Deviant Response: The Effect of Income Inequality on Informal Entrepreneurship in Emerging Economies

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forthcoming in ***Small Business Economics***

This is a pre-peer review version of the manuscript. The published version can be found at:

https://link.springer.com/article/10.1007/s11187-025-01160-w

Drawing on anomie theory, this study examines how income inequality affects informal entrepreneurship in emerging economies. Using a sample of 6,143 new ventures across 34 emerging economies over the period of 2012 to 2013, we find that income inequality encourages informal entrepreneurship, and this relationship is weaker for entrepreneurs with greater general human capital, financial capital, and partnerships. This study enhances our understanding of the social incentives of informal entrepreneurship and how the role of income inequality in informal entrepreneurship varies with entrepreneurs' access to resources. Moreover, we also advance anomie theory by extending the application of anomie theory beyond its focus on traditional deviant behaviors.

Plain English Summary

This study finds that income inequality positively affects informal entrepreneurship, which suggests that disparities in income drive entrepreneurs toward opportunities in the informal sector. Since curbing the prevalence of informal entrepreneurship is a key policy objective, our findings highlight the importance of addressing income inequality as a critical underlying cause. Moreover, this study shows that the positive relationship between income inequality and informal entrepreneurship diminishes among entrepreneurs with greater general human capital, financial capital, and partnerships. These results underscore the value of policy interventions that improve access to education and financial resources. In doing so, policymakers can help entrepreneurs engage in more productive and formal entrepreneurial activities.

Keywords: Income inequality; Informal entrepreneurship; Anomie theory

JEL classifications: D02, L26, M13, O17

1. Introduction

Informal entrepreneurship, which reflects the form of entrepreneurship that does not register with governmental authorities, is widespread globally, especially in emerging economies (Bu & Cuervo-Cazurra, 2020; Webb et al., 2009). For example, informal businesses account for nearly 40% of gross domestic product (GDP) and two-thirds of total employment in emerging countries (La Porta and Shleifer 2014; Medina and Schneider 2018). Yet, why do entrepreneurs start businesses informally instead of formally? The conventional wisdom emphasizes that institutional factors—burdensome bureaucracy, regulatory constraints, taxes, and corruption—impose substantial costs and decrease the returns to formal entrepreneurship, thereby motivating entrepreneurs to operate informally (Laing et al. 2022; Mallon and Fainshmidt 2022; Siqueira et al. 2016). Thus, the decision to engage in informal entrepreneurship is often driven by rational considerations of costs and benefits (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014).

However, beyond economic motivations, social motivations also play a key role in shaping "entrepreneurs' decisions regarding the types of businesses that they choose to start" (Webb et al., 2013, p. 606). Anomie theory provides an insightful framework for understanding these social motivations. Specifically, the theory asserts that certain social structures can create anomic strain—a state characterized by weakened social controls and norms—which, in turn, motivates individuals to act outside the purview of societal regulations and engage in deviant behaviors (Durkheim 1897; Merton 1968). Informal entrepreneurship, as a critical form of deviance (Webb et al., 2013; Salvi et al., 2023), can be profoundly influenced by anomic strain linked to social structures. Despite its relevance, scholars have overlooked this important social motivation (Babbitt et al., 2015; Murnieks et al., 2020), resulting in a fragmented understanding of the drivers of informal entrepreneurship.

Our study addresses this limitation by exploring how income inequality, a critical social structural factor, can generate anomic strain and influence entrepreneurs' decisions to engage in informal entrepreneurship. We argue that income inequality creates disparities in accessing opportunities and resources (Pathak and Muralidharan 2018; Xavier-Oliveira et al. 2015), preventing many entrepreneurs from using formal entrepreneurship to achieve culturally prescribed goals like monetary success. This creates anomic strain and motivates entrepreneurs to resort to deviant actions (Cullen et al. 2014; Tuliao and Chen 2019) like entering informal entrepreneurship.

Moreover, given that anomie theory suggests that anomic strain is unevenly distributed, that some individuals, because of their social positions, enjoy certain advantages which are denied to others (Cloward 1959; Merton 1968), we further argue that although income inequality generates anomie, entrepreneurs will experience varying levels of need to engage in informal entrepreneurship as a deviant response (Xie et al. 2023). For entrepreneurs from advantaged social groups, the anomic strain resulting from income inequality may be less intense or even negligible. Building on this perspective, we examine how two types of resources—human capital and financial resources—serve as proxies for higher economic and social class. We denote the advantaged social group, moderating the relationship between income inequality and informal entrepreneurship.

To test our hypotheses, we analyze a sample of 6,143 new ventures in 34 emerging economies across the period of 2012-2013. We find that income inequality has a positive association with informal entrepreneurship. Moreover, drawing on prior literature (Boudreaux and Nikolaev 2019; Estrin et al. 2016; Mallon and Fainshmidt 2022; Ye et al. 2023), we use general human capital and specific human capital to represent entrepreneurs' human capital, and

we use financial capital and partnerships as indicators of their access to financial resources. The findings reveal that the positive association between income inequality and informal entrepreneurship is weaker for entrepreneurs with higher levels of general human capital, financial capital, and partnerships.

Our study makes three contributions to the literature. First, in contrast to previous studies that predominantly view entrepreneurs' pursuit of informal entrepreneurship as an economically rational choice (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014; Mallon and Fainshmidt 2022), our study uncovers income inequality as a social motivator for informal entrepreneurship by generating anomic strain. This provides deeper insight into the motivations behind entrepreneurs' decisions to enter informal entrepreneurship.

Second, while earlier studies have suggested that income inequality can exert anomic strain and drive individuals toward deviance, they often assume that this strain is evenly distributed across the population (Cullen et al. 2014; Tuliao and Chen 2019). By identifying that the effect of income inequality on informal entrepreneurship is conditional on entrepreneurs' access to human capital and financial resources, we reveal that anomic strain is differentially distributed, with entrepreneurs from different social groups experiencing it to varying degrees. This brings a more nuanced understanding of how social position shapes the impact of income inequality on informal entrepreneurship.

Third, informal entrepreneurship produces both positive outcomes, such as employment creation and social stability (La Porta and Shleifer 2014; Nason and Bothello 2022), and adverse consequences, including the regulatory violations, unfair competition, and most importantly, tax revenue losses (Webb et al. 2013). By theorizing informal entrepreneurship as a deviant response to the anomic strain created by income inequality, we unearth that anomie does not exclusively

result in either negative or positive deviance (Cullen et al. 2014; Merton 1968; Messner and Rosenfeld 1997; Nam et al. 2014). Instead, it can lead to deviant actions with *mixed* social implications. This extends the application of anomie theory beyond its focus on traditional deviant behavior, contributing to a broader understanding of its societal impact.

2. Literature review

2.1. Informal entrepreneurship

Informal entrepreneurship refers to the creation of new ventures that are not legally registered with the government (Dau and Cuervo-Cazurra 2014). While these businesses operate outside formal institutions, they still fall inside the purview of social norms, values, and beliefs (Webb et al. 2009). This differentiates informal entrepreneurship from illegal activities like drug cartels, robberies, and other criminal enterprises (Bu and Cuervo-Cazurra 2020; Webb et al. 2009). Informal entrepreneurship encompasses a wide range of businesses, including street vendors, convenience stores, household businesses, and medium-sized manufacturing firms (Assenova and Sorenson 2017; Siqueira et al. 2016). Therefore, some scholars suggest that informal entrepreneurship overlaps with several other types of entrepreneurial activity, such as self-employment, necessity entrepreneurship, and family businesses (Nason and Bothello 2022; Webb et al. 2013).

While informal entrepreneurship is a pervasive phenomenon around the world, it is more prevalent in emerging economies. For example, the informal sector accounts for more than one-third of GDP and almost two-thirds of total employment in emerging economies, whereas in advanced countries, it represents only around 15% of GDP and one-ninth of employment (La Porta and Shleifer 2014; Medina and Schneider 2018). This underscores the critical role informal

entrepreneurship plays in providing livelihoods for billions of people in emerging countries and in contributing to social stability (Webb et al. 2013). However, it also gives rise to unfavorable societal impacts because the unregistered status permits informal businesses to skirt laws and regulations. This results in issues such as health concerns, environmental pollution, and most importantly, tax losses, which deprive governments of essential funds for infrastructure development and public services, and ultimately, hinder national development (Webb et al. 2013). Accordingly, reducing the size of the informal sector is a key policy objective for many governments (Assenova and Sorenson 2017). To achieve this, it is imperative to understand the motivations behind informal entrepreneurship.

The dominant view in the literature suggests that the decision to operate businesses informally, rather than formally, is primarily driven by economic motivations, such as the rational consideration of costs and benefits (Assenova and Sorenson 2017; Laing et al. 2022; Siqueira et al. 2016). In particular, the institutional environments in many emerging countries are often underdeveloped, and sometimes can even be described as weak or fragile (Amorós et al. 2019; Webb et al. 2020). This results in complex and costly registration processes that consume both time and money. Meanwhile, the perceived benefits of formal registration may be limited due to the government's inability to provide effective public services or social security (Webb et al. 2013). In such instances, informal entrepreneurship allows business owners to avoid taxes, registration fees, and the costs associated with compliance with labor and environmental regulations. Moreover, the ineffectiveness of enforcement agencies means informal entrepreneurs face little risk of detection or punishment (Bu and Cuervo-Cazurra 2020; Salvi et al. 2023). Consequently, many entrepreneurs choose informal entrepreneurship when they perceive it as the more advantageous option. A growing body of evidence shows that institutional

factors like burdensome bureaucracy, organized crime, state fragility, corruption and poor governance and economic institutions contribute to the prevalence of informal entrepreneurship (Ault and Spicer 2022; Autio and Fu 2015; Mallon and Fainshmidt 2022; Siqueira et al. 2016; Webb et al. 2013; Wei et al. 2023).

However, scholars suggest that both economic and social considerations are crucial in influencing "entrepreneurs' decisions regarding the types of businesses that they choose to start" (Webb et al., 2013, p. 606). This indicates that beyond economic motivations, social incentives also significantly influence informal entrepreneurship. Several studies support this argument. For example, the unregistered status of informal entrepreneurship offers greater flexibility in balancing work and family responsibilities, making it particularly appealing to female entrepreneurs, especially those with caregiving duties (Babbitt et al. 2015). Furthermore, entrepreneurs' lack of trust in the state's ability to effectively allocate tax revenues can also drives them toward informal sectors (Rosser et al. 2000). Despite the expanding literature, our understanding of the social motivations behind informal entrepreneurship remains incomplete (Murnieks et al. 2020; Webb et al. 2013), highlighting the need for further investigations.

2.2. Anomie theory and informal entrepreneurship

Anomie theory, which asserts that anomic strain can motivate individuals to engage in deviant behaviors (Cullen et al. 2004; Merton 1968), offers a useful lens for exploring the social motivations behind informal entrepreneurship. Originally conceptualized by Durkheim (1897), anomie refers to the breakdown of social norms and controls that occurs during periods of rapid social change, such as economic development, technological achievements, and modernization. Durkheim suggests that this weakening of traditional norms leads to a rise in deviant behavior. Merton (1968) extends Durkheim's (1897) ideas, arguing that in addition to social changes,

anomie also arises from social structures and cultural values. According to Merton, individuals are motivated to engage in deviant actions when social structures constrain them from using legitimate means to attain goals encouraged by cultural values, such as monetary success.

Although anomie theory was initially used to explain negative forms of deviance, especially suicide (Merton 1968), it has since been applied to a broad spectrum of socially disapproved behaviors, including homicide (Messner and Rosenfeld 1997), robbery (Kim and Pridemore 2005), corruption (Cullen et al. 2004), and unethical conduct (Tuliao and Chen 2019). Yet, more recent developments in the theory, along with the perspective of positive deviance, suggest that deviance is not always negative. Mainemelis (2010) and Nam et al. (2014), for example, argue that anomie facilitates innovation and creative product development, while Cullen et al. (2014) suggest that it can also drive individuals toward opportunity entrepreneurship.

In reality, since informal entrepreneurship operates outside of the boundaries of regulations, anomie theorists have also regarded it as a form of deviance (Salvi et al. 2023). For example, Webb et al. (2013) suggest that when society cannot offer legitimate means to achieve culturally prescribed goals (e.g., monetary success), individuals may turn to informal entrepreneurship as a deviant pathway to those goals. Given this, and with anomie theory highlighting the role of anomic strain in predicting deviant behavior, our study leverages the theory to examine whether income inequality, an important social structural factor, can serve as a social motivator for informal entrepreneurship by generating anomic strain.

2.3. Income inequality and anomic strain

Income inequality has risen dramatically in the past several decades and has become a grand social challenge worldwide (Chancel et al. 2022; Piketty 2014; Tsui et al. 2018). This issue being particularly acute in emerging economies (Bruton et al., 2021). For example, in Brazil, it takes

the bottom segment of the population 19 years of work to earn what the top 0.1% makes in just one month. The income of the richest 5% is 19 times higher than that of the remaining 95%.[1] More importantly, in comparison to advanced countries where the state can provide more equitable access to basic public services and establish relatively inclusive social security systems, emerging countries often face challenges in ensuring equal access to public goods, limiting them to only privileged inhabitants. This accentuates the significance of income inequality as a more salient social concern in emerging countries (Bruton et al., 2021).

Studies have addressed income inequality through the lens of anomie theory, suggesting that it can generate anomic strain (Cullen et al. 2014; Tuliao and Chen 2019). This is because income inequality exacerbates disparities in access to opportunities and resources, depriving much of the population of the means to attain their goals through legitimate channels (Pathak and Muralidharan 2018; Xavier-Oliveira et al. 2015; Xie et al. 2023). A growing body of research offers support for this notion by identifying that income inequality not only triggers negative deviance such as robbery, murder, property crime, corruption, and unethical behaviors (Rufrancos et al., 2013; Tuliao & Chen, 2019), but also spurs positive deviance responses, particularly in the form of opportunity entrepreneurship (Cullen et al. 2014). However, the potential for income inequality to encouage deviant behaviors like informal entrepreneurship remains unexplored.

3. Hypotheses Development

3.1. Income inequality and informal entrepreneurship

As income inequality generates anomic strain by creating disparities in both accessing opportunities and resource acquisition, we argue that it encourages informal entrepreneurship for two reasons:

[1] https://www.oxfam.org/en/brazil-extreme-inequality-numbers.

Disparities in accessing opportunities. Income inequality creates disparities in accessing opportunities. In nations with a high level of income inequality, most of the population tends to be relatively poorer (Jong-sung and Khagram 2005). They confront great financial barriers to afford good schools and higher education (Bénabou 1996). In contrast, affluent individuals are generally better educated and have extensive social networks, which provide them with superior knowledge, critical thinking skills, and valuable information and opportunities that are not available to the general public (Corak 2013). This disparity increases the difficulty for the majority of entrepreneurs to utilize legitimate means, such as pursuing opportunities in the formal sector, to attain culturally valued goals (e.g., monetary success), in that these opportunities commonly require more knowledge and skills to recognize and exploit (Jiménez et al. 2015; Marvel et al. 2016). In such instances, anomic strain arises, motivating entrepreneurs to place less emphasis on the legitimacy of the means and to engage in informal entrepreneurship as a deviant reaction. This notion aligns with Merton's (1968) suggestion that diminished access to legitimate means for goal attainment will result in anomie and a strain toward deviance.

Disparities in resource acquisition. Income inequality results in resources concentrated in the hands of a privileged few, which then restricts access to resources for the majority of the population (Bapuji 2015). Rich groups can exacerbate this problem since they tend to preserve their privileged status through various appropriate means, such as increasing the threshold of entrepreneurship, avoiding taxes, advocating for tax laws favorable to the wealthy, and engaging in bribery (Xavier-Oliveira et al. 2015). Therefore, as income inequality increases in a country, most entrepreneurs will face greater challenges in entering formal entrepreneurship. This is because they encounter substantial blocks in acquiring resources that are needed to initiate and operate formal businesses, especially in emerging economies where the registration fees and

procedures might be overwhelmingly burdensome (Bu and Cuervo-Cazurra 2020). Additionally, the lack of collateral further constrains their ability to attain resources from credit markets (Boudreaux and Nikolaev 2019). This constitutes obstacles for entrepreneurs to augment income and climb the social ladder through legitimate means, leading to the emergence of anomic strain and encouraging entrepreneurs to enter the informal sector as a deviant response.

In sum, arguments based on Merton's (1968) anomie theory suggest that greater income inequality generates anomic strain by restricting most entrepreneurs' access to opportunities and resources needed for attaining monetary success through formal entrepreneurship. This motivates them to resort to deviant actions, in our case, informal entrepreneurship, as a response. Taken together, we propose:

> **Hypothesis 1**. *Income inequality has a positive association with informal entrepreneurship.*

3.2. The moderating effects of entrepreneurs' resources

While income inequality exerts anomic strain and pushes most entrepreneurs toward informal entrepreneurship, we contend that income inequality will asymmetrically affect entrepreneurs' need to engage in deviant behavior. This is because while our preceding logic applies to most individuals in society, it does not apply to everyone. Namely, we do not expect income inequality to encourage informal entrepreneurship among the advantaged social groups in society. Rather, we would expect income inequality to discourage informal entrepreneurship among members of this group and encourage formal entrepreneurship instead.

Therefore, although income inequality may stimulate informal entrepreneurship among the masses, income inequality's effect on informal entrepreneurship will be less severe or even non-existent for the advantaged social group. In this section, we examine how two types of

resources—human capital and financial resources—serve as proxies for the higher economic and social class we denote as the advantaged social group. As a result, income inequality will have a weaker effect on informal entrepreneurship for members of this group who possess these resources.

3.2.1. The moderating effects of entrepreneurs' human capital

Entrepreneurs' human capital refers to their educational attainments, knowledge, skills, and experience (Becker 1964). According to Becker (1964), there are two distinct types of human capital: general and specific human capital. General human represents knowledge and skills that are portable across different industries, often acquired and developed through higher education (Estrin et al. 2016; Xavier-Oliveira et al. 2015), whereas specific human capital for entrepreneurs pertains to task-related skills and experiences in starting and running businesses (Marvel et al. 2016; Unger et al. 2011). Scholars have associated both types of human capital with entrepreneurial activities (Cooper et al. 1994; Marvel et al. 2016; Unger et al. 2011).

We contend that entrepreneurs who possess general and specific human capital are more likely to belong to social groups that have advantages over others. While this may not be true in many developed countries, it is true in the developing world, our study's focus. For example, in Nigeria, only 38% of 15- to 19-year-olds in the poorest quintile have completed grade 1 compared to 98% of the richest quintile.[2] Thus, we expect the anomie arising from disparities in opportunities and resource acquisition that accompany income inequality will exert more severe strain upon entrepreneurs in disadvantaged social groups than those in advantaged ones.

Advantaged social group. We anticipate that income inequality will encourage informal entrepreneurship for the disadvantaged social group but not the advantaged group because the latter, who possess general and specific human capital, has better access to opportunities and

[2] https://www.worldbank.org/en/research/brief/edattain

resources, thereby experiencing less anomic strain associated with income inequality.

General human capital allows entrepreneurs to leverage their broad knowledge base to advance their cognitive abilities, absorb new knowledge, and adapt to adverse situations (Davidsson and Honig 2003; Estrin et al. 2016). This enables them to be more sensitive to entrepreneurial opportunities within formal sectors and helps to overcome disparities in accessing opportunities arising from income inequality. In addition to opportunity discovery, general human capital also facilitates opportunity exploitation (Marvel et al. 2016). Although income inequality hinders most entrepreneurs from acquiring resources, those from advantaged social groups with higher general human capital will be more likely to acquire resources through credit markets and social networks derived from the education system (Ucbasaran et al. 2008). This helps them surmount the resource constraints imposed by income inequality when pursuing formal entrepreneurial opportunities. Therefore, entrepreneurs with higher levels of general human capital can utilize legitimate means to achieve their goals, experiencing less anomic strain from income inequality. Consequently, they are less likely to engage in deviant actions like informal entrepreneurship.

Similarly, entrepreneurs possessing higher specific human capital, such as entrepreneurial experience, will be less affected by the disparities in access to opportunities. Their substantial expertise in entrepreneurial processes can provide valuable skills for identifying market demands and turning opportunities into actions (Dimov 2010). Moreover, since entrepreneurial experience aids in establishing relationships with resource providers (Bruns et al. 2008; Dimov 2010), it can enhance entrepreneurs' access to essential resources. This notably mitigates the barriers they confront when adopting legitimate means, such as formal entrepreneurship, to attain monetary success. Accordingly, such entrepreneurs are in an advantageous position and less exposed to the

anomic strain stemming from income inequality, thereby showing lower motivations toward deviance.

Disadvantaged social group. In contrast to the economic and social elites who already possess general and specific human capital, entrepreneurs from disadvantaged social groups will be less likely to possess these valuable resources. Therefore, they perceive income inequality-induced anomic strain more acutely and are more strongly motivated to pursue informal entrepreneurship as a deviant response. Specifically, when entrepreneurs are poorly educated and endowed with limited specific human capital, they will not only lack the knowledge and entrepreneurial expertise to recognize and exploit formal entrepreneurial opportunities (Jiménez et al. 2015; Unger et al. 2011), but also face greater impediments in acquiring resources from credit market and social networks derived from education systems and prior entrepreneurial activities (Bruns et al. 2008; Unger et al. 2011). Consequently, the legitimate means (formal entrepreneurship) for achieving goals are largely unavailable, leaving these entrepreneurs to face heightened anomic strain and exhibit stronger motivations to enter informal entrepreneurship.

In sum, because entrepreneurs in the advantaged social group have general and specific human capital, they will face fewer barriers in recognizing formal entrepreneurial opportunities and accessing the necessary resources to start formal businesses. As a result, the anomic strain arising from income inequality will be less of a hindrance to them compared to everyone else. Therefore, entrepreneurs who have general and specific capital will have less strain to pursue informal entrepreneurship as a deviant response. Taken together, we propose:

> **Hypothesis 2**. *The positive association between income inequality and informal entrepreneurship will be weaker for entrepreneurs from advantaged social groups, as proxied by (a) general human capital and (b) specific human capital.*

3.2.2 The moderating effects of entrepreneurs' access to financial resources

Our study uses two indicators to capture entrepreneurs' access to financial resources—their financial capital and whether they have partners (Boudreaux and Nikolaev 2019; Mallon and Fainshmidt 2022; Ye et al. 2023). Financial capital plays a pivotal role in entrepreneurship (Linder et al. 2020; Sahasranamam and Nandakumar 2020). It helps alleviate liquidity constraints, provides entrepreneurs with collateral in credit markets (Boudreaux and Nikolaev 2019), and offers flexibility to adjust to external threats and shocks (Cooper et al. 1994). As entrepreneurship entails high levels of uncertainty and new ventures are vulnerable in their formative years, financial resources help entrepreneurs navigate through dynamic and complex environments (Linder et al. 2020; Mallon and Fainshmidt 2022).

Another indicator closely associated with entrepreneurs' access to financial resources is whether they have partners when establishing founding teams (Mallon and Fainshmidt 2022; Ye et al. 2023). Entrepreneurs have the option to start new ventures independently or collaborate with partners. Generally, relative to solo founders, entrepreneurs with partners are better positioned to acquire resources. This advantage arises not only from direct financial contributions from partners but also from access to their social networks (Barringer et al. 2005; Florin et al. 2003). Thus, partnering is particularly beneficial for entrepreneurs facing severe resource limitations in launching and operating new ventures.

Overall, given the significance of financial capital and operating in partnerships in entrepreneurship, we contend that entrepreneurs with access to these resources are more likely to belong to advantaged social groups over others.

Advantaged social group. Entrepreneurs' financial capital frames how they perceive the anomic strain linked to income inequality. With higher levels of financial capital, entrepreneurs will not be affected by the resource disparities that arise from income inequality. Additionally, as

financial capital is “the most generic type of resource and can relatively easily be converted into other types of resources” (Wiklund & Shepherd, 2005, p. 77), it allows entrepreneurs to recruit experienced partners and assemble talented teams (Linder et al. 2020). With access to these resources and capabilities, such entrepreneurs are well-positioned to engage in formal entrepreneurship to achieve their goals. As a result, they experience less anomic strain from income inequality and exhibit diminished motivation to pursue informal entrepreneurship.

Similarly, while income inequality creates disparities in resource access, entrepreneurs from the advantaged social group who have partners are less likely to be influenced, since multiple founders offer more sources to acquire financial resources (Mallon and Fainshmidt 2022). In addition, partnerships also enable entrepreneurs to harness difficulties and external threats (e.g., higher costs in registration procedures and corruption) by relying on collective wisdom and broader social networks (Barringer et al. 2005; Florin et al. 2003). Thus, these entrepreneurs are more inclined to utilize legitimate means, instead of drawing on deviant behaviors like informal entrepreneurship, to achieve culturally valued goals such as monetary success.

Disadvantaged social groups. In contrast, entrepreneurs from disadvantaged social groups will perceive income inequality-induced anomic strain as a more salient issue. This is because their limited financial resources hinder their ability to overcome resource disparities. Compared to entrepreneurs in the advantaged social group who have financial capital or operate in partnerships, those in the disadvantaged group struggle to surmount the resource constraints imposed by income inequality. After all, the Matthew Effect says that those with initial resource endowments will continue to benefit from those resources (e.g., “the rich get richer and the poor get poorer”). The implication is that, absent any initial financial endowments, it will be more difficult to overcome these disparities later in life. As a result, entrepreneurs from the

disadvantaged social group will be more likely to enter informal entrepreneurship, as they have fewer opportunities to exploit entrepreneurial prospects in formal sectors. Consequently, the positive role that income inequality plays in informal entrepreneurship becomes more prominent.

In summary, because entrepreneurs with financial capital, whether from family or partnerships, will be less affected by disparities in opportunities and resources, we expect that the anomic strain brought by income inequality will act as incentives for entrepreneurs in disadvantaged social groups toward deviance but not the advantaged ones. Therefore, we hypothesize:

> **Hypothesis 3.** *The positive association between income inequality and informal entrepreneurship will be weaker for entrepreneurs from advantaged social groups, as measured by possessing (a) financial capital and (b) partnerships.*

4. Method

4.1. Data and sample

We test the hypotheses using data from multiple sources. We began by collecting data on informal entrepreneurship from the Global Entrepreneurship Monitor (GEM), which surveys a representative portion of the population across countries annually to capture their entrepreneurial features and related entrepreneurial activities (Bosma and Kelley 2019). This dataset has been widely used in entrepreneurship research (Amorós et al. 2019; Autio and Fu 2015; Boudreaux et al. 2019; Mallon and Fainshmidt 2022). Specifically, GEM includes a special module regarding firm registration in the 2012 and 2013 survey waves, which serves as our measure of informal entrepreneurship (Mallon and Fainshmidt 2022). We then gathered country-level data from other datasets, including the World Bank Development Index (WDI), the Worldwide Governance Indicators (WGI), the Heritage Foundation's Economic Freedom Index (EFI), the Global Competitiveness Index (GCI), and Hassan and Schneider (2016). These datasets have also been

extensively applied in entrepreneurship studies (Amorós et al. 2019; Autio and Fu 2015; Dau and Cuervo-Cazurra 2014; Mallon and Fainshmidt 2022). Lastly, by merging these datasets, we created a sample of 6,143 new ventures operating in 34 countries over the period from 2012 to 2013. Table 1 presents the country distribution of our sample.

[Insert Table 1 about here]

4.2. Measures

Dependent variable. We measured informal entrepreneurship based on the GEM survey question regarding whether the entrepreneur registered his/her new firms with legal agencies (Mallon and Fainshmidt 2022). This is a binary variable coded as 1 if the entrepreneur did not register the new venture and 0 otherwise (Bu and Cuervo-Cazurra 2020; Siqueira et al. 2016). Moreover, consistent with prior research (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014), we excluded nascent businesses, as "they might be nonregistered not in response to institutions but because they are still gestating" (Mallon & Fainshmidt, 2022, p. 221). Therefore, only newly established firms are included in our sample.

Independent variables. We measured income inequality using the Gini index, the most commonly used indicator in studies of income inequality (Cullen et al. 2014; Pathak and Muralidharan 2018; Xavier-Oliveira et al. 2015; Xie et al. 2023). The Gini index measures the distribution of income across a population, with values ranging from 0 (perfect equality) to 100 (maximus inequality). We collected this data from WDI.

Moderating variables. We gathered all four moderating variables from GEM. First, as general human capital commonly develops through higher education, we used the education level to measure it (Xavier-Oliveira et al. 2015). This is a binary variable coded as 1 if the entrepreneur completed higher education and 0 otherwise. Second, we adopted entrepreneurship

experience as a proxy for entrepreneurs' specific human capital (Estrin et al. 2016). This is because this form of human capital is often acquired through relevant experience (Becker 1964). Entrepreneurship experience is coded as 1 if the entrepreneur reports that he/she has sold, shut down, discontinued, or quit a business in the past 12 months that he/she owned and managed; otherwise, it is coded as 0. Third, following other studies (Boudreaux and Nikolaev 2019; Xavier-Oliveira et al. 2015), we employed entrepreneurs' household income to measure their financial capital. This is also a dummy variable coded as 1 if the entrepreneur belongs to the highest-income group and 0 if he/she belongs to the middle- or lowest-income group. Lastly, we measured multiple founders by drawing upon the question of whether the entrepreneur starts new ventures with at least one partner (Mallon and Fainshmidt 2022; Ye et al. 2023). It is coded as 1 if the answer is yes and 0 otherwise.

Control variables. We controlled for individual- and country-level variables to account for other factors that may affect informal entrepreneurship. At the individual level, we included seven control variables based on data from GEM. First, since scholars indicate that female and older entrepreneurs are more likely to operate businesses without registering with governmental authorities (Babbitt et al. 2015; Williams and Shahid 2016), we controlled for gender and age. Gender is coded as 1 for female and 0 for male, while age is measured as a continuous variable. Moreover, to account for the nonlinear relationship between age and entrepreneurship, we also controlled for age squared (Boudreaux and Nikolaev 2019). Second, studies have reported that entrepreneurs' social capital helps them navigate burdensome registration procedures, we thus controlled for it. This is a binary variable coded as 1 if the entrepreneur knows other entrepreneurs who have started new ventures in the last two years and 0 otherwise (Sahasranamam and Nandakumar 2020).

Third, because entrepreneurs' socio-cognitive traits are closely associated with how they perceive and evaluate informal entrepreneurial opportunities, we controlled for three bivariate variables: opportunity alertness, self-efficacy, and fear of failure. Opportunity alertness is coded as 1 if the entrepreneur believes there will be good opportunities to start a new venture in the next 6 months, and 0 otherwise. Self-efficacy measures whether the entrepreneur believes that he/she has the necessary knowledge and skills to start a business. It takes a value of 1 if the answer is yes and 0 otherwise. Similarly, fear of failure is coded as 1 if the entrepreneur indicates that he/she is afraid of failure, and 0 otherwise. All these variables have been widely used in previous research (Boudreaux et al. 2019).

At the country level, we controlled for eight variables. As scholars have highlighted the importance of countries' economic conditions in informal entrepreneurship (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014), we controlled for GDP per capita and GDP growth. Likewise, we also controlled for two variables related to national labor conditions: unemployment rate and population size, in that individuals are more likely to engage in informal sectors when they cannot find formal employment (Autio and Fu 2015; Siqueira et al. 2016). We collected these data from the WDI.

Additionally, because both formal and informal institutions significantly affect the costs associated with formal registration and operating businesses in the formal sector, following the literature on informal entrepreneurship (Ault and Spicer 2022; Dau and Cuervo-Cazurra 2014; Mallon and Fainshmidt 2022; Thai and Turkina 2014; Wei et al. 2023), we controlled for governance quality, economic freedom, and organized crime. Governance quality was measured using data from the WGI, which includes six sub-indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and

control of corruption. The governance quality index ranges from -2.5 to 2.5, with higher values indicating better governance. Economic freedom was measured using the Heritage Foundation's EFI, which encompasses four major areas: government size, rule of law, open markets, and regulative efficiency. The index ranges from 0 to 100, with higher values indicating greater economic freedom. We measured organized crime by drawing on the question taken from GCI, which asks, "In your country, to what extent does organized crime impose costs on businesses?" Scores range from 1 to 7, with higher scores reflecting lower levels of organized crime. For interpretative clarity, we reverse-coded this variable so that higher scores indicate more severe organized crime. Moreover, given that the size of a country's informal economy may reflect the social acceptability of informal economic activities, which could impact resource acquisition for informal entrepreneurship (Webb et al. 2009), we controlled for the size of informal economy. We acquired this data from Hassan and Schneider (2016). Lastly, we controlled for the ease of starting a business, as the cost and time required to establish a formal enterprise are key factors influencing entrepreneurs' decisions between entering the formal or informal sector. Data for this variable were obtained from the World Bank's Doing Business dataset. The index ranges from 0 to 100, with higher scores indicating lower regulatory costs and greater ease of business registration.

4.3. Estimation methods

Because our study seeks to examine how country-level income inequality affects individual-level informal entrepreneurial activity, we employed hierarchical linear modeling (HLM) to analyze our data (Boudreaux et al. 2019; Bu and Cuervo-Cazurra 2020). HLM allows both the constant term and standard errors to vary randomly across countries, addressing the issue of non-independence within the sample, as entrepreneurs within the same country are likely to be

correlated (Hofmann et al. 2000). Since our dependent variable is binary, and each of the two GEM survey waves includes different groups of entrepreneurs, we finally used a two-level mixed-effects logistic regression to test our hypotheses.

To validate our use of the two-level model, we calculated the intraclass correlation coefficient (l), which came out to 0.226. This indicates that 22.6% of the variance in informal entrepreneurship resides between countries, further justifying the adoption of the two-level mixed-effects approach. We also included industry and year dummy variables to account for industry fixed effects and unobserved time-varying effects (Bu and Cuervo-Cazurra 2020). Additionally, in line with prior studies (Dau and Cuervo-Cazurra 2014; Pathak and Muralidharan 2018; Xie et al. 2023), we lagged all country-level variables, including income inequality, by one year to examine their effects on informal entrepreneurship in the subsequent year. This approach helps mitigate concerns regarding reverse causality.

5. Findings

5.1. Results

Table 2 presents the descriptive statistics and correlation coefficients for all variables. The mean value of informal entrepreneurship is 0.698, indicating that 69.8% of the new ventures in the sample were not registered with governmental authorities. To assess multicollinearity, we calculated the variance inflation factor (VIF) scores, with the highest VIF value being 5.16, suggesting that multicollinearity is not a concern in our model.

[Insert Table 2 about here]

Table 3 reports the results of the two-level mixed-effects logistic regression. Model 1 includes all individual- and country-level control variables, as well as industry and year fixed

effects. Model 2 augments our independent variable—income inequality. We find that income inequality has a significant positive effect on informal entrepreneurship (β = 0.758, p = 0.001), supporting Hypothesis 1. The marginal effect analysis reveals that a one standard deviation increase in income inequality raises the likelihood of an entrepreneur entering informal entrepreneurship by 10.472%.

Model 3 includes the interaction of income inequality with general human capital. The results show that the positive impact of income inequality on informal entrepreneurship weakens for entrepreneurs with higher levels of general human capital (β = –0.103, p = 0.003), providing support for Hypothesis 2a. Model 4 examines the moderating effect of specific human capital. We find a negative but statistically insignificant coefficient of the interaction term between income inequality and specific human capital (β = –0.020, p = 0.533), suggesting that Hypothesis 2b is not supported.

Hypothesis 3a predicts that entrepreneurs' financial capital weakens the positive effect of income inequality on informal entrepreneurship, we observe a negative coefficient of the interaction between income inequality and financial capital (β = –0.114, p = 0.001) in Model 5. This supports Hypothesis 3a. Model 6 adds the interaction of income inequality with multiple founders. The negative coefficient of the interaction term (β = –0.092, p = 0.006) suggests the effect of income inequality on informal entrepreneurship is weaker for entrepreneurs with partners. Therefore, Hypothesis 3b is supported. We report the full model that includes all interaction terms in Model 7 and obtain the same result.

[Insert Table 3 about here]

To better illustrate the moderating effects, Figures 1-4 depict the average predicted probabilities of informal entrepreneurship (with 95% confidence intervals) based on varying

levels of income inequality and moderating variables. Figure 1 presents that relative to their counterpart, entrepreneurs with lower general human capital are more likely to engage in informal entrepreneurship as income inequality increases. Figure 2 plots the moderating effect of specific human capital, where the minimal difference in slopes aligns with the statistically insignificant interaction term in Model 4. Figure 3 plots the interaction of income inequality with financial capital, which finds that the marginal positive effect of income inequality on informal entrepreneurship is weaker for entrepreneurs with higher financial capital. Lastly, Figure 4 graphs the moderating effect of multiple founders. It shows that entrepreneurs with partners are less likely to engage in informal entrepreneurship than those without partners.

[Insert Figures 1-4 about here]

5.2. Robustness tests

We conducted several additional analyses to ensure the robustness of our findings. First, we adopted the Coarsened Exact Matching (CEM) method to adjust our model for self-selection in informal entrepreneurship. This matched sample analysis helps to secure that entrepreneurs who engage in informal and formal entrepreneurship are comparable with each other (Bu and Cuervo-Cazurra 2020; Larsen and Witte 2022). Relative to the most commonly used propensity score matching which needs to estimate the probability of being treated, CEM "coarsens the covariates in strata and assigns weights to individuals depending on how close they are to the treated group" (Nikolova et al., 2023, p. 471). Specifically, we matched informal entrepreneurship based on several covariates including general human capital, specific human capital, financial capital, multiple founders, and age, and finally obtained a matched sample with 6,077 observations. We reported the balancing test results and matching summary in Tables 4 and 5 respectively. The results present that the $L1$ distance decreases after treatment (0.3453 to

0.1122), which indicates a successful match (Blackwell et al. 2009). Thus, we added the CEM weights in our analyses to adjust for the self-selection concern (Larsen and Witte 2022). Table 6 reports the results of using CEM methods, which also support our hypotheses. Overall, all these robustness checks suggest that our findings are reliable.

[Insert Tables 4-6 about here]

Second, we used the Gini index, which measures inequality across the full distribution of income, to capture income inequality in our primary analysis. Following previous studies (Frank 2009), we also adopted top income inequality (e.g., top 10% income share and top 20% income share) as alternative measures of income inequality. We collected these data from the WDI. Tables S1 and S2 report these results, and we find very similar results.

Third, instead of relying solely on two-level mixed-effects logistic regression as in the main analysis, we reexamined our hypotheses using logistic regression with country fixed effects and clustered standard errors. This approach helps to address unobserved heterogeneity across countries. Table S3 displays the results, which are consistent with the main findings.

Fourth, given that the results derived from a large cross-country dataset may be influenced by outlier nations (Bu & Cuervo-Cazurra, 2020), we conducted a robustness check by excluding countries that contributed disproportionately large sample sizes. Specifically, because Brazil alone accounted for more than 30% of the total observations, we removed firms from this country and re-estimated our models. As shown in Table S4, the results remain largely consistent with our main findings.

6. Discussion

The objective of our study was to investigate how income inequality influences informal

entrepreneurship in emerging economies. Drawing on anomie theory, we argue that income inequality, as a social structural factor, generates anomie strain by limiting entrepreneurs' access to legitimate means (e.g., formal entrepreneurship) to achieve personal goals like monetary success, thereby motivating them to engage in informal entrepreneurship as a deviant response. Moreover, we propose that the extent to which entrepreneurs experience anomic strain varies based on their access to human capital and financial resources. By analyzing a sample of 6,143 new ventures in 34 emerging economies, we find that income inequality encourages informal entrepreneurship, but this effect is mitigated for entrepreneurs with higher levels of general human capital, financial capital, and those who have partners.

6.1. Contributions

Our findings generate three contributions. First, by revealing that income inequality fosters informal entrepreneurship through the generation of anomic strain, this study enhances our understanding of the social motivations driving informal entrepreneurship. While scholars have acknowledged that economic motivations—rational considerations of costs and benefits—are central to entrepreneurs' decision to operate informally or formally (Mallon and Fainshmidt 2022; Webb et al. 2013), they also highlight the need for a clearer illustration of the social motivations underlying informal entrepreneurship (Murnieks et al. 2020; Webb et al. 2013). Our study responds to this limitation directly. Drawing on anomie theory, we investigate whether income inequality, as a crucial social structural factor, acts as a social motivation for informal entrepreneurship by creating anomic strain. This contrasts with previous studies that predominantly focus on institutional factors, including burdensome bureaucracy, regulatory constraints, taxes, corruption, and policy change, that are tied to the costs and benefits of running informal ventures (Mallon & Fainshmidt, 2022; Siqueira et al., 2016; Webb et al., 2013). Our

study demonstrates that income inequality, by creating anomic strain, pushes entrepreneurs toward informal entrepreneurship. This supports Webb et al.'s (2013) argument that entrepreneurs are more likely to operate informally in societies where access to legitimate means is limited. Consequently, our study helps to explain why entrepreneurs choose to operate unregistered new ventures beyond purely economic reasons.

Second, this study advances our knowledge of how the relationship between income inequality and informal entrepreneurship varies with entrepreneurs' access to human capital and financial resources, which serve as proxies for their economic and social class. While scholars have found that income inequality can generate anomic strain, they often implicitly assume that this anomic strain affects individuals uniformly (Cullen et al. 2014; Tuliao and Chen 2019). However, anomie theorists suggest that anomic strain is not equally distributed, as individuals from higher social and economic class enjoy advantages that others lack (Cloward 1959; Merton 1968). Recent studies support this notion, with Xie et al. (2022) indicating that those in higher income groups experience less strain from income inequality. Our research extends this body of work by investigating how entrepreneurs' human capital and financial resources, serve as proxies for the higher economic and social class we denote as the advantaged social group, alter the impact of income inequality and informal entrepreneurship. Our results show that while income inequality encourages informal entrepreneurship, entrepreneurs who have greater general human capital, financial resources, and partners are more likely to overcome the anomic strain linked to income inequality and refrain from engaging in this deviant activity. This contributes to a deeper understanding of how entrepreneurs' access to resources matters in offsetting income inequality, emphasizing the importance of considering entrepreneurs' position in the social group spectrum in shaping their perceptions of income inequality.

Third, by theorizing informal entrepreneurship as a deviant response to anomic strain associated with income inequality, we expand the application of anomie theory beyond its focus on traditional deviant behavior. Scholars have noted that anomic strain gives rise to both positive and negative deviant actions. For instance, while sociological research often links anomie to harmful behaviors such as suicide, robbery, and homicide (Kim and Pridemore 2005; Messner and Rosenfeld 1997), management scholars have found that it can also foster positive deviance, including innovation and opportunity entrepreneurship (Cullen et al. 2014; Nam et al. 2014). Our findings indicate that the anomic strain stemming from income inequality drives entrepreneurs toward informal entrepreneurship as a deviant response, which can yield both favorable outcomes, such as job creation and poverty alleviation (in the short term), and destructive consequences, including tax losses, unfair competition, and regulation violations (Webb et al. 2013). In this regard, we advance anomie theory by uncovering that instead of solely giving room to positive *or* negative deviant actions, the anomic strain also leads to deviant actions with *mixed* social implications.

6.2. Policy implications

While informal entrepreneurship may offer short-term social benefits, such as income generation and employment, it also undermines long-term development by diverting resources that governments need to invest in infrastructure and public services, and by constraining the growth of the formal sector (Assenova & Sorenson, 2017; Webb et al., 2013). Consequently, reducing the prevalence of informal entrepreneurship represent critical policy objectives (Bennett 2010). Our research underscores the significant role of income inequality in fueling informal entrepreneurship, offering important guidance for policymakers. Specifically, this suggests that efforts to address income inequality should accompany initiatives to strengthen economic and

political institutions (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014) in order to curb the persistence of informality. Moreover, our study emphasizes the importance of general human capital and access to financial resources in circumventing the anomic strain caused by income inequality. These findings underscore the need to lower educational and financial barriers faced by individuals on the disadvantaged end of the social spectrum. By providing better educational opportunities and improving access to financial resources, policymakers can empower entrepreneurs, reducing reliance on informal entrepreneurship and fostering more productive, formalized entrepreneurial activities.

6.3. Limitations and future directions

Like any study, ours also has several limitations that provide directions for future studies. First, our study measured informal entrepreneurship relied on whether new firms were registered with authorities. Even though unregistered new firms unambiguously belong to informal entrepreneurship and this measurement has been widely used in other studies (Autio and Fu 2015; Dau and Cuervo-Cazurra 2014; Mallon and Fainshmidt 2022; Thai and Turkina 2014), recent scholars have highlighted the multidimensional nature of informality, including aspects like firm registration, tax payment, employee registration, and compliance with health, safety, and environmental regulations (Salvi et al. 2023). Thus, future studies could consider adopting a more comprehensive and continuous measurement of informality to capture its nuances. Second, while our study focused on income inequality as a social motivator for informal entrepreneurship, it is essential to explore the implications of other forms of inequality, such as gender inequality and racial inequality, in encouraging informal entrepreneurship. In doing so, we can have a more comprehensive understanding of the relationship between various forms of inequality and informal entrepreneurship. Third, although we examined how entrepreneurs' access to human

and financial resources helps offset the anomic strain arising from income inequality, other individual-level factors, such as entrepreneurs' socio-cognitive resources, may also play a significant role, yielding avenues for future explorations. Lastly, constrained by the cross-section nature of GEM data, we were unable to investigate whether informal new ventures eventually transform into formal ones. Future studies employing longitudinal data would be valuable in exploring how income inequality affects the formalization of informal businesses.

7. Conclusion

Our study examined the influence of income inequality on informal entrepreneurship and the moderating effects of entrepreneurs' general human capital, specific human capital, financial capital, and multiple founders. Using a sample of 6,143 new ventures across 34 emerging economies over the period of 2012 to 2013, we found that income inequality positively affects informal entrepreneurship. Moreover, this effect becomes weaker when entrepreneurs have higher general human capital, greater financial capital, and partners. The findings not only enrich our knowledge of the social motivations behind informal entrepreneurship in emerging economies and how the relationship between income inequality and informal entrepreneurship varies with entrepreneurs' access to resources, but also extend the application of anomie theory beyond its focus on traditional deviant behaviors.

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Table 1 Distribution of observations along country

Country	N	Country	N	Country	N
Algeria	53	Ghana	257	Philippines	103
Bosnia and Herzegovina	32	Indonesia	716	Romania	38
Botswana	149	Iran	269	South Africa	102
Brazil	1913	Jamaica	86	South Korea	49
Chile	212	Latvia	34	Suriname	10
China	261	Lithuania	41	Thailand	414
Colombia	215	Malaysia	68	Tunisia	8
Costa Rica	17	Mexico	69	Uruguay	27
Ecuador	144	Namibia	115	Vietnam	16
Egypt	47	Nigeria	435	Zambia	35
El Salvador	47	Pakistan	48		
Estonia	40	Peru	73	**Total**	**6,143**

Table 2 Statistics and correlation matrix

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Nonregistration	0.698	0.475	1													
2. Income inequality	45.545	7.816	0.147	1												
3. Gender	0.491	0.500	0.167	0.087	1											
4. Age	36.829	11.258	-0.046	-0.039	0.015	1										
5. Age square (*ln*)	7.120	0.616	0.041	0.014	-0.020	0.141	1									
6. Know entrepreneur	0.606	0.489	-0.074	-0.166	-0.077	-0.050	-0.038	1								
7. Opportunity alertness	0.595	0.491	0.095	0.095	0.020	-0.059	0.006	0.145	1							
8. Self-efficacy	0.779	0.415	-0.070	-0.033	-0.066	-0.004	-0.035	0.214	0.183	1						
9. Fear of failure	0.312	0.463	0.045	-0.021	0.048	-0.013	0.014	-0.078	-0.107	-0.229	1					
10. General human capital	0.163	0.370	-0.276	-0.155	-0.054	-0.002	-0.054	0.089	-0.028	0.051	-0.022	1				
11. Specific human capital	0.067	0.250	-0.002	0.001	0.007	-0.001	-0.008	0.020	0.015	0.025	0.003	-0.005	1			
12. Financial capital	0.359	0.480	-0.238	-0.029	-0.108	-0.022	-0.023	0.090	0.034	0.103	-0.059	0.253	-0.013	1		
13. Multiple founders	0.237	0.425	-0.177	-0.014	-0.079	-0.074	-0.003	0.040	-0.003	0.039	-0.019	0.105	0.027	0.113	1	
14. GDP per capita (*ln*)	8.829	0.763	-0.356	0.248	-0.044	0.080	-0.019	-0.106	-0.170	-0.061	0.029	0.154	-0.070	0.072	0.096	1
15. GDP growth	4.051	3.628	0.250	0.063	0.073	-0.024	-0.010	0.041	0.153	0.022	-0.036	-0.144	0.070	-0.041	-0.087	-0.563
16. Population (*ln*)	18.131	1.372	0.174	-0.004	0.027	-0.036	-0.015	0.005	-0.067	-0.109	0.067	-0.071	-0.126	-0.063	-0.071	-0.030
17. Unemployment rate	8.147	6.075	-0.319	0.064	-0.087	0.020	-0.044	0.007	-0.140	0.090	-0.045	0.132	0.038	0.037	0.125	0.502
18. Governance quality	-0.076	0.587	-0.263	0.242	-0.002	0.105	-0.030	-0.056	-0.072	0.012	-0.021	0.106	0.021	0.045	0.062	0.691
19. Economic freedom	59.761	7.379	-0.229	-0.033	0.010	0.142	-0.014	0.006	0.014	0.048	-0.047	0.160	0.020	0.093	0.057	0.363
20. Organized crime	-4.461	0.849	0.250	0.315	0.076	-0.053	0.010	-0.028	0.096	-0.015	-0.010	-0.097	-0.079	-0.024	-0.060	-0.206
21. Informal economy size	34.939	13.093	0.168	-0.008	0.096	0.001	0.030	-0.127	0.117	-0.002	-0.013	-0.044	0.036	0.028	-0.048	-0.209
22. Ease of starting a business	75.023	7.151	-0.165	-0.319	-0.020	0.048	-0.006	0.073	0.058	0.048	-0.067	0.108	0.024	0.073	0.025	-0.212
	15	**16**	**17**	**18**	**19**	**20**	**21**	**22**								
15. GDP growth	1															
16. Population (*ln*)	-0.047	1														
17. Unemployment rate	-0.486	-0.426	1													
18. Governance quality	-0.106	-0.408	0.486	1												
19. Economic freedom	-0.023	-0.501	0.288	0.749	1											
20. Organized crime	0.073	0.452	-0.384	-0.479	-0.358	1										
21. Informal economy size	0.138	-0.082	-0.341	-0.106	0.120	0.105	1									
22. Ease of starting a business	0.264	-0.280	-0.042	0.079	0.468	-0.183	0.051	1								

Note: All correlations with absolute values higher than 0.024 are significant at the 0.05 level. Two-tailed test.

Table 3 The multilevel logistic regression results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	5.514***	4.331**	4.293**	4.325**	4.383**	4.227**	4.242**
	(1.453)	(1.366)	(1.361)	(1.366)	(1.369)	(1.366)	(1.364)
Individual-level (level 1)							
Gender	0.245***	0.244***	0.243***	0.244***	0.240***	0.242***	0.239***
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Age	-0.118***	-0.116**	-0.113**	-0.116***	-0.115**	-0.118***	-0.115**
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Age square (*ln*)	0.084*	0.084*	0.082*	0.084*	0.087*	0.086*	0.086*
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Know entrepreneur	-0.164***	-0.162***	-0.162***	-0.162***	-0.160***	-0.161***	-0.160***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Opportunity alertness	0.081*	0.079*	0.077*	0.079*	0.078*	0.075*	0.073*
	(0.035)	(0.035)	(0.036)	(0.035)	(0.036)	(0.036)	(0.036)
Self-efficacy	-0.105**	-0.106**	-0.105**	-0.106**	-0.107**	-0.106**	-0.105**
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Fear of failure	0.052	0.053	0.053	0.053	0.055	0.053	0.054
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
General human capital	-0.323***	-0.318***	-0.305***	-0.318***	-0.316***	-0.318***	-0.306***
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Specific human capital	-0.021	-0.022	-0.024	-0.017	-0.024	-0.027	-0.024
	(0.035)	(0.035)	(0.035)	(0.036)	(0.035)	(0.035)	(0.036)
Financial capital	-0.366***	-0.368***	-0.363***	-0.368***	-0.338***	-0.366***	-0.339***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.036)	(0.035)	(0.036)
Multiple founders	-0.201***	-0.202***	-0.200***	-0.203***	-0.199***	-0.174***	-0.176***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.034)	(0.034)
Country-level (level 2)							
GDP per capita (*ln*)	-1.173***	-0.883**	-0.886**	-0.889**	-0.872**	-0.895**	-0.894**
	(0.326)	(0.291)	(0.289)	(0.291)	(0.292)	(0.291)	(0.290)
GDP growth	0.292***	0.207*	0.206*	0.207*	0.205*	0.208*	0.205*
	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.086)
Population (*ln*)	0.466+	0.439+	0.452+	0.440+	0.447+	0.447+	0.462+
	(0.274)	(0.242)	(0.240)	(0.241)	(0.243)	(0.241)	(0.241)
Unemployment	0.180	0.019	0.023	0.018	0.039	0.018	0.038
	(0.217)	(0.191)	(0.190)	(0.191)	(0.192)	(0.191)	(0.191)
Governance quality	-0.194	-0.549	-0.554	-0.540	-0.553	-0.507	-0.510
	(0.430)	(0.405)	(0.403)	(0.405)	(0.407)	(0.404)	(0.404)
Economic freedom	0.516+	0.448	0.442	0.448	0.448	0.417	0.414
	(0.308)	(0.281)	(0.279)	(0.281)	(0.283)	(0.280)	(0.280)
Organized crime	-0.028	-0.171	-0.176	-0.168	-0.159	-0.160	-0.154
	(0.183)	(0.169)	(0.169)	(0.169)	(0.169)	(0.169)	(0.167)
Informal economy size	0.067	0.130	0.151	0.124	0.129	0.134	0.144
	(0.198)	(0.178)	(0.177)	(0.179)	(0.179)	(0.178)	(0.178)
Ease of starting a business	-0.059**	-0.040*	-0.039*	-0.040*	-0.040*	-0.038*	-0.038*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Main and moderating effects							

Income inequality		0.758*** (0.181)	0.771*** (0.180)	0.760*** (0.180)	0.772*** (0.181)	0.772*** (0.180)	0.795*** (0.180)
Income inequality × general human capital			-0.103** (0.035)				-0.083* (0.036)
Income inequality × specific human capital				-0.020 (0.032)			-0.019 (0.032)
Income inequality × Financial capital					-0.114** (0.036)		-0.092* (0.036)
Income inequality × multiple founders						-0.092** (0.033)	-0.083* (0.034)
Observation	6,143	6,143	6,143	6,143	6,143	6,143	6,143
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log likelihood	-2867.13	-2857.90	-2853.49	-2857.71	-2852.85	-2854.15	2846.69
Wald Chi-square	571.96***	592.25***	598.46***	592.54***	599.22***	597.37***	604.60***
LR test vs. Linear regression	316.63***	303.71***	293.47***	304.09***	306.90***	307.14***	300.45***

Note: Standard errors in parentheses.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, two-tailed tests.

Table 4 CEM imbalance measurement, univariate imbalance

Variable	L1	Mean	Min	25%	50%	75%	Max
Financial capital	0.259	-0.259	0	0	-1	0	0
Multiple founders	0.149	-0.149	0	0	0	-1	0
General human capital	0.192	-0.192	0	0	0	-1	0
Specific human capital	0.007	-0.007	0	0	0	0	0
Age	0.080	-0.651	0	-2	0	1	-6
Multivariate L1 distance: 0.3453							

Table 5 CEM matching summary

Number of strata					Number of matched strata		
145					110		
	0				1		
All	1,856				4,287		
Matched	1,820				4,257		
Unmatched	36				30		
Variable	**L1**	**Mean**	**Min**	**25%**	**50%**	**75%**	**Max**
Financial capital	3.6E-16	-5.6E-17	0	0	0	0	0
Multiple founders	9.4E-16	0	0	0	0	0	0
General human capital	7.3E-16	-1.4E-17	0	0	0	0	0
Specific human capital	8.7E-17	-6.2E-17	0	0	0	0	0
Age	0.055	-0.126	0	-1	0	0	3
Multivariate L1 distance: 0.1122							

Table 6 The multilevel logistic regression results: Using the coarsened exact matching method

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	7.483**	5.702**	5.690**	5.710**	5.905**	5.617**	5.815**
	(2.419)	(2.033)	(2.033)	(2.041)	(2.022)	(2.030)	(2.029)
Individual-level (level 1)							
Gender	0.232***	0.231***	0.231***	0.232***	0.227***	0.231***	0.227***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.049)	(0.050)	(0.050)
Age	-0.013	-0.011	-0.010	-0.011	-0.008	-0.011	-0.009
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Age square (*ln*)	0.045	0.044	0.044	0.044	0.046	0.046	0.048
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.039)
Know entrepreneur	-0.155**	-0.154**	-0.153**	-0.154**	-0.150**	-0.152**	-0.149**
	(0.054)	(0.054)	(0.054)	(0.054)	(0.055)	(0.055)	(0.055)
Opportunity alertness	0.084*	0.083*	0.082*	0.083*	0.083*	0.080+	0.079+
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.043)	(0.042)
Self-efficacy	-0.112*	-0.114**	-0.112*	-0.114**	-0.114**	-0.113**	-0.113*
	(0.044)	(0.043)	(0.044)	(0.043)	(0.043)	(0.044)	(0.044)
Fear of failure	0.077	0.079	0.078	0.079	0.080	0.079	0.080
	(0.054)	(0.054)	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)
General human capital	0.078*	0.084*	0.093*	0.084*	0.085*	0.082*	0.090*
	(0.039)	(0.039)	(0.046)	(0.039)	(0.037)	(0.039)	(0.040)
Specific human capital	0.001	-0.001	-0.001	-0.004	-0.002	-0.006	-0.010
	(0.043)	(0.043)	(0.043)	(0.059)	(0.042)	(0.042)	(0.056)
Financial capital	0.042	0.039	0.042	0.039	0.075	0.042	0.076
	(0.068)	(0.067)	(0.068)	(0.067)	(0.050)	(0.067)	(0.051)
Multiple founders	0.110*	0.110*	0.110*	0.110*	0.113*	0.158***	0.160***
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.042)	(0.041)
Country-level (level 2)							
GDP per capita (*ln*)	-1.220***	-0.969**	-0.973**	-0.967**	-0.971**	-0.999**	-1.000**
	(0.347)	(0.349)	(0.346)	(0.347)	(0.345)	(0.351)	(0.343)
GDP growth	0.375***	0.289**	0.288**	0.289**	0.289**	0.287**	0.287**
	(0.107)	(0.093)	(0.093)	(0.093)	(0.091)	(0.093)	(0.091)
Population (*ln*)	0.733	0.591	0.599	0.592	0.601	0.598	0.612+
	(0.458)	(0.371)	(0.370)	(0.372)	(0.372)	(0.371)	(0.372)
Unemployment rate	0.189	-0.021	-0.022	-0.020	-0.015	-0.034	-0.029
	(0.421)	(0.225)	(0.221)	(0.226)	(0.230)	(0.224)	(0.226)
Governance quality	-0.193	-0.622	-0.625	-0.624	-0.624	-0.575	-0.583
	(0.714)	(0.727)	(0.723)	(0.727)	(0.719)	(0.733)	(0.725)
Economic freedom	0.877	0.772	0.767	0.773	0.785	0.740	0.751
	(0.643)	(0.575)	(0.570)	(0.576)	(0.576)	(0.579)	(0.581)
Organized crime	-0.056	-0.173	-0.176	-0.174	-0.157	-0.159	-0.147
	(0.327)	(0.294)	(0.294)	(0.296)	(0.285)	(0.296)	(0.289)
Informal economy size	-0.047	0.016	0.030	0.018	0.006	0.012	0.015
	(0.185)	(0.197)	(0.197)	(0.197)	(0.198)	(0.199)	(0.199)
	-0.083**	-0.058*	-0.058*	-0.058*	-0.060*	-0.056*	-0.059*
	(0.031)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Main and moderating effects							
Income inequality		0.801***	0.794***	0.800***	0.780***	0.800***	0.776***
		(0.219)	(0.217)	(0.219)	(0.215)	(0.219)	(0.212)
Income inequality × general human capital			-0.078*				-0.046
			(0.040)				(0.041)

Income inequality × specific human capital				0.008 (0.062)			0.013 (0.058)
Income inequality × Financial capital					-0.121* (0.052)		-0.108* (0.055)
Income inequality × Multiple founders						-0.136*** (0.038)	-0.131*** (0.037)
Observation	6,077	6,077	6,077	6,077	6,077	6,077	6,077
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudolikelihood	-2914.65	-2906.14	-2904.78	-2906.11	-2901.54	-2899.93	-2895.26

Note: Standard errors in parentheses.
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, two-tailed tests.

Figure 1 The moderating effect of general human capital with 95% confidence intervals

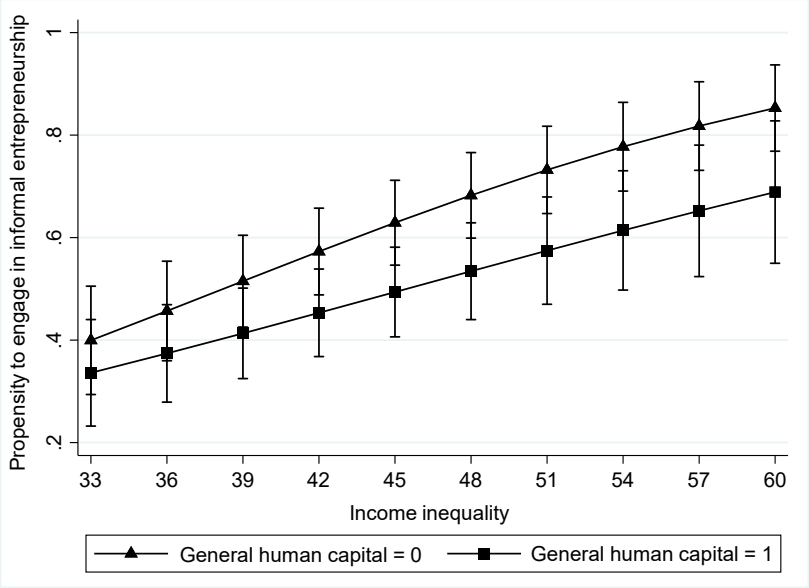

Figure 2 The moderating effect of specific human capital with 95% confidence intervals

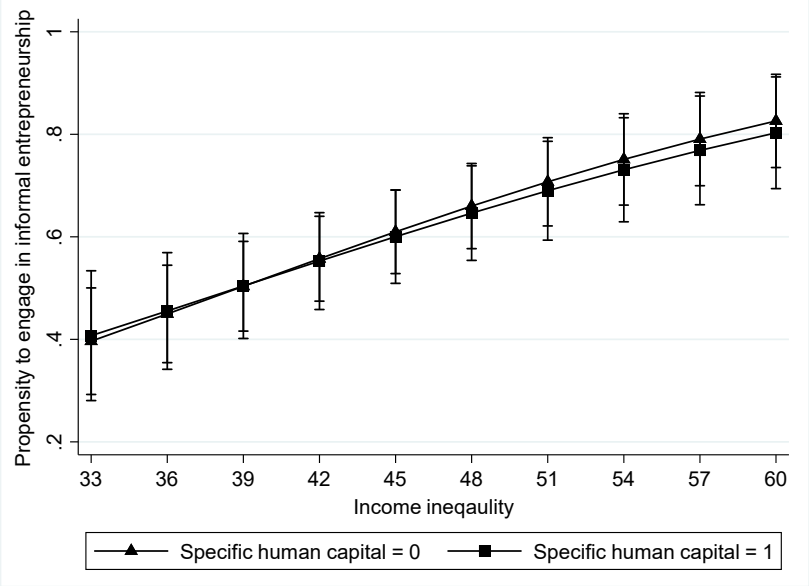

Figure 3 The moderating effect of financial resources with 95% confidence intervals

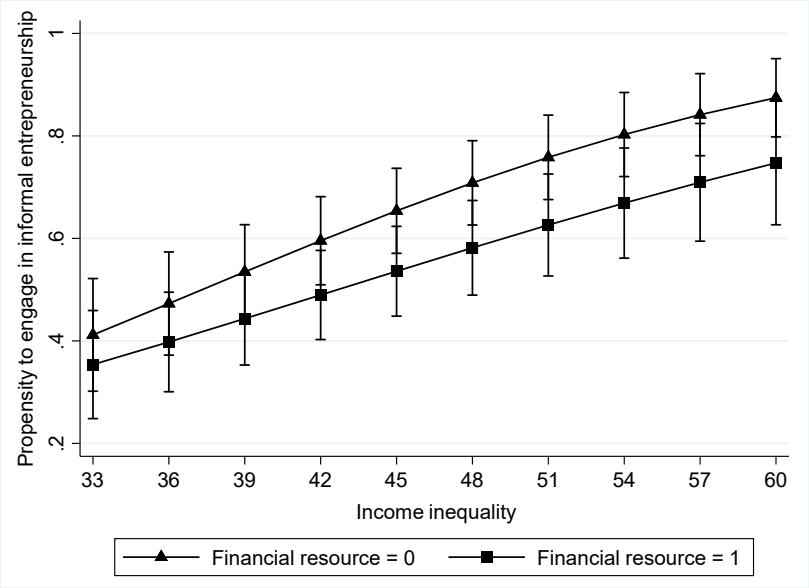

Figure 4 The moderating effect of multiple founders with 95% confidence intervals