



Moving beyond the negative effect of the regulation of entry: Disentangling causality in new venture creation decisions

Maarten Colson¹ · Pieter Vandekerckhof¹ · Wim Marneffe² · Jelle Schepers¹ · Sebastian Aparicio^{3,4}

Accepted: 11 November 2024 / Published online: 21 December 2024
© The Author(s) 2024

Abstract

How and to what extent can entry regulations today still affect start-up decisions across regions and countries before formal new venture creation? This study draws on an overarching institutional framework and conducts two experiments in which we uniquely subject 634 Belgian, Dutch and German nascent entrepreneurs to multiple real regulatory scenarios for starting a new limited liability company. By disentangling how and to what extent different entry regulations and particular components of the regulation of entry can impact start-up decisions across regions, the experiments provide new very granular insights to move beyond existing knowledge about the negative association between entry regulations and new venture creation. Next to this, interestingly, after several robustness analyses, in both experiments, regional and informal institutional factors do not moderate the negative impact of the regulation of entry. In other words, across regions in this study, nascent entrepreneurs do not react significantly differently to the impact of different regulatory start-up conditions. We discuss how these results contribute to the regulatory institutions and entrepreneurship literature and address policy implications.

Keywords Entry regulations · New venture creation · Nascent entrepreneurs · Institutional theory · Entrepreneurship experiment

1 Introduction

Research in regulatory economics has significantly advanced our knowledge over the years about the idea that a more burdensome regulatory environment and new venture creation are negatively associated (Chambers & Munemo, 2019; Chambers et al., 2022; Cordier & Bade, 2023; Dove, 2023; Malone et al., 2019; Mora-Sanguinetti et al., 2024). Notably institutional scholars have made us more conscious that new venture creation

decisions, like nascent entrepreneurs'¹ decision to start (DTS) a new business, are a context-specific response to institutional conditions, and that *particularly* burdensome and costly entry regulations lie at the core of directly constraining and determining new firm formation across regions and countries (Djankov et al., 2002; Urbano et al., 2019; and Welter, 2019). This is why so many developed countries have made starting a new business substantially easier over the years by reducing the regulatory start-up costs, capital requirements, time, and procedures (i.e., regulatory components of entry) to formally start a new limited liability company (LLC) (Klapper & Love, 2016).

Yet, we see a dissonance in the recent literature: while scholars like Broughel and Hahn (2022), Chambers and Munemo (2019) or Laing et al. (2022) posit that entry regulations can still exert a powerful influence on new venture creation in high-income countries, findings from Grilli et al. (2023) report a rather modest influence of this negative association. However, what particularly prevents our understanding from moving beyond this negative effect, which also limits policymakers in current reform efforts to reduce new venture creation barriers, is not per se this discord about the variance of this negative association. Rather, it is the fact that (1) even such recent studies do not only offer limited *granular* insights on different entry regulations' *effective* impact today across regions and countries, (2) particularly existing works provide hardly any detailed *ex ante* insights specifically on to what extent the regulatory components of entry today can *each causally drive start-up decisions before a new venture is even formally started* (Chambers & Munemo, 2019; Cordier & Bade, 2023; Dove, 2023; Mora-Sanguinetti et al., 2024). Therefore, to emphasize the novelty of this study, and to bring new knowledge into an atomized literature, this work's *overarching research question* focuses on *how and to what* extent different entry regulations today can actually affect nascent entrepreneurs' start-up decisions across regions and countries before formal new venture creation.

These critical knowledge gaps can be attributed to conceptual and methodological limitations related to the use of public indices of institutional conditions like the World Bank Doing Business (WBDB) or the Global Entrepreneurship Monitor (GEM), which nearly all studies rely on (Rietveld & Patel, 2023). This explains why detailed evidence is lacking to date that precisely explains the extent to which nascent entrepreneurs, who still need to formally start a new venture, effectively respond to different – especially highly comparable – countries' start-up regulations. Indeed, previous studies primarily have provided high-level associational evidence, based on public data, that between countries that maintain high or low entry barriers, there exists a considerable variance concerning the effect of entry regulations on new venture creation (Chambers & Munemo, 2019; Urbano et al., 2019). Next to this, the literature displays rather disparate findings on how the regulation of entry influences start-up decisions through its different components, meaning that the extent to which these regulatory components can each causally drive new venture creation decisions thus remains to be further studied (Branstetter et al., 2014; van Stel et al., 2007). The root of this scarcity of fine-grained insights lies in secondary data's inherent limitation to too general or often even inadequate conceptualizations of regulatory institutions and,

¹ We conceptualize nascent entrepreneurs in line with the dominant literature as individuals who have been actively involved in new firm gestation activities in the past twelve months to start a new venture (e.g. developed a product or service, developed a business plan, looking for infrastructure or funding, etc.).

together with survival bias, the inability to directly observe to what extent start-up decisions are (or are not) effectively affected by different entry regulations and, on a deeper level, by the individual regulatory components² (Baily & Thomas, 2017; Malone et al., 2019; Su et al., 2017).

Taken together, the above underscores a first need to move beyond existing insights of studies that have established a broad spectrum of negative associational evidence. This not only becomes even more pertinent as this current state in the literature actually challenges the effectiveness of conventional reasoning on regulatory quality in institutional theory (i.e., the fewer entry barriers, the more new venture creation), but also policymakers involved in designing entrepreneurial ecosystems face a critical blind spot because of these limitations (Chowdhury et al., 2019; Levie & Autio, 2011; Urbano et al., 2020). Since entry regulations are necessary and sufficient conditions (North, 1990) that lie at the heart of the ease of doing business in an ecosystem, policymakers need to have *granular* insights beyond what we already know about this negative association. Indeed, such new detailed knowledge on the exact workings and dynamics of current entry regulations and their regulatory components is needed to actually serve as a basis to effectively design evidence-based conducive entrepreneurial ecosystems (Wurth et al., 2022).

By means of two experiments, we first disentangle the impact of different highly comparable current entry regulations (i.e. Dutch, Belgian, and German) and then decompose the causal impact of the regulatory components of entry on nascent entrepreneurs' start-up decisions. We categorize institutions into regulatory (North, 1990), normative and cognitive factors (Scott, 1995), and conduct two sequential experimental vignette studies (i.e., textual scenarios) in which we randomly subject 634 Belgian, Dutch and German nascent entrepreneurs to multiple real but anonymized scenarios of current regulatory settings for starting a new LLC in these countries (see methodology). Next to directly observing actual start-up decisions on preferred regulatory start-up conditions, we account for potential interaction effects of informal normative and cognitive institutionalized influences because these complex phenomena hitherto have been largely neglected in the entry regulations literature (Fuentelsaz et al., 2019; Maurer et al., 2022; Xie et al., 2021). For further contextualization and generalizability of our findings, additionally, next to exploring potential differences in start-up decisions from Belgian, Dutch and German nascent entrepreneurs, we study start-up decisions from nascent entrepreneurs located within the highly developed Meuse-Rhine Euroregion,³ as this allows controlling for (border) region-specific effects that may be at play (Welter et al., 2019).

Experiment one provides granular new insights on how constraining current comparable entry regulations still can actually be by showing that, compared to Dutch start-up regulations, Belgian and German entry regulations considerably lower start-up decisions with as much as twenty-one and fifty-one percent. Then, whereas one's own invested time and the waiting time in days to complete all start-up procedures do

² The majority of studies draw on public data from the WBDB indices. In the light of recent developments to discontinue this global project due to methodological irregularities, this raises additional concerns.

³ This economically important border region comprises approximately four million inhabitants around the central cities Maastricht (the Netherlands), Aachen (Germany), Hasselt (Belgium, Flanders) and Liège (Belgium, Wallonia) which are situated in geographical proximity of each other.

not robustly determine start-up decisions, experiment two provides new knowledge that minimum capital requirements and higher entry costs are essential decision determinants of new venture creation. These regulatory components can cause as much as twenty-eight and twenty-one percent of nascent entrepreneurs not to start a new venture. Finally, our results hold after several robustness tests, and contrary to what institutional scholars would theorize, in both experiments, we find evidence that normative and cognitive institutional factors do not moderate the negative impact of entry regulations and that respondents across regions in this study do not react significantly differently to the impact of the regulation of entry. Particularly this gives support to the generalizability of this study's findings.

We discuss how these results make three new contributions to the regulatory institutions and entrepreneurship literature (Acs et al., 2016; Chambers et al., 2022; Chowdhury et al., 2019; Cordier & Bade, 2023; Dove, 2023; Malone et al., 2019; Mora-Sanguinetti et al., 2024; Urbano et al., 2019, 2020). Also, we shed light on how answering calls to account for informal institutions' interaction effects, and how studying start-up decisions from different (border) regions adds new understanding to the entry regulations literature (Chambers & Munemo, 2019; Djankov et al., 2002; Grilli et al., 2023; Laing et al., 2022). Finally, implications for entrepreneurship policy are discussed (Audretsch et al., 2020).

2 Theoretical background and research questions

2.1 Institutions and new venture creation

Countries' institutional environments create the conditions for new venture creation and as such enable or constrain new firm formation across countries (Chowdhury et al., 2019; Su et al., 2017). The decision to start a new business is a context-specific response to regulatory and informal institutions which can stimulate or impede new venture creation by for example imposing barriers in the form of burdensome entry regulations to start a new firm (Valdez & Richardson, 2013). Scholars increasingly argue that formal and informal institutions can interact, but most studies on the impact of regulatory institutions have hitherto largely neglected these interaction effects that we are only starting to comprehend (Aparicio et al., 2016; Boudreaux et al., 2019; Chowdhury et al., 2019; Xie et al., 2021). To account for these, and to go beyond what we already know about the negative effect of the regulation of entry by means of two experiments, our underpinnings draw on North's (1990) and Scott's (1995) categorization of institutions into regulatory, normative and cognitive dimensions.

2.2 The regulation of entry

The regulation of entry comprises the costs and amplitude of regulatory processes to incorporate a new LLC. In terms of their specific regulatory components, entry regulations consist of the number of administrative procedures to start up, the time in days and official costs to complete these procedures, and the paid-in minimum

capital to formally start a new business (Djankov et al., 2002). Entry regulations directly govern new venture creation decisions (North, 1990) and the literature has particularly shown over the years that if nascent entrepreneurs need to adhere to an abundance of costly and lengthy procedures to formally start a new firm (e.g., if start-up costs constitute a significant part of one's yearly salary or if it takes exuberantly long in time to legally start) that this will negatively influence start-up decisions and new firm formation across countries (Chambers & Munemo, 2019; van Stel et al., 2007). Regulatory quality reasoning in the institutional and regulatory economics literature, therefore, contends that fewer regulatory barriers to entry will lead to higher levels of new venture creation (Chowdhury et al., 2019; Urbano et al., 2020).

Given the explicit link between new venture creation and economic growth, especially policymakers in high-income countries have substantially reformed the regulatory components of entry over the last ten years by reducing the procedures and start-up costs to formally start a new business (Klapper & Love, 2016). Notwithstanding these significant reforms in recent years, there is friction in the recent literature. While scholars like Laing et al. (2022) claim that the regulation of entry still can severely impact new venture creation in high-income countries, insights from Grilli et al. (2023) suggest that entry barriers have a rather modest negative effect on start-up decisions. The main problem, however, is not this dissonance of conclusions about the variance of this negative relationship, but rather that particularly two crucial knowledge gaps in the literature prevent our understanding to go beyond this negative association.

First, limited detailed evidence exists on how and to what extent nascent entrepreneurs will effectively respond to different entry regulations (especially comparable ones). What this means is that we do not precisely understand the actual extent of the variation in the impact of the regulation of entry on nascent entrepreneurs' start-up decisions and which regulatory components in particular drive such new venture creation decisions. Concretely, existing works, even recent ones, have primarily produced high-level associational evidence that easing regulatory barriers to formally start a new business tends to be related to certain increases in newly registered firms (Chambers & Munemo, 2019; Urbano et al., 2019). However, fine-grained insights that show to what extent different entry regulations can effectively constrain nascent entrepreneurs today are missing as the generally used public data and post hoc methods, which nearly all studies rely on, cannot directly observe start-up decisions. In addition, such public data, mainly from the WBDB or GEM, are inherently prone to hindsight and survival bias, meaning that they cannot observe nascent entrepreneurs who may eventually decide to not start a new venture under certain regulatory start-up conditions (Rietveld & Patel, 2023).

Second, the evidence base reveals disparate results concerning the influence of the regulatory components of entry, meaning that the effect of to what extent these components can each causally drive start-up decisions is still not well understood today. Some studies have observed that higher entry costs can severely impede starting a new business (Fonseca et al., 2001). For instance, Klapper et al. (2006) find robust strong negative effects of costly entry regulations on new firm formation. Branstetter et al. (2014) appraise the outcomes of a regulatory reform that considerably diminished firm entry costs. Their findings do highlight that the reform led to increased new venture creation, but chiefly among marginal businesses which shows that the effect

was limited. On the other hand, Ho and Wong (2007) have stressed that high regulatory entry costs hinder opportunity-driven entrepreneurship but do not affect necessity entrepreneurs. Contrastingly, evidence by Dreher and Gassebner (2013) reveals that the days and costs to start a new business are not robust determinants of new venture creation. Their results, however, show that the existence of a larger amount of procedures and larger minimum capital requirements negatively impact entrepreneurship. Next to this, the unique study of Becht et al. (2008) shows that countries with high minimum capital requirements and registration costs can suffer substantial outflows of firm registrations. Their results indicate that incorporations are mainly determined by paid-in minimum capital requirements and formal start-up costs. Van Stel et al. (2007) also demonstrate that minimum capital requirements lower nascent entrepreneurship and deter start-up decisions. Yet, in their influential study, van Stel et al. (2007) suggest that the time, costs and the number of procedures for starting a new business are unrelated to the formation rates of new ventures.

What the above works demonstrate about the regulatory components of entry is that we may expect that particularly capital requirements and start-up costs to start a new business can be primary drivers of new venture creation. We will therefore specifically focus on these components in this study's second experiment for several reasons (see methodology for how we control for the other components by making trade-offs to prevent biases). First, these indirect and direct incorporation costs to start an LLC are directly derived from the number of procedures to formally register a business and also represent an opportunity cost with regard to the time required to complete all procedures to start a new venture (Djankov et al., 2002). In addition, these cost-related components can be objectively and directly observed by nascent entrepreneurs who are rational actors that strive to maximize their utility. Second, while many countries have optimized the regulatory process for new venture creation over the years by reducing the number of burdensome administrative procedures and the time required to start a business, significant start-up costs and large capital requirements still exist in both developing and developed countries. Third, when studying the impact of current entry regulations, because of the above, we expect that drawing direct and explicit attention to the number of procedures to start a new business – even if they have been simplified throughout the years – could generate important biases since entrepreneurs are sensitive to red tape (Su et al., 2017).

In sum, based on the discussed literature, to go beyond existing knowledge on the negative associational effect of the regulation of entry, we formulate the following research questions to explore:

RQ1: To what extent is there, across (border) regions, a variation in the negative causal impact of different entry regulations on nascent entrepreneurs' decision to start a new business?

RQ2: To what extent is there, across (border) regions, a variation in the negative causal impact of different minimum capital requirements on nascent entrepreneurs' decision to start a new business?

RQ3: To what extent is there, across (border) regions, a variation in the negative causal impact of different start-up costs on nascent entrepreneurs' decision to start a new business?

To answer these RQs, we set out two experiments (see methodology for the detailed design). Experiment one explores RQ1 by studying the impact of the actual current entry regulations in the Netherlands, Belgium and Germany. These countries form an ideal setting as they are dominant European high-income countries with highly comparable entry regulations.

This setting allows us to not only explore differences in Belgian, Dutch or German nascent entrepreneurs' start-up decisions, we also study start-up decisions from nascent entrepreneurs located within the Meuse-Rhine Euroregion, which is a crucial economic area and border region between these countries. Finally, experiment two explores RQ2 and RQ3 and decomposes these start-up decisions by disentangling these regulatory components' causal impact.

2.3 Normative dimension

Entry regulations are embedded in an institutionalized normative entrepreneurial environment which relates to the societal values and norms about entrepreneurship that can indirectly stimulate or constrain new venture creation⁴ (Valdez & Richardson, 2013). This normative dimension of entrepreneurship comprises the overall status and respect entrepreneurs receive from society, as well as whether people consider starting a business desirable, or whether entrepreneurs are considered as competent individuals (Schillo et al., 2016; Urbano & Alvarez, 2014). Taken together, normative institutionalized influences reflect the extent to which individuals in a particular country or region admire new venture creation and socially value acting upon entrepreneurial opportunities (Busenitz et al., 2000). In this regard, some countries or regions inherently have deeply rooted conducive norms that can foster engagement in entrepreneurship (Lim et al., 2016).

Such favorable norms and values can also contribute to mitigate regulatory restrictions such as burdensome entry regulations that can impede starting a new business (Li, 2020). This is because when in a country or region individuals experience positive normative institutionalized beliefs about entrepreneurship, this reduces uncertainty and can make starting a business more attractive which can stimulate nascent entrepreneurs to start a new business despite facing entry barriers. Indeed, if nascent entrepreneurs face burdensome entry regulations that can present an important opportunity cost, the normative desirability of entrepreneurship as a context in a country or region can be critical to enable nascent entrepreneurs to effectively act upon uncertain entrepreneurial opportunities by starting a new business (Schillo et al., 2016). Hence, when entrepreneurship in a certain country or region is valued higher or more attractive, this normative support may positively influence the relationship between the regulation of entry and the decision to start a new business. This suggests that interaction effects may be at play. Therefore, we explore:

⁴ Common values and norms towards entrepreneurship are embedded in a country's culture. In the case of venture creation, the normative dimension constitutes as such a specific part of the socio-cultural environment.

RQ4: To what extent, across (border) regions, does the interaction effect of normative institutionalized factors weaken the negative causal impact of the regulation of entry on nascent entrepreneurs' decision to start a new business?

2.4 Cognitive dimension

With regard to new venture creation, cognitive institutionalized factors relate to the knowledge and cognitive structures of individuals in a country or region which influence how one interprets information and makes entrepreneurial decisions (Lim et al., 2016). This dimension captures the skills and knowledge possessed by individuals related to starting and operating a new business (Busenitz et al., 2000). Such cognitive structures are shaped by institutionalized educational systems which determine whether individuals feel capable of starting a new venture (Lim et al., 2016). The reality is that, between countries, there are vast differences in how widely such knowledge and skills about establishing a new business are dispersed. In some regions, through business education or even through experiential learning from entrepreneurial role models, particular entrepreneurship-related knowledge structures about new venture creation can become deeply institutionalized and can indirectly influence start-up decisions if individuals face restrictive regulatory start-up conditions (Bosma et al., 2018).

This means that, as a context, highly developed cognitive structures shaped by cognitive institutions can enable nascent entrepreneurs to be in a better position to cope with the regulatory challenges of new venture creation (De Clercq et al., 2010). As the literature has demonstrated, entry regulations can pose such challenges for start-up decisions. Based on the above, this suggests that the context of favorable cognitive institutionalized factors may reduce the impact of the regulation of entry on nascent entrepreneurs' start-up decisions. This is because when nascent entrepreneurs perceive to have the necessary skills and knowledge to start a new business, fostered by a country's cognitive institutions, they may be more likely to positively deal with cumbersome entry regulations that can impede start-up decisions (Urbano & Alvarez, 2014). Therefore, we explore:

RQ5: To what extent, across (border) regions, does the interaction effect of cognitive institutionalized factors weaken the negative causal impact of the regulation of entry on nascent entrepreneurs' decision to start a new business?

3 Methodology

Instead of using commonly used sterile student samples or already existing founders who just started, we set out two experiments (see Sect. 3.2.) and study start-up decisions just before formal new venture creation of actual nascent entrepreneurs who not only are from Belgium (both the Flanders and Walloon regions), the Netherlands, and Germany, but also from nascent entrepreneurs who are located within the Meuse-Rhine Euroregion. What is interesting about this economically important border region – situated between these countries – is that here, three formal and four informal (Flemish, Walloon, Dutch, and German) institutional environments come together in a small

radius. This further contextualization provides an interesting additional laboratory that can contribute to the generalizability of this study (Welter et al., 2019). Studying nascent entrepreneurs who, in line with the dominant literature, have been actively involved in new firm gestation activities in the past 12 months is indeed notoriously hard because such individuals are not readily detectable. However, this allows us to strengthen external validity and to move away from the critical limitations of commonly used student or existing founder data (Lortie & Castogiovanni, 2015). Also, we can directly observe nascent entrepreneurs who may or may not decide to start a new venture when exposed to different regulatory conditions in our experiments, which is something public data with their earlier discussed limitations and biases cannot do.

3.1 Sample

We cooperated with several (inter)national entrepreneurship stakeholders such as employers' organizations, chambers of commerce, and public one-stop shops to invite actual Belgian, Dutch, and German nascent entrepreneurs to participate in our two experiments with an average duration of twenty minutes. To screen and identify nascent entrepreneurs, the GEM's methodology and filters were used (Reynolds, 2009). Just over 4500 experiments were distributed. After eliminating drop-outs, cases that did not qualify as nascent entrepreneurs and observations that not passed attention checks built in the experiment, a final unique data set of 634 nascent entrepreneurs was constructed, of which 237 respondents are from the Meuse-Rhine Euroregion which is situated between these three countries. Tables 1 and 2 provide respondents' descriptive statistics. Finally, to alleviate nonresponse bias concerns, next to comparing start-up decisions from respondents who were invited through different sources, we compared early and late respondents and found no statistically significant t-test differences.

3.2 Identification strategy and flowchart of the experimental design

We subject 634 nascent entrepreneurs to two experiments in which they are presented with several calibrated and validated (see 3.3) vignettes (i.e., textual scenarios) on different real but anonymized entry regulations to start a limited liability company today (LLC).

Experiment one studies to what extent current entry regulations of three highly comparable and neighboring countries (i.e., the Netherlands, Belgium, and Germany) can influence nascent entrepreneurs' start-up decisions by subjecting all respondents to three validated anonymized vignettes (i.e., scenarios) that reflect all the actual administrative steps and regulatory costs to start a new business in these countries. Respondents thus randomly see three anonymized but actual regulatory country scenarios to start a new firm. We then measure participants' likelihood (LTS) and final decision to start (DTS) in the regulatory settings they are exposed to. In sum, experiment one allows us to study to what extent different highly comparable entry regulations cause a variation in nascent entrepreneurs' start-up decisions today. Table I in this study's supplementary material provides a high-level overview of the current Dutch, Belgian,

Table 1 Summary statistics of the regulatory country vignettes and entry reform vignettes

Respondent region		Regulatory country scenario	All regions	Flemish ^a	Walloon ^a	Dutch ^b	Euroregion
LTS	Belgium		5.80 (2.60)	5.99 (2.38)	5.12 (2.89)	6.04 (2.67)	6.09 (2.49)
	Netherlands		7.30 (2.52)	7.32 (2.35)	6.59 (2.86)	7.32 (2.74)	7.79 (2.29)
	Germany		4.24 (2.83)	4.35 (2.89)	3.78 (2.87)	3.81 (2.26)	4.46 (2.70)
DTS	Belgium		0.61 (0.49)	0.62 (0.48)	0.56 (0.50)	0.64 (0.48)	0.62 (0.48)
	Netherlands		0.82 (0.38)	0.85 (0.36)	0.72 (0.45)	0.75 (0.43)	0.87 (0.34)
	Germany		0.31 (0.46)	0.31 (0.46)	0.25 (0.43)	0.28 (0.45)	0.35 (0.48)
			N = 634	N = 228	N = 169	N = 53	N = 237
<i>Entry reform treatments</i>							
LTS	MC1		5.35 (2.56)	5.48 (2.33)	5.02 (2.93)	4.53 (2.08)	5.47 (2.51)
	MC2		4.12 (2.88)	4.11 (2.72)	4.04 (3.07)	2.74 (2.12)	4.19 (2.90)
DTS	MC1		0.50 (0.50)	0.52 (0.50)	0.47 (0.50)	0.26 (0.44)	0.51 (0.50)
	MC2		0.32 (0.47)	0.32 (0.47)	0.32 (0.47)	0.11 (0.31)	0.32 (0.47)
			N = 207	N = 71	N = 57	N = 19	N = 79
LTS	COST1		6.94 (2.39)	6.85 (2.40)	6.54 (2.68)	6.59 (2.73)	7.29 (2.14)
	COST2		7.14 (2.65)	6.88 (2.54)	6.62 (2.75)	7.06 (3.24)	7.73 (2.60)
DTS	COST1		0.77 (0.42)	0.80 (0.40)	0.65 (0.48)	0.76 (0.43)	0.81 (0.39)
	COST2		0.75 (0.43)	0.74 (0.44)	0.65 (0.48)	0.76 (0.43)	0.82 (0.38)
			N = 218	N = 82	N = 52	N = 17	N = 84
LTS	TIME1		4.62 (2.74)	4.87 (2.77)	3.92 (2.87)	4.65 (2.22)	4.95 (2.50)
	TIME2		4.22 (2.68)	4.73 (2.57)	3.72 (2.63)	3.76 (2.89)	4.14 (2.73)

Table 1 (continued)

Respondent region		Regulatory country scenario	All regions	Flemish ^a	Walloon ^a	Dutch ^b	Euroregion
DTS	TIME1		0.46 (0.50)	0.41 (0.49)	0.40 (0.49)	0.47 (0.50)	0.57 (0.50)
	TIME2		0.39 (0.49)	0.41 (0.49)	0.35 (0.48)	0.41 (0.50)	0.39 (0.49)
			N = 209	N = 75	N = 60	N = 17	N = 74

LTS and DTS cells contain means and standard deviations ()

^aFlemish and Walloon respondents = excl. Belgian regions (province of Liège and Limburg BE) of the Meuse-Rhine Euroregion

^bDutch respondents all are from the Dutch province of Limburg NL, which also is part of the Meuse-Rhine Euroregion

Table 2 Descriptive statistics of independent and control variables

Variable	Mean	SD	Min.	Max.
1. NORM	0.59	0.49	0	1
2. Know ENT	0.82	0.39	0	1
3. OPP	0.60	0.49	0	1
4. Gender	0.63	0.48	0	1
5. Education level	0.75	0.43	0	1
6. Age	0.40	0.49	0	1
7. Labour market regulations	4.63	1.76	1	7
8. Red tape	6.11	1.77	1	10
9. ENT intentions	5.62	1.18	1	7
10. ENT type	0.70	0.46	0	1
N = 634				

and German entry regulations, which constitutes the basis of the first experiment's vignettes (available upon request).

Experiment two then goes deeper by decomposing and isolating start-up decisions. We follow prior experimental designs from scholars such as Hsu et al. (2017) or Malone et al., (2019) to disentangle causality in start-up decisions by analyzing how and to what extent the regulatory components of interest in this study can each drive nascent entrepreneurs' new venture creation decisions. To eliminate carryover effects and participant fatigue, we randomly expose respondents to one of three treatments (see Sect. 3.5.) with two, also randomly, varying levels that reflect actual entry reforms on making it easier or more burdensome to start a new business. In other words, this experiment thus has six anonymized entry reform vignettes related to minimum capital

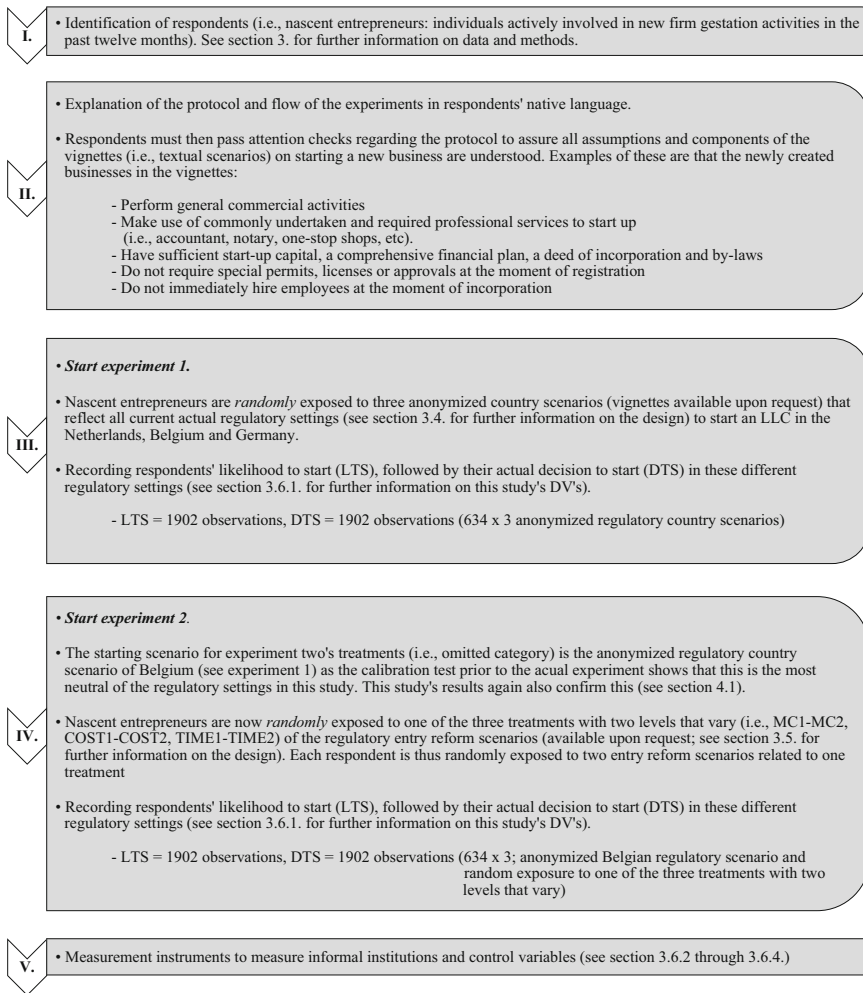


Fig. 1 Flowchart of the experiments

requirements and entry costs to start an LLC and respondents are randomly exposed to only one treatment that consists of two vignettes that are also randomly shown.

The flowchart in Fig. 1 provides a detailed understanding of the flow of the experiment.

3.3 Calibration

Before the experiment, we calibrated and validated all vignettes of experiments 1 and 2 in a pilot test with multiple young business and (public) actors⁵ involved in starting

⁵ . Notaries, accountants, one-stop shops and chambers of commerce.

an LLC (Hsu et al., 2017). No one could identify the anonymized regulatory country scenarios (i.e., experiment 1) from their home country or could deduce potential policy objectives from the entry reform scenarios (i.e., experiment 2).

3.4 Experiment 1: regulatory country vignettes

We first exhaustively mapped all legally required procedures, costs, capital requirements, the time and complexity to start an LLC in the Netherlands (bv), Belgium (bv(ba)/S(P)RL), and Germany (GmbH)^{6,7}. We also considered all commonly undertaken steps with their costs, complexity, and time to start a new venture. We did this with the involvement of relevant actors like public one-stop shops, notaries, accountants, banks, lawyers, and chambers of commerce. For validity purposes, we then critically compared all of this with the WBDB⁸ regulatory indicators to determine whether our design aligned. All of the steps detailed above have led to three anonymized vignettes (i.e., scenarios, one per country) that reflect these countries' complete and real entry regulations, meaning that the scenarios relate to all of the actual procedures, costs, minimum capital requirements, and time⁹ to officially register a new firm in the Netherlands, Belgium and Germany.

3.5 Experiment 2: entry reform vignettes

The first treatment (MC1–MC2) (re)introduces a minimum capital in two steps that can be used for operating the LLC. MC1 reflects an entirely free-to-choose start-up capital that, however, formally needs to be justified in a legally binding comprehensive financial plan which covers company operations for the first 2 years. MC2 reflects a full minimum capital requirement that is comparable to current minimum capital requirements in Germany and the old situation in the Netherlands and Belgium before capital requirements were cut in corporate tax reforms. To prevent dominance of attributes, we always make a trade-off in our vignettes and substantially reduce the start-up costs and one's own time to complete all procedures to start an LLC. The second treatment (COST1–COST2) gradually lowers the costs of starting a business by reducing official costs such as notarization costs. To counterbalance this, we again make a trade-off by moderately increasing one's own time to start a business. To eliminate concerns about cost biases and carryover effects, the third treatment (TIME1–TIME2) is designed as treatment two's inverse. Here, in two vignettes, we considerably reduce the time in days to finally approach approximately within one week to create and operate a new LLC. To

⁶ In accordance with the literature and public indices on starting a business, we focus on the limited liability forms that are most common in these countries among domestic firms.

⁷ We chose these highly comparable countries since, although they lie closely together in public rankings on regulatory start-up conditions, they have interesting nuanced differences in entry regulations.

⁸ We are highly aware of the fact that the WBDB measures have been subject to criticism over the last years and that they have been suspended recently due to critical methodological issues and data irregularities.

⁹ Next to the time in days to complete all procedures, we account for one's own time to start a new business in both experiments.

address dominance of attributes, we slightly increase entry costs as a trade-off for this accelerated process.

3.6 Measures

3.6.1 Likelihood (LTS) and decision to start (DTS) a new business (i.e., LLC)

In both experiments, after each regulatory scenario, respondents first need to indicate on a scale from 1 (very unlikely) to 10 (very likely) how likely they are to formally start a new venture (LTS) in the regulatory start-up conditions they are presented with. Then, respondents' effective decision to start (DTS) always follows by asking whether they would decide to actually start a new business (coded 1 if yes, 0 otherwise) in the institutional settings they are exposed to. In so doing, we follow the literature on entrepreneurship experiments, and, this approach enables us to analyze and determine the consistency of respondents' start-up decisions (Hsu et al., 2017).

3.6.2 Normative dimension

We use four commonly used items from the GEM methodology to measure the normative dimension (e.g. De Clercq et al., 2010; Stenholm et al., 2013) on a seven-point Likert scale: high status and respect, media attention, appropriateness to become rich, and competent individuals. Cronbach's alpha indicates acceptable reliability ($\alpha = 0.76$). Bartlett's test of sphericity ($p < 0.001$) displays that variables are not intercorrelated and the Kaiser–Meyer–Olkin measure ($KMO = 0.75$) suggests correct sampling adequacy. Principal component analysis shows all items loading on one factor. Total variance is 0.59 and all factor loadings are greater than 0.40 as recommended. In line with other studies, we can therefore consider the normative dimension as a single construct (e.g. Camelo-Ordaz et al., 2020) and operationalize it as an index. Based on below or above the mean (4.50), we then calculate a dummy variable (NORM) for our models if respondents experience low (0) or high (1) normative support for starting a new business.

3.6.3 Cognitive dimension

We follow prior literature (e.g. Urbano & Alvarez, 2014) and utilize two well-known dummy variables from the GEM methodology: opportunity perception (OPP) and entrepreneurial role models (KnowENT). These measures for capturing cognitive institutional factors are coded 1 if respondents see good opportunities in the next six months to start a new business or if nascent entrepreneurs know someone personally who started a business in the past two years; 0 otherwise.

3.6.4 Control variables

We add seven controls to our models that are known to influence start-up decisions. First, we include sociodemographic factors such as sex (coded 1 if male, 0 female), age

(coded 1 if younger than thirty-five years, 0 otherwise), and education level (coded 1 if respondents hold a higher education degree, 0 otherwise). Next, we control for the strictness of labor market regulations because this can discourage early-stage entrepreneurship (van Stel et al., 2007). We do this on a seven-point Likert scale by probing to what extent labor market regulations hinder one's decision to start an LLC. Further, we use Borry's (2016) measure of red tape to control for the perceived red tape (the necessity and effectiveness of the administrative process) experienced by nascent entrepreneurs in starting a business because this can affect start-up decisions. Then, we employ Liñán and Chen's (2009) six-item measurement instrument on a seven-point scale to compute an index that controls for the strength of entrepreneurial intentions in our models as this is suggested to be a strong predictor of new venture creation decisions. Finally, since entrepreneurship is heterogeneous in its outcomes, the literature has shown that institutional forces cannot only influence the quantity but also the quality or type of new venture creation (Audretsch et al., 2021). The literature has many ways to delineate types of early-stage entrepreneurship, such as distinguishing between necessity and opportunity nascent entrepreneurs (Colson et al., 2024). To reduce respondents' judgment bias, we, therefore, control for whether a nascent entrepreneur plans to start an LLC (coded 1) or a sole proprietorship (coded 0). We opt for this objective dichotomous variable (ENTtype) as a proxy for the quality of new venture creation since policymakers consider newly established LLCs to be the most qualitative and desirable for economic growth (Ho & Wong, 2007).

4 Analyses and results

4.1 Model specification and main results

First, the main empirical model can be formulated as follows:

$$Y_{is} = \alpha + \zeta_s + \varphi_i + I'_i\delta + P'_i\eta + X'_i\theta + \epsilon_{is}.$$

Y_{is} indicates the likelihood (LTS) or decision to start (DTS) (i.e., start-up decisions) of nascent entrepreneur i (see measures Sect. 3.6.1 again) when subject to the entry regulation scenarios s to start a new LLC in experiment one or two. Table 1 shows excellent consistency between respondents' LTS and DTS in both experiments. Where φ_i includes region fixed effects (see Sect. 3.1.), ζ_s represents the different (anonymized) entry regulation scenarios with fixed effects to which nascent entrepreneur i is randomly subjected in both experiments and captures our key factors of interest to disentangle the impact of entry regulations on new venture creation decisions. See Sect. 3.4. Again for the details of the different regulatory country scenarios in experiment one, and Sect. 3.5. for the different entry reform scenarios in experiment two.

Based on our findings in Table 1, which also highly correspond with public country rankings on the ease of starting a new business such as the WBDB or GEM, the omitted category in experiment one is the scenario of the regulation of entry in the

Netherlands as nascent entrepreneurs indicate that entry barriers here are lowest (DTS is 0.82) for our countries of comparison. The omitted category in experiment two is the scenario of the regulation of entry in Belgium as nascent entrepreneurs signal regulatory start-up conditions here as most neutral (DTS is 0.61) compared to Dutch and German entry regulations. Therefore, experiment two's treatments (MC1–MC2, COST1–COST2, TIME1–TIME2) always randomly start from the anonymized regulatory country scenario of Belgium.

$\Gamma_i \delta$ is a vector that captures the influence of informal institutions and includes perceived normative and cognitive institutionalized factors (see Sect. 3.6.1 and 3.6.2 for these variables' measures). Then, $P_i \eta$ is a vector that accounts for nascent entrepreneurs' perceived strictness of labor market regulations and red tape. Lastly, vector $X_i \theta$ controls for nascent entrepreneurs' sociodemographic factors (sex, education level, age), captures the strength of their entrepreneurial intentions and the quality of their new venture creation plans (see Sect. 3.6.3.)

To estimate the equation above and explore the related RQs, we use ordinary least squares (LTS) and linear probability models (DTS) with Huber-White standard errors. All LTS (OLS) regression models can be consulted in Tables II and III in the supplementary material. Multicollinearity (mean VIFs are 1.95 and 1.78) does not pose an issue in this study's experiments. Before adding and computing interaction terms in Sect. 4.2, as can be seen in Tables 3 and 4, we first analyze our main results.

To explore RQ1, which is related to experiment 1, we start by gauging baseline models – which show the stability of our estimates – (see Tables 3 and II, models 1 and 9) before building full models by adding the informal institutionalized factors and control variables in model 2 ($R^2 = 0.2360$, $p < 0.001$) and model 10 ($R^2 = 0.2342$, $p < 0.001$). We find that, compared to Dutch entry regulations, Belgian and German regulatory settings for new venture creation significantly ($p < 0.001$) lower respondents' LTS ($\beta = -0.283$, $\beta = -0.707$) and DTS ($\beta = -0.213$, $\beta = -0.513$). The results show that, compared to the Dutch regulation of entry, Belgian and German entry regulations significantly lower nascent entrepreneurs' effective decision to start an LLC by as much as twenty-one and fifty-one percentage points. Lastly, findings indicate that the type of new venture creation is important for understanding a nascent entrepreneur's likelihood ($\beta = 0.197$) and decision ($\beta = 0.128$) to start. More specifically, a nascent entrepreneur's DTS is almost thirteen percent higher in these regulatory country scenarios if one plans to start an LLC compared to a sole proprietorship.

Then, Table 4 (and Table III in the supplementary material) presents the regression results of experiment 2 which explores RQ2 and RQ3. Again, we first estimate baseline models to disentangle to what extent the regulatory components can drive new venture creation decisions. Following this, our full models 6 ($R^2 = 0.1615$, $p < 0.001$) and 14 ($R^2 = 0.1903$, $p < 0.001$) reveal several causal impacts of the regulatory components. For RQ2, the first treatment (MC1–MC2) reveals that, controlled for the start-up costs and one's own time to complete all procedures to start an LLC, minimum capital requirements substantially lower nascent entrepreneurs' LTS ($\beta = -0.480$) and DTS ($\beta = -0.283$). Thus, compared to Belgian regulatory settings in which sixty-one percent of nascent entrepreneurs decide to start a new venture, (re)introducing a full minimum capital causes twenty-eight percent of nascent entrepreneurs not to start a new business.

Table 3 LPM regression results of experiment 1 (regulatory country vignettes)

Model	DTS (LPM)			
	1	2	3	4
Number of obs. = 1902				
R ²	.1900	.2360	.2407	.2390
BELGIAN entry regulations	−0.213*** (0.025)	−0.213*** (0.024)	−0.071 (0.110)	−0.197** (0.075)
GERMAN entry regulations	−0.513*** (0.024)	−0.513*** (0.023)	−0.214 [†] (0.117)	−0.386*** (0.071)
Flemish respondent ^a	−0.124* (0.051)	−0.034 (0.053)	0.140 [†] (0.075)	−0.034 (0.054)
Walloon respondent ^a	−0.196*** (0.053)	−0.117* (0.054)	0.020 (0.078)	−0.117* (0.055)
Dutch respondent ^b	−0.166** (0.061)	−0.086 (0.061)	0.014 (0.090)	−0.086 (0.061)
NORM		0.026 (0.021)	0.026 (0.021)	0.082** (0.031)
Know ENT		0.042 (0.028)	0.042 (0.028)	0.049 (0.042)
OPP		0.081*** (0.022)	0.081*** (0.022)	0.096** (0.032)
Sex		0.051* (0.022)	0.051* (0.022)	0.051* (0.022)
Education level		−0.002 (0.024)	−0.002 (0.024)	−0.002 (0.024)
Age		0.037 [†] (0.021)	0.037 [†] (0.021)	0.037 [†] (0.021)
Labor market regulations		−0.005 (0.006)	−0.005 (0.006)	−0.005 (0.006)
Red tape		0.012* (0.006)	0.012* (0.006)	0.012* (0.006)
ENT intentions		0.018 [†] (0.009)	0.018 [†] (0.009)	0.018 [†] (0.009)
ENT type		0.128*** (0.024)	0.128*** (0.024)	0.128*** (0.024)
BE x Flemish respondent			−0.168 (0.114)	
BE x Walloon respondent			−0.144 (0.118)	
BE x Dutch respondent			−0.042 (0.136)	

Table 3 (continued)

Model	DTS (LPM)			
	1	2	3	4
DE x Flemish respondent			-0.353 [†]	(0.122)
DE x Walloon respondent			-0.266	(0.124)
DE x Dutch respondent			-0.257	(0.142)
BE x NORM				-0.073 (0.049)
BE x Know ENT				0.030 (0.065)
BE x OPP				0.003 (0.050)
DE x NORM				-0.097* (0.048)
DE x Know ENT				-0.050 (0.062)
DE x OPP				-0.048 (0.048)

Omitted category to predict the impact of the regulation of entry is the regulatory country scenario of The Netherlands

All models are $p < .001$; () Huber-White standard errors Significant at level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, [†] $p < 0.1$

^aFlemish and Walloon respondents = excl. Belgian regions (province of Liège and Limburg BE) of the Meuse-Rhine Euroregion

^bDutch respondents all are from the Dutch province of Limburg NL, which also is part of the Meuse-Rhine Euroregion

Table 4 LPM regression results of experiment 2 (entry reform vignettes)

Model	DTS (LPM)		
	5	7	8
Number of obs. = 1902			
R ²	.0938	.1712	.1680
MC1 treatment	−0.102* (0.040)	−0.099* (0.039)	−0.067 (0.194)
MC2 treatment	−0.285*** (0.038)	−0.285*** (0.037)	−0.260*** (0.200)
COST1 treatment	0.173*** (0.034)	0.169*** (0.032)	0.139 (0.135)
COST2 treatment	0.155*** (0.035)	0.151*** (0.034)	0.168 (0.158)
TIME1 treatment	−0.139*** (0.040)	−0.136*** (0.039)	−0.078 (0.177)
TIME2 treatment	−0.216*** (0.039)	−0.213*** (0.038)	−0.216* (0.141)
Flemish respondent ^a	−0.035 (0.052)	0.062 (0.055)	0.059 (0.091)
Walloon respondent ^a	−0.105* (0.053)	−0.013 (0.057)	−0.020 (0.093)
Dutch respondent ^b	−0.091 (0.061)	−0.008 (0.064)	−0.012 (0.106)
NORM		0.007 (0.022)	0.007 (0.039)
Know ENT		0.082** (0.029)	0.074 (0.030)
OPP		0.062** (0.023)	0.089* (0.039)
Sex		0.131*** (0.023)	0.130*** (0.023)
Education level		0.001 (0.025)	0.001 (0.025)
Age		0.051* (0.022)	0.051* (0.022)
Labor market regulations		−0.004 (0.006)	−0.005 (0.006)
Red tape		0.024*** (0.006)	0.024*** (0.006)
ENT intentions		0.020* (0.009)	0.020* (0.009)
ENT type		0.107*** (0.026)	0.110*** (0.026)

Table 4 (continued)

Model	DTS (LPM)			
	5	6	7	8
MC2 x Flemish			−0.072 (0.207)	
MC2 x Walloon			0.065 (0.210)	
MC2 x Dutch			−0.275 (0.223)	
COST2 x Flemish			0.087 (0.164)	
COST2 x Walloon			0.132 (0.169)	
COST2 x Dutch			0.133 (0.194)	
TIME2 x Flemish			0.485 (0.151)	
TIME2 x Walloon			0.466 (0.153)	
TIME2 x Dutch			0.418 (0.204)	
MC2 x NORM				0.018 (0.075)
COST2 x NORM				−0.079 (0.070)
TIME2 x NORM				0.114 (0.077)
MC2 x Know ENT				−0.008 (0.093)
COST2 x Know ENT				0.061 (0.098)
TIME2 x Know ENT				−0.009 (0.098)
MC2 x OPP				−0.045 (0.075)
COST2 x OPP				−0.033 (0.072)
TIME2 x OPP				−0.099 (0.077)

Omitted category to predict the impact of the regulation of entry is the regulatory country scenario of Belgium (= starting scenario for treatments)

All models are $p < .001$; () Huber-White standard errors Significant at level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

^aFlemish and Walloon respondents = excl. Belgian regions (province of Liège and Limburg BE) of the Meuse-Rhine Euroregion

^bDutch respondents all are from the Dutch province of Limburg NL, which also is part of the Meuse-Rhine Euroregion

For RQ3, to prevent biases towards cost attributes, we gauge the impact of entry costs with a two-step procedure. The second treatment (COST1–COST2) indicates that, controlled for one's own time to start a business, reducing start-up costs stimulates venture creation since it causes an increase ($\beta = 0.151$) of fifteen percentage points in one's DTS. Finally, the last treatment (TIME1–TIME2) is designed as the inverse of treatment two (COST1–OST2) and considerably reduces the time in days but slightly increases incorporation costs as a trade-off. Results show that increasing start-up costs deters venture creation ($\beta = -0.398$, $\beta = -0.213$) as it causes twenty-one percent of nascent entrepreneurs not to start a new business. Thus, one's own invested time and the (waiting) time in days to complete all procedures to start an LLC appear to be no robust determinants of new venture creation decisions in this study.

Finally, as in this work's first experiment, sociodemographic and control variables behave largely consistent with the extant literature, and adding them also does not substantially change our treatments coefficients' strength. Also here, the type of new venture creation plays an important role in experiment 2 to understand nascent entrepreneurs' likelihood ($\beta = 0.173$) and effective decision ($\beta = 0.107$) to start under different regulatory entry conditions.

4.2 Examining regional differences in start-up decisions

Next, to further contextualize RQ1, RQ2, and RQ3, we examine potential regional differences in start-up decisions if nascent entrepreneurs face different countries' entry regulations. In experiment 1, when analyzing interaction effects in model 3, findings show that only Flemish respondents' DTS is significantly different, but at the 10 percent confidence level ($\beta = -0.353$, $p < 0.1$) when facing German regulatory settings for new venture creation. In experiment 2, interestingly, if nascent entrepreneurs need to actually decide whether or not they would start a new business under various regulatory entry reforms, regional differences are not at play as no significant interaction effects for individuals' DTS can be found in model 7 ($R^2 = 0.1712$, $p < 0.001$). In addition, for the Meuse-Rhine Euroregion, in both experiments, we could also not find significant interaction effects related to nascent entrepreneurs' start-up decisions (detailed results available upon request). Taken together, our results suggest that respondents across regions do not react significantly differently to the impact of the regulation of entry.

4.3 Examining interaction effects of informal institutions

Lastly, in both experiments, we analyze whether informal institutions (RQ4 and RQ5) can positively moderate the negative impact of the regulation of entry. For experiment 1, model 4 ($R^2 = 0.2390$, $p < 0.001$) assesses informal institutions' interaction effects. Results expose that when respondents experience high normative support and are subject to German entry regulations, only then their actual DTS ($\beta = -0.097$) seems to be slightly different by three percentage points. Concerning the cognitive dimension, we could not find any significant interactions. In experiment 2, model 8 ($R^2 = 0.1680$, $p < 0.001$) displays that normative and cognitive institutional factors do not weaken

the impact of capital requirements and start-up costs on nascent entrepreneurs' actual decision to start a new business.

In sum, although limited to merely three percentage points, only in experiment 1, we did find evidence of a high normative dimension weakening the effect of German entry regulations on the DTS. But, interestingly, cognitive institutional interaction effects do not significantly influence nascent entrepreneurs' new venture creation decisions.

4.4 Robustness analyses

Since the above results suggest that neither regional differences nor informal institutional factors in our study cause that nascent entrepreneurs evaluate the impact of different entry regulations and reform treatments significantly differently, we perform four robustness analyses on nascent entrepreneurs' DTS to determine whether this effectively is the case.

4.4.1 Extending controls and cognitive institutional factors

As a first robustness check, we extend our full LPM models 2 and 6, of respectively experiments 1 and 2, with 9 variables. We add to both models 5 new controls and extend the cognitive dimension with 4 additional variables that capture cognitive institutional factors as scholars have stressed the need for more fine-grained operationalizations of such institutional factors in entrepreneurship studies (Su et al., 2017; Urbano et al., 2019). First, we control for high growth expectations by measuring whether nascent entrepreneurs indicate that they plan to hire more than ten full-time employees in the coming two years (coded 1, 0 otherwise). We also control for industry-specific effects by adding four dummy variables that take the value of one if nascent entrepreneurs plan to start a new LLC in manufacturing, wholesale, construction, or services. Then, as a first additional cognitive institutional factor, we follow the literature and measure nascent entrepreneurs' entrepreneurial self-efficacy (ESE), which is shaped by institutionalized cognitive systems like national education systems, and code respondents one if they state that they have the knowledge and skills to formally start a new LLC (e.g. Boudreaux et al., 2019). Next, we measure nascent entrepreneurs' fear of failure (FOF), which is coded one if respondents report that fear of failure would prevent them from starting a business. Following this, we measure prior start-up experience (PEX), which is coded one if nascent entrepreneurs answer that they have already started a venture in the past. Lastly, we measure ethnicity, coded one if respondents report that both their parents were born abroad, as ethnic institutionalized cognitions can influence nascent entrepreneurs' start-up decisions.

The results for models 17 and 20 (see Table IV and V in the supplementary material) not only demonstrate that our earlier full models' findings hold, the beta coefficients of all treatments in both experiments remain highly stable after extending controls and cognitive institutional factors.

4.4.2 Interaction effects of normative and extended cognitive institutional factors

We retain all 9 additional variables from the first robustness exercise and now test whether our results hold after examining the interaction effects of the extended informal institutional factors. Models 18 and 21 (see Table IV and V in the supplementary material) show that all earlier results for both experiments hold and further improve.

What this means is that, contrary to what the literature would expect (Urbano et al., 2019), we find that regional as well as normative and cognitive informal institutional factors do not moderate the negative impact of the regulation of entry. For generalizability purposes, this is important as our results demonstrate that neither regional, normative, nor cognitive institutional interaction effects cause nascent entrepreneurs to react significantly differently to the different entry regulations (experiment 1) and reform treatments (experiment 2) in this study.

4.4.3 Interaction effects of attributing high importance to the regulatory components

To our earlier 9 additional controls and extended cognitive institutional factors, we now also add 5 factors that measure the importance nascent entrepreneurs attribute to the regulatory components of entry in their start-up decisions and examine their potential interaction effects. We measure this by asking to what extent respondents attribute importance to the number of start-up procedures, minimum capital requirements, start-up costs, their own invested time, and (waiting) time in days to formally start an LLC. We register this from one to ten on a seven-point Likert and recode this into five dummy variables based on above (coded 1) or below (coded 0) the mean.

Model 19 and 22 (see Tables IV and V in the supplementary material) show that our earlier results hold. For experiment 1, only when respondents attribute high importance to minimum capital requirements in their decision to start a new LLC, then they evaluate German entry regulations significantly differently ($\beta = -0.309, p < 0.001$). This is an additional important proof of robustness as only this country scenario in our study imposes high minimum capital requirements to formally start. This also perfectly aligns with what we find in experiment 2, namely that, only when nascent entrepreneurs attribute high importance to minimum capital requirements, then they react significantly differently to the entry reform treatment which (re)introduces a full minimum capital to register a firm ($\beta = -0.304, p < 0.001$). In sum, these alterations confirm the robustness and high stability of our results.

4.4.4 Traditional logistic regression

As a final robustness exercise, we estimate a traditional logistic regression model for experiment one and two. The results (Table VI in the supplementary material) are in line with what we have reported here above and yield the same findings as our earlier models. Together with the above tests, this confirms the robustness of our results and alleviates potential concerns about using LPMs (e.g., see Huang, 2019 on the usefulness of LPMs in entrepreneurship experiments).

5 Discussion and conclusion

5.1 Contributions to the literature

Our results contribute to the literature in three different ways to move knowledge beyond existing insights about the negative association between the regulation of entry and new venture creation. While even recent studies offer limited granular insights on the variation of different entry regulations' effective impact today on start-up decisions across regions and countries before actual formal new venture creation (Cordier & Bade, 2023), our first experiment provides new detailed knowledge on how constraining current Dutch, Belgian, and German entry regulations can actually be for new venture creation decisions in these countries. In so doing, first, our findings move the literature on regulatory institutions in entrepreneurship forward by providing novel detailed evidence that entry regulations today still can cause significant impediments to start-up decisions, which leads to differences in new venture creation across countries (Broughel & Hahn, 2022; Chambers & Munemo, 2019; Djankov et al., 2002; Urbano et al., 2019). Concretely, compared to Dutch entry regulations, our first experiment provides robust new evidence that current Belgian and German entry regulations can severely impede start-up decisions as they can cause as much as twenty-one and fifty-one percent of nascent entrepreneurs not to start a new business.

Thus, what particularly is new, is that our results shed new light on the extent to which nascent entrepreneurs effectively respond to facing different existing entry regulations today, by showing that current comparable regulatory start-up conditions, which already have been substantially simplified over the years, remain substantial barriers to new venture creation. Hitherto, even recent studies in the regulatory institutions literature from scholars like Cordier and Bade (2023), Grilli et al. (2023) or Laing et al. (2022) have been unable to provide such detailed evidence as they too, like any other existing works, are limited by the public data on regulatory institutions on which they need to rely (Rietveld & Patel, 2023). These studies are important of course but they continue to add to the existing broad spectrum of negative associational evidence. What we mean by this is that there exists a dissonance in the literature about the extent of this negative association today. Some scholars estimate that the magnitude of the negative effect of the regulation of entry is modest on new venture creation, while others claim that the regulation of entry in high-income countries still exerts a strong influence on start-up decisions (Broughel & Hahn, 2022; Grilli et al., 2023; Laing et al., 2022). This current state therefore actually challenges the effectiveness of regulatory quality reasoning, which contends that the fewer entry barriers there are, the more new venture creation decisions there will be (Chowdhury et al., 2019; Levie & Autio, 2011; Urbano et al., 2020).

Following this, based on our second experiment, our results particularly contribute to the literature on regulatory quality and entrepreneurship policy (Acs et al., 2016; Audretsch et al., 2020; Chowdhury et al., 2019; Urbano et al., 2019). We do this by presenting unique and new causal evidence on the exact workings of to what extent the components of the regulation of entry can each specifically affect nascent entrepreneurs' start-up decisions before formal new venture creation. Our results,

however, do not uncritically subscribe to a dominant trend of merely more simplification of business and start-up regulations which follows from the regulatory quality literature, nor do they support a position that less regulation is inherently better than more. Instead, this work aims to go beyond studies that argue for overall regulatory simplifications based on associational evidence. More precisely, while the literature on the regulatory components of entry has yielded disparate evidence, this work robustly demonstrates that minimum capital requirements and higher entry costs in fact exert a substantial negative causal impact on nascent entrepreneurs' start-up decisions. We empirically thus show that notably these regulatory components are essential decision determinants and remain significant barriers for new venture creation as they can cause as much as twenty-eight and twenty-one percent of nascent entrepreneurs not to start a new business. This new evidence that these regulatory components, even after substantial reform efforts over the years, can still cause significant impediments to nascent entrepreneurs' start-up decisions also particularly adds new understanding to the entrepreneurship policy literature to guide the design of effective policy reforms as we further discuss below (Audretsch et al., 2020).

Lastly, while experimental methodologies are gaining strong traction because of their empirical rigor (Malone et al., 2019), we not only are one of the few to disentangle regulatory impacts on new venture creation decisions, we also answer calls to account for interaction effects of informal institutions which hitherto often remain overlooked in the institutional and especially entry regulations literature (Aparicio et al., 2016; Fuentelsaz et al., 2019; Hsu et al., 2017; Maurer et al., 2022; Xie et al., 2021). In addition, next to directly observing start-up decisions from Belgian, Dutch, and German nascent entrepreneurs, we have also studied the impact of the regulation of entry on individuals located within the Meuse-Rhine Euroregion to account for (border) region effects. With this further contextualization, we add new understanding to the entry regulations literature as scholars now recognize more than ever that start-up decisions occur in a particular institutional environment with idiosyncratic informal normative and cognitive institutionalized influences that can interact with entry regulations (Welter et al., 2019). What particularly is interesting is that, contrary to what institutional scholars would theorize (e.g. Urbano et al., 2019), after several robustness analyses, our results indicate that both regional as well as normative and cognitive institutionalized factors do not moderate entry regulations' negative impact in both experiments on nascent entrepreneurs' decision to start a new business. This adds to the generalizability of these new insights as our findings reveal that regional and informal institutional interaction effects in this study do not cause nascent entrepreneurs to respond significantly differently if they face different entry regulations or reform efforts on minimum capital requirements and start-up costs. These compelling insights have important policy implications to stimulate new venture creation.

5.2 Conclusion and policy implications

Over the years, many developed countries have implemented reforms to deregulate firm entry. However, how and to what extent current existing entry barriers continue to negatively impact new venture creation remains a much debated open question

(Broughel & Hahn, 2022; Chambers & Munemo, 2019; Cordier & Bade, 2023; Grilli et al., 2023; Laing et al., 2022). We provide unique new granular insights to this dissonant discussion by conducting two experiments in which we subject 634 nascent entrepreneurs to multiple real but anonymized scenarios of entry conditions to start an LLC today in the Netherlands, Belgium and Germany. This study's first experiment offers new knowledge that entry regulations still can cause significant impediments to new venture creation and shows that Belgian and German entry regulations can lower start-up decisions with as much as twenty-one and fifty-one percent.

Our findings do not advocate unbridled regulatory reforms. Instead, we move existing knowledge forward by, based on our second experiment, presenting new evidence on the exact workings of to what extent the components of the regulation of entry can each affect nascent entrepreneurs' start-up decisions before formal new venture creation. We find that notably minimum capital requirements and higher entry costs can cause as much as twenty-eight and twenty-one percent of nascent entrepreneurs not to start a new business, whereas one's own invested time and the time in days to complete all start-up procedures do not robustly determine start-up decisions. Interestingly, regional and informal institutional factors do not moderate the negative impact of different entry regulations on nascent entrepreneurs' start-up decisions, which strengthens the generalizability of our results.

For policy implications, this contextualization is important. Much has been said over the years about the effectiveness of entry deregulation policies (Acs et al., 2016). Effective policies, however, first of all require a deep and better understanding of start-up decisions (Audretsch et al., 2020). What this means is that when policymakers want to design conducive entrepreneurial ecosystems that foster firm formation through focusing on the regulation of entry, they need more focused and granular insights into the exact workings of existing entry regulations today. Particularly our results can give a new impulse to the ongoing debate on reducing entry barriers as they go beyond an often one-sided general rationale that less regulation is inherently better.

Indeed, our robust findings can inform policymakers to what extent lowering high minimum capital requirements and start-up costs can each stimulate new venture creation as notably these components still directly cause significant impediments to nascent entrepreneurs' start-up decisions across countries. Guided by our findings, such future reform efforts are even more warranted as there still exist substantial capital requirements and entry costs in high-income countries. Arguments to maintain these already have been theoretically refuted in the past, but our results now also provide a new contemporary and unique fine-grained empirical answer to this (Broughel & Hahn, 2022; Djankov, 2009). In addition, our results also provide evidence that such reform exercises are desirable policy as nascent entrepreneurs across regions in our study do not react significantly different to the significant negative impact of the regulation of entry.

Finally, while regulatory entry reforms in the first place focus on increasing the quantity of entrepreneurship, scholars increasingly recognize that good entrepreneurship policy is not only a numbers game (Urbano et al., 2019). In that respect, our findings lend support that removing high capital requirements and entry costs are also efficient policy reforms. Indeed, further reforming such barriers also positively affects the quality of new venture creation as our findings show that this stimulates nascent

entrepreneurs who plan to start an LLC even more to formally start a new business than those who envision sole proprietorship. This is a valuable additional insight since newly created LLCs are considered highly desirable for economic growth.

5.3 Limitations and future research

Like all studies, this work has some limitations that provide opportunities for future research. First, although we observe start-up decisions directly and are one of the few to move away from the main conceptual and empirical shortcomings in the entry regulations literature, we stimulate future research to even further contextualize and to go beyond our sample of actual nascent entrepreneurs which is limited to three developed countries and one border region (Welter et al., 2019). This can further validate the consistency of this study's new results. Second, we encourage future scholars to take even more fine-grained conceptualizations of informal institutions into account as better knowledge of their interaction effects is fundamental to move our understanding of the influence of regulatory institutions forward (Fuentelsaz et al., 2019; Urbano et al., 2019) Lastly, in this light, as we believe our results are inspiring and since the rigor of experimental methodologies is only starting to be discovered in the literature on institutions in entrepreneurship, we invite scholars to employ more experimental approaches to further explore the role of institutions in different entrepreneurial ecosystems (Broughel & Hahn, 2022; Malone et al., 2019).

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11149-024-09486-1>.

Acknowledgements This paper benefited from presentations at the RENT XXXIII conference in Berlin and the Ghent University WOG I research workshop with Prof. Dr Shaker Zahra that helped to improve the quality of the manuscript. The authors want to thank the external (inter)national partners (employers' organizations, chambers of commerce, public one-stop shops) who helped to disseminate our entrepreneurship experiment to reach this unique sample to study. The authors also want to explicitly thank Prof. Dr Petra Andries (Ghent University) and Prof. Dr Veroniek Collewaert (Vlerick Business School/ KU Leuven) for friendly reviewing this study as this benefited the development of this paper before submitting to the Journal of Regulatory Economics.

Author contribution All authors contributed equally to this work.

Funding Open Access Funding provided by Universitat Autònoma de Barcelona.

Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The study analysed primary data which was collected by the authors.

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

- Acs, Z., Åstebro, T., Audretsch, D., & Robinson, D. (2016). Public policy to promote entrepreneurship: A call to arms. *Small Business Economics*, 47(1), 35–51.
- Aparicio, S., Urbano, D., & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological Forecasting & Social Change*, 102, 45–61.
- Audretsch, D., Belitski, M., Chowdhury, F., & Desai, S. (2021). Necessity or opportunity? Government size, tax policy, corruption, and implications for entrepreneurship. *Small Business Economics*. <https://doi.org/10.1007/s11187-021-00497-2>
- Audretsch, D., Colombelli, A., Grilli, L., Minola, T., & Rasmussen, E. (2020). Innovative start-ups and policy initiatives. *Research Policy*, 49(10), 104027.
- Bailey, J., & Thomas, D. (2017). Regulating away competition: The effect of regulation on entrepreneurship and employment. *Journal of Regulatory Economics*, 52(3), 237–254.
- Becht, M., Mayer, C., & Wagner, H. (2008). Where do firms incorporate? Deregulation and the cost of entry. *Journal of Corporate Finance*, 14(3), 241–256.
- Borri, E. (2016). A new measure of red tape: Introducing the three-item red tape (TIRT) scale. *International Public Management Journal*, 19(4), 573–593.
- Bosma, N., Content, J., 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., Nikolaev, B., & Klein, P. (2019). Socio-Cognitive traits and entrepreneurship: The moderating role of economic institutions. *Journal of Business Venturing*, 34(1), 178–196.
- Branstetter, L., Lima, F., Taylor, L., & Venâncio, A. (2014). Do entry regulations deter entrepreneurship and job creation? Evidence from recent reforms in Portugal. *The Economic Journal*, 124(577), 805–832.
- Broughel, J., & Hahn, R. (2022). The impact of economic regulation on growth: Survey and synthesis. *Regulation & Governance*, 16, 448.
- Busenitz, L., Gómez, C., & Spencer, J. (2000). Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management Journal*, 43(5), 994–1003.
- Camelo-Ordaz, C., Diáñez-González, J., Franco-Leal, N., & Ruiz-Navarro, J. (2020). Recognition of entrepreneurial opportunity using a socio-cognitive approach. *International Small Business Journal*, 38(8), 718–745.
- Chambers, D., McLaughlin, P., & Richards, T. (2022). Regulation, entrepreneurship, and firm size. *Journal of Regulatory Economics*, 61(2), 108–134.
- Chambers, D., & Munemo, J. (2019). Regulations, institutional quality and entrepreneurship. *Journal of Regulatory Economics*, 55(1), 46–66.
- Chowdhury, F., Audretsch, D., & Belitski, M. (2019). Institutions and entrepreneurship quality. *Entrepreneurship Theory and Practice*, 43(1), 51–81.
- Colson, M., Vandekerckhof, P., Marneffe, W., & Schepers, J. (2024). Entrepreneurial alertness during severe crises: The effect on internal corporate venturing through business model innovation as a strategic response. *Creativity and Innovation Management*, 33(1), 77–92.
- Cordier, I., & Bade, M. (2023). The relationship between business regulation and nascent and young business entrepreneurship revisited. *Small Business Economics*, 61(2), 587–616.
- De Clercq, D., Danis, W., & Dakhli, M. (2010). The moderating effect of institutional context on the relationship between associational activity and new business activity in emerging economies. *International Business Review*, 19(1), 85–101.
- Djankov, S. (2009). The regulation of entry: A survey. *The World Bank Research Observer*, 24(2), 183–203.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Schleifer, A. (2002). The regulation of entry. *Quarterly Journal of Economics*, 117, 1–37.
- Dove, J. (2023). One size fits all? The differential impact of federal regulation on early-stage entrepreneurial activity across US states. *Journal of Regulatory Economics*, 63(1–2), 57–73.
- Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, 155(3), 413–432.

- Fonseca, R., Lopez-Garcia, P., & Pissarides, C. (2001). Entrepreneurship, start-up costs and employment. *European Economic Review*, 45(4–6), 692–705.
- Fuentelsaz, L., González, C., & Maicas, J. (2019). Formal institutions and opportunity entrepreneurship. The contingent role of informal institutions. *BRQ Business Research Quarterly*, 22(1), 5–24.
- Grilli, L., Mrkajic, B., & Giraudo, E. (2023). Industrial policy, innovative entrepreneurship, and the human capital of founders. *Small Business Economics*, 60(2), 707–728.
- Ho, Y.-P., & Wong, P.-K. (2007). Financing, regulatory costs and entrepreneurial propensity. *Small Business Economics*, 28(2–3), 187–204.
- Hsu, D. K., Simmons, S. A., & Wieland, A. M. (2017). Designing entrepreneurship experiments: a review, typology, and research Agenda. *Organizational Research Methods*, 20(3), 379–412.
- Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82(3), 591–629.
- Klapper, L., & Love, I. (2016). The impact of business environment reforms on new registrations of limited liability companies. *The World Bank Economic Review*, 30(2), 332–353.
- Laing, E., van Stel, A., & Storey, D. J. (2022). Formal and informal entrepreneurship: A cross-country policy perspective. *Small Business Economics*, 59(3), 807–826. <https://doi.org/10.1007/s11187-021-00548-8>
- Levie, J., & Autio, E. (2011). Regulatory burden, rule of law, and entry of strategic entrepreneurs: An international panel study. *Journal of Management Studies*, 48(6), 1392–1419.
- Li, T. (2020). Institutional environments and entrepreneurial start-ups: an international study. *Management Decision*.
- Lim, D., Oh, C., & De Clercq, D. (2016). Engagement in entrepreneurship in emerging economies: Interactive effects of individual-level factors and institutional conditions. *International Business Review*, 25(4), 933–945.
- Liñán, F., & Chen, Y. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617.
- Lortie, J., & Castogiovanni, G. (2015). The theory of planned behavior in entrepreneurship research: What we know and future directions. *International Entrepreneurship and Management Journal*, 11(4), 935–957.
- Malone, T., Koumpias, A. M., & Bylund, P. L. (2019). Entrepreneurial response to interstate regulatory competition: evidence from a behavioral discrete choice experiment. *Journal of Regulatory Economics*, 55(2), 172–192. <https://doi.org/10.1007/s11149-019-09375-y>
- Maurer, J., Creek, S., Bendickson, J., McDowell, W., & Mahto, R. (2022). The three pillars' impact on entrepreneurial activity and funding: A country-level examination. *Journal of Business Research*, 142, 808–818.
- Mora-Sanguinetti, J. S., Quintana, J., Soler, I., & Spruk, R. (2024). The heterogenous effects of a higher volume of regulation: Evidence from more than 200k Spanish norms. *Journal of Regulatory Economics*, 65(1–3), 137–153. <https://doi.org/10.1007/s11149-023-09466-x>
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511808678>
- Reynolds, P. (2009). Screening item effects in estimating the prevalence of nascent entrepreneurs. *Small Business Economics*, 33(2), 151–163.
- Rietveld, C. A., & Patel, P. C. (2023). A Critical assessment of the national expert survey data of the global entrepreneurship monitor. *Entrepreneurship Theory and Practice*, 47(6), 2494–2507. <https://doi.org/10.1177/10422587221134928>
- Schillo, R., Persaud, A., & Jin, M. (2016). Entrepreneurial readiness in the context of national systems of entrepreneurship. *Small Business Economics*, 46(4), 619–637.
- Scott, W. (1995). *Institutions and organizations*. Sage.
- Stenholm, P., Acs, Z., & Wuebker, R. (2013). Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity. *Journal of Business Venturing*, 28, 176–193.
- Su, J., Zhai, Q., & Karlsson, T. (2017). Beyond red tape and fools: institutional theory in entrepreneurship research, 1992–2014. *Entrepreneurship Theory and Practice*, 41(4), 505–531.
- Urbano, D., & Alvarez, C. (2014). Institutional dimensions and entrepreneurial activity: An international study. *Small Business Economics*, 42(4), 703–716.
- 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.

- 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>
- Valdez, M., & Richardson, J. (2013). Institutional determinants of macro-level entrepreneurship. *Entrepreneurship Theory and Practice*, 37(5), 1149–1175.
- van Stel, A., Storey, D., & Thurik, A. (2007). The effect of business regulations on nascent and young business entrepreneurship. *Small Business Economics*, 28(2), 171–186.
- Welter, F., Baker, T., & Wirsching, K. (2019). Three waves and counting: The rising tide of contextualization in entrepreneurship research. *Small Business Economics*, 52(2), 319–330.
- Wurth, B., Stam, E., & Spigel, B. (2022). Toward an entrepreneurial ecosystem research program. *Entrepreneurship Theory and Practice*, 46(3), 729–778. <https://doi.org/10.1177/1042258721998948>
- Xie, Z., Wang, X., Xie, L., Dun, S., & Li, J. (2021). Institutional context and female entrepreneurship: A country-based comparison using fsQCA. *Journal of Business Research*, 132, 470–480.

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

Authors and Affiliations

Maarten Colson¹  · Pieter Vandekerckhof¹  · Wim Marneffe²  ·
Jelle Schepers¹  · Sebastian Aparicio^{3,4} 

✉ Maarten Colson
maarten.colson@uhasselt.be

✉ Sebastian Aparicio
sebastian.aparicio@uab.cat

Pieter Vandekerckhof
pieter.vandekerckhof@uhasselt.be

Wim Marneffe
wim.marneffe@uhasselt.be

Jelle Schepers
jelle.schepers@uhasselt.be

¹ Faculty of Business Economics, Research Center for Entrepreneurship and Family Firms (RCEF), Hasselt University Agoralaan, Building D, 3590 Diepenbeek, Belgium

² Economics & Public Policy (PEC), Faculty of Business Economics, Hasselt University Agoralaan, Building D, 3590 Diepenbeek, Belgium

³ Department of Business, Universitat Autònoma de Barcelona, Av. Eix Central, Edifici B2, 08193 Bellaterra (Cerdanyola del Vallès), Spain

⁴ Centre for Entrepreneurship and Social Innovation Research (CREIS), Universitat Autònoma de Barcelona, Carrer Emprius, 2, 08202 Sabadell (Barcelona), Spain