Speed of pro-market reforms and entrepreneurial innovation

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Abstract This paper examines how pro-market reforms affect entrepreneurial innovation through the lens of the dynamic institution-based view of the firm. We propose that the speed at which changes occur has a positive influence on entrepreneurial innovation. Additionally, we hypothesize that, in highly uncertain environments, entrepreneurs with higher levels of entrepreneurial self-efficacy and those who have recently entered the market are better equipped to respond in terms of innovation. To test our hypotheses, we conduct a multilevel, cross-country analysis using data from the Global Entrepreneurship Monitor for the period 2009–2018, focusing on individual-level measures of entrepreneurial behavior. Our findings largely support our hypotheses, indicating that a high speed of pro-market reforms has a positive effect on entrepreneurial innovation. Furthermore, this relationship is partially mediated by entrepreneurial self-efficacy and is more pronounced among new entrepreneurs compared to established ones.

Plain English Summary Rapid pro-market reforms boost entrepreneurial innovation, particularly among new entrepreneurs and those confident in their capabilities. Although previous studies have analyzed the role of institutional context in the innovation strategies of new companies, the literature has typically taken a static perspective. In light of recent findings, where the speed of change appears crucial strategically, earlier studies may offer a partial view, potentially leading to incomplete results. Our research incorporates this dynamic perspective of institutional change in analyzing entrepreneurial innovation, and our findings support this approach. Specifically, when pro-market reforms occur rapidly, entrepreneurial innovation increases. This effect is even stronger when entrepreneurs believe in their capabilities or when their ventures are in early stages. From a policy perspective, this suggests that governments should prioritize accelerating institutional reforms to create a more dynamic, supportive environment for new ventures. Additionally, enhancing systems that build entrepreneurial confidence and skills can further boost the effectiveness of these reforms.

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1 Introduction

Innovation serves as a crucial driver of economic development, providing businesses with a competitive advantage and ensuring their survival (Barney, 1991; Baumol, 2002; Lengnick-Hall, 1992). Entrepreneurs, in particular, play a pivotal role in the creation of new products and services (Schumpeter, 1934), making it imperative to understand the determinants of entrepreneurial innovation. Scholars have sought to explore this phenomenon and have identified antecedents at both the individual (Koellinger, 2008) and the country level (Autio et al., 2014; Fuentelsaz et al., 2018). Regarding the latter, empirical evidence has established significant variations in entrepreneurial activity across nations (Zahra, 2007; Welter, 2011; Acs et al., 2018), with institutional development emerging as a key determinant of these disparities (Bjørnskov & Foss, 2016; Duran et al., 2019; Wan & Hoskisson, 2003). Audretsch (2023) further argues that fostering a rich entrepreneurial ecosystem is essential for maximizing innovation potential and achieving economic growth. Consequently, numerous countries have made efforts over the past two decades to create an environment conducive to business activity and entrepreneurship. Understanding the influence of the institutional environment, including institutional changes such as improvements in property rights and reduction of commercial barriers, is crucial for analyzing entrepreneurial innovation.

Most institutional changes implemented in countries have aimed to remove restrictions on economic activity, facilitating business operations. Although the concept of pro-market reforms (i.e., "the improvement of rules and regulations that facilitate market transactions and limit the role of government in the economy", Cuervo-Cazurra et al., 2019a, 2019b), is gaining traction in global strategy and business research (Cuervo-Cazurra et al., 2019a, 2019b), further research is required. Recent studies have demonstrated diverse effects of pro-market reforms on business decisions and performance, depending on

the level and speed of these reforms (Banalieva et al., 2015; Cuervo-Cazurra et al., 2019a, 2019b). While some studies indicate a negative impact of high-speed pro-market reforms on firm performance (Banalieva et al., 2015, 2018), others establish a positive relationship only considering the level of the pro-market reforms (Cuervo-Cazurra & Dau, 2009). Given that, previous studies have emphasized the importance of institutional changes on entrepreneurial behavior (Wu et al., 2022), ignoring the role of the speed of changes in the analysis of entrepreneurial decisions can lead to incomplete conclusions. Recent studies have begun to consider the consequences of the speed of change, highlighting that entrepreneurial entry varies depending on short-term changes in the rule of law (Mickiewicz et al., 2021). Hence, our paper seeks to address this gap by incorporating the speed of pro-market reforms into the analysis of the determinants of entrepreneurial innovation.

This emerging stream of literature, known as the dynamic institution-based view (Banalieva et al., 2015), bridges the static (reforms level) and dynamic (reform process) aspects of the institutional environment, providing a foundation for a new institutional dynamic view of business strategy. According to this perspective, rapid pro-market reforms cause uncertainty when quickly removing country entry barriers, leading to the emergence of new market spaces (Chen et al., 2017; Havrylyshyn, 2007). Additionally, the arrival of new competitors with novel technologies accelerates the life cycle of existing products. These rapid pro-market reforms play a crucial role in creating new market opportunities, highlighting the need to incorporate the perspective of institutional dynamism into the analysis of entrepreneurial innovation. In uncertain environments, previous research suggests that certain strategic resources, such as prior experience (Chen et al., 2017; Fuentelsaz et al., 2022) or being a family firm (Banalieva et al., 2015), can help firms navigate such situations. Consequently, entrepreneurs who possess skills to effectively deal with uncertain environments, such as self-efficacy and flexibility, are better equipped to adapt to changing circumstances. Given that flexibility is a key characteristic of new entrepreneurs, understanding the behavior of both new and established entrepreneurs in these situations can shed light on the ongoing debate regarding their differences.

Therefore, the objective of this paper is to provide a new theoretical perspective by incorporating institutional dynamism into the analysis of entrepreneurial innovation. This approach allows for a better understanding of the contexts in which greater opportunities for entrepreneurial innovation arise and which entrepreneurs are more likely to capitalize on them. Furthermore, we recognize that not all entrepreneurs are equally affected by the speed of institutional change, and we propose that the relationship between the speed of change and entrepreneurial innovation is contingent upon several skills and resources possessed by the entrepreneur. Specifically, we posit that entrepreneurial self-efficacy and being a young entrepreneur, positively moderate the aforementioned relationship.

To test our hypotheses, we employ a multilevel analysis using a sample of 109,075 observations from entrepreneurs operating in 65 countries over a period of ten years (2009–2018). Our findings confirm that a high speed of pro-market reforms positively enhances the innovative activity of entrepreneurs. Additionally, if entrepreneurs possess skills that facilitate this process or if they are more flexible due to being in the early stages of their entrepreneurial journey, the relationship is amplified.

This paper contributes to the literature in three main ways. First, it integrates the new perspective of the dynamic institution-based view into the analysis of entrepreneurial innovation. Given the influence of rapid pro-market reforms on generating opportunities and creating market spaces, this perspective proves crucial in understanding entrepreneurial innovation. In this regard, the paper delves into the novel concept of institutional dynamism, expanding on recent studies focusing on the entrepreneurial phenomenon (Mickiewicz et al., 2021), with a specific emphasis on a fundamental entrepreneurial decision, namely innovation. Second, our study further explores the debate surrounding the differences between young and established entrepreneurs, demonstrating that the flexibility associated with being at the beginning of an entrepreneurial career is a key skill during periods of pro-market reforms. Finally, we provide new empirical evidence at a global level that highlights the significance of the speed of institutional change in strategic decision-making, utilizing an empirical analysis encompassing 65 countries.

2 Theoretical framework and hypotheses

2.1 Dynamic institution-based view

The institutional environment within which firms compete influences their decision-making by either facilitating or restricting their activities (North, 1990; Peng et al., 2008, 2009). This, in turn, has an impact on firm performance (Cuervo-Cazurra et al., 2019a, 2019b; Dikova & Brouthers, 2016; Hernández et al., 2018; Wan & Hoskisson, 2003). Consequently, the institutional environment plays a pivotal role in entrepreneurial activities (Bjørnskov & Foss, 2016).

However, the institutional environment is not static but evolves over time (Peng, 2003). Some countries, aiming to liberalize their markets, implement institutional changes known as pro-market reforms (Cuervo-Cazurra & Dau, 2009; Hoskisson et al., 2000; Newman et al., 2000; Park et al., 2006; Peng, 2003). Pro-market reforms involve improving rules and regulations to facilitate market transactions and limit government intervention in the economy (Cuervo-Cazurra et al., 2019a, 2019b: 598), leading to enhanced national governance and economic liberalization (Dau, 2012).

On the one hand, governments strive to reduce market imperfections by enacting improvements in laws, regulations, public goods, and infrastructure. For instance, they promote innovation by strengthening property rights protection (Chen & Puttitanun, 2005) and implementing contractual dispute resolution mechanisms that mitigate trading risks. On the other hand, pro-market reforms seek to minimize government intervention by liberalizing prices and reducing industrial and commercial barriers, thus allowing the entry and operation of additional economic actors. This enhances the quality of potential exchange partners, fosters competition and innovation, and improves the business environment (Dau, 2012).

Research on pro-market reforms examines how firm strategies and structures evolve in response to changes in the economic, political, and sociocultural components of a country (Saka-Helmhout et al., 2016). Nevertheless, the influence of pro-market reforms on business and entrepreneurial decisions, as well as their performance, remains unclear, and contradictory findings have been reported (Cuervo-Cazurra et al., 2019a, 2019b). Although recent

research has tried to shed light on this addressing how institutional changes alter the effects of entrepreneurial strategies (Wu et al., 2022), the inconclusive evidence has prompted the literature to shift its focus from the scope of reforms to the speed at which these reforms occur (i.e., the rate of market liberalization over time), leading to the emergence of a dynamic institution-based view that explains the influence of the speed of pro-market reforms on firm-level strategy (Banalieva et al., 2015).

The speed of reforms makes reference to the "country's rate of market liberalization achieved over time" (Banalieva et al., 2015, p. 1360). The concept of speed combines the magnitude of the changes in the scope of pro-market reforms (distance traveled) and the time interval between the old and new scopes (duration time). This construct bridges the static (reform scope) and dynamic (reform process) dimensions of the institutional environment, giving the base for a new institutional dynamic view of business strategy (Banalieva et al., 2015). Governments may swiftly introduce reforms to signal a commitment to market liberalization and enhance efficiency (Banalieva et al., 2018; Huang, 2013; Walsh, 2007). However, those with a history of intensive reforms might proceed more slowly due to stakeholder pressure or changes in mandate (Rajan & Zingales, 2003). Examples of rapid institutional changes were those carried out in Spain following the economic crisis of 2008. These encompassed the restructuring of the financial system, the introduction of labor reforms to enhance job market flexibility, the implementation of fiscal adjustments to increase revenue and reduce deficits, an overhaul of the pension system for long-term sustainability, and the introduction of measures in the energy market to enhance efficiency.

Previous studies have indicated that rapid pro-market reforms can have negative effects on firm performance given the increase of uncertainty environment and the existence of adaptation costs (Banalieva et al., 2015, 2018). Also, the speed of reforms can influence the choice of entry mode for internationalization, where in countries where formal institutions develop rapidly, companies tend to prefer greenfield investments, as these provide more control while in regions where factor markets are evolving quickly, acquisitions are favored, allowing firms to leverage existing local resources and capabilities more effectively (Chen et al., 2017). Other research has focused on

strategic resources that can help firms succeed during periods of rapid pro-market reforms, such as previous experience (Chen et al., 2017; Fuentelsaz et al., 2022) or being a family firm (Banalieva et al., 2015). Ongoing research supports these findings by demonstrating that the impact of reforms on entrepreneurial activities, innovation, and knowledge varies depending on the speed of reform implementation. For instance, Li and Tang (2021), in their study on the determinants of university technology transfer, reveal that a high institutional scope can facilitate technology transfer in universities. However, when the pace of change is excessively fast, this transfer is negatively affected. Furthermore, Mickiewicz et al. (2021) highlight the significance of time in the entrepreneurial process, indicating that the timing of entry varies in response to short-term changes in the rule of law.

Consequently, the literature appears to confirm that the speed at which changes occur is as important as the pro-market reforms themselves (Banalieva et al., 2015; Cuervo-Cazurra et al., 2019a, 2019b).

2.2 Entrepreneurial innovation

Innovation plays a crucial role in determining competitiveness and economic growth (Acs, 2008; Audretsch & Thurik, 2001; Audretsch et al., 2006; Grilo & Thurik, 2005; Wennekers & Thurik, 1999). It is a key driver of business performance and firm survival, especially in dynamic markets (McDowell et al., 2018; Rauch et al., 2009). Ever since the early work of Schumpeter (1934), the connection between innovation and entrepreneurship has been established (Audretsch et al., 2006; Colombelli et al., 2016), with the term "entrepreneurial innovation" defined as "the implementation of creative ideas through discovery and exploitation of opportunities in entrepreneurial firms" (Hung & Mondejar, 2005: 120). However, it should be noted that not all entrepreneurs are innovators, and that innovation rates vary significantly across countries. As a result, scholars and policymakers have focused on identifying factors that encourage innovative entrepreneurs.

One stream of research approaches entrepreneurial innovation from a contextual perspective, acknowledging that the environment in which entrepreneurial behavior is embedded influences organizational structures and processes (Scott, 2004). The context not only affects individual decisions to

become entrepreneurs but also shapes the characteristics of new ventures (Audretsch, 2023), subsequently impacting growth levels, innovation, and overall country development (Baumol, 1996; Minniti & Lévesque, 2008). Audretsch (2023), in his reflection about the evolution of entrepreneurship research, emphasizes the role of institutions as a driver of entrepreneurial activity as the field evolves. Historically, the field focused predominantly on the individual traits of entrepreneurs, prioritizing their unique personality traits and characteristics (Frese, 2009; McClelland, 1961) while largely neglecting the influence of external factors, such as institutional contexts. Early studies primarily investigated the reasons behind individual choices to become entrepreneurs, often attributing success to inherent traits and characterizing entrepreneurs as social deviants who struggled to fit into more established corporations.

As research in entrepreneurship has matured, it has undergone a significant transformation, shifting from a narrow view that considers entrepreneurs as independent actors to a more nuanced understanding of the profound impact of institutional frameworks on entrepreneurial activity (Audretsch, 2007; Audretsch & Lehmann, 2016). This paradigm shift acknowledges that institutional factors, including regulations, cultural norms, and available resources, play a crucial role in shaping entrepreneurial activity and fostering an environment conducive to innovation and sustainable business growth. Within this framework, the concept of National Systems of Innovation (NSI), proposed by Freeman (1987) and Lundvall (1992), is particularly significant. The NSI framework highlights that innovation does not happen in isolation; rather, it results from dynamic collaboration among governments, industries, and the education sector. This interaction is crucial as it fosters learning and the transfer of knowledge, both essential for creating an environment conducive to innovation. Moreover, the institutional context has been highlighted as a significant factor that can influence the level and types of firms created in a country (Bowen & De Clercq, 2008; Stenholm et al., 2013; Autio & Fu, 2015) and can deeply affect enterprise policies, including decisions regarding innovation (Banjo & Doren, 2013). The variations in national institutional environments have been evaluated in terms of their enabling and constraining effects on firms' strategic options, including innovation (Zhu et al., 2012). Additionally,

collaborative activities between firms, universities, and scientific establishments have been identified as important for fostering innovation (Bruneel et al., 2010; Ferrer-Serrano et al., 2021; Guerrero & Urbano, 2021). Furthermore, the literature has examined the contingent effect of the institutional context on the relationship between an entrepreneur's characteristics and entrepreneurial innovation (Fuentelsaz et al., 2018). While the relationship between institutional context and innovation is well-documented (Koellinger, 2008), the potential relationship between institutional dynamism and innovation has received less attention.

2.3 Speed of pro-market reforms and entrepreneurial innovation

The institutional environment is constantly changing, requiring companies and entrepreneurs to adapt continuously (Peng, 2003). When pro-market reforms occur rapidly, the environment becomes highly uncertain (Xu & Meyer, 2013), which can have negative effects on firm performance due to the high costs of adaptation (Banalieva et al., 2015; Banalieva et al., 2018; Fuentelsaz et al., 2022), such as learning to implement production targets or searching for new customers (Hurt et al., 2000). However, despite the challenges and complexity brought about by rapid pro-market reforms, quick market liberalization and turbulence in the business environment can also have positive consequences for entrepreneurial innovation, particularly for newcomers who are not constrained by the rigidity that often limits established companies. Specifically, the speed of pro-market reforms impacts entrepreneurial innovation on both the demand and supply sides.

On the demand side, the literature highlights the changing quality of life for individuals in countries undergoing pro-market reforms (Illner, 1998). Factors such as civil rights, employment, wages, housing, and consumption quality contribute to overall quality of life. Institutional transformations, including pro-market reforms, lead to shifts in individuals' consumption patterns (Illner, 1998). As a result, companies need to adapt quickly, increasing uncertainty for established businesses. While the prices of goods and services may increase slightly, there is also a demand for improved quality and variety. This can be attributed to the entry of new competitors into the market, which

is facilitated by the removal of entry barriers through market liberalization (North, 1990). As entry barriers are rapidly reduced, consumers become increasingly discerning and demanding, causing existing products and services to fall short of their escalating expectations. Consequently, new market opportunities emerge that require attention. Established companies often struggle to meet customer expectations in these uncertain environmental conditions, creating opportunities for entrepreneurs to innovate and capitalize on.

On the supply side, pro-market reforms have consequences that extend beyond macroeconomic effects, such as price liberalization, and also encompass international policy (Del Sol & Kogan, 2007). The implementation of pro-market reforms leads to an increase in imports, the inflow of foreign direct investment, and the outflow of local companies to foreign markets (Del Sol & Kogan, 2007). This not only intensifies local competition due to the entry of new foreign competitors but also introduces new processes and technologies to the market (Chen et al., 2017; Havrylyshyn, 2007). The advent of new participants and technological dynamism results in a shorter life cycle for existing products, introducing uncertainty in the market. In fact, if pro-market reforms are implemented rapidly, products are swiftly replaced. This new and uncertain dynamic environment presents opportunities for the growth of products that need to replace obsolete ones. Furthermore, when this transformation is accompanied by improved property rights and increased safety for firms introducing new products to the market (Chen & Puttitanun, 2005), the anticipated outcome is an upsurge in innovation.

Therefore, the rapid elimination of entry barriers creates new market opportunities and nurtures a consumer base that is becoming more sophisticated and demanding (Ilner, 1980). The entry of new competitors with technologies that expedite product obsolescence further fuels innovation in these uncertain and dynamic environments. Entrepreneurs with the ability to identify and capitalize on open market niches and seize opportunities are likely to demonstrate higher levels of innovation in such scenarios.

Therefore, we propose our first hypothesis:

Hypothesis 1: The higher the speed of pro-market reforms is, the greater the entrepreneurial innovation.

2.4 The moderating role of entrepreneurial self-efficacy

Hypothesis 1 proposes that a high speed of pro-market reforms in a country positively influences entrepreneurial innovation by creating new market opportunities that cater to more sophisticated demands. However, we argue that the strength of this relationship is contingent upon the self-efficacy of entrepreneurs. The concept of self-efficacy is rooted in social cognitive theory (Bandura, 2001), which underscores an individual's confidence in their capability to perform a given task. According to social cognitive theory, individuals who believe they can achieve desired outcomes through their actions are more likely to succeed (Bandura, 1997). Self-efficacy, as a personality trait, triggers entrepreneurs' alertness when the business landscape undergoes sudden transformations and plays a vital role in shaping entrepreneurial intentions, garnering significant attention in entrepreneurship research due to its close association with entrepreneurial outcomes (Yang & Cheng, 2009: 430). Literature has also shown that self-efficacy is based on tenets of social cognitive theory, where personal factors, behaviour, and environmental interactively determine each other (Bandura, 1997, 2001).

Concerning new business creation, entrepreneurial self-efficacy (ESE) refers to an individual's confidence in their ability to perform entrepreneurial activities (McGee et al., 2009). Empirical studies have evidenced a correlation between ESE and various behaviors, including entrepreneurial intentions, opportunity recognition, new venture growth, and innovation (Baum & Locke, 2004; Boyd & Vozikis, 1994; Ozgen & Baron, 2007; Wei et al., 2020).

Consequently, ESE becomes a crucial resource in explaining an entrepreneur's belief in their ability to exert control over the environment and serves as a significant moderating factor in the relationships between entrepreneurial behavior and its antecedents (Boyd & Vozikis, 1994). Ahlin et al. (2014) argue that self-efficacy moderates the relationship between an entrepreneur's creativity and product innovation. Specifically, individuals with higher self-efficacy are more adept at leveraging their creativity, leading to positive impacts on product innovation. Similarly, Tang (2008) suggests that self-efficacy enables entrepreneurs to recognize their ability to leverage environmental resources and adapt their entrepreneurial mental frameworks

to better align with new market information. Consequently, entrepreneurs with strong self-efficacy are more likely to respond favorably to dynamic changes in competitive and uncertain environments, identify available resources, recognize market imbalances, and evaluate opportunities appropriately (Tang, 2008; Drnovšek et al., 2010; Schmitt et al., 2018).

Expanding on existing research, recent studies highlight that entrepreneurs with high self-efficacy are better equipped to identify and respond quickly to changes arising from technological advancements and market demand fluctuations. These entrepreneurs are more likely to introduce new products and ideas to the market, capitalizing on emerging opportunities (Schmitt et al., 2018). Conversely, entrepreneurs with low entrepreneurial self-efficacy struggle to adapt flexibly due to a lack of confidence, resulting in reduced levels of innovation (Peng et al., 2015). Considering that not all firms adapt equally to rapid institutional changes (Banalieva et al., 2015; Fuentelsaz et al., 2022), and that certain characteristics, such as self-efficacy, facilitate adaptation in such environments, we propose that when rapid institutional changes create more competitive landscapes (Banalieva et al., 2015), entrepreneurs with a higher capacity for exploration and a strong belief in their self-efficacy are more likely to be innovative. These entrepreneurs perceive uncertainty as a challenge rather than a deterrent (Drnovšek et al., 2010; Jex et al., 2001). Their enhanced self-efficacy improves their alertness to opportunities and boosts their confidence in their ability to innovate and achieve their goals. Consequently, they are better positioned to capitalize on the new business and technological opportunities that arise due to the accelerated pace of pro-market reforms.

Based on these arguments, our second hypothesis proposes that:

Hypothesis 1a: Entrepreneurial self-efficacy strengthens the positive relationship between the high speed of pro-market reforms and entrepreneurial innovation.

2.5 The moderating role of entrepreneurial youth

Our third hypothesis posits that younger firms derive greater innovation benefits from the high speed of pro-market reforms compared to more mature firms. This assertion is based on the distinct capabilities and competencies exhibited by these organizations.

Established firms, although efficient in a stable environment, often have a larger infrastructure that necessitates formalized procedures, rules, and mechanistic organizational structures. These elements are designed to ensure managerial control, efficiency, consistency, and reliability within the organization (Cohen & Levin, 1989; Rotemberg & Saloner, 1994; Dougherty, 2001). However, this rigidity can pose limitations when it comes to innovation and adapting to new competitive and market conditions arising from rapid institutional change. In line with Schumpeter's Mark II framework (Schumpeter, 1942), where large firms institutionalize innovation processes, the bureaucratic nature of established firms can hinder their entrepreneurial agility. While these organizations may have the capacity to innovate, their inclination to adhere to established routines and risk-averse behavior often stifles creative destruction, reducing their overall innovative output. Additionally, firms that have been in the market for an extended period may become more resistant to changing their established routines to accommodate rapid institutional changes, hindering their ability to develop new products or services.

Although established entrepreneurs may possess nonmarket resources, such as informal connections with local authorities, suppliers, customers, and legislators, which can serve as valuable sources of information during rapid market reforms (Cuervo-Cazurra & Genc, 2011; Henisz & Zelner, 2012; Zaheer, 1995), this anticipation of rapid reforms may not necessarily benefit them in terms of innovation. The focus on adapting to the new institutional landscape to maintain their current operations and positive performance (Banalieva et al., 2015) may divert their efforts and resources away from recognizing new market opportunities. Consequently, their ability to perceive and exploit emerging market windows may be limited.

In contrast, new entrepreneurs -defined in this study as those ventures launched less than three and a half years ago- exhibit characteristics that set them apart from established firms. These entrepreneurs, aligned with Schumpeter's Mark I regime (Schumpeter, 1934), play a transformative role in the economic landscape. As described by Schumpeter, they disrupt established markets through innovative

combinations of resources and ideas. Typically, they are visionaries who challenge the status quo and foster technological and organizational advancements. They exhibit faster learning abilities, greater flexibility, and a fresh perspective on the market. These attributes enable them to identify valuable goods or services that meet consumer demands and are feasible to produce (Ireland et al., 2003). Unlike established firms, new ventures are not burdened by rigid rules, bureaucratic hierarchies, or inertia, which hinders their adaptability to changes (Hölttä-Otto et al., 2013). As a result, new entrepreneurs are better equipped to identify and exploit new market opportunities (Burg et al., 2012), leading to increased levels of innovation. So, we propose our third hypothesis:

> Hypothesis 1b: Being a new entrepreneur positively moderates the positive relationship between the high speed of pro-market reforms and entrepreneurial innovation.

3 Data, variables and empirical strategy

We build our database by collecting information from various sources. To begin, we utilized the Global Entrepreneurship Monitor (GEM) to gather data on individual entrepreneurial behavior from 2009 to 2018. The GEM conducts surveys targeting adults aged between 16 and 64 years in numerous countries worldwide. This broad coverage allows for comparisons of individual behavior across countries with diverse institutional development patterns. Specifically, our sample encompasses a total of 109,075 individual entrepreneurs[1] that operate in 65 emerging and developed countries[2] over a ten-year period.

For country-level data, we accessed two distinct databases. To measure pro-market reforms, we relied on the Index of Economic Freedom provided by the Heritage Foundation. Additionally, we obtained other relevant country-level variables from the World Bank.

3.1 Dependent variable

We approach entrepreneurial innovation by utilizing information gathered from GEM surveys, following earlier studies such as Estrin et al., (2022), Hoogendoorn et al., (2020), and Pindado et al. (2023). Specifically, we assessed whether the product or service was perceived as new and unfamiliar by "all, some, or none of your potential customers" (Estrin et al., 2022). We categorized this variable, assigning a value of one when all customers considered the product as new, and zero otherwise. While this subjective approach leaves the determination of the innovative nature of the product or service in the hands of the entrepreneur, it also acknowledges that the novelty of a product or service cannot be objectively defined. As stated by Koellinger (2008, p. 22), from "an economic point of view, a product, service, or production process does not need to be new to the world to have economic impact". Furthermore, although with some nuances, our dependent variable aligns with the guidelines of the Oslo Manual for collecting and interpreting innovation data (Horbach et al., 2012, p. 113).

3.2 Independent variable

Speed of pro-market reforms. The construction of the dependent variable is based on the economic freedom index provided by the Heritage Foundation (Banalieva et al., 2018; Fuentelsaz et al., 2022). The index comprises 12 items (10 items before 2018) that assess the rule of law (property rights, government integrity, judicial effectiveness), the government size (government spending, tax burden, fiscal health), the regulatory efficiency (business freedom, labor freedom, monetary freedom), and the open markets (trade freedom, investment freedom, financial freedom) and ranges from 0 to 100, where 0 represents the minimum level of freedom in a country, and 100 indicates the maximum level. Following previous research (Banalieva et al., 2015; Chen et al., 2017; Fuentelsaz et al., 2022), we construct the variable for the speed of pro-market reforms as a continuous variable as follows. We determine the ratio between the actual speed and the fastest speed for each country. The actual speed captures the change in institutions from year t to the base year (in our case, 2009) divided by the number of years that have passed (i.e., Actual

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[1] The individuals, that are randomly chosen each period following statistical criteria to guarantee representativeness, vary from one year to another, thus they no constitute a panel.

[2] A list of the countries included in the sample can be seen in Table 3.

Speed = (scope year t – scope base year) / (year t – base year)). Since our focus is on measuring pro-market reforms, the variable takes a value if this ratio is positive. Additionally, to account for the size of the reforms, we divide the actual speed by the difference between the maximum value the reform can take (in our case, 100) and the institutional level in the base year (i.e., *Fastest Speed = Max scope possible (100) – scope base year*).[3]

Entrepreneurial *self-efficacy* is measured using a dummy variable that takes a value of 1 if the entrepreneur believes they possess the necessary knowledge, skills, and experience to start a new business (Schmutzler et al., 2019). This measurement is derived from the GEM question: *"Do you think you possess the knowledge, skills, and experience to start a new business?"* If the response is affirmative, the variable is assigned a value of 1; otherwise, it is assigned a value of 0.

New entrepreneur. This is a dummy variable that takes a value of 1 if the entrepreneur reports that their venture was launched less than three and a half years ago, which aligns with the definition of Total Entrepreneurial Activity (TEA) used by GEM (Reynolds et al., 2002). If the venture is older than three and a half years, the variable is assigned a value of 0.

3.3 Control variables

We have included control variables at both the individual and country levels in our analysis, drawing from previous studies. At the individual level, we consider various characteristics that have been shown to influence entrepreneurial innovation. *Gender* is accounted for, as men are more likely to be entrepreneurs than women (Kirzner, 1978; Koellinger, 2008; Fuentelsaz et al., 2018; Estrin et al., 2022). *Education* is also included as a positive influence on entrepreneurial innovation, categorized into secondary, secondary degree, post-secondary, or graduate level (Schmutzler et al., 2019). *Age* is considered as a factor since young people tend to be more risk-tolerant, which can influence their innovative capacity (Schmutzler et al., 2019; Estrin et al., 2022). The entrepreneur's network of contacts is also taken into

account, with a dummy variable indicating whether they know other entrepreneurs (*know entrepreneur*). This network can influence opportunity assessment, reduce ambiguity, and contribute to the innovative process (Koellinger, 2008; Minniti, 2005). The ability to perceive business opportunities *(opportunity perception)* is essential in entrepreneurship, so a dummy variable is included to indicate whether the individual expects good opportunities in their area of residence in the next six months (Schmutzler et al., 2019). The variable of *fear of failure* is also considered, as low fear of failure is expected to increase innovative entrepreneurial activity (Fuentelsaz, et al., 2018). This dummy variable serves as a proxy for culture and captures downside risk tolerance associated with starting a new business (Schmutzler et al., 2019). *Household income* of the entrepreneurs is included as they often require significant funding to start a new venture, and availability of funding can influence innovation (Fuentelsaz et al., 2018; Koellinger, 2008).

At the country level, we take into account the general economic context related to entrepreneurial innovation. *GDP per capita* is included to capture the impact of economic development on entrepreneurship (Kuznets, 1971; Koellinger, 2008; Estrin et al., 2022). *GDP growth* is also considered to reflect the economic cycle and its influence on ambitious entrepreneurial projects (Koellinger & Roy Thurik, 2012; Maksimov et al., 2017). *Labor costs*, measured as GDP per person employed, are controlled for as they play a key role in the development of new business opportunities (Schmutzler et al., 2019). *Country size*, represented by the logarithm of the population in million inhabitants, is included as a larger internal consumer market can drive innovative entrepreneurship (Schmutzler et al., 2019). To account for resource availability and market conditions, we include the number of patents as a proxy for *country strategic assets*, as well as the presence of *country natural resources* such as ores, metals, and fuel exports. Institutional conditions of the country are considered by including the *institutional quality*, measured as the degree of economic freedom using the Economic Freedom Index of the Heritage Foundation (Cuervo-Cazurra et al., 2019a, 2019b). To address potential endogeneity in the dependent variable (maybe some companies operating in the market can influence government policies, conditioning the scope and speed of change in the institutions), we incorporate the *control*

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[3] For a more detailed explanation of this measure, see Banalieva et al. (2015).

of corruption variable from the Worldwide Governance Indicators (with values ranging between -2.5 and 2.5), where higher levels represent lower levels of corruption in the country. The list of variables, their descriptions, and sources are summarized in Table 1.

4 Results

4.1 Descriptive statistics

Tables 2, 3 and 4 present some descriptive statistics and correlations of the variables used in the analysis. Table 2 reveals that 17% of the entrepreneurial activities in the sample are classified as innovative. On average, countries are experiencing pro-market reforms at a speed of 2%, but some countries have a change rate as high as 13%. A significant majority of entrepreneurs, 81%, believe that they possess the necessary knowledge, skills, and experience to start a new business. Additionally, 61% of the sample consists of ventures that are less than three and a half years old, while the remaining 39% are established businesses.

Examining the control variables at the individual level, it is observed that 60% of the entrepreneurs in the sample are men, with an average age of nearly 40 years. A majority, 60%, personally know someone who has started a new business in the past two years. Moreover, 62% of the entrepreneurs perceive good opportunities to start a business, whereas 30% indicate that fear of failure influences their decision to launch a new venture. Regarding the country-level controls, the average GDP per capita is approximately $14,000, although there is a high standard deviation indicating significant variation among countries. The average GDP growth rate is 3.79%. The GDP per employee is slightly above $48,000. Notably, there is substantial variation in the availability of strategic and natural resources among the countries where the new ventures are based.

Additionally, a description of how the entrepreneurs included in the sample are distributed among the different sectors and countries is provides in Table 3. Regarding the sectors, GEM aggregates the different activities into four different industries (extractive, transforming, business services and consumer-oriented). As we can see, and in line with previous studies (GEM, 2022; OCDE, 2015), around

half of the entrepreneurs (56%) focus their activity on consumer-orientation. Around a quarter of the new ventures focus its activity to the transforming industry (24.4%), while the remaining quarter is divided between business services (13.2%) and the extractive industry (6.4%). If we look at the different countries included in the sample, we see that it includes both advanced and emerging countries, and is distributed more or less equally among them, with some exceptions such as Brazil or Colombia (with a slightly higher presence). The reason is that, due to financial restrictions, not all countries participate in the survey every year.

Upon examining the correlations between the variables (Table 4), several noteworthy observations can be made. Firstly, there is a positive and significant correlation between the innovative behavior of entrepreneurs and the speed of pro-market reforms. This suggests that countries undergoing faster pro-market reforms are more likely to have entrepreneurs engaging in innovative activities. Additionally, there is a positive correlation between entrepreneurial self-efficacy (confidence in skills) and entrepreneurial innovation, indicating that entrepreneurs who believe in their abilities are more likely to engage in innovative behavior. Furthermore, there is a positive correlation between being in the early stage of the venture (less than three and a half years old) and entrepreneurial innovation, implying that newer ventures are more likely to engage in innovative activities.

In terms of the control variables, high correlations were observed between institutional quality and GDP per capita, as well as between institutional quality and labor costs. This suggests that countries with higher institutional quality tend to have higher GDP per capita and higher labor costs. It is important to note that these correlations do not indicate multicollinearity issues among the variables, as a variance inflation factor (VIF) analysis was conducted and the obtained values, with a mean VIF close to 3 and lower than 10, suggest that multicollinearity problems are not significant (Neter et al., 1990).

4.2 Statistical approach

To account for the hierarchical structure of the data, which includes information at two different levels (individuals at level 1, and countries at level 2), a multilevel analytical technique is employed. This

Table 1 Data Description and Sources

Variable	Description	Type	Level	Source
Dependent				
Entrepreneurial innovation	How many (potential) customers consider the product new/unfamiliar? *1 = all customers agree that the product/service of this business is new, 0 otherwise*	Binary	Individual	GEM
Independent				
Speed of pro-market reforms	Measure the speed of time that each country employs during pro-market reforms, given the maximum scope that institutions could evolve *(Actual speed of pro-market reforms/Fastest speed)*	Continuous	Country	EFI
Self-efficacy	Do you have the knowledge, skill, and experience required to start a new business? *1 = Yes 0 = otherwise*	Binary	Individual	GEM
New entrepreneur	Is the entrepreneur at an early stage of entrepreneurial activity or not? *1 = entrepreneur with less than 3.5 years of activity* *0 = entrepreneur with more than 3.5 years of activity*	Binary	Individual	GEM
Individual-level control variables				
Gender	Gender of the respondent *1 = Male 0 = Woman*	Binary	Individual	GEM
Education	Identifies the highest educational degree obtained *primary, some secondary, secondary degree, post-secondary, graduate level*	Categorical	Individual	GEM
Age	The exact age of the respondent at the time of the interview	Continuous	Individual	GEM
Know entrepreneur	Do you personally know someone who started a business in the past 2 years? *1 = Yes 0 = otherwise*	Binary	Individual	GEM
Opportunity perception	In the next 6 months, there will be good opportunities for starting a business in the area where you live? *1 = Yes 0 = otherwise*	Binary	Individual	GEM
Fear of failure	Fear of failure would prevent you from starting a new business? *1 = Yes 0 = otherwise*	Binary	Individual	GEM
Household income	Entrepreneurs were asked to provide information about their household income *lower (1), middle (2), and upper (3) levels of the income distribution of the country of origin*	Categorical	Individual	GEM
Country-level control variables				
GDP pc	GDP per capita (current US$)	Continuous	Country	World Bank
GDP growth	GDP growth (annual %)	Continuous	Country	World Bank
Labor costs	GDP per person employed (constant 2017 PPP $, in miles)	Continuous	Country	World Bank
Country size	Total population size (ln)	Continuous	Country	World Bank
Country strategic assets	Patent applications (In miles)	Continuous	Country	World Bank
Country natural resources	Ores and metals exports (% of merchandise exports); Fuel exports (% of merchandise exports)	Continuous	Country	World Bank
Institutional quality	A value between 0 and 100 which measures the degree of economic freedom of a country *(0 low level of economic freedom, 100 maximum level)*	Continuous	Country	EFI
Control of corruption	A value between -2.5 and 2.5 that captures perceptions of the extent to which public power is exercised for private gain in a country (a high level represented a low level of corruption)	Continuous	Country	WGI

Table 2 Descriptive statistics

Variable	N	Mean	SD	Min	Max
Entrepreneurial innovation	109,075	0.17	0.38	0	1
Speed of pro-market reforms	109,075	0.02	0.02	0	0.13
Self-efficacy	109,075	0.81	0.40	0	1
New entrepreneur	109,075	0.61	0.49	0	1
Gender	109,075	0.60	0.49	0	1
Education	109,075	1.98	1.08	0	4
Age	109,075	39.81	12.2	17	90
Know entrepreneur	109,075	0.60	0.49	0	1
Opportunity perception	109,075	0.62	0.49	0	1
Fear of failure	109,075	0.30	0.46	0	1
Household income	109,075	31,259	32,898	33	68,100
GDP per capita	109,075	13,942	16,819	1,024	103,085
GDP growth	109,075	3.79	2.62	-6.03	11.34
Labor Costs	109,075	48.10	30.90	8.08	241.39
Country size	109,075	110 M	237 M	596.3	1,390 M
Country strategic assets (patent application residents)	109,075	19.78	128.1	0	1,393
Country strategic assets (patent application non-residents)	109,075	7.76	16.68	0	148.2
Country natural resources (ores and metals exports)	109,075	10.33	16.66	0.18	81.21
Country natural resources (fuel exports)	109,075	18.07	24.42	0	92.42
Institutional quality	109,075	65.41	7.26	48.6	89.4
Control of corruption	109.075	0.13	0.85	-1.22	2.29

SD = standard deviation; N = number of observations; GDP = gross domestic product

approach allows for the control of clustering of individual data within countries, ensuring that the assumption of independent observations is not violated (Snijders & Bosker, 2011). Ignoring this hierarchical structure could lead to biased standard errors and unreliable regression coefficients (Rabe-Hesketh & Skrondal, 2012; Bryk & Raudenbush, 1992). The multilevel design enables the examination of variation in the effect of the speed of pro-market reforms across countries by allowing this effect to vary at the country level (Hox, 2010). Since the dependent variable (*entrepreneurial innovation*) is dichotomous, a logistic regression model with random intercepts that vary across countries and over time is used.

A prerequisite for employing multilevel estimation is the presence of sufficient variation at the different levels of analysis (Aguinis et al., 2013). To assess the existence of individual-level variations across countries, a null model (model with intercept only) is computed. The inter-class correlation (ICC) of the null model measures the proportion of total variation in the dependent variable that can be attributed to

differences between countries. In this case, the ICC is calculated to be 0.159, indicating that 15.9% of the variance in the dependent variable is attributable to country-level differences, while 84.1% is attributable to individual-level variations. Although there is no specific threshold for an ideal ICC, previous studies have reported ICC values ranging from 5 to 30% (Aguinis et al., 2013). Furthermore, a likelihood ratio test is conducted to compare the fit of the multilevel logistic regression model with that of a traditional logistic regression. The test shows high significance, indicating that the multilevel model provides a better fit to the data.

4.3 Main results

Table 5 presents the results of the multilevel mixed-effects logistic regression. Model 1 displays the results with only the individual variables included. Model 2 incorporates all country variables, including the *speed of pro-market reforms*, allowing us to

Table 3 Percentage of entrepreneurs by country and sector

Country	Extractive	Transforming	Business services	Consumer-oriented	Of the total sample
Angola	0,9%	16,9%	4,7%	77,6%	**0,7%**
Argentina	1,1%	26,8%	14,2%	57,9%	**0,2%**
Australia	3,4%	21,8%	39,1%	35,6%	**0,1%**
Austria	7,1%	18,5%	33,6%	40,8%	**1,2%**
Bangladesh	16,0%	23,7%	1,8%	58,4%	**0,2%**
Bosnia and Herzegovina	28,1%	28,5%	8,7%	34,7%	**0,8%**
Botswana	15,2%	21,0%	10,2%	53,6%	**1,7%**
Brazil	2,0%	31,3%	8,1%	58,6%	**7,7%**
Bulgaria	6,7%	27,8%	9,7%	55,8%	**0,4%**
Chile	3,2%	27,2%	15,4%	54,3%	**5,4%**
China	1,8%	26,0%	10,0%	62,3%	**1,1%**
Colombia	2,5%	29,6%	15,9%	52,1%	**9,1%**
Costa Rica	2,7%	25,5%	8,6%	63,2%	**0,5%**
Croatia	15,5%	26,6%	24,5%	33,5%	**1,4%**
Czech Republic	3,8%	29,5%	29,1%	37,6%	**0,6%**
Egypt	11,3%	32,3%	6,0%	50,4%	**0,1%**
Estonia	10,5%	31,2%	28,4%	29,9%	**0,9%**
France	8,8%	24,6%	29,3%	37,3%	**0,5%**
Georgia	46,8%	21,9%	4,7%	26,6%	**0,4%**
Germany	2,9%	19,3%	32,7%	45,0%	**3,0%**
Greece	3,8%	25,6%	23,1%	47,4%	**0,1%**
Guatemala	1,6%	20,5%	6,5%	71,4%	**4,3%**
Hungary	12,7%	30,6%	21,4%	35,4%	**0,8%**
India	9,2%	20,3%	4,4%	66,1%	**2,0%**
Indonesia	3,7%	14,9%	5,4%	76,1%	**6,8%**
Iran	6,9%	25,4%	13,8%	53,9%	**1,1%**
Israel	1,5%	20,8%	31,4%	46,4%	**0,7%**
Italy	11,8%	21,3%	33,1%	33,8%	**0,3%**
Jamaica	18,4%	15,9%	3,1%	62,6%	**1,3%**
Japan	3,4%	17,6%	26,1%	52,9%	**0,1%**
Jordan	6,5%	26,0%	2,0%	65,5%	**0,2%**
Kazakhstan	8,7%	23,0%	8,2%	60,1%	**0,7%**
Latvia	15,0%	31,8%	18,3%	34,9%	**0,8%**
Lebanon	4,8%	17,4%	4,3%	73,5%	**0,9%**
Lithuania	11,0%	31,5%	19,9%	37,5%	**0,8%**
Luxembourg	2,8%	21,7%	35,8%	39,6%	**0,1%**
Malaysia	7,9%	18,3%	6,7%	67,0%	**1,6%**
Mexico	1,4%	14,0%	4,5%	80,0%	**2,0%**
Montenegro	8,6%	13,6%	14,1%	63,6%	**0,2%**
Morocco	3,6%	39,9%	2,7%	53,7%	**1,0%**
Nigeria	5,0%	24,3%	6,4%	64,3%	**2,7%**
North Macedonia	14,2%	32,8%	10,5%	42,4%	**0,3%**
Norway	13,2%	23,5%	32,3%	31,0%	**0,7%**
Panama	2,4%	23,9%	7,8%	66,0%	**0,9%**
Peru	7,7%	23,3%	5,9%	63,1%	**3,9%**

Table 3 (continued)

Country	Extractive	Transforming	Business services	Consumer-oriented	Of the total sample
Philippines	4,7%	13,1%	3,5%	78,6%	**1,5%**
Poland	6,1%	34,0%	20,1%	39,8%	**2,6%**
Portugal	7,6%	20,9%	22,4%	49,1%	**0,4%**
Qatar	1,9%	34,0%	22,7%	41,3%	**1,0%**
Romania	19,3%	28,3%	18,1%	34,2%	**1,0%**
Russia	5,7%	32,6%	11,7%	50,0%	**0,3%**
Saudi Arabia	0,4%	19,4%	6,8%	73,4%	**0,5%**
Singapore	0,2%	18,6%	27,1%	54,1%	**0,6%**
Slovak Republic	0,9%	42,5%	20,8%	35,7%	**0,2%**
Slovenia	9,1%	25,8%	34,1%	31,0%	**0,3%**
South Korea	2,4%	27,8%	13,5%	56,4%	**2,0%**
Sweden	13,2%	16,9%	37,4%	32,5%	**1,7%**
Switzerland	6,6%	20,7%	31,4%	41,3%	**1,7%**
Thailand	15,5%	14,7%	5,0%	64,7%	**5,3%**
Tunisia	31,4%	28,6%	11,4%	28,6%	**0,0%**
Turkey	4,9%	0,0%	17,6%	37,8%	**5,3%**
United Arab Emirates	1,3%	29,5%	22,5%	46,7%	**0,7%**
Uruguay	5,7%	28,0%	16,0%	50,3%	**1,1%**
Vietnam	6,1%	16,9%	4,9%	72,1%	**1,2%**
Zambia	10,9%	13,5%	3,5%	72,1%	**2,1%**
Total	**6,4%**	**24,4%**	**13,2%**	**56,0%**	**100,0%**

[*]*The data in the table are calculated over 94,080 entrepreneurs included in the main sample (there are 14,995 individuals for whom this industry data is unavailable)*

test its positive influence on entrepreneurial innovation (Hypothesis 1). Finally, Model 3 presents the complete specification, incorporating both moderating effects: the effect of entrepreneurial *self-efficacy* (Hypothesis 1a) and the effect of being a *new entrepreneur* (Hypothesis 1b). Results are presented using odds ratios. In comparison to marginal effects, odds ratios provide a clearer, consistent and scalable interpretation of the results, especially in a multilevel context where the influence of independent variables is measured at different hierarchical levels.[4] As can be seen at the bottom of Table 5, the Wald chi-square values indicate that all models are statistically significant. The Akaike Information Criterion (AIC),

where a lower value suggests a better model fit, supports the preference for the full model specification. Additionally, likelihood ratio tests comparing the use of multilevel mixed-effects logistic regression models with ordinary logistic regression models confirm the necessity of employing the multilevel technique, as mentioned earlier.

The results presented in Table 5 remain usually stable and provide valuable insights into the role of a high speed of pro-market reforms in entrepreneurial innovation, as well as the advantages certain entrepreneurs may have in such contexts. Supporting Hypothesis 1, we anticipate that rapid improvements in pro-market reforms will create new market opportunities and accelerate technology obsolescence, thereby positively impacting entrepreneurial innovation. As indicated in Table 5 (Model 3), the *speed of pro-market reforms* variable exhibits a positive and statistically significant effect ($p < 0.01$). This implies that when reforms occur at a high speed, the likelihood of

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[4] Odds ratio allow us (1) to interpret the results in terms of relative probability, (2) are independent of the scale of the dependent variable (which facilitates comparison between different studies or between different levels of a multilevel analysis) and (3) facilitate the interpretation since these ratios are already normalized.

Table 4 Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Entrepreneurial innovation	1.00																			
2. Speed of pro-market reforms	0.03*	1.00																		
3. Self-efficacy	0.05*	0.03*	1.00																	
4. New entrepreneur	0.07*	0.04*	0.05*	1.00																
5. Gender	0.01*	0.01*	0.06*	-0.04*	1.00															
6. Education	0.02*	0.08*	0.10*	0.07*	0.05*	1.00														
7. Age	-0.02*	-0.02*	-0.03*	-0.31*	0.02*	-0.10*	1.00													
8. Know entrepreneur	0.02*	-0.01*	0.18*	0.11*	0.04*	0.10*	-0.11*	1.00												
9. Opportunity perception	0.05*	0.05*	0.17*	0.12*	-0.01*	0.01*	-0.08*	0.18*	1.00											
10. Fear of failure	-0.02*	-0.02*	-0.20*	-0.04*	-0.05*	-0.06*	0.02*	-0.05*	-0.12*	1.00										
11. Household income	0.02*	0.10*	0.09*	-0.02*	0.10*	0.23*	0.01	0.11*	0.05*	-0.06*	1.00									
12. GDP per capita	-0.04*	-0.05*	0.00	-0.07*	0.08*	0.21*	0.18*	-0.07*	-0.06*	-0.06*	0.08*	1.00								
13. GDP growth	0.13*	0.15*	0.01*	0.05*	0.02*	-0.03*	-0.08*	0.06*	0.09*	-0.00	0.03*	-0.31*	1.00							
14. Labor cost	-0.02*	-0.08*	0.02*	-0.07*	0.11*	0.23*	0.15*	-0.03*	-0.07*	-0.05*	0.08*	0.90*	-0.23*	1.00						
15. Population	0.02*	-0.12*	-0.07*	-0.07*	-0.04*	-0.15*	-0.03*	0.02*	0.04*	0.08*	-0.04*	-0.37*	0.23*	-0.39*	1.00					
16. Country strategic assets (patents application)	-0.01*	-0.04*	-0.05*	-0.01*	-0.01	0.03*	0.03*	0.04*	-0.02*	0.02*	0.03*	0.06*	0.09*	-0.01*	0.25*	1.00				

Table 4 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
17. Country natural resources (ores and metals)	0.07*	-0.09*	0.05*	0.09*	-0.04*	-0.03*	-0.02*	0.03*	0.06*	-0.06*	0.01*	-0.14*	-0.01*	-0.20*	-0.17*	-0.08*	1.00			
18. Country natural resources (fuel exports)	0.01	0.34*	0.06*	0.08*	-0.01*	0.04*	-0.09*	0.05*	0.12*	-0.04*	0.02*	-0.17*	0.02*	-0.18*	0.12*	-0.09*	-0.24*	1.00		
19. Institutional quality	0.09*	0.14*	0.03*	0.04*	0.04*	0.23*	0.14*	-0.05*	-0.01	-0.07*	0.08*	0.65*	-0.11*	0.50*	-0.54*	-0.07*	0.15	-0.17*	1.00	
20. Control of corruption	0.02*	-0.10*	0.03*	-0.05*	0.07*	0.22*	0.19*	-0.04*	-0.03*	-0.07*	0.07*	0.61*	-0.18*	0.58*	-0.41*	0.00	0.10	-0.34*	0.75*	1.00

p-value * <0.1

entrepreneurial innovation increases, aligning with Hypothesis 1.

Regarding Hypothesis 1a, our contention is that in uncertain environments characterized by rapid pro-market reforms and emerging opportunities, entrepreneurs with higher levels of confidence in their skills and previous entrepreneurial experience will be better positioned to capitalize on these new prospects and engage in innovation. However, the results from Model 3 of Table 5 reveal that the effect of *entrepreneurial self-efficacy* on the relationship between the speed of pro-market reforms and entrepreneurial innovation is positive but not statistically significant ($p < 0.426$). Consequently, Hypothesis 1a is not supported. This unexpected outcome prompted us to conduct further analysis, which will be discussed in the subsequent section.

Finally, Hypothesis 1b posits that established entrepreneurs who have been operating in the market for a longer period may exhibit rigidity when it comes to seizing new opportunities arising from rapid pro-market reforms. In this context, longer-established entrepreneurs may invest time and resources in adapting their activities to swift changes, potentially overlooking or failing to capitalize on emerging opportunities. As expected, the results from Model 3 of Table 5 demonstrate that being a new entrepreneur strengthens the positive relationship between a higher speed of pro-market reforms and entrepreneurial innovation ($p < 0.01$). Figure 1 illustrates the plot of the (significant) marginal effects of this positive interaction. As depicted, entrepreneurs with shorter business lifespans (less than 42 months) display a greater probability of innovating during periods of rapid reforms compared to established entrepreneurs, as postulated. Therefore, Hypothesis 1b is supported.

4.4 Further analysis

In light of the unexpected result for Hypothesis 1a, which differ from previous studies that highlight the importance of entrepreneurial skills and experience when pro-market reforms take place at high speed (Banalieva et al., 2015; Chen et al., 2017), it may be of interest to delve into the reasons behind this discrepancy. With this aim in mind, we further examine this hypothesis taking into account that entrepreneurial skills may be different depending on the stage of the venture along the life cycle. In particular,

Table 5 Multilevel mixed-effects logistic regressions (Dependent Variable: entrepreneurial innovation)

	Model 1	Model 2	Model 3
	OR (SE)	OR (SE)	OR (SE)
Individual-level variables (level 1)			
Self-efficacy	1.242***(0.030)	1.244***(0.030)	1.221***(0.040)
New entrepreneur	1.273***(0.025)	1.267***(0.025)	1.203***(0.031)
Gender	0.987(0.018)	0.985(0.018)	0.985(0.018)
Education (secondary)	1.064*(0.037)	1.065*(0.037)	1.066*(0.037)
Education (secondary degree)	1.072**(0.032)	1.056*(0.031)	1.055*(0.031)
Education (post-secondary)	1.001(0.032)	0.992(0.032)	0.991(0.031)
Education (graduate level)	1.039(0.051)	1.033(0.051)	1.032(0.051)
Age	1.000(0.001)	1.000(0.001)	1.000(0.001)
Know entrepreneur	1.033*(0.019)	1.040**(0.019)	1.040**(0.019)
Opportunity perception	1.216***(0.023)	1.198***(0.023)	1.199***(0.023)
Fear of failure	0.999(0.019)	0.995(0.019)	0.995(0.019)
Household income (middle level)	0.939***(0.022)	0.947**(0.023)	0.947**(0.023)
Household income (upper level)	0.973(0.022)	0.957*(0.022)	0.958*(0.022)
Country-level variables (level 2)			
GDP per capita		2.148***(0.246)	2.177***(0.249)
GDP growth		1.034***(0.007)	1.033***(0.007)
Labor Costs		0.976***(0.004)	0.976***(0.004)
Country size		1.424***(0.158)	1.416***(0.155)
Country strategic assets (patent application residents)		0.999(0.001)	0.999(0.001)
Country natural resources (ores and metals exports)		0.964***(0.006)	0.965***(0.006)
Country natural resources (fuel exports)		1.012***(0.003)	1.011***(0.003)
Institutional quality		1.068***(0.007)	1.067***(0.007)
Control of corruption		1.702***(0.183)	1.674***(0.180)
Main effects			
(H1) Speed of pro-market reforms		310.9***(249.63)	24.76**(34.01)
(H1a) Speed of pro-market reforms * Self-efficacy			2.520 (2.789)
(H1b) Speed of pro-market reforms * New entrepreneur			13.35***(11.53)
N	109,075	109,075	109,075
Log likelihood	-44,518.616	-44,282.32	-44,277.34
Wald test (χ2)	457.79***	878.62***	889.57***
LR test vs logistic regression	10,427.06***	6559.58***	6566.14***
AIC	89,067.232	88,614.639	88,608.697

*Exponentiated coefficients; Standard errors (SE) in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01; AIC = Akaike Information Criterion; OR = odds ratio; GDP = gross domestic product*

self-efficacy will be of special relevance to overcome phenomena such as the liability of the newness (Stinchcombe, 1965) or the liability of adolescence (Brüderl & Schüssler, 1990) that may even lead to higher rates of failure. To investigate this, we propose testing Hypothesis 1a exclusively on a sample comprising new entrepreneurs (i.e., those with less than 42 months of business lifespan). In this revised

analysis, we employ a multilevel logistic regression model, using a reduced sample size of 67,024 observations. Similar to the main analysis, the presence of relevant country-level effects is indicated by the intra-class correlation (ICC), which now stands at 0.14, falling within the accepted range.

The new results are presented in Table 6. Once again, the tests indicate that the full model (Model 6)

Fig. 1 Graphical representation of marginal effects of the moderating effect (being a new entrepreneur)
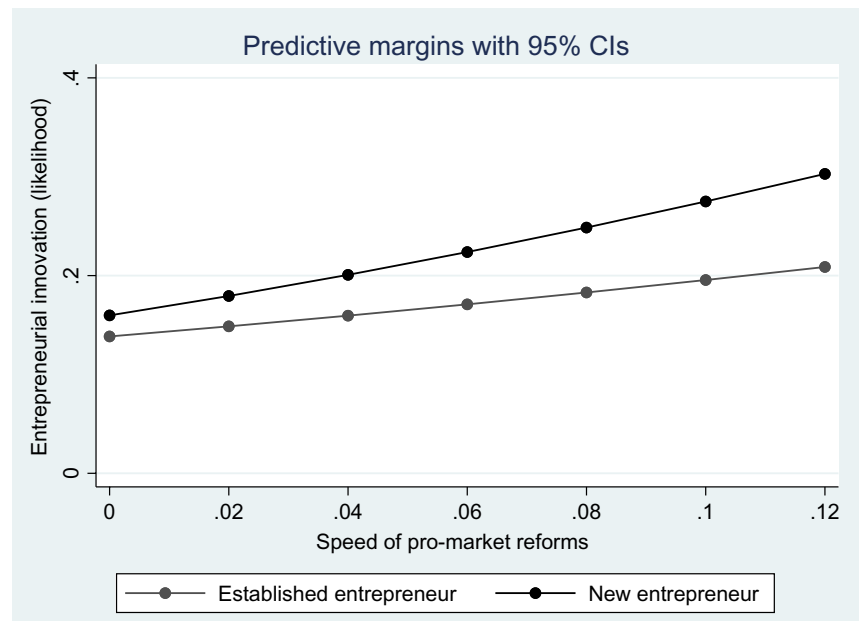
is the preferred specification. When considering only the sample of new entrepreneurs, we observe a positive and significant moderating effect ($p < 0.10$) for entrepreneurs with entrepreneurial self-efficacy. This finding aligns with our proposed Hypothesis 1a, but only for entrepreneurs in the early stages of their ventures. Specifically, the positive effect of a high speed of pro-market reforms on entrepreneurial innovation is enhanced for individuals who perceive themselves to possess certain entrepreneurial skills. These individuals are better able to capitalize on opportunities, resulting in a greater likelihood of innovation. Figure 2 visually depicts the marginal (significant) effects of this moderation. As shown in Fig. 2, entrepreneurs who have a sense of self-efficacy are more likely to engage in innovation as the speed of pro-market reforms increases. Therefore, we find partial support for Hypothesis 1a.

Furthermore, it can be argued that the influence of the speed of pro-market reforms on entrepreneurs' innovation capacity may be conditioned by the economic conditions on the country in which they operate. Although the country effect included in the main analysis may partially control for this circumstance, innovation is closely linked to the economic capacity of entrepreneurs, which determines the resources available and their flexibility, thus being influenced by the economic environment that surrounds the

entrepreneur. For this reason, we performed an additional analysis splitting our sample according to the level of GDP per capita of the country.[5] Again, we replicate our multilevel logistic regression model (similar to the main analysis) and we verified the existence of variability. The results, presented in Table 7, reveal notable differences between Model 7 (low level of GDP per capita) and Model 8 (high level of GDP per capita). Although in both subsamples the results remain stable and aligned with the main analysis (confirming Hypotheses 1 and 1b), the coefficients differ between the models. The results indicate that the positive effect of speed of pro-market reforms on entrepreneurial innovation is considerably stronger in countries with lower economic capacity (18,728.4 with $p < 0.01$ in contrast to 0.001 with $p < 0.05$). In economies with high GDP per capita, entrepreneurs typically have better access to resources, which allows them to capitalize more quickly opportunities through aggressive and effective investments in innovation. However, these same resources also allow firms to respond quickly, thereby narrowing the window of opportunity for entrepreneurs. In contrast, in

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[5] The average GDP per capita in our sample is $13,942 (see Table 2), thus, we separately estimate our model for countries below and above this average.

Table 6 Multilevel Logistic Regressions (Dependent Variable: entrepreneurial innovation by new entrepreneurs)

|	Model 4	Model 5	Model 6
	OR (SE)	OR (SE)	OR (SE)
Individual-level variables (level 1)			
Self-efficacy	1.238***(0.037)	1.231***(0.037)	1.174***(0.048)
Gender	1.014 (0.022)	1.013 (0.022)	1.013 (0.022)
Education (secondary)	1.110**(0.049)	1.118**(0.050)	1.118**(0.050)
Education (secondary degree)	1.112***(0.042)	1.104***(0.042)	1.104***(0.042)
Education (post-secondary)	1.031 (0.041)	1.032 (0.042)	1.032 (0.042)
Education (graduate level)	1.071 (0.065)	1.081 (0.065)	1.080 (0.065)
Age	1.001 (0.001)	1.001 (0.001)	1.001 (0.001)
Know entrepreneur	0.997 (0.023)	1.009 (0.023)	1.009 (0.023)
Opportunity perception	1.197***(0.028)	1.173***(0.027)	1.173***(0.028)
Fear of failure	0.973 (0.023)	0.971 (0.023)	0.971 (0.023)
Household income (middle level)	0.958 (0.027)	0.962 (0.028)	0.963 (0.028)
Household income (upper level)	0.990 (0.027)	0.971 (0.027)	0.971 (0.027)
Country-level variables (level 2)			
GDP per capita		1.001***(0.000)	1.001***(0.000)
GDP growth		1.050***(0.008)	1.050***(0.008)
Labor Costs		0.982***(0.004)	0.982***(0.004)
Country size		0.719***(0.090)	0.718***(0.090)
Country strategic assets (patent application residents)		0.990***(0.002)	0.990***(0.002)
Country natural resources (ores and metals exports)		0.965***(0.006)	0.965***(0.006)
Country natural resources (fuel exports)		1.030***(0.004)	1.030***(0.004)
Institutional quality		1.059***(0.009)	1.059***(0.009)
Control of corruption		1.322**(0.153)	1.324**(0.153)
Main effects			
(H1) Speed of pro-market reforms		305.34***(280.31)	43.37**(64.53)
(H1a) Speed of pro-market reforms * Self-efficacy			9.236*(12.27)
N	67,024	67,024	67,024
Log likelihood	-29,750.12	-29,564.677	-29,563.263
Wald test (χ2)	151.98***	487.69***	490.92***
LR test vs logistic regression	6412.52***	4072.37***	4073.26***
AIC	59,528.23	59,177.35	59,176.52

*Exponentiated coefficients; Standard errors (SE) in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; AIC = Akaike Information Criterion; OR = odds ratio; GDP = gross domestic product*

countries with low GDP per capita, although entrepreneurs have fewer resources at their disposal, lower initial competition and a more flexible economic structure allow them to take advantage of gaps left by firms that cannot adapt quickly, incentivizing innovation in these contexts (Ayyagari et al., 2011). Moreover, in these environments, lower regulatory rigidity may offer an additional advantage to entrepreneurs who adapt quickly to new opportunities (Puffer et al., 2010).

4.5 Robustness test

We conducted an additional test to examine the robustness of our findings. In this test, we replicated our main analysis by using a different measure of entrepreneurial innovation, which categorizes the levels of innovation into three categories: non-innovators (*none,* value 0), entrepreneurs with some customers considering their product new (*some,* that adopt a value of 1), and entrepreneurs with all customers

Fig. 2 Graphical representation of marginal effects of the moderating effect (entrepreneurs with self-efficacy)
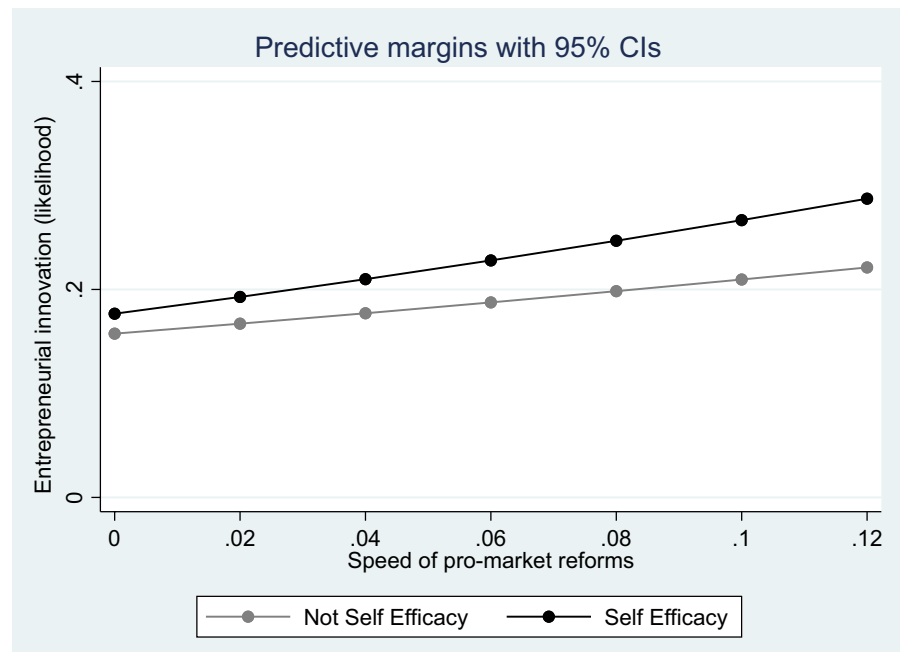
considering their product new (*all,* with a value of 2). To analyze this new model, we employed a multilevel mixed-effects ordered logistic regression with two levels (individual level 1 and country level 2), similar to the main analysis. Once again, the ICC indicates the presence of relevant country-level effects, with an ICC value of 0.16 falling within accepted ranges. The results of this analysis are presented in Table 8. As shown in Table 8, the results remain stable compared to the main analysis, indicating the robustness of our findings.

5 Discussion and conclusions

Institutional changes that aim to liberalize markets and reduce regulatory constraints have traditionally been viewed as having a positive impact on economic activity (Cuervo-Cazurra & Dau, 2009; Cuervo-Cazurra et al., 2019a, 2019b). However, it is important to consider that when these changes occur too rapidly, the resulting uncertainty may dampen their effects. For example, Banalieva et al. (2015) introduce the dynamic institution-based view of the firm, high-lighting that while the extent of institutional reforms positively affects firm performance, a higher speed of implementation can have a detrimental effect. In the context of entrepreneurship, Mickiewicz et al. (2021)

have also explored the significance of time in the entrepreneurial process. They demonstrate that entry into entrepreneurship varies depending on short-term changes in the rule of law. In line with the insights from these previous works, our research incorporates the dynamic institution-based view of the firm into the analysis of entrepreneurial innovation. Specifically, we examine the positive effect of a high speed of pro-market reforms on the innovative behavior of entrepreneurs. Building on the literature on dynamic institutions and innovative entrepreneurship, we argue that rapid institutional reforms, characterized by the swift removal of entry barriers, changes in consumer behavior, and the emergence of new technologies brought by foreign competitors, create new market spaces and render existing products obsolete. Entrepreneurs, driven by the desire to capitalize on these new and uncertain market opportunities, are more likely to engage in innovation. Hence, in accordance with our expectations, we find evidence supporting the notion that a high speed of pro-market reforms increases the likelihood of entrepreneurial innovation.

Furthermore, prior literature has highlighted the importance of skills and adaptability in uncertain and rapidly changing environments brought about by pro-market institutional changes. Specifically, we argue that entrepreneurs who possess self-confidence

Table 7 Multilevel Logistic Regressions by GDP per capita subsamples (Dependent Variable: entrepreneurial innovation)

	Low GDP per capita	High GDP per capita
	Model 7	Model 8
	OR (SE)	OR (SE)
Individual-level variables (level 1)		
Self-efficacy	1.224*** (0.044)	1.084 (0.100)
New entrepreneur	1.114*** (0.031)	1.837*** (0.139)
Gender	0.957** (0.019)	1.156*** (0.053)
Education (secondary)	1.065* (0.039)	1.093 (0.149)
Education (secondary degree)	1.039 (0.032)	1.064 (0.137)
Education (post-secondary)	0.985 (0.033)	0.969 (0.125)
Education (graduate level)	0.969 (0.055)	1.152 (0.167)
Age	1.000 (0.001)	1.001 (0.002)
Know entrepreneur	1.036* (0.021)	1.057 (0.048)
Opportunity perception	1.222*** (0.026)	1.080* (0.050)
Fear of failure	0.975 (0.021)	1.014 (0.049)
Household income (middle level)	0.966 (0.025)	0.867** (0.052)
Household income (upper level)	0.971 (0.025)	0.913* (0.050)
Country-level variables (level 2)		
GDP per capita	5.332*** (0.756)	1.642* (0.475)
GDP growth	1.018** (0.008)	1.014 (0.019)
Labor Costs	1.017** (0.008)	1.000 (0.005)
Country size	2.073*** (0.345)	0.928 (0.116)
Country strategic assets (patent application residents)	0.997** (0.001)	1.004 (0.003)
Country natural resources (ores and metals exports)	0.963*** (0.006)	0.991 (0.022)
Country natural resources (fuel exports)	1.002 (0.004)	1.018*** (0.007)
Institutional quality	1.054*** (0.009)	1.025 (0.016)
Control of corruption	1.685*** (0.205)	0.591*** (0.119)
Main effects		
(H1) Speed of pro-market reforms	18,728.4*** (28,203.5)	0.001** (0.000)
(H1a) Speed of pro-market reforms * Self-efficacy	1.471 (1.67)	870.4 (3713.2)
(H1b) Speed of pro-market reforms *New entrepreneur	22.54*** (20.12)	0.001** (0.003)
N	85,506	23,569
Log likelihood	-35,984.9	-8,031.5
Wald test (χ2)	962.90	202.56
AIC	72,023.92	16,116.98

Exponentiated coefficients; Standard errors (SE) in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; AIC=Akaike Information Criterion; OR=odds ratio; GDP=gross domestic product*

Low GDP per capita (GDPpc)=GDPpc lower than the mean; High GDPpc=GDPpc higher than the mean

and believe in their ability to navigate the business landscape are better equipped to manage uncertainty and capitalize on opportunities presented by these changes. Additionally, we contend that early-stage entrepreneurs, unencumbered by their own history and constraints, are more flexible in identifying and exploiting opportunities. Consistent with our arguments, our findings confirm that entrepreneurs in the early stages of their ventures are more successful in leveraging rapid institutional changes to drive innovation compared to more established entrepreneurs. Conversely, established entrepreneurs often face challenges in adapting their existing businesses to the changing environment, leading to limited innovation.

Table 8 Multilevel mixed-effects ordered logistic regressions (Dependent Variable: categorical entrepreneurial innovation)

	Model 9	Model 10	Model 11
	OR (SE)	OR (SE)	OR (SE)
Individual-level variables (level 1)			
Self-efficacy	1.195***(0.019)	1.276***(0.021)	1.307***(0.029)
New entrepreneur	1.605***(0.021)	1.533***(0.021)	1.455***(0.026)
Gender	1.084***(0.013)	1.064***(0.013)	1.064***(0.013)
Education (secondary)	1.119***(0.027)	1.023 (0.025)	1.024 (0.025)
Education (secondary degree)	1.270***(0.026)	1.086***(0.023)	1.085***(0.023)
Education (post-secondary)	1.468***(0.031)	1.173***(0.026)	1.172***(0.026)
Education (graduate level)	1.661***(0.054)	1.291***(0.044)	1.290***(0.044)
Age	0.997***(0.001)	0.993***(0.001)	0.993***(0.001)
Know entrepreneur	1.070***(0.014)	1.055***(0.014)	1.056***(0.014)
Opportunity perception	1.163***(0.015)	1.134***(0.015)	1.134***(0.015)
Fear of failure	1.034**(0.014)	1.022 (0.014)	1.022 (0.014)
Household income (middle level)	0.988 (0.016)	0.986 (0.017)	0.986 (0.017)
Household income (upper level)	1.075***(0.017)	1.055***(0.017)	1.054***(0.017)
Country-level variables (level 2)			
GDP per capita		0.999***(0.000)	0.999***(0.000)
GDP growth		1.108***(0.003)	1.107***(0.003)
Labor Costs		1.001 (0.000)	1.001 (0.000)
Country size		1.438***(0.013)	1.439***(0.013)
Country strategic assets (patent application residents)		1.006***(0.000)	1.006***(0.000)
Country natural resources (ores and metals exports)		0.999 (0.000)	0.999 (0.000)
Country natural resources (fuel exports)		0.998***(0.000)	0.998***(0.000)
Institutional quality		1.079***(0.002)	1.079***(0.002)
Control of corruption		0.983 (0.018)	0.984 (0.018)
Main effects			
(H1) Speed of pro-market reforms		0.047***(0.018)	0.020***(0.018)
(H1a) Speed of pro-market reforms * Self-efficacy			0.288 (0.233)
(H1b) Speed of pro-market reforms * New entrepreneur			15.235***(9.605)
cut1	2.608***(0.094)	148,576***(29,155)	145,501***(28,632)
cut2	10.12***(0.372)	620,935***(122,389)	608,307***(120,231)
var(_cons[country])	1.835***(0.301)	2.208***(0.471)	2.221***(0.477)
N	109,075	109,075	109,075
Log likelihood	-104,784.87	-100,950.91	-100,940.5
Wald test (χ2)	3098.92***	9449.87***	9485.95***
LR test vs ordered logistic regression	837.65***	845.31***	846.19***
AIC	209,601.73	201,953.82	201,937.00

Exponentiated coefficients; Standard errors (SE) in parentheses *$p<0.1$, ** $p<0.05$, *** $p<0.01$; AIC=Akaike Information Criterion; OR=odds ratio; GDP=gross domestic product*

Furthermore, our results indicate that individuals who perceive themselves as having the requisite knowledge, skills, and experience for entrepreneurship exhibit higher levels of innovation in uncertain contexts, but this effect diminishes as entrepreneurs gain expertise and familiarity with the environment. Once entrepreneurs attain a certain level of expertise, their knowledge and familiarity with the business environment enable them to effectively navigate pro-market reforms, rendering self-efficacy less influential.

From a theoretical perspective, our main contribution lies in integrating the dynamic institution-based view into the analysis of entrepreneurial innovation. By considering the role of speed in institutional changes, we provide a comprehensive understanding of the influence institutions exert on business innovation. Building upon recent studies that have begun exploring the temporal aspect of institutional change in the entrepreneurial context (Mickiewicz et al., 2021), our research delves deeper into the significance of speed, particularly in relation to entrepreneurial innovation. Moreover, our study contributes to the ongoing debate on the distinctions between young and established entrepreneurs, demonstrating that young entrepreneurs may possess a greater propensity for innovation in the face of rapid institutional pro-market reforms. Finally, our research presents new empirical evidence on the impact of institutional change speed on business outcomes (Cuervo-Cazurra et al., 2019a, 2019b), specifically highlighting its positive effect on entrepreneurial innovation in a large multi-country sample.

Our study has significant implications for both managerial practice and policy. Regarding the former, potential entrepreneurs should recognize that environments characterized by high-speed pro-market reforms offer favorable conditions for the success of innovative new ventures. Contrary to previous literature (Banalieva et al., 2015, 2018; Fuentelsaz et al., 2022), which has shown a negative impact of the speed of institutional change on business performance, our findings suggest that in terms of introducing new products to the market, the uncertainty generated by the new competitive landscape, coupled with the entrenched practices and risk aversion of established competitors, mitigates the liability of newness typically faced by new ventures. Additionally, during the early stages of the entrepreneurial process, subjective beliefs about their potential play a crucial role for emerging entrepreneurs. In this context, self-efficacy can serve as a valuable substitute for extensive knowledge and experience. In other words, entrepreneurs can assess their innovative potential by analyzing the institutional environment in which they operate or plan to operate. Innovation is more likely to thrive during periods of institutional change, such as after a change in government, as rapid transformations create windows of opportunity that new entrepreneurs can exploit. Established companies, therefore, need to be vigilant in monitoring market developments and the actions of emerging competitors.

From a policy perspective, governments should consider the potential trade-offs associated with implementing rapid pro-market reforms. While such reforms can have a positive impact on market innovation, they may also have a detrimental effect on firm performance. Therefore, our research emphasizes the importance of exercising caution when implementing comprehensive reforms, and suggests the need to strike a balance between the two dimensions. Furthermore, fostering entrepreneurial education from the early stages of schooling can play a crucial role in cultivating an entrepreneurial culture within society. By promoting entrepreneurial education, policymakers can enhance the development of self-efficacy and strengthen individuals' ability to identify innovative entrepreneurial opportunities. This, in turn, can contribute to the overall growth and success of the entrepreneurial ecosystem.

However, it is important to acknowledge certain limitations in our study that warrant further attention in future research. First, our model measures entrepreneurial innovation based on the subjective perception of founders regarding the innovative nature of their new product in the market. While innovation is inherently subjective (Koellinger, 2008) and dependent on individual perspectives, having more detailed information about the level of innovation would enhance the robustness of our results. Second, the data limitations within the GEM database restricted our ability to differentiate between different types of innovation, such as product innovation versus process innovation. Investigating whether the speed of change affects these different types of innovation differently would provide valuable insights. Third, participants self-reported their levels of entrepreneurial self-efficacy, which may introduce self-reporting biases. Future research could employ more objective measures of this variable to minimize potential biases or collect more targeted data that would allow for advanced econometric techniques like the control function approach (Wooldridge, 2015) to solve this limitation. Nonetheless, it is worth noting that perceptions often play a significant role in shaping outcomes (Krueger & Brazeal, 1994). Fourth, our macro-level analysis primarily focuses on the speed of pro-market reforms. However, it is plausible that the speed of other macro dimensions related to laws

and regulations could also influence the propensity for entrepreneurial innovation. Therefore, identifying and incorporating additional relevant variables related to these macro dimensions would strengthen the robustness of our findings.

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