



Managing destructive entrepreneurship in place: formal and informal institutions for the achievement of regional economic growth

Sebastian Aparicio · Diego Martinez-Moya · Juan Carlos Muñoz-Mora · David Urbano

Accepted: 11 June 2025 / Published online: 9 July 2025
© The Author(s) 2025

Abstract Given institutional incentives, is entrepreneurship always good for the economy? While the literature about its benefits for society is extensive, a salient lacuna exists regarding the negative side of entrepreneurship. This study, hence, explores how institutions condition destructive entrepreneurial activity, which is linked to the economic growth of Colombian regions. Institutional economics helps us

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11187-025-01090-7>.

S. Aparicio · D. Urbano (✉)
Department of Business, Universitat Autònoma de Barcelona, Edifici B, Campus UAB, Bellaterra, 08913 Barcelona, Spain
e-mail: david.urbano@uab.cat

S. Aparicio
e-mail: sebastian.aparicio@uab.cat

S. Aparicio · D. Urbano
Centre for Entrepreneurship and Social Innovation Research (CREIS), Edifici S, Campus Sabadell, 08202 Barcelona, Spain

D. Martinez-Moya
Fundación ECSIM, Carrera 10 # 19 SUR 196 C39, Medellín, Colombia
e-mail: diego.martinez@fundacionecsim.org

J. C. Muñoz-Mora
School of Finance, Economics, and Governance, Universidad EAFIT, Carrera 49, Cl. 7 Sur #50, Medellín, Colombia
e-mail: jmunozm1@eafit.edu.co

understand the underlying relationships, which are tested through 3SLS, on a sample of 1122 municipalities in Colombia. We show that a negative effect of new coca crops (as destructive entrepreneurship) on regional economic growth exists, but it is conditioned by the institutional reinforcement and integral performance index (as formal institutions), as well as historical land conflict and hectares of land belonging to religious sects (as informal institutions). Other forms of (destructive) entrepreneurship are therefore envisioned and put in place for the continued development of the current literature and the management of public policy.

Plain English Summary Entrepreneurship has been highlighted as a powerful engine for economic growth. Yet, countries such as Colombia have created perverse incentives for the emergence of destructive entrepreneurship, which negatively affects growth. Using a two-step approach in Colombian regions, we observe whether formal and informal institutions' incentives condition the negative association between new coca crops (as destructive entrepreneurial activity) and the regional economic growth process of Colombia. We find that the government presence and control (i.e., institutional reinforcement and integral performance index—as formal institutions), as well as areas historically characterized by conflict (as informal institutions), mitigate the negative influence of destructive entrepreneurship on regional growth.

Similarly, the land belonging to religious sects (as an informal factor) discourages destructive entrepreneurial activity that destroys regional productivity. Thanks to this evidence, we contribute to the public debate about incentivizing and monitoring destructive entrepreneurship.

Keywords Destructive entrepreneurship · Institutions · Developing countries · Economic growth

JEL Classification B52 · L26 · M13 · O17 · O40

1 Introduction

Entrepreneurship has long been hailed as a cornerstone of regional and national development, with a vast body of literature documenting its role in fostering innovation, job creation, and economic growth (Baumol & Strom, 2007; Urbano et al., 2019; Wennekers & Thurik, 1999). However, the focus of this research has predominantly been on productive entrepreneurship, which aligns with societal welfare (Baumol, 1990; Bjørnskov & Foss, 2016). This emphasis has led to a rich understanding of how entrepreneurship, shaped by the institutional environment, catalyzes growth through opportunity-driven activities (Acs et al., 2018; Aparicio et al., 2018; Bosma et al., 2018; Content et al., 2020; Theodoraki et al., 2022). Yet, what happens when these same institutions—or their deficiencies—spur entrepreneurship that undermines economic progress?

Institutional economics (North, 1990, 2005) provides a crucial lens through which to examine this duality. Institutions, encompassing formal rules (such as regulations, procedures, and laws) and informal norms (such as societal values, habits, and culture), not only shape entrepreneurial opportunities but also determine whether such activities are productive, unproductive, or even destructive (Baumol, 1990). Destructive entrepreneurship—manifested in activities like corruption, extortion, or drug cultivation—can thrive in environments where institutional frameworks fail to disincentivize harmful behavior (Boudreaux et al., 2018; Desai et al., 2013). Despite its implications for regional economic disparities, the relationship between institutions, destructive entrepreneurship, and economic growth remains

insufficiently explored. This lacuna becomes more evident when destructive entrepreneurship is manifested through illicit activities such as coca crops, causing terrible effects on the economy, health, and society at large.

By using coca crops as a manifestation of destructive entrepreneurial activity, we find that this gap is particularly striking in contexts like Colombia, where profound institutional challenges, regional inequalities, and the existence of some destructive entrepreneurs, such as cartels, who grow coca and sell cocaine exist (Muñoz-Mora et al., 2018). It is worth noting that national and local governments have implemented policies to bolster institutional capacity and encourage productive entrepreneurship. This is the case of national funds for regional development, called *regalías*. The allocation of these funds depends on regional performance indices such as *integral performance index* (IPI) and *institutional reinforcement*. The low level of *regalías* would entail weak institutional support and inadequate utilization of public resources at the regional level (Muñoz-Mora et al., 2018). The Departamento Nacional de Planeación—DNP hereafter—(2005), which is the national department in charge of creating and monitoring development plans, has defined *institutional reinforcement* as the capacity and effectiveness of formal governance mechanisms—such as property rights, regulations, and enforcement systems—to promote legal and productive behavior while deterring unlawful or detrimental actions. Similarly, the *integral performance index* (IPI) encompasses effectiveness, efficiency, legal compliance, and managerial capacity to measure municipal fiscal management quality and results, which is useful for evaluating how local governments contribute to development and budget execution (DNP 2005)—critical factors in confronting the dynamics of destructive entrepreneurship.

These efforts are also often undercut by the persistence of informal institutions and a legacy of organized violence and crime. For instance, the outlawing of armed groups such as the Fuerzas Armadas Revolucionarias de Colombia (FARC) inadvertently incentivized destructive entrepreneurship, particularly in coca cultivation and illicit trade, transforming Colombia into a leading producer of coca leaves (Bruce-Jones & Smith, 2019; Dávalos & Dávalos, 2020). This has implied two cultural reactions. On the one hand, the *land* utilized for cultivation has long

been subject to conflict and civil war. As the government has no presence there, rules emerge because of the socialization process among communities and armed groups (Fergusson et al., 2020a, 2020b). On the other hand, those municipalities with low governmental presence have also relied on *religious groups* as potential leaders of the communities, guiding actors and actions (Fajardo, 1969). These dynamics raise critical questions: How have formal and informal institutions shaped destructive entrepreneurship (i.e., new coca crops)? What have been the implications for regional economic growth, particularly in contexts where institutional legitimacy is contested?

To address these questions, this paper explores how institutions condition destructive entrepreneurial activity, which is negatively linked to the economic growth of Colombian regions. Grounded in the principles of institutional economics, we examine how both formal institutions (e.g., *IPI* and *institutional reinforcement*) and informal institutions (e.g., *land with historical conflicts* and owned by *religious groups*) influence harmful entrepreneurial activities like new coca cultivation (in hectares). Leveraging a municipality-level panel dataset (2005–2009) from the Centro de Estudios Sobre Desarrollo Económico (CEDE), we employ a three-stage least squares (3SLS) simultaneous equations approach to capture the complex, reciprocal relationships between institutions, destructive entrepreneurship, and growth. We find that formal institutions, such as investment in *institutional reinforcement* and the *IPI*, have a negative impact on destructive entrepreneurship in Colombia's municipalities. Additionally, we observe that informal institutions, such as historical *land conflicts*, also discourage destructive entrepreneurship, which is negatively linked to the regional economic growth of Colombia.

Our findings contribute to the literature in four significant ways. First, we demonstrate that formal institutional investments, measured by the *institutional reinforcement* and *integral performance index (IPI)*, reduce destructive entrepreneurship, challenging traditional views that the lack of such institutions often facilitates harmful activities (Baumol, 1990). Second, we extend the study of informal institutions, showing how historical *land conflicts* exacerbate destructive entrepreneurship. These results are in line with prior literature on institutions and entrepreneurship, which suggests that informal factors (in contrast to formal

ones) seem to be more important for (either spurring or mitigating) entrepreneurial activity (cf. Bruton et al., 2010; Thornton et al., 2011; Urbano et al., 2019). Third, we provide empirical evidence linking destructive activities—such as coca cultivation—to diminished economic growth at the regional level, advancing debates on the economic costs of harmful entrepreneurship. This brings new insights into the discussion about the dark side of entrepreneurship (Desai et al., 2013; Shepherd et al., 2024), in which certain activities emerge to destroy economies and societies in favor of personal interest (Baumol, 1990). Lastly, we propose policy recommendations that emphasize institutional strengthening, social inclusion programs, and coordinated monitoring mechanisms to mitigate destructive entrepreneurship and promote sustainable development.

The remainder of this paper is organized as follows: Sect. 2 presents the Colombian context, which is the laboratory we use for our empirical analysis. Section 3 outlines the theoretical framework, positioning institutional economics as the foundation for our analysis and hypothesis development. Section 4 describes the data and methodology. Section 5 presents our results and robustness checks, and Sect. 6 discusses the implications of our findings, highlighting policy recommendations, study limitations, and avenues for future research. Finally, Sect. 7 presents the main conclusions of the paper.

2 Historical context of institutions and destructive entrepreneurship in Colombia

Colombia exemplifies how both formal and informal institutions shape entrepreneurial behavior, influencing the allocation of entrepreneurial talent toward either productive or destructive activities, with significant implications for regional economic growth. Historically, Colombia's weak and unreliable formal institutions have created conditions conducive to destructive entrepreneurship, a phenomenon well-documented in the literature. Kalmanovitz (2000) highlights that institutional fragility has hindered Colombia's economic development and perpetuated barriers to growth. Institutional quality, particularly the transparency and effectiveness of governance, plays a central role in shaping societal outcomes, as noted by Nieto-Aleman et al. (2019). Their analysis

emphasizes the importance of institutional strength in fostering peace and promoting sustainable development over time (Ibáñez & Velásquez, 2009).

Formal institutional mechanisms such as the *integral performance index* (IPI) and *institutional reinforcement* programs have been pivotal in addressing governance deficiencies. However, as Acemoglu and Robinson (2012) argue, the synergy between economic and political institutions is crucial, as political power heavily influences the efficacy of economic governance. In Colombia, this synergy is often undermined by the absence of legitimacy in formal institutions, particularly in regions plagued by historical *land conflicts* (Grajales, 2015). The lack of coherence between local orders and formal institutions perpetuates a cycle of institutional weakness, fueling violence and corruption. Fergusson et al., (2020a, 2020b) further illustrate how the absence of clear rules exacerbates issues such as rural property disputes, financial underdevelopment, and regional inequities, all of which incentivize destructive entrepreneurship (Desai et al., 2013).

Informal institutions, including *historical land conflicts* and *land ownership by religious groups*, also play a critical role in shaping entrepreneurial behavior. In regions where formal institutions are absent or weak, informal norms and power structures fill the void (Urbano et al., 2024). For example, the overlapping influence of *religious landownership* and historical disputes over land rights has created unique

socio-political dynamics that affect local economic activities. These informal systems often interact with weak formal institutions to create a fertile ground for illicit activities, including drug trafficking and illegal armed enterprises. Grajales (2015) underscores how these informal dynamics undermine formal governance and contribute to the perpetuation of destructive entrepreneurship.

In an illustrative way, Figs. 1 and 2 show the progressive increase in the number of hectares of land (properties) belonging to *religious sects* in Colombia from 2000 to 2005 and 2010, and the land utilized for coca cultivation, respectively. In 2000, the average number of municipal hectares was 26.6 hectares, in 2005, it was 28.18, and in 2010, it was 37.24 hectares. Also, Fig. 1 shows that there was a displacement and growth of these hectares, especially in municipalities far from large cities. This is consistent with the expansion of coca crops over the years (see Fig. 2).

The literature on productive entrepreneurship in Colombia offers a contrasting perspective, emphasizing the potential for formal institutional strengthening to create an environment conducive to productive economic activities. Studies such as Aparicio et al. (2018) and Cortés-Sánchez (2018) demonstrate how institutional quality, measured through indices like the institutional strength index, correlates with increased productive entrepreneurship. These findings highlight the importance of targeted public policies in promoting entrepreneurial ventures that contribute

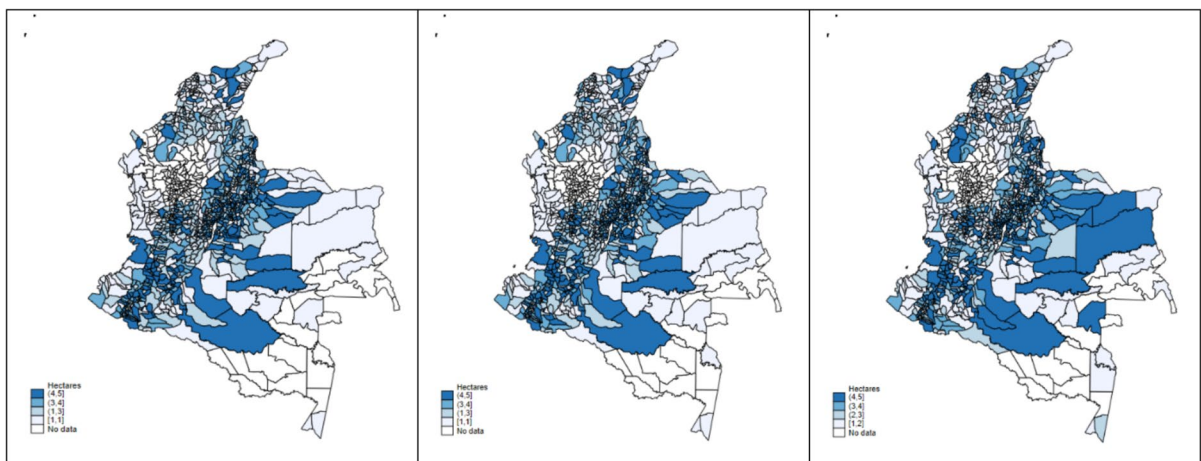


Fig. 1 Hectares of land (properties) belonging to religious sects in Colombia (2000–2005–2010). Source: own elaboration from CEDE data

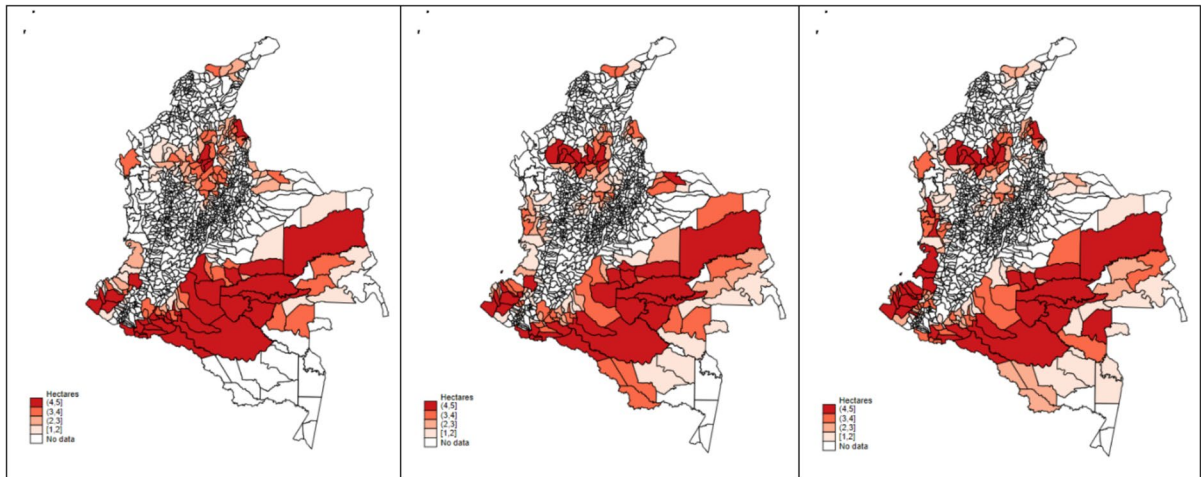


Fig. 2 Hectares of coca crops in Colombia (2000–2005–2010). Source: own elaboration from CEDE data

positively to economic growth. For instance, peace-building efforts in Colombia's post-conflict era have focused on leveraging entrepreneurship to foster reconciliation and socio-economic inclusion (Cortés-Sánchez, 2018; Murcia et al., 2019).

Despite these positive efforts, Colombia's history of drug trafficking and armed conflict illustrates the detrimental effects of destructive entrepreneurship on economic outcomes. The interplay between informal institutions and formal governance failures has facilitated the rise of illicit activities, with drug trafficking serving as a prime example. The work of Aschner and Montero (2020) on the spatial dynamics of drug trafficking highlights how informal power structures and weak formal oversight allow criminal enterprises to flourish. Similarly, Duncan (2014) reveals the oligopolistic control of coercion in Colombia, where multiple actors—including paramilitaries and guerrillas—compete for dominance, further undermining economic stability. The persistence of coca cultivation and the challenges of implementing substitution policies illustrate the complexities of addressing destructive entrepreneurship in regions marked by institutional fragility (Acero Vargas et al., 2019; Tellez, 2019). These dynamics resonate with Desai et al.'s (2013) theoretical framework, which identifies civil conflict, political instability, and weak institutions as defining features of destructive entrepreneurship in transitional economies. Colombia's historical trajectory, marked by socio-political instability and protracted civil war, exemplifies this relationship.

Hence, the Colombian experience underscores the profound influence of both formal and informal institutions on entrepreneurial activities and their economic consequences. The interplay between mechanisms like the *IPI* and *institutional reinforcement*, and informal dynamics such as *land conflicts* and *religious influences*, highlights the complexity of addressing destructive entrepreneurship. Strengthening institutional quality in both dimensions is essential for redirecting entrepreneurial efforts toward productive ventures, reducing regional inequities, and fostering sustainable economic growth.

3 Conceptual framework

3.1 Theoretical foundations

Based on the previous section's arguments, the Colombian case perfectly fits Baumol's (1990) definitions of productive, unproductive, and destructive entrepreneurship. Productive entrepreneurship generates positive externalities, while unproductive behavior seeks rent without contributing to or harming society. Destructive entrepreneurship, however, imposes negative externalities on the economy and society. Baumol (1990) links these entrepreneurial types to North's (1990) institutional framework, where "rules of the game" shape economic behavior. North (1990, 2005) classifies institutions into formal (laws, policies) and informal (norms, social

perceptions). Williamson (2000) highlights that informal institutions persist longer due to socialization processes. Institutional economics helps explain why individuals pursue entrepreneurship (Bruton et al., 2010; Thornton et al., 2011). As institutions vary across regions, economic growth depends on institutional incentives (Bjørnskov & Foss, 2016; Urbano et al., 2019). Baumol and Strom (2007), drawing on North and Thomas (1973), argue that institutions determine entrepreneurial opportunities, influencing regional and national outcomes either positively (productive) or negatively (unproductive/destructive).

Research has examined both formal and informal institutions (Audretsch et al., 2024; Bjørnskov & Foss, 2016; Bruton et al., 2010; Chowdhury et al., 2019; Urbano et al., 2019). However, recent studies emphasize the role of state fragility in deterring productive entrepreneurship and fostering harmful activities (Amorós et al., 2019; Audretsch & Moog, 2022; Audretsch et al., 2022; Colson et al., 2024; McMullen et al., 2008). Indices assessing governmental performance (Da Cruz & Marques, 2014; Moon & DeLeon, 2001) illustrate this issue. For instance, Cortés-Sánchez (2018) examined institutional strength's impact on destructive entrepreneurship. Similar indices in Colombia guide public funding allocation. According to DNP (2005), the *institutional reinforcement* and *integral performance indices*, framed by Law 617 of 2000 and Law 152 of 1994, promote regional autonomy and monitor financial, administrative, and sectoral management to curb corruption. Urbano et al. (2019) and Zhai et al. (2019) note that formal institutions are more studied than informal ones, likely due to data availability. However, history (Wadhvani et al., 2020; Wapshott & Mallett, 2024) and religion (Block et al., 2020; Smith et al., 2021) are crucial for understanding entrepreneurship at national and regional levels. In conflict-prone areas with weak formal institutions, informal mechanisms arise to regulate behavior. Regions with persistent violence have developed their own unwritten laws (Muñoz-Mora et al., 2018), while *religious groups* provide social stability amid uncertainty (Fergusson et al., 2020a, 2020b). Such informal institutions align with the concept of institutional voids (Webb et al., 2020).

Given the significance of formal and informal institutions in shaping (destructive) entrepreneurship and economic growth, what are the mechanisms

linking them to harmful activities and economic outcomes?

3.2 Hypothesis development

Concerning formal factors, the relationship between formalized institutions and destructive entrepreneurship, particularly in the context of coca cultivation in Colombia, underscores the critical role of *institutional reinforcement* in mitigating the negative effects of this type of economic activity on regional growth. Drawing on Baumol (1990) and Desai et al. (2013), the literature highlights how institutions can shape the allocation of entrepreneurial efforts, influencing the prevalence of productive, unproductive, and destructive entrepreneurship (Anand et al., 2023; Boudreaux et al., 2018; Sobel, 2008). For example, high-quality formal institutions—especially mechanisms such as *institutional reinforcement*—may play a critical role in shaping entrepreneurial behavior by constraining opportunities for destructive entrepreneurship and fostering environments conducive to lawful and value-generating activities (Bjørnskov & Foss, 2016; Chowdhury et al., 2019).

According to DNP (2005), *institutional reinforcement* refers to the strengthening of formal governance structures—such as property rights, regulatory frameworks, and enforcement mechanisms—that create incentives for lawful and productive activities while disincentivizing illegal or harmful ones. The influence of such institutions on destructive entrepreneurship is evident in contexts where weak or ineffective governance fosters perverse incentives. Desai et al. (2013) emphasize that weak institutions contribute to the emergence of violence and corruption, providing fertile ground for destructive entrepreneurial activities such as coca cultivation. This view is supported by Holmes and Amin Gutiérrez de Piñeres (2014), who argue that weak local and national governments fail to provide the necessary security and social services, thereby enabling illegal activities. Similarly, Robinson (2016) attributes the persistence of poverty and violence in Colombia to extractive political institutions that can not enforce laws effectively and reach out to municipalities.

As we described, coca cultivation, as a form of destructive entrepreneurship, is deeply intertwined with Colombia's socio-economic and political landscape. Muñoz-Mora et al. (2018) illustrate how

formal institutions, particularly those that strengthen land property rights and implement effective anti-drug policies, can significantly reduce coca crops. *Institutional reinforcement* in this context operates through mechanisms such as the provision of alternative livelihoods, the enforcement of property rights, and the implementation of crop substitution programs. For example, Dávalos and Dávalos (2020) find that farmers with access to credit, technical support, and cash payments for licit crops are less likely to engage in coca cultivation. These findings align with the broader argument that institutional quality influences entrepreneurial decision-making, steering efforts away from destructive activities.

The spatial and economic dynamics of coca cultivation also highlight the vulnerability of remote and marginalized regions to destructive entrepreneurship (Urbano et al., 2024). Bonilla-Mejía and Higuera-Mendieta (2019) show that protected areas and collective lands can mitigate the expansion of coca crops by limiting deforestation and providing legal safeguards. However, these outcomes are contingent on the effective implementation of formal institutions, particularly in regions where state presence is weak. This underscores the importance of *institutional reinforcement* not only as a deterrent to coca cultivation but also as a means of promoting equitable regional development. The broader implications of *institutional reinforcement* extend to its role in regional economic growth. Destructive entrepreneurship, as exemplified by coca cultivation, has a negative impact on social welfare and economic stability, reinforcing cycles of poverty and inequality (Baumol, 1990; Minniti 2016). By addressing the root causes of such activities—through improved governance, targeted social policies, and economic incentives—formal institutions can create a more conducive environment for productive entrepreneurship. This is consistent with Sobel's (2008) findings, which demonstrate that high-quality institutions foster wealth creation by promoting lawful and innovative entrepreneurial ventures. *Institutional reinforcement* as a formal institution, therefore, plays a meaningful role in curbing destructive entrepreneurship in Colombia. By addressing the underlying socio-economic and political factors that drive coca cultivation, such as weak property rights and limited access to resources, institutional strengthening can reduce the prevalence of these activities. Furthermore, by mitigating the

negative effects of destructive entrepreneurship, *institutional reinforcement* contributes to regional economic growth, fostering a more sustainable and equitable development trajectory for Colombian regions. The literature is clear on how institutional strengthening is key to the reduction of illicit crops, which allows us to propose the following hypothesis:

Hypothesis 1a: Formal institutions such as institutional reinforcement have a negative effect on destructive entrepreneurship (i.e., new coca crops) in Colombia's municipalities, which is negatively linked to regional economic growth.

The *integral performance index (IPI)*, a formal institutional measure of municipal management, serves to understand and mitigate destructive entrepreneurship, such as coca cultivation, in Colombia. Proposed by DNP (2005), the IPI incorporates four key components—effectiveness, efficiency, compliance with legal requirements, and management capacity, including fiscal performance. This index encapsulates the management quality and outcomes of municipal entities, offering a comprehensive framework to assess their role in development and budget execution, which are essential in addressing the challenges posed by destructive entrepreneurship.

Literature underscores that municipal performance, as captured by the IPI, directly influences the prevalence of coca crops in Colombia. Effectiveness in municipal governance, which involves delivering public services and enforcing the rule of law, is particularly critical in curbing destructive entrepreneurship. Urbano et al. (2024) argue that coca cultivation thrives in environments where local governance is ineffective or under-resourced, as such conditions enable illegal activities to proliferate. Destructive entrepreneurship, characterized by illicit practices, diverts resources from productive economic endeavors, weakens social cohesion, and hampers regional economic growth (Ács et al. 2018; Box et al., 2018). The mechanisms through which municipal performance affects destructive entrepreneurship are multifaceted. For instance, weak enforcement of property rights and poorly defined land ownership, as highlighted by Muñoz-Mora et al. (2018), create conditions that incentivize illicit coca cultivation. In such contexts, individuals are more likely to resort to illegal activities when legitimate economic opportunities

are either inaccessible or inadequately supported (Sautet, 2013). By contrast, municipalities with strong IPI scores are better equipped to enforce legal frameworks and provide resources, reducing the economic viability and appeal of coca cultivation.

Moreover, robust municipal governance facilitates the design and implementation of public policies that promote productive entrepreneurship while deterring destructive activities. Effective administrative and fiscal management, a key component of the IPI, enables municipalities to allocate resources toward alternative development programs and support for legitimate economic activities. For example, Dávalos (2016) highlights how social investments in education, security, and health, enabled by sound budget execution, emerge as viable strategies for reducing coca cultivation. These efforts complement broader national strategies and offer sustainable alternatives to short-term measures such as aerial spraying, which Vargas (2005) critiques for its limited long-term impact. Strong municipal performance also fosters an environment conducive to opportunity entrepreneurship, which has been shown to positively influence economic growth (Aparicio et al., 2016; Bjørnskov & Foss, 2016). Municipalities with high IPI scores are better positioned to create conditions that attract and retain legitimate businesses, further diminishing the relative attractiveness of engaging in destructive entrepreneurship. Policies aimed at reducing bureaucratic hurdles, enhancing access to credit, and supporting small and medium-sized enterprises are particularly effective in this regard (Heinonen & Hytti, 2016).

The IPI serves as a critical formal institution in Colombia, shaping the municipal capacity to combat destructive entrepreneurship, particularly coca cultivation. By strengthening the effectiveness, efficiency, and fiscal management of municipalities, the IPI helps mitigate the adverse effects of illicit activities on regional economic growth. This underscores the importance of investing in municipal *institutional reinforcement* as a long-term strategy for fostering sustainable development and reducing the socioeconomic harms associated with destructive entrepreneurship. Therefore, we propose that:

Hypothesis 1b: Formal institutions such as the municipality's integral performance index (IPI) have a negative effect on destructive entrepreneur-

ship (i.e., new coca crops) in Colombia's municipalities, which is negatively linked to regional economic growth.

According to Bruton et al. (2010) and Thornton et al. (2011), informal institutions gain more importance than formal ones in shaping entrepreneurship. This is especially true in developing countries, where formal institutions are often absent or weak (Urbano et al., 2020). As an example, land owned by *religious sects* in rural Colombia has shaped entrepreneurial activities. In these regions, informal institutions frequently emerge as dominant forces, influencing social norms and entrepreneurial behaviors. *Religious sects*, as longstanding societal actors, have historically shaped cultural and economic practices, particularly in areas where state presence is limited (Leal, 2018). The hectares of land under their control, while formally managed by religious organizations, often operate within informal frameworks that reflect the norms and customs of the communities they serve. This duality creates a unique institutional landscape that negatively influences the emergence and expansion of destructive entrepreneurship, particularly coca cultivation.

The connection between religious land ownership and coca cultivation is shaped by the absence of institutions. In many rural municipalities, the state's inability to provide effective oversight leaves large tracts of land owned by religious sects vulnerable to illicit activities (Bonilla-Mejía & Higuera-Mendieta, 2019; Grajales, 2015). Coca cultivation thrives in these governance vacuums, where the lack of formal institutional presence allows for the proliferation of illegal enterprises. Similar patterns have been observed in protected areas, where weak institutional frameworks and inadequate enforcement measures make them susceptible to encroachment by coca growers. This vulnerability highlights a broader issue: while informal institutions like *religious sects* provide social cohesion and stability, they are equipped to fill the enforcement gaps left by formal institutions, inadvertently disabling destructive entrepreneurial practices. Religion itself also influences behaviors linked to other crops than coca cultivation (Urbano et al., 2024). Studies have shown that religious beliefs impact agricultural decisions, with some *religious groups* more likely to engage in other cultivation than coca leaves. For instance, Ibáñez and Carlsson (2010) found that

Protestants in Colombia exhibit a lower likelihood of cultivating coca compared to Catholics. This suggests that religious norms and values intersect with economic decisions in complex ways. Leal (2018) posits that the geographic distribution of *religious sects* depends on the availability of institutional support and population density, further indicating that areas with limited state presence face greater challenges in maintaining the intended social and moral influence of these institutions. However, the precise mechanisms by which religious affiliation and land ownership negatively influence coca cultivation remain insufficiently understood, underscoring the need for further research into this multifaceted relationship.

Destructive entrepreneurship, such as coca cultivation, undermines regional economic growth by diverting resources from productive activities and destabilizing legitimate economic structures (Bau-mol & Strom, 2007). The encroachment of coca crops onto lands owned by *religious sects* exemplifies how informal institutions, when unsupported by robust formal governance, can inadvertently reduce harmful economic practices. In turn, this dynamic exacerbates social and economic inequality, preventing cycles of poverty and insecurity that hinder long-term development (Voigt, 2018). While religious organizations provide critical social services and moral guidance, their landholdings alone may substitute for the regulatory functions of a strong formal institutional framework. Addressing this issue requires a collaborative approach that integrates the strengths of both formal and informal institutions. Strengthening the state's capacity to enforce land use regulations and provide oversight in rural areas is essential to reducing the vulnerability of religious lands to coca cultivation (Bonilla-Mejía & Higuera-Mendieta, 2019). Simultaneously, engaging *religious sects* as partners in development initiatives could leverage their deep-rooted social influence to promote sustainable and lawful economic activities (Steer & Sen, 2010). This dual strategy recognizes the interdependence of formal and informal institutions in shaping entrepreneurial landscapes and fostering regional economic growth. Ultimately, understanding and addressing the informal institutional dynamics of land owned by *religious sects* is critical to mitigating the destructive

entrepreneurship that undermines Colombia's economic potential. Hence, we suggest:

Hypothesis 2a: Informal institutions such as the presence of religious sects (measured as hectares of land belonging to them) have a negative effect on destructive entrepreneurship (i.e., new coca crops) in Colombia's municipalities, which is negatively linked to regional economic growth.

Historical *land conflict*, as an informal institution, has profoundly influenced Colombia's social and economic trajectory, including its relationship with destructive entrepreneurship such as coca cultivation. Rooted in long-standing disputes over land ownership and use, these conflicts have created structural inequalities and persistent poverty, which provide fertile ground for illicit activities. Berry (2017) highlights that *land conflicts* have historically led to displacement and land invasions by peasants asserting their perceived rights, resulting in negative externalities that ripple through affected communities. The persistence of these conflicts has long entrenched economic disparities, which in turn create conditions conducive to destructive entrepreneurship. However, the causal links between historical *land conflicts* and coca cultivation are deeply intertwined with the broader social and institutional dynamics of rural Colombia. Saffon and Sánchez Torres (2019) identify a strong relationship between early 20th-century land disputes and contemporary forced displacements, with unfair land reform processes and the presence of violent armed groups acting as mediating factors. These elements foster environments where coca cultivation becomes a viable, albeit destructive, economic option for displaced or disenfranchised populations. In this regard, the government intervenes to clear land ownership, while equitably distributing mechanisms attenuate these trends, as informal land claims and the presence of effective state oversight help communities vulnerable to exploitation by illicit actors (Urbano et al., 2024). Despite these challenges, formal interventions aimed at addressing *land conflict* have shown promise in mitigating its effects on coca cultivation. Since 2007, land restitution has been recognized as a fundamental right of displaced populations in Colombia, as affirmed by the Constitutional Court (World Bank 2018). Municipalities with a history of *land conflict* that experience state

intervention—such as through programs by formal institutions like the Federación Nacional de Cafeteros (FNC)—tend to see reductions in coca cultivation (García-Yi 2014; Ibáñez et al., 2013). This suggests that the presence of formal institutions can counterbalance the negative effects of historical *land conflict* by restoring order and providing alternative pathways for economic stability.

Nevertheless, studying the economic impact of historical *land conflicts* remains complex due to their deeply rooted nature and the multifaceted ways in which they shape local economies. Fergusson (2013) explains that the center-oriented policies affected the history of Colombia's development negatively. This led to low military protection, inadequate infrastructure, and hence, narrowed markets, among other aspects, in the periphery of the country. To survive, people left their lands (mostly utilized for agriculture) as a consequence of constant violence and murders, which were occupied by guerrilla groups afterwards. Low economic development was (and somehow is still) experienced while destructive activities gained predominance. This is better illustrated by Berry (2017), who underscores the difficulty of isolating the effects of historical events like land disputes on contemporary economic outcomes. However, these conflicts' role as an informal institution is undeniable, as they continue to influence entrepreneurial behavior, including destructive forms like coca cultivation, negatively. Their legacy underscores the critical need for integrated approaches that address both the historical underpinnings and contemporary manifestations of *land conflict*.

Addressing the nexus between historical *land conflict* and destructive entrepreneurship requires a combination of formal institutional interventions and localized, community-driven solutions. State-led land restitution and fair land distribution policies can help rectify historical injustices and reduce the appeal of coca cultivation as an economic fallback. Simultaneously, efforts to strengthen community institutions and promote inclusive economic opportunities can mitigate the lingering effects of historical *land conflicts*. Recognizing the dual role of historical *land conflicts* as both a source of vulnerability and a driver of entrepreneurship is essential for fostering long-term regional economic growth and stability in Colombia. Although there are some gaps in this part of the literature, our interpretation of the

extant literature enables us to suggest the following hypotheses:

Hypothesis 2b: Informal institutions such as historical land conflict (measured as municipalities affected by civil war between 1918 and 1931) have a negative effect on destructive entrepreneurship (i.e., new coca crops) in Colombia's municipalities, which is negatively linked to regional economic growth.

4 Methodology

4.1 Data

To examine the previous hypotheses, we employ the CEDE (Centro de Estudios Sobre Desarrollo Económico) multisource municipality-level panel dataset over the 2005–2009 period. The Universidad de los Andes (Colombia) builds the CEDE panel dataset (Acevedo & Bornacelly, 2014), whose main sources of information collection are composed mainly of ministries, administrative departments, and other entities that are official sources of information such as the National Planning Department (DNP—based on the Spanish acronym), Ministry of Agriculture, Ministry of Defense, the Colombian Drug Observatory (ODC—based on the Spanish acronym), and Agustín Codazzi Geographic Institute (IGAC—based on the Spanish acronym). The database is representative because it has information available for the 1122 municipalities of Colombia, which is updated annually. Thanks to this dataset, important research has been conducted to understand different aspects, such as the individual, family, and municipality-level predictors of corporal punishment (i.e., hitting with objects and spanking) in the Colombian economy (Arias et al., 2019; Fergusson et al., 2020a, 2020b; Martínez, 2017), useful to inform prevention and intervention strategies.

In this dataset, we can find municipal characteristics such as good governance, land and agriculture, violence and conflict, education, health, and public services. For this research, an unbalanced CEDE panel dataset with 5610 observations from 1122 municipalities enables us to identify coca crops (as the dependent variable that represents destructive

entrepreneurship), as well as institutions (both formal and informal) taken as the independent variables. It also enables us to capture the growth of the municipalities through the GDP. Based on the structure of this information at the municipality level, we complement the analysis by controlling for local characteristics (e.g., displaced population, fiscal performance index, transfer income, own income, and expenses).

4.1.1 Dependent variables

For our first dependent variable, we define destructive entrepreneurship through the new hectares of coca crops in the municipalities of Colombia. This variable is found in the panel of violence and conflict belonging to the CEDE database, which compiles information on historical violence, drug cultivation, and displacement. The panel on violence and conflict extracts the variable of coca crops obtained from the Illicit Crop Monitoring Global Program of the United Nations Office on Drugs and Crime (UNODC). The methodology to compute the variable consists of capturing a set of satellite images that cover the entire continental Colombian territory. This variable is well accepted in the literature because it has been used over the years in research related to the area of study (cf. Davalos (2016) and Rincón-Ruiz et al. (2016)). According to Dávalos and Dávalos (2020), Colombia is the world's largest producer of coca leaf, attributing this to general socio-economic and cultural characteristics, as well as short-term economic incentives for growers.

Economic growth constitutes our second dependent variable and the main outcome. This variable consists of showing the municipal per capita GDP in Colombia from 2005 through 2009. Economic growth has been widely studied since the contribution made by Solow (1956), as this has been a historically used measure to observe the economic behavior of countries across time. From Lucas (1988), with his models of capital accumulation and technological change, human capital through schooling, and specialized human capital through the learning-by-doing method, to the models of convergence in which there is an attempt to know why some countries grow at faster rates than others (Barro & Sala-i-Martin, 1990), economic growth shows its importance in the economic literature.

4.1.2 Independent variables

There exists literature interested in identifying the impact of formal and informal institutions on economic growth (Acemoglu, 2010; Acemoglu et al., 2017; Aparicio et al., 2016; Casson et al., 2010). On the one hand, we used investment in *institutional reinforcement* and the municipal *integral performance index (IPI)* as variables representing formal institutions. Investment in *institutional reinforcement* is an investment project carried out by the DNP, which seeks to promote a greater impact of public investment policies, developing tools, and agreements related to institutional capacities that strengthen the public management capacities at different government levels and other actors in territorial development. *Institutional reinforcement* and its relationships with the economy have been studied in the literature exploring its effects on the rural economy (Yerznkian, 2017) and demographic changes (McNicoll and Cain 1989). However, no relationship with entrepreneurial activities has yet been presented in the literature. The municipal *integral performance index (IPI)* seeks to evaluate the performance of territorial entities in terms of their public administration effectiveness in meeting the goals of their development plans, the efficiency of the provision of basic education, health and drinking water services, compliance with budgetary execution requirements defined by law, and administrative and fiscal management through the review of information. Caldas et al. (2020) use a similar index to develop a new evaluation model called the municipality sustainability index (MSI) based on the integration of a municipality's financial performance with community sustainability and governance.

We also take the total number of hectares of *land belonging to religious sects* and a dummy that allows us to identify whether there has been a *land conflict* in a municipality between 1918 and 1931 as variables representing informal institutions. These two variables reveal the religious customs and land history of the municipalities; i.e., they show rules or norms established by society itself. For example, Cao et al. (2019) confirm that firms located in high-religiosity regions are associated with more financial trade, especially in regions where formal institutions are weak or formal financing channels are limited. Similarly,

Hilary and Hui (2009) find that the relationship between individual religiosity and risk aversion influences the organizational behavior of firms. In this way, we use the IGAC data to obtain the hectares of land belonging to *religious sects* in the municipalities of Colombia. This variable has been little used in the literature to observe the effects of religion on economic variables, most of the time using surveys that demonstrate people's religious beliefs (e.g., Ibanez & Carlsson, 2010). The dummy variable of *land conflict* presence between 1918 and 1931 (Fernandez 2010) depends largely on the informality of land presented in the twentieth century in the municipalities of Colombia.

4.1.3 Control variables

The control variables were chosen under two criteria. On the one hand, some controls are part of the municipal characteristics (income, percentage of transfer incomes, percentage of own incomes, fiscal performance index (FPI), industrial sector as part of the GDP, administrative capacity, rural index, rural population, value of agricultural credits (VAC), and expenses). Other controls are related to the political, historical, and social context of Colombia (e.g., ambushes, demobilized, departmental development index (DDI), displacement, and police reinforcement).

Variables such as income (corresponding to the sum of tax, non-tax and transfer income in billions of Colombian pesos from DNP), percentage of transfer incomes (percentage corresponding to transfer income over total income), percentage of own incomes (own income over total income from DNP), administrative capacity (from calculations made by the DNP), and expenses (institutional performance expenditures from DNP) enable us to identify the overview of the municipalities' public policies. Other variables such as rural index (developed by CEDE with data from the 2005 census), rural population (from DNP) and value of agricultural credits (VAC) allow us to observe the rural municipal context in Colombia (Chouvy & Laniel, 2007). However, there is one control variable that should be emphasized, which is the FPI (calculated by the DNP). This is a proxy for corruption in our research and plays an important role given that the country's socio-political context has been framed by this variable (Langbein

& Sanabria, 2013; Tate, 2018). Furthermore, variables such as ambushes, demobilized, displacement, and police reinforcement are part of the context of violence through which many of the municipalities in Colombia have experienced. These variables also fit the literature exposing the effects of violence and crime on economic outcomes in developing countries (Cortés-Sánchez, 2018; Schultze-Kraft et al., 2018; Vargas & Caruso, 2014). Finally, we believe that it is important to observe whether the municipal behavior is biased by the department (as a bigger territorial unit) to which it belongs; therefore, observing the behavior of the departmental growth is key to our research.

4.2 Empirical strategy

The association between both dependent and independent variables are assessed through a multi-level model (i.e., simultaneous equations), which enables us to observe the direct and indirect effect that formal and informal institutions have on destructive entrepreneurship and economic growth, respectively, of municipalities m in survey year t :

$$DE_{mt} = \alpha + \beta_1 F_{mt} + \beta_2 I_{mt} + \beta_3 MC_{mt} + \varepsilon_{mt} \quad (1)$$

$$GDP_{mt} = \alpha + \beta_1 \widehat{DE_{mt}} + \beta_2 MP_{mt} + \varepsilon_{mt} \quad (2)$$

Before implementing the 3SLS approach, we conducted a variance inflation factor (VIF) test, which resulted in a VIF score of 1.39, indicating that multicollinearity is not a concern in our model. In Eq. (1), destructive entrepreneurship outcomes are shown by DE_{mt} , while it is directly affected by formal (F_{mt} , *institutional enforcement* and *integral performance index*), as well as informal institutions (I_{mt} , hectares of land (properties) belonging to *religious sects* and presence of *land conflict*). We condition on MC_{mt} , which contains the unobservable effects of some municipality variables such as rural population, the total number of displaced people, and the total value of agricultural loans granted by the Agrarian Bank. However, Eq. (2) is our primary focus, which reveals the direct effect that the estimated destructive entrepreneurship ($\widehat{DE_{mt}}$) exerts on economic growth at the municipal level (GDP_{mt}), conditioning by MP_{mt} , which contains invariant controls over time such as

the industrial sector's GDP, departmental development index, percentage of own income and income from transfers. It also contains controls directly related to institutional performance, such as the fiscal performance indicator (proxy of corruption) and administrative capacity.

As a baseline, we estimate a multivariate regression (OLS) on our simultaneous equations to capture the effect that destructive entrepreneurship has on the economic growth of municipalities. This first methodology gives us an understanding of the expected effects (see Table 1 in the electronic supplementary

Table 1 Descriptive statistics

	Description	Mean	SD	Min	Max	P50	N
Equation 1							
Dependent variable							
Ln New Coca Crops	Logarithm of total new coca crops hectares at the municipal level	4.503	1.960	0.693	8.869	4.691	685
Independent variables							
Ln Institutional reinforcement	Logarithm of financial resources allocated by municipalities to improve the administrative, operational and governance capacity of local institutions	0.281	0.444	0.000	3.723	0.156	662
Ln Municipality's integral performance index	Logarithm of Municipality's integral performance index	3.954	0.391	0.000	4.440	4.035	685
Land conflict	Presence of land conflicts between 1901 and 1931	0.077	0.267	0.000	1	0	685
Ln Religious sects landholding	Logarithm of Hectares religious communities	1.393	1.775	0.000	8.382	0.693	563
Control variables							
Ln Rural Population	Logarithm of Rural population	9.314	0.696	6.804	11.320	9.346	685
Ln Displaced Expelled	Logarithm of total number of people displaced by displacement	6.351	1.278	0.000	9.963	6.410	685
Ln Value of total agricultural loans	Logarithm of Value of total agricultural loans	4.166	1.414	0.693	7.290	4.430	636
Equation 2							
Dependent variable							
Ln GDP Growth	Logarithm of economic growth measured as the change in GDP between periods	0.043	0.041	-0.070	0.201	0.041	685
Independent variables							
Ln New Coca Crops	Logarithm of total new coca crops at the municipal level	4.503	1.960	0.693	8.869	4.691	685
Control variables							
Ln Income Transfers	Logarithm of the percentage of income from transfers	4.299	0.308	2.453	4.612	4.387	676
Ln Own Income	Logarithm of the percentage of own income	2.206	0.671	0.000	3.863	2.259	676
Ln Fiscal Performance Index	Logarithm of the fiscal performance indicator	4.098	0.133	3.482	4.412	4.109	676
Ln Industrial GDP	Logarithm of municipal GDP in the industrial sector	0.038	0.094	0.000	1.860	0.016	685
Ln Administrative Capacity	Logarithm of Administrative Capacity Index	3.610	0.975	0.000	4.594	3.879	685
Ln Departmental Development	Logarithm of Departmental Development Index	4.133	0.184	3.196	4.487	4.167	685

material). However, the OLS results do not capture the indirect effects of formal and informal institutions on economic growth since this methodology only captures the direct effects of destructive entrepreneurship on the main outcome of Eq. (2). Thus, to overcome this difficulty, we used a three-stage estimation (3SLS) (Wooldridge, 2002) that considers both the direct and indirect effects that institutions and destructive entrepreneurship have on municipal economic growth. Specifically, Zellner and Theil (1962) developed the three-stage estimation method, going one step further by using the two-stage least squares estimated moment matrix of the structural disturbances to estimate all coefficients of the entire system simultaneously. This is what allows the technique to be a full information method, which takes into account the constraints of the parameters in different structural equations. The first advantage of the 3SLS specification over OLS is that it has characteristics of total information. However, one could think that through the steps performed in this methodology, the mean-square errors can increase, which would allow the OLS estimation to have a point in favor. Nevertheless, Greene (2012) presents limited and full information estimates for Klein's Model I and demonstrates that intuition suggests the use of system methods such as 3SLS, generalized methods of moments (GMM), and full information maximum likelihood (FILM) over single-equation methods such as 2SLS and the limited information maximum likelihood (LIML). Moreover, Greene (2012) suggests that the only reason to use the latter methods is disappearing due to the computational advances of the software used for these estimates.

5 Results

5.1 Main results

Table 1 presents descriptive statistics for all variables. Logarithmic transformation was applied to reduce dispersion bias, except for the conflict variable (a dummy). On average, Colombian municipalities have 413 (4.5 log) hectares of coca cultivation, a notably high value. However, Dávalos (2016) reports a decline from 2000 to 2010, which is promising for policymakers. GDP per capita growth averages 4.5% (4.3% log), reflecting steady economic expansion.

Rural population and fiscal performance index (FPI) are critical variables. The rural share averages 62.34% (13,933 people, 9.31 log), aligning with literature on historical *land conflict* and weak institutional presence in rural areas. This may explain the association between *religious sect* landholdings and coca crops. FPI's mean value (59.7%, 4.09 log) signals high corruption levels, serving as a proxy rather than a perception index, reinforcing Colombia's socio-political challenges.

Table 2 (supplementary material) shows relationships that meet expectations. Coca crops correlate negatively with economic growth (-0.181^*), the *integral performance index* (-0.118^*), and positively with *land conflict* (0.063^*), supporting our hypotheses.

Table 2 reports 3SLS regression results, preferred over OLS due to better data fit and ability to capture indirect effects of institutions on economic growth through destructive entrepreneurship (coca crops). Model selection follows the Akaike (1974) and Schwarz (1978) criteria. Hence, our analysis relies on Table 2.

Models 1–6 comprise two equations: the first examines formal and informal institutions' effects on coca crops, while the second links coca crops and control variables to economic growth. Models 1 and 4 assess formal institutions (investment in *institutional reinforcement* and *IPI*) independently, while Models 2–3 and 5–6 incorporate informal institutions (*land conflict* and *religious sect* landholdings). The second equation remains unchanged to identify estimated errors from Eq. 1.

Hypotheses 1a and 1b posit that investment in *institutional reinforcement* and *IPI* reduces coca cultivation, indirectly fostering economic growth. Models 1 and 4 confirm this: a 1% increase in *institutional reinforcement* or *IPI* reduces coca crops by 0.375% and 0.952%, respectively. These findings align with Dávalos (2016), Muñoz-Mora et al. (2018), and Vargas (2005), reinforcing the role of institutional strength in curbing destructive entrepreneurship. While *IPI* has a larger effect, both variables significantly influence outcomes, supporting research on corruption's negative impact on growth and development (Boudreaux et al., 2018; Langbein & Sanabria, 2013; Tonoyan et al., 2010).

Hypotheses 2a and 2b suggest that informal institutions (*land conflict*, *religious sect* landholdings)

Table 2 Main results

Equation 1						
Dependent variables	Ln New Coca Crops	Ln New Coca Crops	Ln New Coca Crops	Ln New Coca Crops	Ln New Coca Crops	Ln New Coca Crops
Independent variables						
Ln Institutional reinforcement	−0.375* (0.152)	−0.172 (0.153)	−0.384* (0.163)			
Ln Municipality's integral performance index				−0.952*** (0.225)	−0.953*** (0.219)	−0.955*** (0.232)
Land conflict		−1.245*** (0.248)			−1.298*** (0.235)	
Ln Religious sects landholding			−0.031 (0.041)			−0.031 (0.041)
Control variables						
Ln Rural Population	0.484*** (0.128)	0.507*** (0.125)	0.488*** (0.137)	0.490*** (0.124)	0.542*** (0.121)	0.501*** (0.132)
Ln Displaced Expelled	0.643*** (0.067)	0.649*** (0.065)	0.716*** (0.069)	0.571*** (0.066)	0.590*** (0.065)	0.639*** (0.068)
Ln Value of total agricultural loans	−0.301*** (0.050)	−0.318*** (0.049)	−0.225*** (0.055)	−0.271*** (0.049)	−0.294*** (0.048)	−0.193*** (0.054)
Constant	−2.860** (0.940)	−3.001** (0.919)	−3.582*** (1.003)	1.128 (1.264)	0.719 (1.233)	0.361 (1.333)
Equation 2						
Dependent variables	Ln GDP growth	Ln GDP growth	Ln GDP growth	Ln GDP growth	Ln GDP growth	Ln GDP growth
Independent variables						
Ln New coca crops	−0.005*** (0.001)	−0.006*** (0.001)	−0.004** (0.001)	−0.005*** (0.001)	−0.006*** (0.001)	−0.004** (0.001)
Control variables						
Ln Income Transfers	−0.002 (0.005)	−0.002 (0.005)	−0.007 (0.006)	−0.002 (0.005)	−0.002 (0.005)	−0.007 (0.006)
Ln Own Income	−0.010*** (0.003)	−0.010*** (0.003)	−0.007* (0.003)	−0.010*** (0.003)	−0.010*** (0.003)	−0.006* (0.003)
Ln Fiscal performance	−0.008 (0.013)	−0.007 (0.013)	−0.022 (0.016)	−0.011 (0.013)	−0.011 (0.013)	−0.028+ (0.016)

Table 2 (continued)

Ln Industrial GDP	−0.030*	−0.028+	−0.065**	−0.028+	−0.026+	−0.065**
	(0.015)	(0.015)	(0.024)	(0.015)	(0.015)	(0.024)
Ln Administrative Capacity	−0.013***	−0.013***	−0.011***	−0.013***	−0.013***	−0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Ln departmental development	0.047***	0.046***	0.048***	0.043***	0.042***	0.044***
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)
Constant	−0.013	−0.011	0.042	0.014	0.019	0.080
	(0.075)	(0.075)	(0.086)	(0.074)	(0.074)	(0.086)
N	615	615	502	628	628	512
R-sq	0.309	0.332	0.361	0.329	0.356	0.383
AIC	−2.010	−24.560	−15.559	7.085	−20.965	−8.820
BIC	55.471	37.343	43.501	64.838	41.231	50.516

Standard errors in parentheses. + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

negatively affect coca cultivation, which in turn reduces economic growth. Models 2–3 and 5–6 confirm this. A 1% rise in *land conflict* reduces coca crops by 1.245% and 1.298% under investment and IPI conditions, respectively, corroborating Berry (2017). Similarly, a 1% increase in *religious sect* landholdings reduces coca crops by 0.031%, though the effect is not significant, consistent with Ibanez and Carlsson (2010) and Ibanez and Klasen (2017). *Institutional reinforcement* loses significance once *land conflict* is introduced, though *IPI* remains significant.

Models 1–6 also confirm coca crops' negative impact on municipal GDP growth (−0.005% on average). This aligns with Boudreaux et al. (2018) and Antony et al. (2017), reinforcing institutions' role in mitigating destructive entrepreneurship and promoting economic growth (Acs, 2010; Franz, 2016). Figures 1A and 2A (supplementary material) illustrate marginal effects. The presence of *religious sect* landholdings weakens the impact of *institutional reinforcement* on coca crops (confirming Model 3's findings). However, when formal and informal institutions coexist, their combined effect on GDP growth is stronger. Notably, *IPI* remains significant even after accounting for informal institutions.

Control variables also reveal key insights. Municipalities with higher local revenue generation (vs. transfers) show stronger economic performance. A 1% rise in the departmental development index

under institutional investment increases GDP growth by 0.047%–0.043%. However, FPI (as a corruption proxy) negatively impacts GDP per capita (−0.008% to −0.011%), supporting literature on corruption's detrimental effects (Ahmad et al., 2012; Farooq et al., 2013; Gründler & Potrafke, 2019; Mo, 2001).

5.2 Robustness

The results align with the existing literature, but we conducted two additional checks to validate our specifications. First, we re-estimated the model using the homicide rate as an alternative measure of destructive entrepreneurship. Second, we tested for corruption bias in Colombian municipalities. Table A3 (supplementary material) presents findings using homicide rate per 100,000 inhabitants as the dependent variable, capturing organized crime (Mejía, 2016), a form of destructive entrepreneurship (Desai et al., 2013). The results largely mirror those in Table 2 (models 1 and 4), except for a key difference: the effect of hectares owned by *religious groups* on new coca cultivation turns positive, contradicting expectations.

To test for corruption bias, we excluded municipalities with fiscal performance indices below 50% (cf. He, 2016), ensuring the robustness of our estimates. Table A4 (supplementary material) confirms all hypotheses: a 1% increase in investment in *institutional reinforcement* and *IPI* reduces destructive entrepreneurship (new coca crops) by 0.403% and

0.942%, respectively (models 1 and 4), leading to GDP growth. However, informal institutions like *land conflict* weaken formal institutions' impact, as investment in *institutional reinforcement* reduces destructive entrepreneurship by only 0.236% (not significant). This reinforces Boudreaux et al.'s (2018) findings, demonstrating that formal institutions curb destructive entrepreneurship even in high-corruption municipalities.

Ultimately, institutions play a crucial role in mitigating the negative effects of destructive entrepreneurship on municipal economic growth, supporting the validity of our specification and findings for theoretical and policy discussions.

6 Implications for theory and practice

This study provides novel insights into the role of institutions in shaping destructive entrepreneurial activity and its implications for economic growth, particularly within Colombia's socio-political context. By addressing gaps in prior research—which has largely focused on direct effects while overlooking the broader institutional environment—this study advances the understanding of how formal and informal institutions condition entrepreneurial behavior (Baumol, 1990; North, 1990).

The findings confirm that investments in *institutional reinforcement* and the *integral performance index (IPI)* significantly reduce destructive entrepreneurship, such as the expansion of new coca crops. These results align with existing literature (Antony et al., 2017; Boudreaux et al., 2018; Desai et al., 2013; Shepherd et al., 2024) while offering new insights into the relative effectiveness of different institutional mechanisms. Although *institutional reinforcement* has a stronger quantitative impact, the higher statistical significance of the *IPI* highlights its crucial role in curbing corruption—an aspect warranting further exploration—(Boudreaux et al., 2018; Dejardin & Laurent, 2024). This nuanced perspective enhances theoretical and empirical discussions by illustrating the multifaceted influence of institutional frameworks. Beyond formal institutions, this research underscores the significance of informal institutions in shaping economic outcomes. Factors such as *land conflict* and property ownership by *religious sects* exert a substantial influence on destructive

entrepreneurship, highlighting the economic consequences of socio-cultural dynamics. These findings contribute to the literature by illustrating how formal and informal institutions function independently, reinforcing the complexity of their interaction. This perspective advances research on destructive entrepreneurship in developing economies (Urbano et al., 2024) and challenges conventional institutional analyses that often overlook unobservable socio-cultural forces. The results also provide empirical evidence from Colombian municipalities, where governance structures often emerge through socialization processes among guerrilla groups, religious organizations, and local communities. Finally, this study extends the limited literature on the economic impact of destructive entrepreneurship. By demonstrating that activities such as coca cultivation significantly hinder municipal economic growth, it reinforces the broader economic costs associated with illicit enterprises. Additionally, the findings reveal the dual role of fiscal policies: while reliance on government transfers undermines growth, self-generated income fosters economic resilience. This insight into municipal fiscal autonomy has important implications for policy design, paving the way for future research on sustainable local development.

6.1 Theoretical implications

The theoretical contributions of this research are both substantial and multifaceted, particularly in the domains of institutional economics and entrepreneurship. By demonstrating how institutions—both formal and informal—shape the landscape of destructive entrepreneurship, the findings enrich Baumol's (1990) theoretical proposition that institutional frameworks determine entrepreneurial incentives and activity types. The inclusion of variables such as *institutional reinforcement*, the *IPI* (as formal factors), and *land conflict* and land ownership by *religious groups* (as part of the informal environment) expands the understanding of “rules of the game,” situating them within a context of institutional fragility and corruption. This nuanced approach advances the theoretical discourse by illustrating how institutional quality influences entrepreneurial outcomes in diverse socio-political settings (Audretsch et al., 2024). Certainly, the operationalization of formal institutions through

the *Integral Performance Index* (IPI) and *institutional reinforcement* provides novel tools for evaluating the effectiveness of governance structures in redirecting entrepreneurial efforts away from illicit or unproductive avenues. These institutions play an important role within contexts marked by fragility, informality, and corruption.

Moreover, the study reconceptualizes destructive entrepreneurship as both a process and an outcome, as argued by Douhan and Henrekson (2008). This perspective is particularly salient in regions where institutional weaknesses compel individuals to engage in illicit activities out of necessity. The analysis of informal institutions such as *religious sects* expands the study's theoretical contributions. These religious groups operate as powerful informal institutions that shape local norms, resource access, and conflict dynamics. In addition, *land conflict* provides a critical lens for examining the socio-cultural dimensions of destructive entrepreneurship and their subsequent impact on economic outcomes. This insight not only complements existing theoretical frameworks but also enriches the discussion on institutional interplay in unstable environments. These insights complement our comprehension of destructive entrepreneurship (Desai et al., 2013) not merely as a reaction to institutional failure, but as a phenomenon embedded within competing normative orders.

The findings also build on North and Thomas's (1973) foundational work by highlighting the harmful determinants of economic growth, specifically those arising from destructive entrepreneurship. By integrating the influence of violence, political instability, and institutional inefficiencies into the analysis, the study offers a broader theoretical perspective on the mechanisms through which destructive entrepreneurship undermines both economic growth and social development. These factors may similarly play a critical role in regions with complex socio-cultural dynamics, such as parts of the Middle East and North Africa. Drawing on Mansfield (2016), one might think that the role of tribal affiliations or religious institutions in these regions often parallels the influence of informal institutions in Colombia. By situating these findings within a broader theoretical framework, this research underscores the universality of institutional interdependencies in shaping (destructive) entrepreneurial activities and their economic consequences.

6.2 Policy implications

The findings have profound policy implications, offering actionable insights for addressing destructive entrepreneurship and its broader economic and social consequences. One of the most significant contributions is the emphasis on strengthening formal institutions, particularly through increased investment in *institutional reinforcement*. However, such efforts must be accompanied by robust mechanisms for accountability and oversight to mitigate corruption, which remains a critical barrier to effective governance. This dual focus on institutional capacity and accountability aligns with the study's insights into the interplay between governance quality and economic growth (Audretsch et al., 2024; Boudreaux et al., 2018).

The research also highlights the importance of recognizing and integrating informal institutions into policy frameworks (Urbano et al., 2024). By addressing socio-cultural factors such as *land conflict* and their role in shaping entrepreneurial behaviors, policymakers can develop more holistic strategies to reduce destructive activities. Strengthening the synergy between formal and informal institutions could amplify their collective impact, particularly in reducing illicit coca cultivation and promoting sustainable development.

In addition, the study advocates for alternative approaches to coca eradication that go beyond aerial spraying (Dávalos & Dávalos, 2020). Investments in health, education, and basic services provide viable pathways for coca growers to transition to legal livelihoods. These findings contribute to ongoing policy debates by emphasizing the importance of multi-sectoral strategies in addressing the root causes of illicit entrepreneurship. Furthermore, targeted policies that address historical violence and inequality could focus on high-risk municipalities, ensuring that interventions are both context-specific and impactful. This idea is also helpful for the policy discussion around coca cultivation as a factor strongly related to poor access to services and lack of employment opportunities (Dávalos, 2016). In countries facing similar issues, such as Peru and Bolivia with coca cultivation or Myanmar with opium production (Mansfield, 2016), the lessons learned from *institutional reinforcement* and anti-corruption measures in Colombia can serve as

a valuable reference. Policymakers in these contexts might adopt tailored versions of the *integral performance index (IPI)* to monitor and incentivize municipal-level governance improvements, ensuring accountability and effectiveness in their interventions.

Overall, by generalizing these policy lessons, this research contributes to a global discourse on combating destructive entrepreneurship (Desai et al., 2013). It underscores the need for multi-sectoral, multi-institutional approaches that adapt to local contexts while drawing from shared principles of institutional strengthening and socio-economic development. This perspective equips policymakers across diverse regions with the tools to address the underlying causes of destructive entrepreneurial behavior and its adverse effects on economic growth and social well-being.

6.3 Limitations and future research

While this study offers substantial theoretical and policy contributions, it also identifies limitations that open avenues for future research. One limitation lies in the inability to fully trace the transmission mechanisms through which corruption affects institutional efficacy and economic growth. Future studies could address this gap by employing dynamic models to explore these pathways in greater depth. Another limitation stems from the study's unbalanced panel, which restricts the temporal scope of the analysis. Expanding the dataset to include additional years, particularly those following the peace agreements with FARC, could provide valuable insights into how structural shifts influence the relationships between institutions, destructive entrepreneurship, and economic growth. Additionally, the spatial effects of violence and inequality remain underexplored, presenting an opportunity for further research to examine these dynamics using spatial econometric models (see, for example, Urbano et al., 2024). While our modeling approach has tried to assess these economic outputs, other complexities can be considered in future research. For instance, Urbano et al. (2024) have explored how formal institutions interact with destructive entrepreneurship to displace productive activities. Similar explorations can be considered for the application of North and Thomas (1973) to institutions, destructive entrepreneurial activity, and

economic growth. In this regard, since we show that formal institutions are important (but still these might be absent) to reduce harmful entrepreneurship, future work can consider how informal institutions either mitigate or reinforce the lack of formal ones when understanding destructive entrepreneurship.

Finally, future studies could delve into the socio-economic characteristics and motivations of individuals engaged in destructive entrepreneurship. By incorporating measures of entrepreneurial behavior, such as those proposed by Spivack and McKelvie (2021), researchers could gain a more nuanced understanding of the drivers behind such activities. Exploring these dimensions over time and in response to structural changes or external shocks would further enrich the literature on destructive entrepreneurship and its broader implications.

7 Conclusions

In conclusion, this study provides significant insights into the complex interplay between institutions, destructive entrepreneurship, and economic growth, offering both theoretical and policy contributions. First, the paper emphasizes the pivotal role of formal and informal institutions in shaping entrepreneurial activity. Formal institutions, such as investment in *institutional reinforcement* and the *integral performance index (IPI)*, demonstrate a significant capacity to reduce destructive entrepreneurship, reinforcing theoretical propositions from North (1990) and Baumol (1990) while highlighting potential synergies between institutional mechanisms and corruption. Similarly, the nuanced effects of informal institutions, such as *land conflicts* and *religious land ownership*, underscore their negative influence on (destructive) entrepreneurial dynamics and the broader economic landscape, enriching existing literature on institutional constraints and socio-political contexts. Second, this research confirms the negative impact of destructive entrepreneurship, such as new coca crop cultivation, on regional economic growth in Colombia. It further reveals how fiscal dependency on transfers and departmental development indices interact with municipal economic outcomes, presenting avenues for future exploration of structural and

spatial effects. Finally, these findings advocate for targeted policy interventions that strengthen institutional capacity, improve governance, and address socio-economic inequalities, offering alternative approaches to mitigate destructive entrepreneurship beyond punitive measures.

Funding Open Access Funding provided by Universitat Autònoma de Barcelona. Sebastian Aparicio and David Urbano acknowledge the financial support from Grant PID2022-141777NB-I00 funded by MCIN/AEI/ and by “ERDF A way of making Europe” and Grant 2021-SGR-00719 funded by AGAUR-Generalitat de Catalunya. Sebastian Aparicio, as a Serra Hunter Fellow at the UAB, acknowledges the Serra Hunter programme and the Catalan Government for constant support. Finally, David Urbano acknowledges support from ICREA under the ICREA Academia programme.

Data Availability The data are available from the authors upon reasonable request and with the permission of the Colombian organizations that gathered the data (all of them cited in the manuscript).

Declarations

Conflicts of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity and poverty*. Crown Publishers.
- Acemoglu, D., Robinson, J. A., & Verdier, T. (2017). Asymmetric growth and institutions in an interdependent world. *Journal of Political Economy*, 125(5), 1245–1305. <https://doi.org/10.1086/693038>
- Acemoglu D. (2010). Growth and institutions. In S. N. Durlauf, & P. Wacziarg (Eds.), *Economic Growth*. The New Palgrave Economics Collection. Palgrave Macmillan. https://doi.org/10.1057/9780230280823_16
- Acero Vargas, C., Parada Hernández, M. M., & Machuca Pérez, D. X. (2019). The narcotization of peace: Decisions, pressures and institutional design of the comprehensive national programme for the substitution of illicit crops. *Analisis Politico*, 32(97), 114–135. <https://doi.org/10.15446/anpol.v32n97.87195>
- Acevedo, K., & Bornacelly, I. (2014). Panel municipal del CEDE. Documentos CEDE No. 26. Universidad de los Andes.
- Acs, Z. J. (2010). Entrepreneurship and economic development: The valley of backwardness. *Annals of Innovation & Entrepreneurship*, 1(1), 5641. <https://doi.org/10.3402/aie.v1i1.5602>
- Acs, Z. J., Estrin, S., Mickiewicz, T., & Szerb, L. (2018). Entrepreneurship, institutional economics, and economic growth: An ecosystem perspective. *Small Business Economics*, 51(2), 501–514. <https://doi.org/10.1007/s11187-018-0013-9>
- Ahmad, E., Ullah, M. A., & Arfeen, M. I. (2012). Does corruption affect economic growth? *Latin American Journal of Economics*, 49(2), 277–305. <https://doi.org/10.7764/LAJE.49.2.277>
- Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6), 716–723. <https://doi.org/10.1109/TAC.1974.1100705>
- Amorós, J. E., Ciravegna, L., Mandakovic, V., & Stenholm, P. (2019). Necessity or opportunity? The effects of state fragility and economic development on entrepreneurial efforts. *Entrepreneurship Theory and Practice*, 43(4), 725–750. <https://doi.org/10.1177/1042258717736857>
- Anand, A., Branzei, O., Parameswar, N., & Muskat, B. (2023). Dark and destructive? Configurations of negative ends and means in entrepreneurship research. *Academy of Management Proceedings*, 2023(1), 17676.
- Antony, J., Klarl, T., & Lehmann, E. E. (2017). Productive and harmful entrepreneurship in a knowledge economy. *Small Business Economics*, 49(1), 189–202. <https://doi.org/10.1007/s11187-016-9822-x>
- Aparicio, S., Urbano, D., & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological Forecasting and Social Change*, 102, 45–61. <https://doi.org/10.1016/j.techfore.2015.04.006>
- Aparicio, S., Urbano, D., & Gomez, D. (2018). Entrepreneurship and regional economic growth in Antioquia: An empirical analysis. *Economics and Business Letters*, 7(2), 84–91. <https://doi.org/10.17811/eb1.7.2.2018.84-92>
- Arias, M. A., Ibáñez, A. M., & Zambrano, A. (2019). Agricultural production amid conflict: Separating the effects of conflict into shocks and uncertainty. *World Development*, 119, 165–184. <https://doi.org/10.1016/j.worlddev.2017.11.011>
- Aschner, J. P., & Montero, J. C. (2020). Architectures, spaces, and territories of illicit drug trafficking in Colombia and Mexico. *Crime, Media, Culture*. <https://doi.org/10.1177/1741659020910212>

- Audretsch, D. B., & Moog, P. (2022). Democracy and entrepreneurship. *Entrepreneurship Theory and Practice*, 46(2), 368–392. <https://doi.org/10.1177/1042258720943307>
- Audretsch, D. B., Belitski, M., Chowdhury, F., & Desai, S. (2022). Necessity or opportunity? Government size, tax policy, corruption, and implications for entrepreneurship. *Small Business Economics*, 58(4), 2025–2042. <https://doi.org/10.1007/s11187-021-00497-2>
- Audretsch, D. B., Belitski, M., Chowdhury, F., & Desai, S. (2024). Regulating entrepreneurship quality and quantity. *Research Policy*, 53(2), 104942. <https://doi.org/10.1016/j.respol.2023.104942>
- Barro, R. J., & Sala-i-Martin, X. X. (1990). Economic growth and convergence across the United States. *National Bureau of Economic Research*, (August), 61.
- Baumol, W. J., & Strom, R. J. (2007). Entrepreneurship and economic growth. *Strategic Entrepreneurship Journal*, 1(3–4), 233–237. <https://doi.org/10.1002/sej.26>
- Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5), 893–921. <http://www.jstor.org/stable/2937617>
- Benoit, E. (2003, June). Not just a matter of criminal justice: States, institutions, and North American Drug Policy. *Sociological Forum*. <https://doi.org/10.1023/A:1024091630176>
- Berry, R. A. (2017). Reflections on injustice, inequality and land conflict in Colombia. *Canadian Journal of Latin American and Caribbean Studies*, 42(3), 277–297. <https://doi.org/10.1080/08263663.2017.1378400>
- Bjørnskov, C., & Foss, N. J. (2016). Institutions, entrepreneurship, and economic growth: What do we know and what do we still need to know? *Academy of Management Perspectives*, 30(3), 292–315. <https://doi.org/10.5465/amp.2015.0135>
- Block, J., Fisch, C., & Rehan, F. (2020). Religion and entrepreneurship: A map of the field and a bibliometric analysis. *Management Review Quarterly*, 70, 591–627. <https://doi.org/10.1007/s11301-019-00177-2>
- Bonilla-Mejía, L., & Higuera-Mendieta, I. (2019). Protected areas under weak institutions: Evidence from Colombia. *World Development*, 122, 585–596. <https://doi.org/10.1016/j.worlddev.2019.06.019>
- Bosma, N., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51(2), 483–499. <https://doi.org/10.1007/s11187-018-0012-x>
- Boudreaux, C. J., Nikolaev, B. N., & Holcombe, R. G. (2018). Corruption and destructive entrepreneurship. *Small Business Economics*, 51(1), 181–202. <https://doi.org/10.1007/s11187-017-9927-x>
- Box, M., Gratzner, K., & Lin, X. (2018). Destructive entrepreneurship in the small business sector: Bankruptcy fraud in Sweden, 1830–2010. *Small Business Economics*, 54(2), 437–457. <https://doi.org/10.1007/s11187-018-0043-3>
- Bruce-Jones, T., & Smith, M. L. R. (2019). Coca, Clausewitz, and Colombia: The inadequacy of micro-level studies in explaining FARC violence against civilians during the Colombian Civil War. *Studies in Conflict and Terrorism*. <https://doi.org/10.1080/1057610X.2019.1616927>
- Bruton, G. D., Ahlstrom, D., & Li, H.-L. (2010). Institutional theory and entrepreneurship: Where are we now and where do we need to move in the future? *Entrepreneurship Theory and Practice*, 34(3), 421–440. <https://doi.org/10.1111/j.1540-6520.2010.00390.x>
- Caldas, P., Dollery, B., & Marques, R. C. (2020). Measuring what matters in local government: A Municipality Sustainability Index. *Policy Studies*. <https://doi.org/10.1080/01442872.2020.1726311>
- Cao, C., Chan, K. C., Hou, W., & Jia, F. (2019). Does religion matter to informal finance? Evidence from trade credit in China. *Regional Studies*, 53(10), 1410–1420. <https://doi.org/10.1080/00343404.2019.1575506>
- Casson, M. C., Della Giusta, M., & Kambhampati, U. S. (2010). Formal and Informal Institutions and Development. *World Development*, 38(2), 137–141. <https://doi.org/10.1016/j.worlddev.2009.10.008>
- Chouvy, P. A., & Laniel, L. R. (2007). Agricultural drug economies: Cause or alternative to intra-state conflicts? *Crime, Law and Social Change*, 48(3–5), 133–150. <https://doi.org/10.1007/s10611-007-9085-1>
- Chowdhury, F., Audretsch, D. B., & Belitski, M. (2019). Institutions and entrepreneurship quality. *Entrepreneurship Theory and Practice*, 43(1), 51–81. <https://doi.org/10.1177/1042258718780431>
- Colson, M., Vandekerckhof, P., Marneffe, W., Schepers, J., & Aparicio, S. (2024). Moving beyond the negative effect of the regulation of entry: Disentangling causality in new venture creation decisions. *Journal of Regulatory Economics*. In press. <https://doi.org/10.1007/s11149-024-09486-1>
- Content, J., Bosma, N., Jordaan, J., & Sanders, M. (2020). Entrepreneurial ecosystems, entrepreneurial activity and economic growth: New evidence from European regions. *Regional Studies*, 54(8), 1007–1019. <https://doi.org/10.1080/00343404.2019.1680827>
- Cortés, D., Santamaría, J., & Vargas, J. F. (2016). Economic shocks and crime: Evidence from the crash of Ponzi schemes. *Journal of Economic Behavior and Organization*, 131, 263–275. <https://doi.org/10.1016/j.jebo.2016.07.024>
- Cortés-Sánchez, J. D. (2018). Institutional strength, peace-building, and productive entrepreneurship-exploratory analysis in Colombia. *Business: Theory and Practice*, 19, 88–102. <https://doi.org/10.3846/BTP.2018.10>
- Cotte-Poveda, A., Martínez-Carvajal, J. (2019). Economic development, political violence and socio-political instability in Colombia: An econometric analysis using panel data. *European Research Studies Journal*, XXII (Issue 1), 237–253. <https://doi.org/10.35808/ersj/1421>
- Da Cruz, N. F., & Marques, R. C. (2014). Revisiting the determinants of local government performance. *Omega*, 44, 91–103. <https://doi.org/10.1016/j.omega.2013.09.002>
- Dávalos, E. (2016). New answers to an old problem: Social investment and coca crops in Colombia. *International Journal of Drug Policy*, 31, 121–130. <https://doi.org/10.1016/j.drugpo.2016.02.002>
- Dávalos, E., & Dávalos, L. M. (2020). Social investment and smallholder coca cultivation in Colombia. *Journal of Development Studies*, 56(6), 1118–1140. <https://doi.org/10.1080/00220388.2019.1650167>

- Dejardin, M., & Laurent, H. (2024). Entry-regulation and corruption: Grease or sand in the wheels of entrepreneurship? Fresh evidence according to entrepreneurial motives. *Small Business Economics*, 62(3), 1223–1272. <https://doi.org/10.1007/s11187-023-00802-1>
- Desai, S., Acs, Z. J., & Weitzel, U. (2013). A model of destructive entrepreneurship: Insight for conflict and postconflict recovery. *Journal of Conflict Resolution*, 57(1), 20–40. <https://doi.org/10.1177/0022002712464853>
- DNP (Departamento Nacional de Planeación) (2005). Metodología para la medición y análisis del desempeño municipal. Internet document, available at: https://colaboracion.dnp.gov.co/CDT/Desarrollo%20Territorial/laMetod_desem_mpal.pdf. Accessed October 12, 2024
- Douhan, R., Magnus, H. (2008). “The political economy of entrepreneurship: An introduction.” In *The Political Economy of Entrepreneurship Volumes I and II*, edited by Magnus Henrekson and Robin Douhan, xi–xxxi. Douhan Cheltenham, UK: Edward Elgar.
- Duncan, G. (2014). Drug trafficking and political power: Oligopolies of coercion in Colombia and Mexico. *Latin American Perspectives*, 41(2), 18–42. <https://doi.org/10.1177/0094582X13509071>
- Fajardo, L. H. (1969). *Social structure and personality: The protestant ethic of the Antioqueños*. University of Texas Press.
- Farooq, A., Shahbaz, M., Arouri, M., & Teulon, F. (2013). Does corruption impede economic growth in Pakistan? *Economic Modelling*, 35, 622–633. <https://doi.org/10.1016/j.econmod.2013.08.019>
- Fergusson, L. (2013). The political economy of rural property rights and the persistence of the dual economy. *Journal of Development Economics*, 103(1), 167–181. <https://doi.org/10.1016/j.jdeveco.2013.02.009>
- Fergusson, L., María Ibáñez, A., & Riaño, J. F. (2020a). Conflict, educational attainment, and structural transformation: La violencia in Colombia. *Economic Development and Cultural Change*, 69(1), 335–371. <https://doi.org/10.1086/702995>
- Fergusson, L., Querubin, P., Ruiz, N. A., & Vargas, J. F. (2020b). The real winner’s curse. *American Journal of Political Science*. <https://doi.org/10.1111/ajps.12508>
- Franz, T. (2016). Plan Colombia: Illegal drugs, economic development and counterinsurgency – A political economy analysis of Colombia’s failed war. *Development Policy Review*, 34(4), 563–591. <https://doi.org/10.1111/dpr.12161>
- García-Yi, J. (2014). Heterogeneous motivations for coca growing: The case of an indigenous Aymara community in Peru. *The International Journal on Drug Policy*, 25(6), 1113–1123.
- Grajales, J. (2015). Land grabbing, legal contention and institutional change in Colombia. *Journal of Peasant Studies*, 42(3–4), 541–560. <https://doi.org/10.1080/03066150.2014.992883>
- Greene, W. H. (2012). *Econometric Analysis* (7th ed.). Prentice Hall.
- Gründler, K., & Potrafke, N. (2019). Corruption and economic growth: New empirical evidence. *European Journal of Political Economy*, 60. <https://doi.org/10.1016/j.ejpoleco.2019.08.001>
- He, N. (2016). Rethinking the causes of corruption: Perceived corruption, measurement bias, and cultural illusion. *Chinese Political Science Review*, 1(2), 268–302. <https://doi.org/10.1007/s41111-016-0024-0>
- Heinonen, J., & Hytti, U. (2016). Entrepreneurship mission and content in Finnish policy programmes. *Journal of Small Business and Enterprise Development*, 23(1), 149–162. <https://doi.org/10.1108/jsbed-10-2014-0170>
- Hilary, G., & Hui, K. W. (2009). Does religion matter in corporate decision making in America? *Journal of Financial Economics*, 93(3), 455–473. <https://doi.org/10.1016/j.jfineco.2008.10.001>
- Holmes, J. S., Gutiérrez, A., & de Piñeres, S. (2014). Violence and the state: Lessons from Colombia. *Small Wars and Insurgencies*, 25(2), 372–403. <https://doi.org/10.1080/09592318.2013.857939>
- Ibanez, M., & Carlsson, F. (2010). A survey-based choice experiment on coca cultivation. *Journal of Development Economics*, 93(2), 249–263. <https://doi.org/10.1016/j.jdeveco.2009.10.002>
- Ibanez, M., & Klasen, S. (2017). Is the war on drugs working? Examining the Colombian case using micro data. *Journal of Development Studies*, 53(10), 1650–1662. <https://doi.org/10.1080/00220388.2016.1241386>
- Ibáñez A. M. Muñoz-Mora J. and Verwimp P. (2013) Abandoning coffee under the threat of violence and the presence of illicit crops: Evidence from Colombia. *Documento CEDE* 2013–35. Universidad de los Andes.
- Ibáñez, A. M., & Velásquez, A. (2009). Identifying victims of civil conflicts: An evaluation of forced displaced households in Colombia. *Journal of Peace Research*, 46(3), 431–451. <https://doi.org/10.1177/0022343309102661>
- Ibáñez, M. (2010). *Who crops coca and why? The case of Colombian farmers* (No. 40). Discussion Papers.
- Kalmanovitz, S. (2000). Colombian institutions in the twentieth century. *International Journal of Politics, Culture and Society*, 14(1), 235–255. <https://doi.org/10.1023/A:1007877416678>
- Langbein, L., & Sanabria, P. (2013). The shape of corruption: Colombia as a case study. *Journal of Development Studies*, 49(11), 1500–1513. <https://doi.org/10.1080/00220388.2013.800858>
- Leal, C. (2018). The Colombia reader: History, culture, politics. *Hispanic American Historical Review*, 98(3), 505–506. <https://doi.org/10.1215/00182168-6933589>
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42. [https://doi.org/10.1016/0304-3932\(88\)90168-7](https://doi.org/10.1016/0304-3932(88)90168-7)
- Mansfield, D. (2016). *A state built on sand: How opium undermined Afghanistan*. Oxford University Press.
- Martínez, L. R. (2017). Transnational insurgents: Evidence from Colombia’s FARC at the border with Chávez’s Venezuela. *Journal of Development Economics*, 126, 138–153. <https://doi.org/10.1016/j.jdeveco.2017.01.003>
- McMullen, J. S., Bagby, D. R., & Palich, L. E. (2008). Economic freedom and the motivation to engage in entrepreneurial action. *Entrepreneurship Theory and Practice*, 32(5), 875–895. <https://doi.org/10.1111/j.1540-6520.2008.00260.x>

- Mejía, D. (2016). Plan Colombia: An analysis of effectiveness and costs. *Brookings Institution Information Paper*, 1–17. Retrieved from <https://www.brookings.edu/wp-content/uploads/2016/07/mejia-colombia-final-2.pdf>
- Mo, P. H. (2001). Corruption and economic growth. *Journal of Comparative Economics*, 29(1), 66–79. <https://doi.org/10.1006/jcec.2000.1703>
- Moon, M. J., & DeLeon, P. (2001). Municipal reinvention: Managerial values and diffusion among municipalities. *Journal of Public Administration Research and Theory*, 11(3), 327–352. <https://doi.org/10.1093/oxfordjournals.jpart.a003505>
- Muñoz-Mora, J. C., Tobón, S., & D'Anjou, J. W. (2018). The role of land property rights in the war on illicit crops: Evidence from Colombia. *World Development*, 103, 268–283. <https://doi.org/10.1016/j.worlddev.2017.10.021>
- Murcia, E. T., Mosquera, R., & Andrade, J. M. (2019). Entrepreneurship as a tool for productive inclusion: Analysis of the case of Colombia. *TEM Journal*, 8(1), 195–200. <https://doi.org/10.18421/TEM81-27>
- Nieto-Aleman, P. A., Garcia-Alvarez-Coque, J. M., Roig-Tierno, N., & Mas-Verdú, F. (2019). Factors of regional poverty reduction in Colombia: Do institutional conditions matter? *Social Policy and Administration*, 53(7), 1045–1063. <https://doi.org/10.1111/spol.12474>
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.
- North, D. C. (2005). *Understanding the process of economic change*. Princeton University Press.
- North, D. C., & Thomas, R. P. (1973). *The rise of the western world: A new economic history*. Cambridge University Press.
- Rincón-Ruiz, A., Correa, H. L., León, D. O., & Williams, S. (2016). Coca cultivation and crop eradication in Colombia: The challenges of integrating rural reality into effective anti-drug policy. *International Journal of Drug Policy*, 33, 56–65. <https://doi.org/10.1016/j.drugpo.2016.06.011>
- Saffon, M. P., & Sánchez Torres, F. (2019). Historical grievances and war dynamics: Old land conflicts as a cause of current forced displacements in Colombia. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3422907>
- Sautet, F. (2013). Local and systemic entrepreneurship: Solving the puzzle of entrepreneurship and economic development. *Entrepreneurship Theory and Practice*, 37(2), 387–402. <https://doi.org/10.1111/j.1540-6520.2011.00469.x>
- Schultze-Kraft, M., Chinchilla, F. A., & Moriconi, M. (2018). New perspectives on crime, violence and insecurity in Latin America. *Crime, Law and Social Change*, 69(4), 465–473. <https://doi.org/10.1007/s10611-017-9758-3>
- Schwarz, G. (1978). Estimating the Dimension of a Model. *The Annals of Statistics*, 6(2), 461–464. <https://doi.org/10.1214/aos/1176344136>
- Shepherd, D. A., Seyb, S., & Souitaris, V. (2024). On the edge of destruction: An impaired-regulation model of destructive entrepreneurial action. *Journal of Management*, 50(2), 722–751. <https://doi.org/10.1177/01492063221126710>
- Smith, B. R., McMullen, J. S., & Cardon, M. S. (2021). Toward a theological turn in entrepreneurship: How religion could enable transformative research in our field. *Journal of Business Venturing*, 36(5), 106139. <https://doi.org/10.1016/j.jbusvent.2021.106139>
- Sobel, R. S. (2008). Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, 23(6), 641–655. <https://doi.org/10.1016/j.jbusvent.2008.01.004>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70(1), 65–94. <https://doi.org/10.2307/1884513>
- Spivack, A. J., & McKelvie, A. (2021). Measuring addiction to entrepreneurship. *Journal of Business Venturing Insights*, 15, e00212.
- Steer, L., & Sen, K. (2010). Formal and informal institutions in a transition economy: The case of Vietnam. *World Development*, 38(11), 1603–1615. <https://doi.org/10.1016/j.worlddev.2010.03.006>
- Tate, W. (2018). Paramilitary politics and corruption talk in Colombia. *Culture, Theory and Critique*, 59(4), 419–441. <https://doi.org/10.1080/14735784.2018.1522596>
- Tellez, J. F. (2019). Peace agreement design and public support for peace: Evidence from Colombia. *Journal of Peace Research*, 56(6), 827–844. <https://doi.org/10.1177/0022343319853603>
- Theodoraki, C., Dana, L. P., & Caputo, A. (2022). Building sustainable entrepreneurial ecosystems: A holistic approach. *Journal of Business Research*, 140, 346–360.
- Thornton, P. H., Ribeiro-Soriano, D., & Urbano, D. (2011). Socio-cultural factors and entrepreneurial activity: An overview. *International Small Business Journal*, 29(2), 105–118. <https://doi.org/10.1177/0266242610391930>
- Tonoyan, V., Strohmeier, R., Habib, M., & Perlitz, M. (2010). Corruption and entrepreneurship: How formal and informal institutions shape small firm behavior in transition and mature market economies. *Entrepreneurship: Theory and Practice*, 34(5), 803–831. <https://doi.org/10.1111/j.1540-6520.2010.00394.x>
- Uprimny, R., spsampsps Guzmán, D. E. (2016). Seeking alternatives to repression: Drug policies and the rule of law in Colombia. In *Drug Policies and the Politics of Drugs in the Americas* (pp. 87–103). Springer International Publishing. https://doi.org/10.1007/978-3-319-29082-9_6
- Urbano, D., Aparicio, S., & Audretsch, D. (2019). Twenty-five years of research on institutions, Entrepreneurship, and economic growth: What has been learned? *Small Business Economics*, 53(1), 21–49. <https://doi.org/10.1007/s11187-018-0038-0>
- Urbano, D., Audretsch, D., Aparicio, S., & Noguera, M. (2020). Does entrepreneurial activity matter for economic growth in developing countries? The role of the institutional environment. *International Entrepreneurship and Management Journal*, 16(3), 1065–1099. <https://doi.org/10.1007/s11365-019-00621-5>
- Urbano, D., Aparicio, S., Muñoz-Mora, J. C., & Martínez-Moya, D. (2024). The spatial interplay between productive and destructive entrepreneurship: Do institutions meet expectations in rural areas? *Entrepreneurship & Regional Development*. in Press. <https://doi.org/10.1080/08985626.2024.2389378>
- Vargas, R. (2005). Strategies for controlling the drug supply: Policy recommendations to deal with illicit crops and

- alternative development programs. *Journal of Drug Issues*, 35(1), 131–150. <https://doi.org/10.1177/002204260503500106>
- Vargas, J. F., & Caruso, R. (2014, January 1). Conflict, crime, and violence in Colombia. *Peace Economics, Peace Science and Public Policy*. <https://doi.org/10.1515/peps-2013-0062>
- Voigt, S. (2018). How to measure informal institutions. *Journal of Institutional Economics*, 14(1), 1–22. <https://doi.org/10.1017/S1744137417000248>
- Wadhvani, R. D., Kirsch, D., Welter, F., Gartner, W. B., & Jones, G. G. (2020). Context, time, and change: Historical approaches to entrepreneurship research. *Strategic Entrepreneurship Journal*, 14(1), 3–19. <https://doi.org/10.1002/sej.1346>
- Wapshott, R., & Mallett, O. (2024). *Small business stories in the formation of enterprise policy: A narrative policy analysis of the UK Bolton Committee*. Impress. <https://doi.org/10.1007/s11187-024-00966-4>
- Webb, J. W., Khoury, T. A., & Hitt, M. A. (2020). The influence of formal and informal institutional voids on entrepreneurship. *Entrepreneurship Theory and Practice*, 44(3), 504–526. <https://doi.org/10.1177/1042258719830310>
- Wennekers, S., & Thurik, R. (1999). Linking entrepreneurship and economic growth. *Small Business Economics*, 13(1), 27–56. <https://doi.org/10.1023/A:1008063200484>
- Williamson, O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38(3), 595–613. <https://doi.org/10.1257/jel.38.3.595>
- Wooldridge, J. M. (2002). Econometric analysis of cross section and panel data. *Books.googlecom*, 58(2), 752. <https://doi.org/10.1515/humr.2003.021>
- Yerznkian, B. H. (2017). Institutional reinforcement: Three types of relations. *Journal of Institutional Studies*, 9(1), 27–38. <https://doi.org/10.17835/2076-6297.2017.9.1.027-038>
- Zellner, A., & Theil, H. (1962). Three-stage least squares: Simultaneous estimation of simultaneous equations. *Econometrica*, 30(1), 54. <https://doi.org/10.2307/1911287>
- Zhai, Q., Su, J., Ye, M., & Xu, Y. (2019). How do institutions relate to entrepreneurship: An integrative model. *Entrepreneurship Research Journal*, 9(2), 20170001. <https://doi.org/10.1515/erj-2017-0001>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.