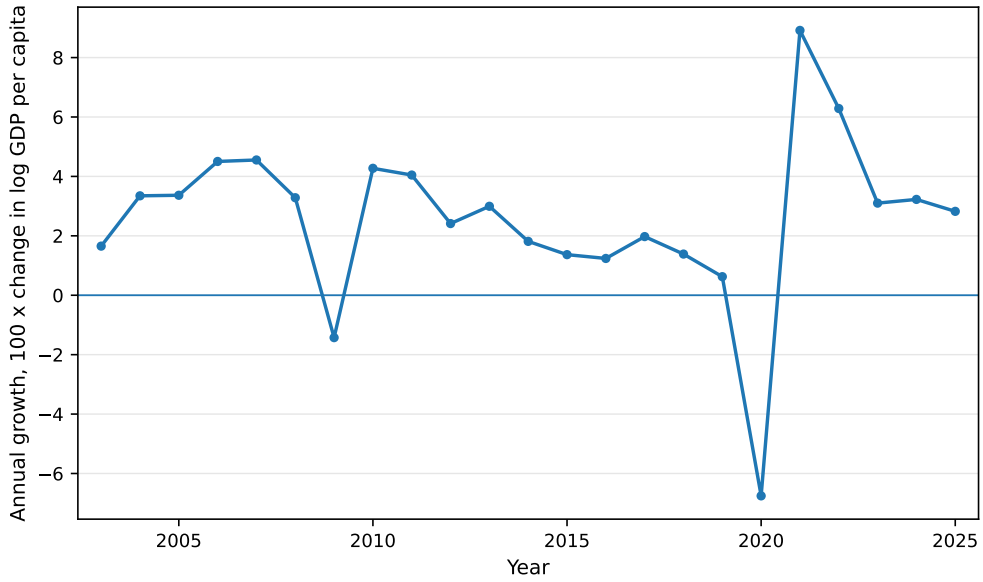
Figure 1: Population-weighted regional real GDP per capita in constant 2015 US dollars, 2002–2025



Note: Ratio of the sum of real GDP to the total population of the 17 economies included in the sample. The measure is not expressed in purchasing-power-parity terms. *Source:* Authors' calculations based on the World Bank's World Development Indicators.

The upward movement in regional income contrasts with the instability of annual economic growth. Figure 2 reports the unweighted average of national real GDP per capita growth rates and shows pronounced fluctuations throughout the period. A region may therefore achieve higher income over the long run while its individual economies continue to experience irregular growth trajectories. The economic setting in which entrepreneurial activity takes place is neither stable nor homogeneous.

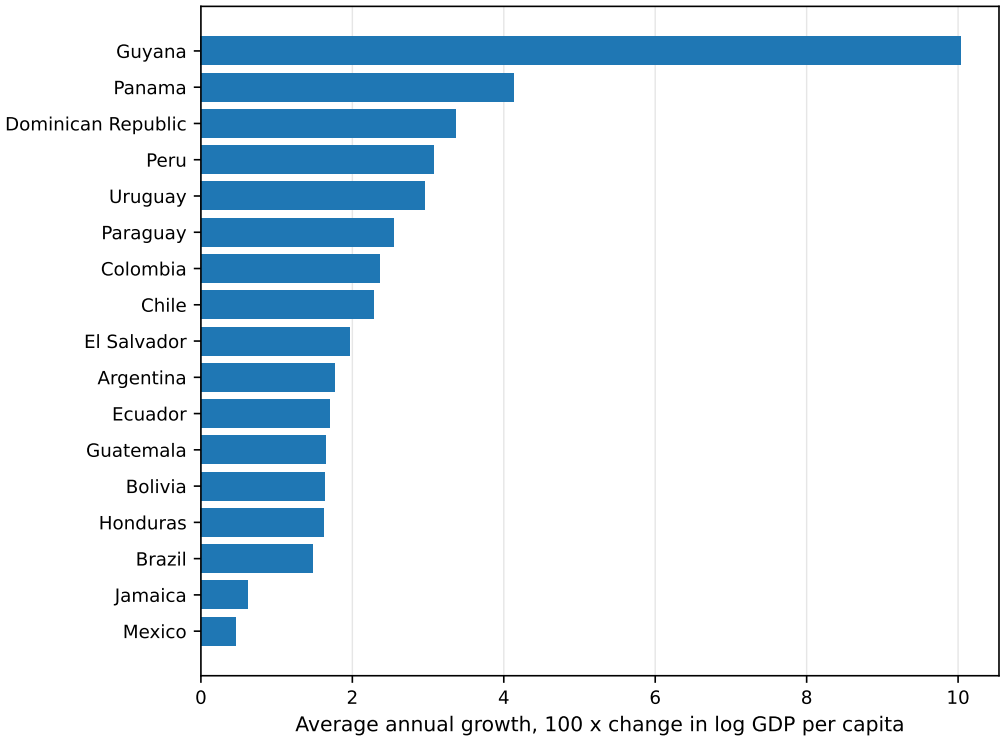
Figure 2: Average annual real GDP per capita growth in the Latin American and Caribbean sample, 2003–2025



Note: Unweighted annual average of $100\Delta \ln y$ across the 17 economies included in the sample. *Source:* Authors' calculations based on the World Bank's World Development Indicators.

The regional average also masks markedly different growth experiences across countries. The dispersion in Figure 3 shows that entrepreneurial activity has evolved under very different macroeconomic trajectories across the region. The coexistence of business creation with both rapid and sluggish growth reinforces the central argument of the article: entrepreneurship is not associated with the same economic outcomes in every country, and its contribution may depend on the institutional, informal, and productive conditions under which firms operate.

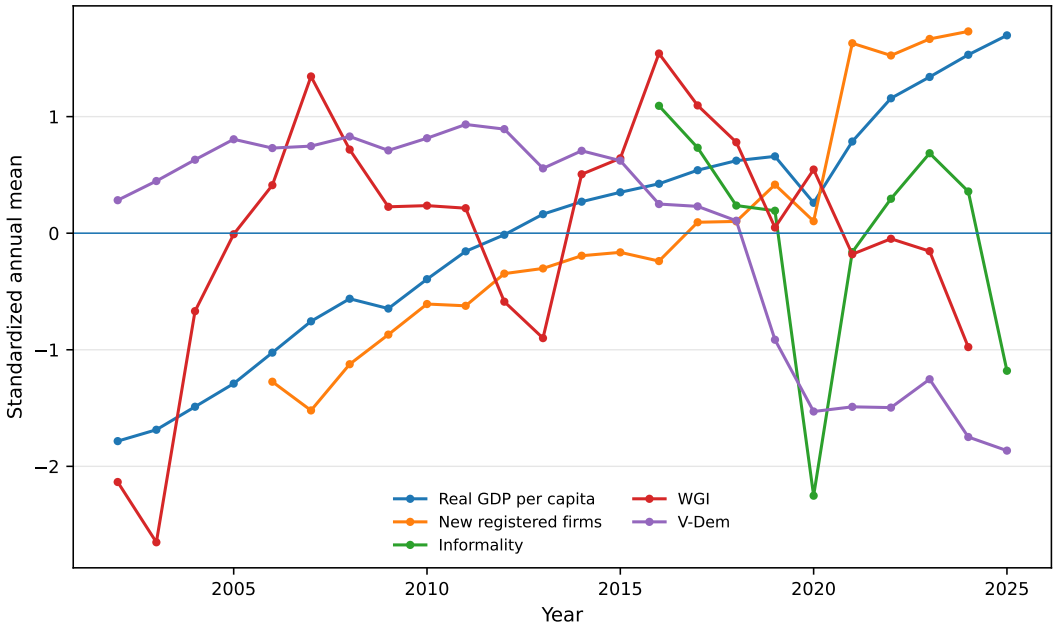
Figure 3: Average annual real GDP per capita growth by country, 2003–2025



Note: Arithmetic mean of annual real GDP per capita growth, measured as $100\Delta \ln y$, over the common 2003–2025 period. Each country has 23 annual growth observations. *Source:* Authors' calculations based on the World Bank's World Development Indicators.

These contrasting growth experiences become more informative when considered alongside the evolution of entrepreneurship, informality, and institutions. Figure 4 compares the standardized annual means of real GDP per capita, new registered firms, labor informality, the World Bank's Worldwide Governance Indicators (WGI), and the Varieties of Democracy (V-Dem) indicators. Viewed together, these five series place the expansion of formal business entry within the broader institutional and economic trajectory of the region.

Figure 4: Regional trends in GDP per capita, formal business entry, informality, and institutions, 2002–2025



Note: Each series is standardized using its own time-series mean and standard deviation. Annual means are calculated from the available country-year observations for the 17 economies included in the sample. Informality coverage is concentrated in 2016–2025. *Source:* Authors' calculations based on World Bank WDI, World Bank WGI, V-Dem v16, and ILOSTAT.

The figure shows that real GDP per capita and new registered firms follow a broadly upward trajectory, particularly during the later years of the period. Institutional conditions, however, evolve less uniformly. WGI fluctuates over time, while V-Dem records a pronounced decline in the most recent years; informality also follows an uneven trajectory. The expansion of formal business entry has therefore not been accompanied by a uniform strengthening of the institutional environment across the region. This is precisely why the relationship between entrepreneurship and economic performance must be examined together with institutional quality and informality.

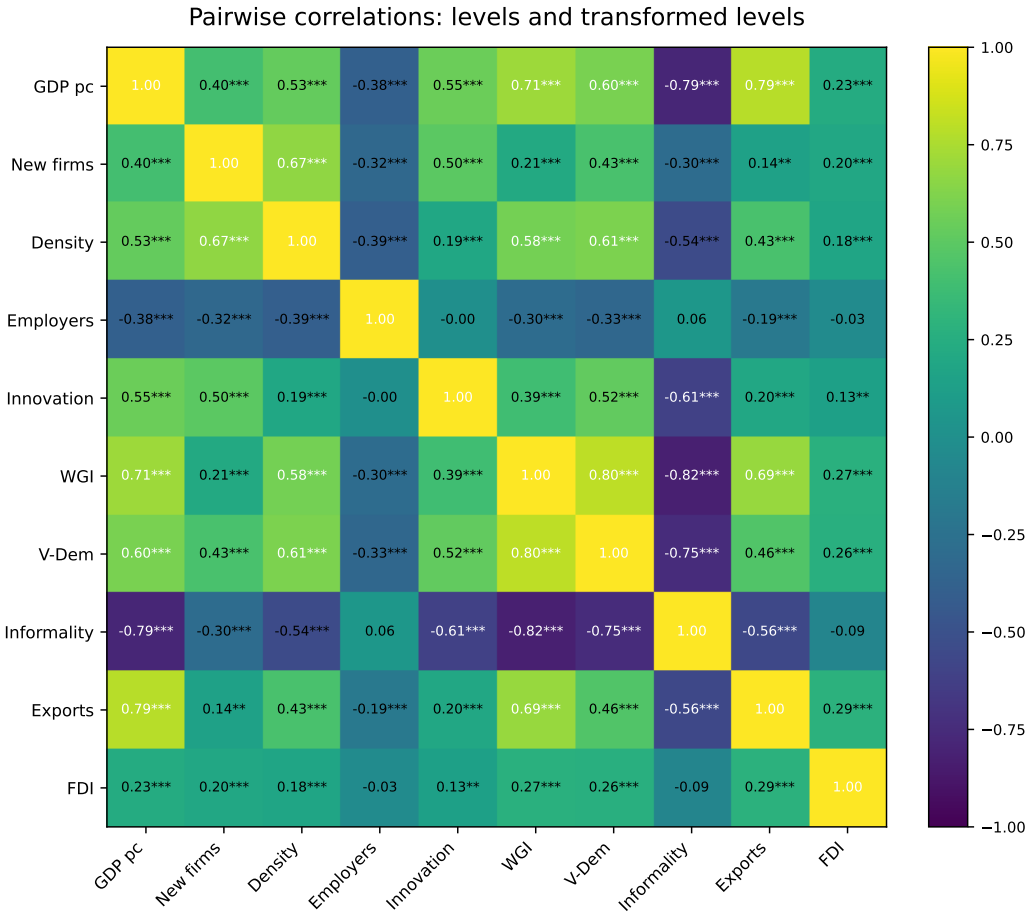
This joint evolution illustrates the mechanism motivating the article. Registering a new firm represents entry into the formal business sector, but registration alone does not ensure that the firm will survive, expand, innovate, hire workers, or contribute to productivity. Its capacity to do so may depend on the quality of public institutions, the enforcement of rules and contracts, access to finance and markets, and the prevalence of informal economic activity. Institutions and informality are therefore part of the environment through which entrepreneurial activity may or may not become associated with higher income and economic growth.

The temporal patterns also raise the question of whether economies with greater business creation tend to exhibit better economic outcomes. Figures 5 and 6 examine this relationship through Pearson correlations based on country-year observations. The first matrix considers income and the explanatory variables in levels, while the second considers annual growth rates and changes. Together, they show whether the structural relationships observed across the region are also present in short-run economic movements.

Figure 5 shows a clear descriptive pattern. Real GDP per capita is positively and statistically significantly correlated with new registered firms, new-business density, innovative entrepreneurship, WGI, V-Dem, exports per capita, and FDI per capita, and negatively correlated with labor informality.

Higher-income observations therefore tend to be characterized by greater formal business creation, stronger institutional indicators, greater external integration, and lower informality. These relationships portray a broader regional configuration in which entrepreneurship, institutions, informality, and productive integration evolve as connected dimensions of economic development.

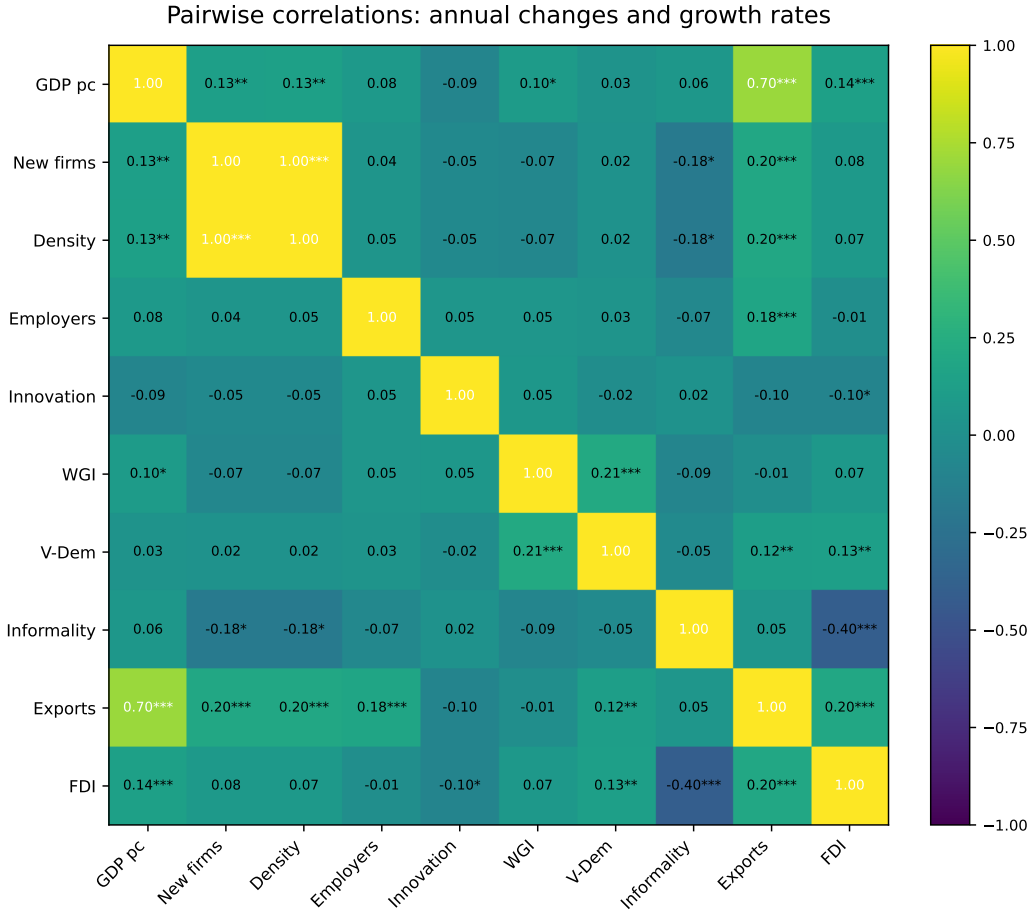
Figure 5: Bivariate correlations in levels and transformed levels



Note: Pearson correlations use pairwise-complete country-year observations from the 17 economies included in the sample. The variables are log real GDP per capita; log new registered firms; log new-business density; log employers' share; the innovative entrepreneurship index; aggregate WGI; aggregate V-Dem; log informal employment; log exports per capita; and asinh(FDI per capita). The innovative entrepreneurship index is the mean of the available standardized components for resident patents and industrial designs per million workers, R&D expenditure as a share of GDP, and high-technology exports as a share of manufactured exports; at least two components are required. *Source:* Authors' calculations based on the World Bank's World Development Indicators and Entrepreneurship Database, World Bank WGI, V-Dem v16, and ILOSTAT SDG indicator 8.3.1.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The relationships become weaker and more selective when annual growth rates and changes are considered. As shown in Figure 6, growth in exports per capita retains the strongest bivariate association with real GDP per capita growth. Growth in new registered firms and new-business density displays smaller positive associations, whereas changes in the innovative entrepreneurship index are not significantly correlated with economic growth. The contrast with the level results suggests that the characteristics associated with relatively high income do not explain annual improvements in economic performance with the same strength. It also points toward formal business entry and productive integration as the dimensions most closely connected to the short-run growth patterns observed in the sample.

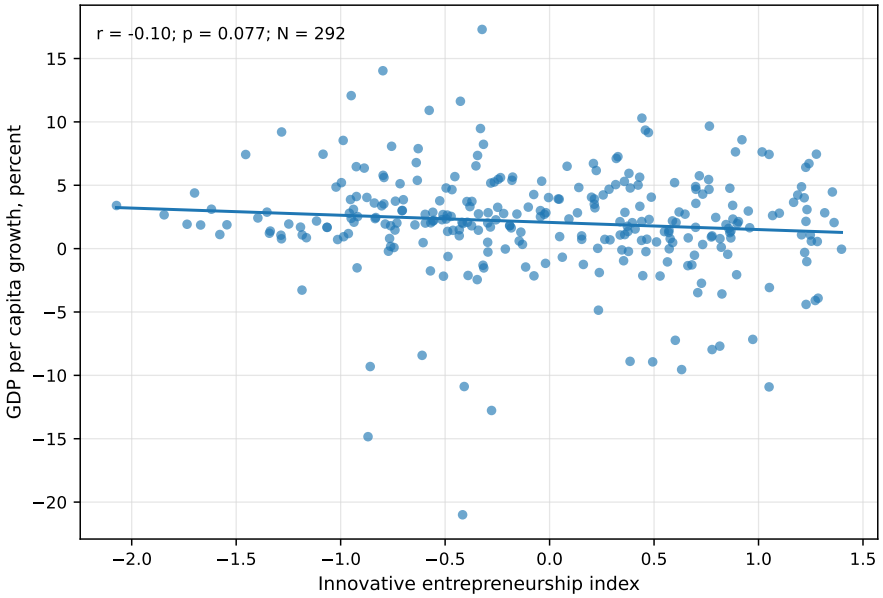
Figure 6: Bivariate correlations in growth rates and annual changes



Note: Pearson correlations use pairwise-complete country-year observations from the 17 economies included in the sample. The matrix is constructed from annual GDP per capita growth; growth in log new registered firms, log new-business density, log employers' share, log informal employment, and log exports per capita; annual changes in the innovative entrepreneurship index, WGI, and V-Dem; and the annual change in asinh(FDI per capita). *Source:* Authors' calculations based on the World Bank's World Development Indicators and Entrepreneurship Database, World Bank WGI, V-Dem v16, and ILOSTAT SDG indicator 8.3.1. The innovative entrepreneurship index uses the four World Bank components described in the note to Figure 5.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The relationship between innovative entrepreneurship and economic growth is presented separately in Figure 7. The fitted line indicates a weak negative unconditional association in the available country-year observations. Within this sample, the composite innovation measure remains more informative as a complementary indicator of entrepreneurial and technological capacity than as a stable explanation of annual changes in economic growth. The distinction reinforces the importance of separating formal business entry from other dimensions of entrepreneurship instead of assuming that all available measures represent the same economic process.

Figure 7: Innovative entrepreneurship and economic growth



Note: Country-year observations ($N = 292$) from the 17 economies included in the sample; the line is a bivariate linear fit. *Source:* Authors' calculations based on World Bank indicators included in the project database.

Overall, the evidence highlights three features of the Latin American and Caribbean experience. First, the long-run increase in average regional income coexists with substantial volatility and cross-country heterogeneity in economic growth. Second, formal business creation has expanded within an environment characterized by persistent labor informality and uneven institutional development. Third, the strong relationships observed in income levels become weaker and more dependent on the entrepreneurship measure when annual growth rates and changes are considered.

These patterns connect the regional context to the article's central empirical proposition. The relevant issue is not simply whether entrepreneurship and income move together, but whether greater formal business entry is associated with improved economic performance after accounting for institutional quality, labor informality, productive integration, persistent country characteristics, and common time shocks. The econometric analysis that follows examines this conditional relationship against the empirical background established by these stylized facts.

3 Theoretical Framework and Literature Review

The Ramsey–Cass–Koopmans framework provides the starting point for understanding how capital accumulation and technological conditions shape long-run income (Ramsey, 1928; Cass, 1965; Koopmans, 1965). In its standard formulation, however, entrepreneurship does not appear as a distinct productive force. The framework used in this article introduces entrepreneurship as a knowledge externality through which business creation can contribute to aggregate production. This mechanism is consistent with endogenous-growth models in which knowledge generates social returns that exceed the private returns received by individual firms (Romer, 1986, 1990).

Entrepreneurship can activate this mechanism by transforming dispersed knowledge into new products, production processes, organizational forms, and markets. This interpretation follows the

Schumpeterian view of entrepreneurship as a source of economic transformation (Schumpeter, 1934) and the knowledge-spillover theory of entrepreneurship, according to which new firms commercialize knowledge that incumbent organizations do not fully exploit (Acs et al., 2009). Nevertheless, business creation is not productive by definition. Entrepreneurial effort may be productive, unproductive, or destructive depending on the incentives and opportunities created by the surrounding environment (Baumol, 1990). The economic contribution of entrepreneurship therefore depends on both the type of activity created and the conditions under which firms operate.

This distinction is particularly relevant in Latin America and the Caribbean. The region combines widespread entrepreneurial activity with persistent difficulties in innovation, scaling, and productivity (Lederman et al., 2014; Acs and Amorós, 2008). Evidence for Peru similarly indicates a relationship between business entrepreneurship and economic growth while emphasizing the importance of the broader economic environment (León-Mendoza, 2019). More recent cross-country research also finds that the relationship between entrepreneurship and growth varies across measures and institutional settings (Munyo and Veiga, 2024). These findings caution against treating all forms of entrepreneurship as equivalent.

Entrepreneurship policies in the region have increasingly sought to simplify business creation, expand access to finance, strengthen entrepreneurial capabilities, and support innovation. However, the implementation and institutional coordination of these policies remain uneven across countries (OECD et al., 2024). Policies that increase the number of new firms may therefore expand formal entry without necessarily ensuring firm survival, innovation, productivity, or growth. In this article, new registered firms constitute the principal measure of entrepreneurship because they capture entry into the formal business sector. New-business density provides the closest alternative measure, while the employers' share and the innovative entrepreneurship index are used as complementary indicators.

Whether formal business entry generates productive knowledge depends partly on the institutional environment in which entrepreneurial activity takes place. Institutions determine the incentives under which entrepreneurs identify opportunities, allocate resources, and organize production. Secure property rights, contract enforcement, regulatory predictability, and effective public administration can reduce uncertainty and facilitate investment, hiring, and firm expansion (North, 1990). Weak institutions, by contrast, may redirect entrepreneurial effort toward regulatory avoidance, rent seeking, or short-term survival instead of innovation and productivity. Institutions consequently affect not only the amount of entrepreneurship observed in an economy, but also the forms that entrepreneurial activity takes.

Empirical research supports this connection between institutions, entrepreneurship, and economic performance. Opportunity-driven entrepreneurship is more likely to contribute to growth when supported by an effective institutional environment (Aparicio et al., 2016). Reviews of the literature similarly show that formal and informal institutions influence entrepreneurial entry, opportunity recognition, and the capacity of new firms to generate economic value (Urbano et al., 2019). Evidence from developing economies further suggests that the association between entrepreneurial activity and growth depends on institutional conditions rather than operating uniformly across countries (Urbano et al., 2020).

Within this institutional setting, labor informality is a central feature of the environment in which entrepreneurship develops in Latin America and the Caribbean. Informality may reflect exclusion

from formal employment and business opportunities, but it may also represent an exit response to regulation, taxation, or limited confidence in public institutions (Perry et al., 2007). Informal activity can provide employment and income when formal opportunities are scarce, yet informal firms generally operate with restricted access to finance, technology, legal protection, skilled labor, and larger markets (La Porta and Shleifer, 2014).

The relationship between informality and productivity is therefore not merely mechanical. Evidence from Brazil shows that formal and informal firms differ in productivity, scale, and responses to enforcement and formalization policies (Ulyssea, 2018). More broadly, informality reflects interactions among firm productivity, labor-market conditions, regulation, enforcement, and economic development (Ulyssea, 2020). Evidence from Latin American countries also indicates that formal institutions influence the prevalence and character of informal entrepreneurial activity (Salinas et al., 2023).

Institutions and informality are consequently connected components of the regional entrepreneurial environment. Stronger institutions can reduce the costs and uncertainty associated with formal activity, whereas persistent informality may restrict the markets, resources, and incentives available to registered firms. Formal business entry may therefore coexist with very different economic outcomes depending on whether new firms operate in an environment that allows them to survive, expand, and become productive.

The contribution of entrepreneurship may also depend on the degree to which firms are connected to broader productive and international markets. Export participation can promote learning, scale, quality upgrading, and the reallocation of resources toward more productive firms, although more productive firms are also more likely to become exporters (Clerides et al., 1998; Melitz, 2003). Foreign direct investment may generate technological, managerial, and market spillovers, but these benefits depend on domestic absorptive capacity (Borensztein et al., 1998). Exports and FDI are therefore incorporated as features of the productive environment instead of as independent explanations competing with the article's central argument.

These theoretical and empirical arguments can be organized within an augmented Ramsey–Cass–Koopmans model that incorporates an entrepreneurial knowledge externality into aggregate production (Barro and Sala-i Martin, 2004). A representative household chooses consumption over time according to:

$$\max_{\{c_t\}_{t\geq 0}} \int_0^\infty e^{-\rho t} \frac{c_t^{1-\theta} - 1}{1-\theta} L_t \, dt. \tag{1}$$

Here, ρ is the rate of time preference, θ is the inverse of the intertemporal elasticity of substitution, and population grows at the exogenous rate n. Aggregate production is given by:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \kappa_t^\gamma. \tag{2}$$

In this expression, A_t denotes total factor productivity, K_t is physical capital, L_t denotes population, and κ_t represents the entrepreneurial knowledge externality. In per-capita terms, capital evolves according to:

$$\dot{k}_t = A_t k_t^\alpha \kappa_t^\gamma - c_t - (\delta + n) k_t. \tag{3}$$

Taking the entrepreneurial externality as external to the individual firm's private optimization problem, the Euler equation is:

$$\frac{\dot{c}_t}{c_t} = \frac{1}{\theta}\left[\alpha A_t k_t^{\alpha-1}\kappa_t^{\gamma} - \delta - \rho\right]. \tag{4}$$

In the conditional steady state, output per capita is:

$$y^* = \alpha^{\frac{\alpha}{1-\alpha}} A^{\frac{1}{1-\alpha}} \kappa^{\frac{\gamma}{1-\alpha}} (\rho+\delta)^{-\frac{\alpha}{1-\alpha}}. \tag{5}$$

This expression shows that entrepreneurship can raise steady-state output when it generates knowledge that increases aggregate productive capacity. To connect this mechanism with the regional environment, total factor productivity is written as:

$$\ln A_{it} = a_i + \lambda_t + \sigma S_{it} - \eta F_{it} + \mu \ln X_{it} + \nu \operatorname{asinh}(D_{it}). \tag{6}$$

The entrepreneurial knowledge externality is represented as:

$$\ln \kappa_{it} = \omega E_{it}. \tag{7}$$

Here, E_{it} denotes formal business entry, S_{it} institutional quality, F_{it} labor informality, X_{it} exports, and D_{it} foreign direct investment. The country component a_i captures persistent national characteristics, while λ_t captures shocks shared across economies. Substituting these expressions into the steady-state equation yields:

$$\begin{aligned} \ln y_{it}^* = C + \frac{1}{1-\alpha}\Big(& a_i + \lambda_t + \gamma\omega E_{it} + \sigma S_{it} - \eta F_{it} \\ & + \mu \ln X_{it} + \nu \operatorname{asinh}(D_{it})\Big) - \frac{\alpha}{1-\alpha}\ln(\rho+\delta). \end{aligned} \tag{8}$$

The model provides a direct bridge to the empirical analysis. Formal business entry represents the entrepreneurial channel, institutions and informality characterize the environment in which that channel operates, and exports and FDI capture productive integration. The real interest rate plus depreciation is included empirically as a proxy for the cost of capital. Country and year fixed effects correspond to a_i and λ_t, respectively. Specifications using new-business density, alternative institutional indicators, labor productivity, and interaction terms are treated as complementary extensions of this central model.

Taken together, the model and the literature imply that increases in formal business entry should be positively associated with real GDP per capita growth across the 17 Latin American and Caribbean economies included in the sample, conditional on institutional quality and labor informality. The estimations using income levels and labor productivity examine complementary implications of the same mechanism, while the alternative entrepreneurship measures and estimators assess whether the central relationship depends on a particular operational definition or econometric specification.

4 Data and Methodology

The empirical analysis combines annual country-level information for 17 Latin American and Caribbean economies: Argentina, Bolivia, Brazil, Chile, Colombia, the Dominican Republic,

Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, and Uruguay. The observation period is 2002–2025, although the effective coverage differs across variables. Real GDP per capita, labor productivity, trade, foreign direct investment, labor-market indicators, and the macroeconomic controls are drawn from the World Bank's World Development Indicators (World Bank, 2026b). Formal business entry and new-business density come from the World Bank Entrepreneurship Database, whose measures refer to newly registered limited-liability companies and therefore capture formal rather than total entrepreneurial activity (World Bank, 2026a). Institutional quality is measured alternatively using author-constructed aggregates based on the World Bank's Worldwide Governance Indicators (WGI) (Kaufmann and Kraay, 2024; World Bank, 2025) and the Varieties of Democracy (V-Dem) v16 dataset (Coppedge et al., 2026); labor informality is obtained from ILOSTAT's SDG indicator 8.3.1 (International Labour Organization, 2026).

The database is constructed on a country–year frame containing 408 potential observations, corresponding to 17 economies observed over 24 years. This frame is complete for real GDP per capita, but the estimation panels are unbalanced because the explanatory variables have different temporal and geographical coverage. New registered firms and new-business density contain 274 observations, WGI 391, the innovative entrepreneurship index 303, and labor informality 143. Each regression is therefore estimated with the complete observations available for the variables included in that specification, without imputing missing values. The Appendix reports coverage by country and variable. A short balanced panel comprising Argentina, Brazil, Mexico, Peru, and Uruguay over 2017–2022 is used only as a sensitivity exercise.

The principal outcomes are real GDP per capita, expressed in logarithms, and its annual growth rate, defined as $g_{it} = 100\Delta \ln y_{it}$. Labor productivity, measured as real GDP per worker, and its growth rate provide complementary outcomes. Formal entrepreneurial activity is represented primarily by the logarithm of new registered firms. New-business density, the employers' share, and the innovative entrepreneurship index are used to assess whether the results depend on a particular operational measure of entrepreneurship. New-business density is the number of newly registered limited-liability companies per 1,000 working-age adults. The innovative entrepreneurship index is the mean of the available standardized components for resident patents and industrial designs per million workers, research and development expenditure as a share of GDP, and high-technology exports as a share of manufactured exports; at least two components are required to construct the index.

WGI and V-Dem are introduced in separate specifications because they capture related but distinct dimensions of the institutional environment. The WGI aggregate used in the analysis is constructed from four governance dimensions: Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. Let PV_{it}, RQ_{it}, RL_{it}, and VA_{it} denote the corresponding 0–100 component scores. The aggregate is the simple arithmetic mean

$$WGI_{it} = \frac{PV_{it} + RQ_{it} + RL_{it} + VA_{it}}{4}. \tag{9}$$

All four components are required for a country–year observation to enter the aggregate. The level specifications use the natural logarithm of this index,

$$S_{it}^{WGI} = \ln(WGI_{it}). \tag{10}$$

The WGI variable employed in the regressions is therefore a four-component governance aggregate rather than an average of all six dimensions published within the broader WGI framework.

The alternative institutional measure is constructed from five V-Dem v16 democracy indices: Electoral Democracy, Liberal Democracy, Participatory Democracy, Deliberative Democracy, and Egalitarian Democracy. Let ED_{it}, LD_{it}, PD_{it}, DD_{it}, and EGD_{it} denote these five indices. The V-Dem aggregate is defined as

$$VDEM_{it} = \frac{ED_{it} + LD_{it} + PD_{it} + DD_{it} + EGD_{it}}{5}. \tag{11}$$

All five dimensions are required, and no logarithmic transformation is applied to the resulting V-Dem aggregate. Thus,

$$S_{it}^{VDEM} = VDEM_{it}. \tag{12}$$

The two institutional measures should therefore not be interpreted as interchangeable proxies for a single latent institutional concept. The WGI specification summarizes four selected dimensions of governance, whereas the V-Dem specification combines five dimensions of democracy. Their separate inclusion also avoids mechanically combining institutional measures constructed from conceptually different underlying indicators.

For the growth specifications, the institutional variables are transformed consistently with their level definitions. Changes in WGI are measured as $100\Delta \ln(WGI_{it})$, whereas changes in V-Dem are measured as $100\Delta VDEM_{it}$. Entrepreneurship, the resulting institutional variables, and informality are mean-centered before interaction terms are formed. Exports enter in per-capita or per-worker logarithms, according to the dependent variable. Foreign direct investment is expressed per capita and transformed using the inverse hyperbolic sine, which accommodates zero and negative observations. The cost-of-capital proxy is $q_{it} = \text{asinh}(r_{it}^{\text{real}} + \delta)$, with an annual depreciation rate of 5%. Population growth is included in the income-per-capita specifications and employment growth in the labor-productivity specifications. Gross fixed capital formation is not added as a separate structural regressor because capital accumulation is endogenous in the theoretical model.

Table 1: Selected descriptive statistics: unbalanced panel

Variable	N	Mean	SD	Min	Max
Log real GDP per capita	408	8.751	0.581	7.500	10.576
GDP per capita growth	391	2.565	5.369	-21.001	48.311
Log exports per capita	358	7.369	0.637	6.303	9.043
asinh FDI per capita	391	5.427	2.311	-8.684	9.661
Log new registered firms	274	9.233	1.916	3.178	13.795
Log new-business density	274	0.149	1.027	-2.967	2.501
Log employers' share	408	1.440	0.315	0.783	2.464
Innovative entrepreneurship index	303	-0.023	0.773	-2.073	1.397
Log WGI aggregate	391	4.021	0.139	3.751	4.387
V-Dem aggregate	408	0.521	0.146	0.164	0.841
Log informal employment	143	3.983	0.343	3.064	4.435
asinh(real interest + depreciation)	334	2.990	1.366	-4.670	5.287
Population growth	391	1.052	0.620	-0.415	2.959

The empirical strategy is organized around a two-way fixed-effects model. Country effects absorb persistent characteristics, such as geography, historical productive structure, and long-standing institutional differences, that may be correlated with entrepreneurship and economic performance,

while year effects capture shocks shared across the region. The main specification combines new registered firms with WGI because this pairing most directly links formal business creation to the governance environment emphasized in the theoretical framework. Standard errors are clustered by country to allow for heteroskedasticity and serial correlation within economies.

Because the preferred fixed-effects specifications are estimated with 13 country clusters, conventional cluster-robust inference may overstate statistical precision. Inference for the focal entrepreneurship coefficients is therefore additionally evaluated using wild-cluster bootstrap tests at the country level. The bootstrap procedure preserves clustering at the country level and provides a finite-sample robustness check on the conventional country-clustered standard errors. Wild-cluster bootstrap p-values are reported separately for the principal entrepreneurship coefficients and are given greater weight when assessing their statistical significance. This difference is particularly relevant for results close to conventional significance thresholds. Random-effects estimates are reported only as a comparison, because their identifying assumption requires the country-specific component to be uncorrelated with the regressors.

The fixed-effects specification for income levels is:

$$\begin{aligned}\ln y_{it} = \mu_i + \lambda_t + \beta_E E^c_{it} + \beta_S S^c_{it} + \beta_F F^c_{it} + \beta_{ES} E^c_{it} S^c_{it} + \beta_{EF} E^c_{it} F^c_{it} \\ + \beta_{SF} S^c_{it} F^c_{it} + \beta_{ESF} E^c_{it} S^c_{it} F^c_{it} + \mathbf{Z}'_{it}\boldsymbol{\gamma} + \varepsilon_{it},\end{aligned} \tag{13}$$

Here, E^c_{it} denotes centered entrepreneurship, S^c_{it} centered institutional quality, F^c_{it} centered labor informality, and $\mathbf{Z}_{it}$ the vector of productive and macroeconomic controls. Depending on the institutional specification, S_{it} corresponds either to $\ln(WGI_{it})$ or to $VDEM_{it}$ as defined above. The specification follows the hierarchical principle by retaining all lower-order terms associated with the triple interaction. The relevant quantity is not an isolated interaction coefficient but the conditional marginal association between entrepreneurship and income:

$$\frac{\partial \ln y_{it}}{\partial E^c_{it}} = \beta_E + \beta_{ES} S^c_{it} + \beta_{EF} F^c_{it} + \beta_{ESF} S^c_{it} F^c_{it}. \tag{14}$$

This expression indicates whether the association of formal business entry with economic performance changes with institutional quality and labor informality.

To examine annual economic growth, the same two-way fixed-effects design is estimated in changes. The principal contemporaneous equation is:

$$g_{it} = \mu_i + \lambda_t + \theta_E \Delta E_{it} + \theta_S \Delta S_{it} + \theta_F \Delta F_{it} + \Delta \mathbf{Z}'_{it}\boldsymbol{\eta} + v_{it}. \tag{15}$$

Here, ΔS_{it} follows the transformation appropriate to the institutional measure: $100\Delta \ln(WGI_{it})$ in the WGI specifications and $100\Delta VDEM_{it}$ in the V-Dem specifications. The corresponding centered interaction terms are added when the conditioning roles of institutions and informality are examined. A conditional-convergence specification relates current growth to initial income and lagged structural conditions:

$$g_{it} = \mu_i + \lambda_t + \varphi \ln y_{i,t-1} + \boldsymbol{\psi}' \mathbf{W}_{i,t-1} + \Delta \mathbf{Z}'_{it}\boldsymbol{\eta} + u_{it}, \tag{16}$$

Here, $\mathbf{W}_{i,t-1}$ contains lagged entrepreneurship, institutions, informality, and the interaction terms included in the corresponding specification. A negative value of φ is consistent with conditional convergence. The labor-productivity extensions replace real GDP per capita and population growth with real GDP per worker and employment growth, respectively. These estimations, together with the alternative entrepreneurship indicators and V-Dem specifications, are interpreted as complementary applications of the same empirical framework instead of as independent empirical exercises.

Difference and System generalized method of moments (GMM) estimators provide an additional check on income persistence and the possible endogeneity of entrepreneurship. Difference GMM eliminates country effects by first-differencing and uses suitable lagged levels as instruments (Arellano and Bond, 1991). System GMM augments the differenced equations with equations in levels and additional moment conditions based on lagged differences (Blundell and Bond, 1998). The instrument set is restricted through collapsed instruments, short lag windows, and fewer instruments than countries. The reported two-step standard errors use the finite-sample correction proposed by Windmeijer (2005). Instrument validity and serial correlation are assessed with the Hansen test and the Arellano–Bond AR(2) test, respectively. Because the GMM samples contain only 13 economies, these estimates are treated strictly as dynamic robustness exercises and do not replace the fixed-effects results on which the article's conclusions are based.

5 Results

Building on the empirical strategy described above, Table 2 presents the two-way fixed-effects estimates for real GDP per capita, with formal business entry as the principal measure of entrepreneurship. WGI and V-Dem are introduced separately, and the alternative entrepreneurship indicators show whether the central relationship extends beyond registered business creation. Because entrepreneurship, institutions, and informality are centered before the interaction terms are constructed, the entrepreneurship coefficient represents its association with real GDP per capita when institutional quality and informality are at their sample means.

Table 2: Selected coefficients from two-way fixed-effects level specifications

	WGI				V-Dem			
	New firms	Density	Employers	Innovation	New firms	Density	Employers	Innovation
Entrepreneurship	0.0304**	0.0310**	-0.0219	-0.0421	0.0501***	0.0453**	0.0705	-0.0127
	(0.0132)	(0.0124)	(0.0462)	(0.0392)	(0.0153)	(0.0149)	(0.0628)	(0.0366)
Wild-cluster p-value	0.180	0.165	–	–	0.056	0.075	–	–
Institutions	0.504	0.367	0.899***	1.065**	-0.0963	0.0079	0.329*	0.174
	(0.489)	(0.341)	(0.248)	(0.355)	(0.0879)	(0.103)	(0.151)	(0.159)
Informality	-0.0846	-0.0929	-0.0753	0.155	-0.0091	-0.0800	-0.0529	-0.0299
	(0.110)	(0.102)	(0.0737)	(0.0887)	(0.0567)	(0.0935)	(0.0909)	(0.0533)
$E \times INF$	-0.0125	-0.0171	0.192	0.151	-0.0001	0.0249	0.277	0.0705
	(0.0295)	(0.0273)	(0.185)	(0.116)	(0.0329)	(0.0501)	(0.156)	(0.0794)
$E \times S \times INF$	-0.0316	-0.165	-1.326*	0.481	0.216***	0.224*	-0.115	0.523
	(0.145)	(0.153)	(0.620)	(0.411)	(0.0634)	(0.119)	(0.704)	(0.388)
Exports	-0.0081	0.0215	0.0089	0.0838	-0.0292	0.0074	0.0371	0.0179
	(0.108)	(0.101)	(0.0683)	(0.0785)	(0.0971)	(0.107)	(0.0623)	(0.0900)
FDI	0.0011	0.0009	0.0011	0.0031	0.0012	0.0009	0.0004	0.0033
	(0.00242)	(0.00224)	(0.00256)	(0.00219)	(0.00192)	(0.00165)	(0.00290)	(0.00211)
Observations	81	81	90	76	81	81	90	76
Countries	13	13	13	13	13	13	13	13
Within R^2	0.784	0.792	0.820	0.798	0.768	0.757	0.758	0.741

Note: Country-clustered standard errors are reported in parentheses. All specifications include country and year effects. The constituent lower-order interaction terms and remaining controls are included in the estimations but are not displayed. Stars refer to conventional country-clustered inference: $^{*}p < 0.10$, $^{**}p < 0.05$, and $^{***}p < 0.01$. Wild-cluster bootstrap p-values are reported separately for the focal formal-entry coefficients and are given priority when assessing their statistical significance.

In the WGI specifications, the coefficients on new registered firms and new-business density are positive, with estimated elasticities close to 0.03. Under conventional country-clustered inference, both coefficients are statistically significant at the 5% level. However, their statistical significance does not survive wild-cluster bootstrap inference, with p-values of 0.180 and 0.165, respectively. The WGI level relationship should therefore be interpreted as positive but imprecisely estimated rather than as statistically robust. The point estimates imply that, at the sample means of WGI and informality, a 10% increase in either formal-entry measure is associated with approximately 0.3% higher real GDP per capita.

The V-Dem level estimates also associate formal business entry positively with income. The coefficients on new firms and density are 0.0501 and 0.0453, respectively. Their wild-cluster bootstrap p-values are 0.056 and 0.075, providing marginal evidence at the 10% level but not at the 5% level. Neither the employers' share nor the innovative entrepreneurship index has a statistically significant focal coefficient under either institutional measure. The evidence therefore distinguishes formal entry from the broader entrepreneurship proxies, but remains sensitive to the institutional measure and inference threshold.

The interaction terms provide more selective evidence about the conditions governing this relationship. The interaction between entrepreneurship and informality is not statistically significant in any of the eight level specifications. The triple interaction is positive and conventionally significant for new firms and density under V-Dem, whereas it is not significant for these formal-entry measures under WGI and is not reproduced for the employers' share or innovation. These V-Dem estimates suggest that the relationship between formal entry and income may vary jointly with democracy and informality, but they do not establish a stable moderating mechanism across institutional measures or entrepreneurship proxies. The direct informality coefficients are not statistically significant in the reestimated V-Dem models. Exports and FDI are likewise statistically insignificant in all eight level specifications reported in the table.

Table 3 examines whether changes in entrepreneurial activity are associated with annual real GDP per capita growth. The distinction between formal entry and the broader entrepreneurship measures becomes clearer in these specifications.

Table 3: Entrepreneurship growth and real GDP per capita growth

Specification	New firms	Density	Employers	Innovation
FE–WGI	0.0731***	0.0743***	-0.0421	-0.0126
	(0.0225)	(0.0227)	(0.0275)	(0.00803)
Wild-cluster p-value	0.046	0.042	–	–
Observations	64	64	73	59
Countries	13	13	13	13
Within R^2	0.891	0.891	0.879	0.922
RE–WGI	0.0723**	0.0738**	-0.0109	-0.0112
	(0.0239)	(0.0244)	(0.0223)	(0.00792)
Observations	64	64	73	59
Countries	13	13	13	13
Overall R^2	0.867	0.868	0.850	0.897
FE–V-Dem	0.0299	0.0292	-0.0250	-0.0173
	(0.0187)	(0.0188)	(0.0334)	(0.0130)
Wild-cluster p-value	0.198	0.207	–	–
Observations	64	64	73	59
Countries	13	13	13	13
Within R^2	0.910	0.910	0.876	0.921
RE–V-Dem	0.0324*	0.0318*	-0.0010	-0.0209
	(0.0169)	(0.0169)	(0.0268)	(0.0176)
Observations	64	64	73	59
Countries	13	13	13	13
Overall R^2	0.896	0.896	0.848	0.882

Note: Entries report the coefficients on the corresponding entrepreneurship-growth measure. Country-clustered standard errors are reported in parentheses. All specifications include year effects. FE models include country fixed effects, whereas RE models include country-specific random effects. Stars refer to conventional country-clustered inference: $^{*}p < 0.10$, $^{**}p < 0.05$, and $^{***}p < 0.01$. Wild-cluster bootstrap p-values are reported separately for the focal formal-entry coefficients in the FE specifications and are given priority when assessing their statistical significance.

Growth in new registered firms and new-business density is positively associated with economic growth in the FE–WGI specifications. Both coefficients remain statistically significant at the 5% level under wild-cluster bootstrap inference, with p-values of 0.046 and 0.042, respectively. Their RE–WGI counterparts are similar in magnitude and conventionally significant. Under V-Dem, the FE coefficients on the two formal-entry measures remain positive but are smaller and statistically insignificant; their wild-cluster bootstrap p-values are 0.198 and 0.207. The corresponding RE–V-Dem coefficients are significant only at the 10% level under conventional inference. The employers' share and the innovative entrepreneurship index remain insignificant throughout. The growth results therefore provide the strongest evidence for a relationship between formal business creation and economic performance in the preferred FE–WGI specifications, while also showing that the result is sensitive to the institutional measure used.

The conditional-convergence estimates in Table 4 place this relationship within the adjustment dynamics suggested by the theoretical model.

Table 4: Conditional-convergence estimates: FE–WGI specifications

	New firms	Density	Employers	Innovation
Lagged initial income	-40.94***	-36.77**	-46.22***	-46.81***
	(13.16)	(14.08)	(12.41)	(15.06)
$E_{t-1} \times INF_{t-1}$	-3.287*	-3.476*	21.44	-6.183
	(1.702)	(1.666)	(21.34)	(11.00)
Exports	0.194*	0.208*	0.178**	0.172**
	(0.107)	(0.109)	(0.0741)	(0.0702)
Lagged cost of capital	-0.339**	-0.267	-0.141	-0.137
	(0.121)	(0.158)	(0.160)	(0.208)
Observations	75	75	82	75
Countries	13	13	13	13
Within R^2	0.877	0.877	0.880	0.884

Note: The table reports selected coefficients from the two-way fixed-effects convergence equations. Country-clustered standard errors are reported in parentheses. All specifications include country and year effects. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Lagged income is negative and statistically significant in all four specifications, a pattern consistent with conditional convergence within the sample. Under conventional country-clustered inference, the lagged interaction between entrepreneurship and informality is negative and statistically significant at the 10% level for new firms and density, suggesting that informality may weaken the subsequent growth contribution of formal business creation. Given the small number of country clusters and the marginal level of significance, this interaction evidence should be regarded as suggestive rather than conclusive. It is also not reproduced for the other entrepreneurship measures. Exports are positively associated with growth in all four convergence specifications, while the lagged cost of capital is negative and statistically significant only in the new-firms model.

Table 5 reports the new-firms and WGI results obtained from alternative estimators. These estimates are presented to evaluate sensitivity rather than to assign equal weight to models with different identifying assumptions.

Table 5: Complementary estimator results: new firms and WGI

	FE	RE	Difference GMM	System GMM
Lagged income	–	–	-0.2289	0.1588
			(0.4691)	(0.1697)
New firms	0.0304**	-0.0214	0.1391	0.1333*
	(0.0132)	(0.0464)	(0.1506)	(0.0625)
Wild-cluster p-value	0.180	–	–	–
WGI	0.504	0.657	0.3363	0.2388
	(0.489)	(0.775)	(0.2412)	(0.3181)
Informality	-0.0846	-0.993*	0.0555	-0.1748
	(0.110)	(0.529)	(0.1241)	(0.1201)
$E \times INF$	-0.0125	0.130	0.0245	0.1871**
	(0.0295)	(0.137)	(0.0764)	(0.0731)
Exports	-0.0081	0.251***	0.3930*	0.4790***
	(0.108)	(0.0524)	(0.1857)	(0.0486)
FDI	0.0011	-0.0056*	–	–
	(0.0024)	(0.0026)		
Cost of capital	0.0033	-0.0450	0.0021	-0.0040
	(0.0024)	(0.0288)	(0.0096)	(0.0032)
Observations	81	81	64	81
Countries	13	13	13	13
Within/overall R^2	0.784	0.972	–	–
Instruments	–	–	8	11
AR(1), p	–	–	0.336	0.500
AR(2), p	–	–	0.029	0.326
Hansen, p	–	–	0.731	0.762
Sargan, p	–	–	0.580	0.032

Note: Standard errors are reported in parentheses. FE and RE correspond to the level specification, whereas the GMM models include lagged income and use a more parsimonious set of covariates; their coefficients are therefore not directly comparable. The GMM columns report two-step estimates with Windmeijer-corrected standard errors and finite-sample t inference. The instrument matrices are collapsed and contain fewer instruments than countries. Stars refer to conventional country-clustered inference in the FE and RE columns and to finite-sample t inference in the GMM columns: $^{*}p < 0.10$, $^{**}p < 0.05$, and $^{***}p < 0.01$. The wild-cluster bootstrap p-value is reported separately for the focal FE coefficient and is given priority when assessing its statistical significance.

The WGI-based GMM estimates do not provide an independent validation of the fixed-effects result. Difference GMM rejects the absence of second-order serial correlation, with an AR(2) p-value of 0.029, undermining the validity of the lagged instruments in that specification. System GMM does not reject the null of no second-order serial correlation, and its Hansen test does not reject the instrument set. However, AR(1) is not statistically significant and the Sargan test rejects at the 5% level. The positive System GMM coefficient on new firms is significant only at the 10% level under finite-sample inference and should not be interpreted as decisive corroboration. Given these diagnostics and the effective sample of only 13 countries, the dynamic estimates remain a limited robustness exercise and do not alter the weight assigned to the fixed-effects evidence.

Table 6 extends the dynamic-panel check to V-Dem and all four entrepreneurship indicators. It reports the focal entrepreneurship coefficient, its interaction with informality, and the principal model diagnostics.

Table 6: Dynamic-panel robustness estimates using V-Dem

	Difference GMM					System GMM				
Measure	Entrepreneurship	$E \times INF$	Obs.	AR(2)	Hansen	Entrepreneurship	$E \times INF$	Obs.	AR(2)	Hansen
New firms	0.1215	0.0676	64	0.021	0.594	0.1245	0.1765	81	0.425	0.637
	(0.1711)	(0.0839)				(0.0895)	(0.1714)			
Density	0.0902	-0.0227	64	0.036	0.815	-0.0222	0.1398	81	0.475	0.081
	(0.1476)	(0.0948)				(0.0731)	(0.2317)			
Employers	0.7287	-4.5670	78	0.284	0.660	0.4221	-2.6450	95	0.106	0.750
	(0.7586)	(5.1198)				(0.3358)	(1.5964)			
Innovation	0.0464	-0.3686	59	0.817	0.429	0.0762	-0.2720	76	0.523	0.436
	(0.1913)	(0.5868)				(0.1425)	(0.4280)			

Note: Two-step estimates with Windmeijer-corrected standard errors are reported; standard errors appear in parentheses. Difference GMM uses eight instruments and System GMM eleven, in every case fewer than the 13 countries in the effective estimation sample. Reported p-values correspond to the Arellano–Bond AR(2) and Hansen tests. None of the focal coefficients is statistically significant at the 10% level under finite-sample t inference.

The V-Dem GMM results do not confirm a dynamic effect for any entrepreneurship measure. Neither the focal entrepreneurship coefficients nor their interactions with informality are statistically significant at the 10% level in Difference or System GMM. The Difference GMM specifications for new firms and density reject the null of no second-order serial correlation, with AR(2) p-values of 0.021 and 0.036. Although the remaining AR(2) and Hansen statistics are generally more favorable, the System GMM density specification has a Hansen p-value of 0.081, and AR(1) is not statistically significant in any of the eight V-Dem models. The corresponding Sargan tests also reject instrument validity in the density and innovation System GMM specifications. These diagnostics reinforce the decision to treat the V-Dem dynamic estimates as limited robustness evidence rather than as a separate basis for inference.

The complementary labor-productivity estimates point in a similar but not identical direction. Exports per worker are positively associated with productivity, whereas informality and employment growth generally enter with negative signs. FDI is positive in some growth and productivity specifications but is neither statistically nor economically stable across models. The results consequently provide stronger evidence for formal business entry in the growth equations and for export integration than for a systematic contribution from FDI.

Taken together, the estimates support a deliberately narrower conclusion than the proposition that entrepreneurship automatically generates economic growth. The strongest evidence concerns changes in formal business creation: growth in new registered firms and new-business density is positively associated with annual real GDP per capita growth in the FE–WGI specifications, and both relationships remain statistically significant under wild-cluster bootstrap inference. In the income-level specifications, the corresponding WGI coefficients are positive but imprecisely estimated under small-cluster inference, while the V-Dem estimates provide only marginal support at the 10% level. The relationship is not reproduced for the employers' share or the innovative entrepreneurship index, and the V-Dem growth and dynamic-panel estimates do not confirm it. Moreover, the interaction estimates do not establish a stable conditioning role for institutions or informality across specifications. The main empirical regularity is therefore a comparatively robust association between formal business entry and economic growth within the WGI fixed-effects framework, rather than a general effect of entrepreneurship on economic performance. These findings are observational and should be interpreted as within-country associations rather than definitive causal effects.

6 Discussion

The results clarify the sense in which entrepreneurship is associated with economic performance in Latin America and the Caribbean. The clearest evidence concerns changes in formal business creation and economic growth. Growth in new registered firms and new-business density is positively associated with real GDP per capita growth in the preferred fixed-effects specifications using WGI, and both relationships remain statistically significant under wild-cluster bootstrap inference. In the income-level specifications, the corresponding WGI coefficients are also positive, with estimated elasticities close to 0.03, but their statistical significance does not survive the small-cluster correction. The reestimated V-Dem level models yield larger positive coefficients for new firms and density, with wild-cluster bootstrap p-values of 0.056 and 0.075. This constitutes marginal evidence at the 10% level, but not at the 5% level. The same support does not carry over to the V-Dem fixed-effects growth equations or to the V-Dem dynamic-panel estimates. The evidence is therefore strongest for the relationship between changes in formal business entry and economic growth under WGI, while the positive association in income levels remains more sensitive to the institutional measure, estimator, and inference threshold. Moreover, the pattern is not reproduced for the employers' share or the innovative entrepreneurship index. This distinction matters because the registration of new firms captures the expansion of the formal business base, but does not by itself reveal whether those firms survive, grow, innovate, or generate productivity gains. The results are consequently consistent with the regional diagnosis of many firms but limited innovation described by Lederman et al. (2014), as well as with Baumol (1990), who emphasizes that the economic contribution of entrepreneurship depends on the activities toward which entrepreneurial effort is directed. They also complement the regional evidence presented by León-Mendoza (2019): entrepreneurship may be associated with economic growth, but the relationship depends on how entrepreneurial activity is defined and on the environment in which it takes place. From the perspective of the knowledge-spillover theory developed by Acs et al. (2009), entry contributes to growth only when new firms are capable of transforming knowledge and opportunities into commercially productive activity.

The institutional results reinforce the importance of distinguishing among different dimensions of the institutional environment. WGI has a positive and statistically significant direct coefficient in some specifications based on the employers' share and innovative entrepreneurship, whereas the direct V-Dem coefficient is conventionally significant only in the employers specification. At the same time, the V-Dem level models provide marginal wild-bootstrap support for the focal new-firms and density coefficients. These findings indicate that the governance dimensions represented in the WGI aggregate used here—Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability—capture a different institutional environment from the electoral, liberal, participatory, deliberative, and egalitarian dimensions summarized by the V-Dem aggregate. This does not imply that one institutional measure is inherently superior to the other; rather, it shows that alternative institutional concepts are not empirically interchangeable. The result is consistent with the argument that institutions influence economic performance by structuring incentives and reducing uncertainty (North, 1990), as well as with evidence that the relationship between entrepreneurship and growth depends on the surrounding institutional setting (Aparicio et al., 2016; Urbano et al., 2019).

The interaction results remain too heterogeneous to identify a stable institutional mechanism. The entrepreneurship–informality interaction is statistically insignificant in all eight fixed-effects level specifications. The triple interaction is positive and conventionally significant for new firms and density under V-Dem, suggesting that the conditional association between formal entry and

income may vary jointly with democracy and informality. However, this pattern is absent for the corresponding WGI formal-entry models, is not reproduced for the employers' share or innovation, and does not receive support from the growth or dynamic-panel specifications. The triple-interaction estimates should therefore be treated as specification-specific evidence rather than as proof of a general institutional threshold or compensating effect. Overall, the results do not establish that improvements in institutional quality systematically strengthen the entrepreneurship association or offset the economic constraints associated with informality.

Informality emerges more clearly as a structural constraint than as a uniform moderator of entrepreneurship. Its strong negative descriptive association with income per capita and its generally negative coefficients in the random-effects and labor-productivity models indicate that economies with greater labor informality tend to operate with lower levels of income and productivity. However, the direct coefficient becomes less precisely estimated once country and year effects are introduced; it is not statistically significant in the reestimated V-Dem fixed-effects models. This suggests that an important part of the unconditional association reflects persistent differences across countries. The lagged interaction between entrepreneurship and informality is negative for new firms and new-business density in the conditional-convergence equations under conventional country-clustered inference, but only at the 10% significance level. Given the relatively small number of country clusters and the marginal precision of these estimates, this evidence should be interpreted as suggestive rather than conclusive. The pattern is also not reproduced consistently in the remaining estimators. The results consequently offer more support for viewing informality as part of a low-productivity economic structure than for claiming that it systematically reduces the marginal contribution of every form of entrepreneurship. This interpretation is consistent with the exit and exclusion mechanisms described by Perry et al. (2007), the productivity differences between formal and informal firms emphasized by La Porta and Shleifer (2014), and the heterogeneous nature of informal firms documented in more recent research (Ulyssea, 2018, 2020).

Exports constitute the most recurrent productive correlate of economic performance in the estimations. Although their coefficient is statistically insignificant in the reported fixed-effects level specifications, exports are positively associated with economic growth in the conditional-convergence equations, with output per worker in the complementary productivity models, and in several dynamic-panel specifications. This pattern is compatible with learning, scale, quality upgrading, and reallocation toward more productive firms. At the same time, the results cannot distinguish these mechanisms from the possibility that more productive firms and economies are also more likely to enter foreign markets, a selection problem emphasized by Clerides et al. (1998) and incorporated into the heterogeneous-firm framework of Melitz (2003). The evidence for foreign direct investment is less stable. Its coefficient is not statistically significant in the preferred levels models and changes across the growth and productivity specifications. This instability is consistent with the argument that the contribution of FDI depends on domestic absorptive capacity, human capital, productive linkages, and sectoral composition (Borensztein et al., 1998). The negative cost-of-capital coefficient found in some equations is also consistent with the theoretical model, although it is not sufficiently stable to constitute one of the central empirical findings.

The dynamic estimations neither overturn the fixed-effects interpretation nor independently confirm it. In the WGI new-firms specification, Difference GMM rejects the null of no second-order serial correlation, with an AR(2) p-value of 0.029, which casts doubt on the validity of the lagged instruments. System GMM yields a positive new-firms coefficient that is significant only at the 10% level under finite-sample inference. Although its AR(2) and Hansen tests do not reject their

respective null hypotheses, AR(1) is statistically insignificant and the Sargan test rejects at the 5% level. The V-Dem estimates provide still less dynamic support: none of the four entrepreneurship coefficients or entrepreneurship–informality interactions is statistically significant at the 10% level under either Difference or System GMM. The Difference GMM models for new firms and density reject the AR(2) null, while the System GMM density model produces a Hansen p-value of 0.081. AR(1) is statistically insignificant across all eight V-Dem specifications, and the Sargan test rejects in the density and innovation System GMM models. Although the collapsed instrument counts remain below the number of countries, the estimations are based on only 13 effective countries. The GMM results should therefore be treated as a limited sensitivity exercise rather than as stronger evidence of a causal or dynamic entrepreneurship effect.

The policy implication is not that governments should seek to maximize the number of new firms independently of their productive potential. Policies centered exclusively on registration may increase business entry without necessarily improving firm survival, innovation, productivity, or scale. A more coherent strategy would connect formal entry with access to finance, managerial and technological capabilities, worker training, export networks, and opportunities to participate in domestic and international value chains. Formalization policies should likewise combine simpler regulation and enforcement with tangible benefits from operating formally, while institutional reforms should improve regulatory predictability, government effectiveness, and contract enforcement. The lack of a stable estimated interaction effect also implies that the analysis does not identify a single institutional reform or informality threshold that would automatically convert additional entry into growth. These priorities are consistent with recent regional policy recommendations that emphasize productive transformation and the creation of an enabling environment for SMEs and entrepreneurship (OECD et al., 2024). Because the estimates are observational, these implications should be understood as policy directions consistent with the empirical patterns rather than as the effects of interventions identified causally by the analysis.

Overall, the article provides a qualified answer to the question of when entrepreneurship is associated with better economic performance in Latin America and the Caribbean. The strongest empirical regularity is the positive relationship between changes in formal business creation and economic growth in the fixed-effects specifications using WGI, a result that remains statistically significant after accounting for the small number of country clusters through wild-cluster bootstrap inference. The corresponding WGI relationship with income levels is positive but less precisely estimated, while the V-Dem level models offer only marginal support and the V-Dem growth and GMM results do not confirm the relationship. Institutions and informality remain central to the theoretical and regional interpretation of the results, but the estimated interactions do not identify a robust institutional threshold or a single mechanism through which informality modifies the entrepreneurship relationship. The principal contribution is therefore to distinguish the expansion of formal business entry from the broader processes of innovation, productivity, and firm growth, and to show that entrepreneurship should be analyzed as part of a productive and institutional system instead of as an isolated source of economic growth.

7 Conclusion

While Latin America and the Caribbean display considerable entrepreneurial activity, does this translate into higher productivity and economic growth? The evidence suggests that the relevant distinction lies not simply in whether economies have more or less entrepreneurship, but in the forms that entrepreneurial activity takes and the productive and institutional environments in which it develops.

Formal business creation emerges as the dimension of entrepreneurship most closely associated with better economic performance. The strongest evidence concerns economic growth: increases in new registered firms and new-business density are positively associated with real GDP per capita growth in the fixed-effects specifications using WGI, and both relationships remain statistically significant under wild-cluster bootstrap inference. In the income-level specifications, the corresponding WGI coefficients are also positive and conventionally significant, but their significance does not survive the small-cluster correction. The V-Dem level specifications provide marginal support for the two formal-entry measures at the 10% level under wild-cluster inference, but this relationship is not confirmed in the V-Dem growth or dynamic-panel models. The employers' share and the innovative entrepreneurship index likewise do not display a consistent association with economic performance. The findings therefore support a relationship between formal business entry and economic growth under a specific empirical framework, rather than a general effect of every form of entrepreneurship.

Institutions and informality remain important components of the environment in which entrepreneurial activity develops, but the estimated interactions do not identify a stable moderating mechanism. Some V-Dem level specifications produce significant triple interactions, while the corresponding WGI, growth, and dynamic-panel models do not reproduce that pattern. The evidence consequently does not establish a general institutional threshold or demonstrate that stronger institutions systematically offset the constraints associated with informality. Informality is more consistently related to lower income and productivity as a structural characteristic of the regional economy than as a uniform moderator of the contribution of entrepreneurship.

The dynamic-panel estimations do not provide an independent confirmation of the preferred fixed-effects findings. Although System GMM produces a positive new-firms coefficient in the WGI specification, its statistical significance is marginal and the diagnostic tests require caution. None of the focal entrepreneurship coefficients or entrepreneurship–informality interactions is statistically significant in the V-Dem GMM specifications. Together with the small effective samples and mixed serial-correlation and instrument-validity diagnostics, these results justify treating Difference and System GMM as limited robustness exercises rather than as evidence of a causal or dynamic effect.

This interpretation also defines the limits of the analysis. The data are observational and unbalanced, effective sample sizes vary across specifications, and the available indicators do not permit direct observation of firm survival, scale, productivity, or the allocation of entrepreneurial effort. The results are also sensitive to the entrepreneurship measure, institutional indicator, estimator, and inference procedure employed. Consequently, the analysis identifies conditional within-country associations rather than causal effects.

Future research could examine these mechanisms using firm-level or subnational data, measures that better distinguish productive and opportunity-driven entrepreneurship from necessity-driven activity, and identification strategies capable of isolating the causal channels linking business creation, institutions, informality, and productivity. For the region, the central question is ultimately not how to generate more firms, but how to create the conditions that enable new firms to survive, become productive and innovative, access larger markets, and achieve sustained growth.

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Appendix

A Derivation of the Augmented RCK Model

Population evolves according to

$$\dot{L}_t = nL_t,$$

so that

$$L_t = L_0 e^{nt}.$$

Aggregate production is given by

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \kappa_t^{\gamma},$$

where A_t denotes total factor productivity, K_t is the aggregate capital stock, L_t is population, and κ_t represents the entrepreneurial knowledge externality.

The term κ_t is not interpreted as an additional reproducible factor of production analogous to physical capital. Rather, it acts as a multiplicative shifter of productive capacity.

Dividing aggregate output by population gives output per capita:

$$y_t = \frac{Y_t}{L_t} = A_t k_t^{\alpha} \kappa_t^{\gamma},$$

where

$$k_t = \frac{K_t}{L_t}.$$

A.1 Capital Accumulation

The aggregate resource constraint is

$$\dot{K}_t = Y_t - C_t - \delta K_t,$$

where C_t denotes aggregate consumption and $\delta > 0$ is the depreciation rate.

Defining per-capita consumption as

$$c_t = \frac{C_t}{L_t},$$

the law of motion for capital per capita is

$$\dot{k}_t = A_t k_t^{\alpha} \kappa_t^{\gamma} - c_t - (\delta + n) k_t.$$

A.2 Household Optimization

The representative household has constant-relative-risk-aversion preferences. The social planner chooses the path of per-capita consumption to maximize

$$\max_{\{c_t\}_{t \geq 0}} \int_0^{\infty} e^{-\rho t} L_t \left(\frac{c_t^{1-\theta} - 1}{1 - \theta} \right) dt,$$

where ρ is the subjective discount rate and $\theta > 0$ is the inverse of the intertemporal elasticity of substitution.

For the formulation used here, we assume

$$\rho > n.$$

Since

$$L_t = L_0 e^{nt},$$

the objective function can equivalently be written, apart from the constant L_0, as

$$\int_0^{\infty} e^{-(\rho - n)t} \left(\frac{c_t^{1-\theta} - 1}{1 - \theta} \right) dt.$$

Thus, the effective discount rate in the per-capita formulation is $\rho - n$.

The corresponding current-value Hamiltonian is

$$\mathcal{H} = \frac{c_t^{1-\theta} - 1}{1 - \theta} + \lambda_t \left[A_t k_t^{\alpha} \kappa_t^{\gamma} - c_t - (\delta + n) k_t \right].$$

The first-order condition with respect to consumption is

$$\frac{\partial \mathcal{H}}{\partial c_t} = c_t^{-\theta} - \lambda_t = 0,$$

which implies

$$\lambda_t = c_t^{-\theta}.$$

The current-value costate equation is

$$\dot{\lambda}_t = (\rho - n) \lambda_t - \frac{\partial \mathcal{H}}{\partial k_t}.$$

Since

$$\frac{\partial \mathcal{H}}{\partial k_t} = \lambda_t \left[\alpha A_t k_t^{\alpha-1} \kappa_t^{\gamma} - (\delta + n)\right],$$

we obtain

$$\dot{\lambda}_t = (\rho - n)\lambda_t - \lambda_t \left[\alpha A_t k_t^{\alpha-1} \kappa_t^{\gamma} - (\delta + n)\right].$$

Dividing by λ_t,

$$\frac{\dot{\lambda}_t}{\lambda_t} = \rho + \delta - \alpha A_t k_t^{\alpha-1} \kappa_t^{\gamma}.$$

Because

$$\lambda_t = c_t^{-\theta},$$

it follows that

$$\frac{\dot{\lambda}_t}{\lambda_t} = -\theta \frac{\dot{c}_t}{c_t}.$$

Combining the two expressions gives the Euler equation:

$$\frac{\dot{c}_t}{c_t} = \frac{1}{\theta} \left[\alpha A_t k_t^{\alpha-1} \kappa_t^{\gamma} - \delta - \rho\right].$$

The optimization problem is completed by the transversality condition

$$\lim_{t \to \infty} e^{-(\rho-n)t} \lambda_t k_t = 0.$$

A.3 Conditional Steady State

Holding A and κ constant, a conditional steady state requires

$$\dot{c}_t = 0 \qquad \text{and} \qquad \dot{k}_t = 0.$$

From the Euler equation, the condition $\dot{c}_t = 0$ implies

$$\alpha A (k^*)^{\alpha-1} \kappa^{\gamma} = \rho + \delta.$$

Solving for the conditional steady-state capital stock gives

$$k^* = \left(\frac{\alpha A \kappa^{\gamma}}{\rho + \delta}\right)^{\frac{1}{1-\alpha}}.$$

Substituting k^* into the production function,

$$y^* = A (k^*)^{\alpha} \kappa^{\gamma},$$

yields

$$y^* = \alpha^{\frac{\alpha}{1-\alpha}} A^{\frac{1}{1-\alpha}} \kappa^{\frac{\gamma}{1-\alpha}} (\rho + \delta)^{-\frac{\alpha}{1-\alpha}}.$$

The second steady-state condition,

$$\dot{k}_t = 0,$$

determines steady-state consumption:

$$c^* = A(k^*)^\alpha \kappa^\gamma - (\delta + n)k^*.$$

Hence, population growth affects the amount of output required to maintain capital per capita and therefore affects steady-state consumption. Under the social-planner formulation adopted above, however, it does not enter the modified golden-rule condition that determines k^*.

A.4 Logarithmic Decomposition

Taking logarithms of the conditional steady-state output expression gives

$$\ln y^* = \frac{\alpha}{1-\alpha} \ln \alpha + \frac{1}{1-\alpha} \ln A + \frac{\gamma}{1-\alpha} \ln \kappa - \frac{\alpha}{1-\alpha} \ln(\rho + \delta).$$

The corresponding logarithmic decomposition is

$$d \ln y^* = \frac{1}{1-\alpha} d \ln A + \frac{\gamma}{1-\alpha} d \ln \kappa - \frac{\alpha}{1-\alpha} d \ln(\rho + \delta).$$

This expression provides the theoretical motivation for distinguishing among productivity-enhancing factors, the entrepreneurial knowledge externality, and the cost of capital accumulation in the empirical analysis.

Entrepreneurship is interpreted as one potential source of additional productive capacity through the entrepreneurial knowledge externality, while institutional quality and informality characterize the environment in which productive activity takes place. Exports and foreign direct investment represent complementary channels through which market access, technology, and productive capabilities may be associated with economic performance. The cost-of-capital variable relates more directly to the accumulation-cost channel represented in the steady-state expression.

These empirical variables should therefore be understood as operational proxies for broader theoretical mechanisms rather than as direct measures of the structural parameters of the RCK model.

B Data Construction and Coverage

B.1 Construction of the Institutional Aggregates

The institutional variables used in the empirical analysis are author-constructed aggregates based on the underlying indicators reported by the Worldwide Governance Indicators (WGI) and V-Dem v16 datasets. This subsection documents their construction to facilitate replication.

The WGI aggregate is constructed from four governance dimensions: Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. The analysis uses the corresponding WGI scores measured on a 0–100 scale. Let PV_{it}, RQ_{it}, RL_{it}, and VA_{it} denote the four component scores for country i in year t. The aggregate is defined as the simple arithmetic mean

$$WGI_{it} = \frac{PV_{it} + RQ_{it} + RL_{it} + VA_{it}}{4}.$$

In the analytical database, the four underlying components are stored as `pv_score`, `rq_score`, `rl_score`, and `va_score`. All four component scores are required for a country–year observation to receive a WGI aggregate value, and each component receives equal weight. No additional weighting scheme is applied.

The institutional variable used in the level specifications is the natural logarithm of this aggregate:

$$S_{it}^{WGI} = \ln(WGI_{it}).$$

Thus, the WGI measure used in the article is a four-component governance aggregate rather than an average of all six dimensions available in the broader WGI framework. For the growth specifications, the corresponding annual change is defined as

$$G_{it}^{WGI} = 100\,[\ln(WGI_{it}) - \ln(WGI_{i,t-1})] = 100\Delta\ln(WGI_{it}).$$

The V-Dem aggregate is constructed from five democracy indices reported in V-Dem v16: Electoral Democracy, Liberal Democracy, Participatory Democracy, Deliberative Democracy, and Egalitarian Democracy. Let ED_{it}, LD_{it}, PD_{it}, DD_{it}, and EGD_{it} denote the respective component indices. The aggregate is defined as

$$VDEM_{it} = \frac{ED_{it} + LD_{it} + PD_{it} + DD_{it} + EGD_{it}}{5}.$$

In the analytical database, these components are stored as `vdem_electoral`, `vdem_liberal`, `vdem_particip`, `vdem_deliber`, and `vdem_egalitarian`. All five component indices are required for a country–year observation to receive a V-Dem aggregate value, and each component receives equal weight.

No logarithmic transformation is applied to the V-Dem aggregate. Therefore, the institutional variable used in the level specifications is

$$S_{it}^{VDEM} = VDEM_{it}.$$

For the growth specifications, the corresponding annual change is

$$G_{it}^{VDEM} = 100\left[VDEM_{it} - VDEM_{i,t-1}\right] = 100\Delta VDEM_{it}.$$

The two institutional aggregates are consequently not alternative transformations of the same underlying index. WGI combines four selected governance dimensions, whereas V-Dem combines five dimensions of democracy. They are introduced in separate regressions throughout the empirical analysis. Centering is performed only after the relevant level or growth transformation has been constructed.

B.2 Temporal Coverage by Variable

Table 7: Temporal coverage by variable

Variable	First year	Last year	Countries	Observations
Log real GDP per capita	2002	2025	17	408
GDP per capita growth	2003	2025	17	391
Log exports per capita	2002	2025	15	358
Inverse-hyperbolic-sine FDI per capita	2002	2024	17	391
Log new registered firms	2006	2024	17	274
Log new-business density	2006	2024	17	274
Log employers share	2002	2025	17	408
Innovative entrepreneurship index	2002	2024	17	303
Log WGI aggregate	2002	2024	17	391
V-Dem aggregate	2002	2025	17	408
Log informal employment	2016	2025	17	143
Transformed cost-of-capital measure	2002	2025	15	334
Population growth	2003	2025	17	391

Note: Coverage refers to observed data availability rather than imputed values. Differences in temporal coverage imply that the effective estimation sample may vary across entrepreneurship measures, institutional indicators, and model specifications.

B.3 Country-Level Availability

Table 8: Number of available observations by country and variable

Country	GDP pc	New firms	Density	Employers	Innovation	WGI	V-Dem	Informality
Argentina	24	19	19	24	22	23	24	9
Bolivia	24	5	5	24	7	23	24	7
Brazil	24	19	19	24	22	23	24	10
Chile	24	18	18	24	21	23	24	10
Colombia	24	12	12	24	20	23	24	9
Dominican Republic	24	8	8	24	15	23	24	10
Ecuador	24	19	19	24	20	23	24	9
El Salvador	24	19	19	24	17	23	24	9
Guatemala	24	19	19	24	19	23	24	8
Guyana	24	19	19	24	4	23	24	4
Honduras	24	19	19	24	10	23	24	2
Jamaica	24	19	19	24	20	23	24	8
Mexico	24	19	19	24	23	23	24	10
Panama	24	10	10	24	17	23	24	9
Paraguay	24	12	12	24	22	23	24	9
Peru	24	19	19	24	22	23	24	10
Uruguay	24	19	19	24	22	23	24	10

Note: Counts reflect observed data availability instead of imputation. Regression samples are constructed using complete observations for the variables included in each specification. Consequently, the effective sample size may differ across entrepreneurship measures, institutional indicators, and estimators.

C Estimation Conventions and Interpretation of Interaction Terms

C.1 Centering of Interaction Variables

Entrepreneurship, institutional quality, and informality are centered before interaction terms are constructed. Let

$$E_{it}^{c} = E_{it} - \bar{E}, \qquad S_{it}^{c} = S_{it} - \bar{S}, \qquad F_{it}^{c} = F_{it} - \bar{F},$$

where E denotes the entrepreneurship measure, S institutional quality, and F informality. In the WGI level specifications, $S_{it} = \ln(WGI_{it})$, whereas in the V-Dem level specifications, $S_{it} = VDEM_{it}$. In the corresponding growth specifications, the institutional variables are $100\Delta \ln(WGI_{it})$ and $100\Delta VDEM_{it}$, respectively. The bars denote the corresponding sample means used to construct the centered variables.

Centering does not alter the underlying interaction relationship, but it facilitates interpretation of the lower-order coefficients. In particular, the coefficient on entrepreneurship represents its conditional association with the dependent variable when the interacting variables are evaluated at their sample means.

C.2 Two-Way Interaction

For a specification containing an interaction between entrepreneurship and informality,

$$\ln y_{it} = \cdots + \beta_E E_{it}^{c} + \beta_F F_{it}^{c} + \beta_{EF}\left(E_{it}^{c} F_{it}^{c}\right) + \varepsilon_{it},$$

the marginal association of entrepreneurship is

$$\frac{\partial \ln y_{it}}{\partial E_{it}^{c}} = \beta_E + \beta_{EF} F_{it}^{c}.$$

Accordingly, β_E represents the conditional association between entrepreneurship and the dependent variable when informality is at its sample mean, whereas β_{EF} indicates how this association changes as informality varies.

C.3 Triple Interaction

For the fully interacted specification involving entrepreneurship, institutional quality, and informality,

$$\begin{aligned} \ln y_{it} = \cdots &+ \beta_E E_{it}^{c} + \beta_S S_{it}^{c} + \beta_F F_{it}^{c} \\ &+ \beta_{ES} E_{it}^{c} S_{it}^{c} + \beta_{EF} E_{it}^{c} F_{it}^{c} \\ &+ \beta_{SF} S_{it}^{c} F_{it}^{c} + \beta_{ESF} E_{it}^{c} S_{it}^{c} F_{it}^{c} + \varepsilon_{it}, \end{aligned}$$

the marginal association of entrepreneurship is

$$\frac{\partial \ln y_{it}}{\partial E_{it}^{c}} = \beta_E + \beta_{ES} S_{it}^{c} + \beta_{EF} F_{it}^{c} + \beta_{ESF} S_{it}^{c} F_{it}^{c}.$$

The triple-interaction coefficient β_{ESF} should therefore not be interpreted as an independent effect of entrepreneurship, institutions, or informality. Instead, it captures whether the manner in which one conditioning variable modifies the entrepreneurship relationship itself varies with the level of the other conditioning variable.

C.4 Small-Cluster Inference

The preferred fixed-effects specifications contain a relatively small number of country clusters. Conventional cluster-robust standard errors may therefore provide overly precise inference in finite samples. For this reason, the focal formal-entry coefficients are additionally evaluated using wild-cluster bootstrap tests conducted at the country level.

In the income-level specifications using WGI, the coefficients on new registered firms and new-business density are positive, but their wild-cluster bootstrap p-values are 0.180 and 0.165, respectively. Accordingly, the statistical significance obtained using conventional country-clustered inference does not survive the small-cluster robustness check. These coefficients are therefore interpreted as positive but imprecisely estimated associations with real GDP per capita.

The corresponding results are stronger in the economic-growth equations. The wild-cluster bootstrap p-values for growth in new registered firms and new-business density are 0.046 and 0.042, respectively. Both coefficients therefore remain statistically significant at the 5% level after accounting for the relatively small number of country clusters. This difference in precision motivates placing greater empirical weight on the association between changes in formal business creation and real GDP per capita growth than on the corresponding income-level relationship.

The V-Dem specifications provide a different robustness pattern. In the income-level equations, the wild-cluster bootstrap p-values are 0.056 for new registered firms and 0.075 for new-business density. These estimates are therefore marginally significant at the 10% level, but not at the 5% level. In the corresponding growth equations, the p-values are 0.198 and 0.207, respectively, so neither formal-entry coefficient remains statistically significant under wild-cluster inference. Thus, the strongest small-cluster evidence is specific to the WGI growth specifications rather than common to both institutional measures.

C.5 Dynamic-Panel Estimation and Diagnostics

The Difference GMM and System GMM specifications include lagged log real GDP per capita, centered entrepreneurship, centered institutional quality, centered informality, the interaction between centered entrepreneurship and informality, log exports per capita, and the transformed cost-of-capital measure. To limit instrument proliferation, the instrument matrices are collapsed. Lagged log real GDP per capita is instrumented with its second and third lags in Difference GMM and with its second lag in System GMM. Entrepreneurship and its interaction with informality are instrumented with their second lags. Institutional quality, informality, exports, and the cost-of-capital measure

enter as standard instruments in the differenced equation. The models use two-step estimation with finite-sample adjustment and Windmeijer-corrected robust standard errors.

The dynamic-panel estimations are based on 13 effective countries. The instrument count is eight in Difference GMM and eleven in System GMM, remaining below the number of countries in every reported model. The diagnostic tests do not, however, support a uniformly clean dynamic specification. In particular, some Difference GMM equations reject the null of no second-order serial correlation, and some System GMM equations reject the Sargan test despite more favorable Hansen statistics. The Hansen tests must also be interpreted cautiously given the small sample. None of the focal entrepreneurship coefficients or entrepreneurship–informality interactions in the V-Dem GMM models is statistically significant at the 10% level. For these reasons, the GMM estimates are treated as complementary sensitivity evidence rather than as causal estimates or as the basis for the paper's main conclusions.

C.6 Comparison Across Specifications

Coefficient magnitudes should not be compared mechanically across the levels, growth, and labor-productivity specifications because the dependent variables and, in some cases, their transformations differ. Statistical significance is therefore interpreted jointly with coefficient stability across alternative entrepreneurship measures, institutional indicators, and estimators rather than on the basis of any single specification. For the focal formal-entry coefficients in the preferred fixed-effects specifications, wild-cluster bootstrap inference is given greater weight because of the small number of country clusters. The resulting evidence indicates that the positive association between formal business entry and economic growth is most robust in the WGI specifications. The V-Dem results provide only marginal evidence in levels and do not confirm the growth relationship under wild-cluster inference or dynamic-panel estimation.

C.7 Sensitivity Samples

The balanced-panel specification contains only five countries and 30 observations and is therefore treated as a sensitivity exercise instead of as the principal estimation sample. With so few country clusters, statistical significance in the balanced-panel estimates should be interpreted with particular caution. The exercise is used primarily to assess coefficient signs, magnitudes, and sensitivity to sample composition rather than to provide independent inferential evidence.