Economic Regulation, Opportunity-driven Entrepreneurship and Gender Gap: Emerging versus High-income Economies

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Abstract

Purpose – Institutional environment plays a crucial role in determining the nature of entrepreneurship that prevails in an economy. In this paper, we address how business, labour and credit regulations contribute differently to both the overall prevalence of opportunity-driven entrepreneurship and its gender gap in high-income and emerging economies.

Design/methodology/approach – On the basis of an unbalanced panel of 41 countries over the period 2005-2016, we estimate system Generalized Method of Moments models. We also perform an Ordinary Least Square analysis to address gender differences in opportunity-driven entrepreneurship.

Findings – We find that higher credit market liberalisation is especially associated with more entrepreneurship by opportunity. Nevertheless, while credit market regulation stands out as a key element to promote opportunity-based entrepreneurship in both high-income and emerging countries, in the emerging world business regulation is also largely related to the prevalence of opportunity entrepreneurship. In terms of gender gap, business and labour market freedom seem to exert an equalizing effect on the divide in entrepreneurship by opportunity, specifically in emerging economies.

Originality/value – Our findings allow the identification of regulatory policy reform priorities to enhance the prevalence of opportunity-driven entrepreneurship depending on the level of a

country's development. They also identify which specific areas of economic regulation would speed up closing the gender gap in opportunity entrepreneurship.

Keywords

Entrepreneurship, opportunity, regulation, gender

Introduction

The prevalence of opportunity-driven entrepreneurship (ODE) in an economy depends not only on individuals´ personal characteristics, but also on environmental factors such as demography, societal norms, education, finances, physical infrastructure or regulatory policies (Aparicio *et al.*, 2016; Fuentelsaz *et al.*, 2019), which might influence the nature of entrepreneurship and the way entrepreneurs behave (Welter, 2011; Welter & Smallbone, 2012).

In a changing global environment where regulatory adjustments are constantly required to adapt to the new circumstances, the understanding of how key aspects of economic regulation contribute to ODE seems crucial in order to promote this kind of entrepreneurship, frequently associated with high growth aspirations, innovations and exploitation of new market niches, as well as large contribution to job creation and economic growth (Autio and Acs, 2010; Estrin *et al.*, 2013). In recent decades business, labour and credit regulations have emerged, among the numerous institutional aspects determining the nature of entrepreneurial activity, as key regulatory areas from the perspective of market economy, with significant economic and social implications (Gwartney *et al.*, 2018).

Nevertheless, the effects of the various dimensions of economic regulation on entrepreneurial activity may not be homogeneous in countries with significant differences in levels of development or even between different population groups within countries. From an

international perspective, traditionally entrepreneurship literature has focused on economically developed economies, assuming that findings in the developed world may be equally applicable to other development contexts. Nonetheless, over the last decades a growing interest has emerged to assess whether theoretical perspectives on economic regulation in mature market contexts are valid in emerging economies (Kiss *et al.*, 2012). The specific economic and political environments of less-economically developed countries often create settings in which entrepreneurial strategies are likely to be different from those in high-income countries (Kiss *et al.*, 2012).

Likewise, given the significant differences in socioeconomic conditions between population groups and particularly between men and women, within countries we might expect certain regulatory aspects related to the ease of doing business, labour flexibility and credit market liberalisation to have a different impact on the development of ODE by gender. Furthermore, in some countries women are not subject to the same economic regulation as men, still facing barriers in respect to signing a contract, opening a bank account, having ownership rights over property, or registering a business (ILO, 2016; Fike, 2017). All this prevents a significant number of women from engaging in mutually beneficial exchanges and hampers their entrepreneurial activities making them less frequent and less profitable than men's (Minniti, 2010; Xavier *et al.*, 2012), implying the existence of a considerable gender gap in ODE across the globe.

This study investigates the extent to which business, labour and credit regulations contribute differently to both the overall prevalence of ODE and its gender gap, identifying the differential role of each of the three dimensions of economic regulation by the country's contextual economic development level. To this end, we make use of a panel of 41 high-income and emerging countries over the period 2005-2016, revealing differences in the effects of the diverse regulatory aspects examined on the magnitude of ODE and the closure of the gender gap in

ODE depending on countries' level of development. This way, this study attempts to fill a gap in the literature in line with recent calls to examine entrepreneurship as a complex phenomenon that cannot be fully understood without considering the institutional context in which entrepreneurial action is embedded.

The paper is organised as follows. The next section deals with the theoretical framework. Subsequently, data and methodology are featured. Finally, we present and discuss the empirical results, and in the last section we offer some conclusions.

Theoretical Framework

The most significant contributions to entrepreneurship literature include the work of historical economists such as Cantillon, Say and Mill. Nevertheless, it was not until the 20th century that Schumpeter stressed entrepreneurs' innovative dimension, closely related to the current concept of opportunity-driven entrepreneurship.

The aforementioned standpoint –focused on individual-level characteristics of entrepreneurs– prevailed in the literature until the irruption of Baumol´s theories. In a seminal paper, Baumol (1990) brought to light the importance of the institutional and policy environment in the entrepreneurial process and showed that entrepreneurs' actions at a given time and place depend heavily on the 'rules of the game' of each economy. In fact, entrepreneurs channel their efforts in different directions depending on the type of established economic, political, and legal institutions that shape the reward structure of any given society.

Considering the importance of the interaction between the socio-economic context and the institutional environment for entrepreneurship, Kloosterman *et al.* (1999) developed the concept of *mixed embeddedness*. This approach underlines that the general environment determines to a very large extent the quantity and quality of entrepreneurship opportunities, since institutions such as the configuration of markets, the set of rules and regulations and their

level of compliance, and business practices which regulate particular markets substantially influence entrepreneurial opportunity structures at sectoral, local and national levels (Kloosterman, 2000). This way, the mixed embeddedness approach provides the basis for understanding entrepreneurial activities through the combination of the micro-level, considering the skills and resources of the individual entrepreneurs, the meso-level of the local opportunity structure and the macro-institutional framework (Kloosterman, 2010).

Under this approach, some studies underline significant links between opportunity structure and institutional environments, highlighting the importance of elements such as regulations regarding labour and businesses (Kloosterman, 2010) and related to access to financial resources (Hall and Soskice, 2001; Neville *et al.*, 2018). In the framework of the mixed embeddedness approach, we focus on the role of economic regulation in opportunity entrepreneurship, including business, labour and credit regulations, disentangling different possible effects for groups of countries depending on the level of development and for social groups (men and women) within countries.

First, focusing on business regulation, it should be stressed that we refer to the extent to which regulations and bureaucratic procedures restrain entry to the market and reduce competition (Gwartney *et al.*, 2020). Thus, the existence of inadequate regulatory rules is a common barrier to free entrepreneurial activities, such that inappropriate business regulation may be perceived by the innovative entrepreneurial sector as an obstacle to creating, operating and closing a business. Arguments against business regulation tend to be grouped into licensing requirements, registration difficulties, increase of production costs, bureaucratic corruption and environmental or safety regulations (McMullen, *et al.*, 2008). From the perspective of the opportunity structure, business regulations posing a barrier are essentially found in traditional industries where interests may have become entrenched (Kloosterman, 2010). Moreover, the variability of the bureaucratic burden among countries is noteworthy (see e.g. World Bank,

2018), so that even after a business is open, both regulatory certainty and transparency in its application can account for the burden it has to bear. As a result, greater transparency helps to define clearer ´rules of the game´ that facilitate and reduce entrepreneurs' costs by creating predictable environments to develop entrepreneurial opportunities (O'Driscoll *et al.*, 2003). This leads to our first hypothesis:

H1. Inadequate business regulation tends to discourage ODE.

Second, by labour regulation we refer to measures related to establishing minimum wages, limits of hours worked, hiring and firing restrictions, as well as requirements related to the safety and health of workers that may have a considerable impact on the opportunity structure in a complex way (Kloosterman, 2010). Hence, the main arguments in favour of labour freedom focus on the fact that government regulation promotes the rigidity of the labour market and hinders automatic adjustments between workers and employers (Miller *et al.*, 2018).

Moreover, when government intervenes in setting wages, it has an impact on a company's cost function. Entrepreneurs feel they have to manage a higher cost structure due to decisions beyond their control, undermining their autonomy (Mueller and Thomas, 2001). This leads to the following hypothesis to be tested in the empirical analysis:

H2. Very strict labour regulation tends to hinder ODE.

Third, in terms of credit market regulation we refer to regulatory restraints that limit the freedom of exchange in credit markets (Gwartney *et al.*, 2020). A solid and efficient financial system guarantees the availability of essential services for innovative entrepreneurs, such as access to credit and the ability to deposit savings. Therefore, effective financial market regulation enables a high performing exchange of opportunities between investors, businesses and households (Patel *et al.*, 2018), augmenting transparency and decreasing the costs derived from the search for funding. Arguments for financial freedom advocate limiting public

intervention, such that interest rates and prices could be generated in the credit market through the logical process of supply and demand of financial assets, which is expected to favour the environment for opportunity-driven entrepreneurs to carry out their activity.

In contrast, inefficient regulation increases the costs of financing business activity and limits competition. This way, if barriers to access credit markets are too high or interest rates are not engaging due to inefficient performances, investors will avoid allocating their resources to the financial market, reducing the available capital and therefore affecting market prices. This suggests the following hypothesis:

H3. Credit market liberalisation tends to favour ODE.

Moreover, following in the framework of the mixed embeddedness approach, institutional forces related to business, labour and credit regulations would be expected to affect differently countries that are in different stages of economic development in terms of opportunity entrepreneurship. As a product of social, economic and institutional forces, the opportunity structure might, to a great extent, be determined in each country by its productive structure and structural changes in progress. According to Kloosterman and Rath (2001), the profile of the opportunity structure may increase the number of entrepreneurial opportunities in the transition from industrial to post-industrial countries. This way, possible differences in the opportunity structure might be connected to economic development (Kloosterman, 2010). Thus, as emerging economies are often characterised differently in comparison with developed market economies (Anderson and Ronteau, 2017), firms in emerging economies could be expected to develop organisational structures and capabilities to flexibly respond to the often-changing rules of the game in business creation or labour and credit markets (De Castro *et al.*, 2014). This leads us to formulate the following hypothesis:

H4. The role of economic regulation in opportunity entrepreneurship in emerging countries differs in relation to high-income economies.

Finally, in terms of the differential effects of economic regulation on female/male opportunity entrepreneurship in both groups of countries, we hypothesise that economic regulation might play a significant and differentiated role in determining gender differences in opportunity-driven entrepreneurship, which is based not only on the arguments given supporting H4 and the mixed embeddedness approach, but also on the *liberal feminist theory* (Fischer *et al.*, 1993). The latter arises in opposition to *social feminist theory* (Fischer *et al.*, 1993), which suggests that men and women are inherently different by nature and women might adopt different perspectives that may or may not be as effective as the approaches adopted by men. The liberal feminist theory suggests that the historically poorer performance of women running businesses might be caused by environmental factors that dispossess women of crucial resources, such as business education or financial resources. Under this view, women are still imbued in socio-cultural discrimination, which might deter female opportunity-driven entrepreneurs from launching new entrepreneurial initiatives, getting more qualified jobs or accessing to financial resources in comparison with their male counterparties. In empirical terms, case studies and qualitative evidence strongly suggest that female entrepreneurs do indeed face major constraints, which do not all reflect efficiency considerations (Acs *et al.*, 2011). Particularly, women are still more likely than men to be necessity entrepreneurs and less likely to be opportunity entrepreneurs (Kelley *et al.*, 2015) due to four main reasons (Warnecke, 2013): (i) the informal sector tends to be predominantly female, (ii) it is common that women present lower educational attainment than men; (iii) women are usually less likely to have access to formal business networks, are charged higher interest rates, and are less likely to obtain loans; and (iv) women spend more time than men in domestic work. Additionally, let us recall that, especially in less economically developed countries, economic regulation for women

might differ from that for men in reference to essential facts, such as registering a business, signing a contract or opening a bank account (De Vita *et al.*, 2014; ILO, 2016; Fike, 2017). Hence, the specific barriers that women face when participating in the labour market, accessing credit or creating a business (see, e.g., Hampel-Milagrosa, 2010) may differ in the perception and implementation of opportunities for entrepreneurship depending on the country's level of economic development. We then expect that economic regulation may contribute differently to widening or narrowing the gender gap in ODE in high-income and emerging countries. Therefore, we could hypothesise the following:

H5. The role of economic regulation in the gender gap of opportunity entrepreneurship in emerging countries differs in relation to high-income economies.

Data and Methodology

Data

We use Global Entrepreneurship Monitor (GEM) country-level data, which provides general statistics on opportunity entrepreneurship since 2005. GEM publications constitute a trusted resource widely used by academics and major international organisations, from the United Nations to OECD (Reynolds *et al.*, 2005; Urbano and Alvarez, 2014). Data on opportunity entrepreneurship are collected through the Adult Population Survey (APS), which is administered to a minimum random sample of 2,000 working-age adults in each economy, ensuring that it is nationally representative. We thus consider the percentage of the working-age population indicating that they started a business reporting opportunity —search for economic improvement or to be more independent— as a major motive.

Regarding economic regulation, we employ data from the Economic Freedom of the World (EFW) index (Gwartney, *et al.*, 1996) released annually by the Fraser Institute to measure the

degree of economic freedom present in five major areas: Size of Government; Legal System and Security of Property Rights; Sound Money; Freedom to Trade Internationally; and Regulation. We focus on the three dimensions of Regulation, namely business, labour and credit regulations. The annual data are available since 2000 in a chain-linked version suitable for analysis over time. In comparison with Heritage Foundation's Index of Economic Freedom (IEF), it is frequently argued that the Fraser Institute's EFW seems to be a more appropriate tool to measure institutions and policies across countries (Ott, 2018).

We classify countries in terms of economic development on the basis of the World Bank and IMF guidelines, such that high-income economies are those with a GNI per capita of $12,056 or more, and emerging economies are those listed by the IMF in its 2016 World Economic Outlook (International Monetary Fund, 2016). In the case of high-income countries listed by the IMF as emerging economies, we consider them as emerging (this is the case of Argentina, Chile, Hungary and Poland). This way, our research focuses on an unbalanced panel of 41 high-income and emerging countries over the period 2005-2016, of which 22 are high-income countries and 19 emerging countries [1] (see available data by country in Table A I of the Appendix).

Dependent variable

Our dependent variable, ODE, measures entrepreneurship by opportunity. In particular, it shows the percentage of all respondents aged 18-64 involved in total Early-stage Entrepreneurial Activity (TEA) and reporting opportunity as a major motive. TEA, in turn, is defined as the percentage of the adult population aged 18-64 that is in the process of starting a business or has already started a business (a nascent entrepreneur or owner-manager of a new business) that is less than 42 months old.

Independent variables

We make use of data from the three Regulation dimensions of the EFW as explanatory variables, namely *Business regulation*, *Labour market regulation* and *Credit market regulation*. Choosing *Business regulation* allows capturing the extent to which regulations and bureaucratic procedures restrain entry and reduce competition throughout components such as administrative requirements, bureaucracy costs or extra payments/bribes/favouritism when starting a business. *Labour market regulation* reflects the extent to which regulations regarding hiring and firing, mandated costs of worker dismissal or minimum wage are present in the labour market. Finally, *Credit market regulation* measures the extent to which regulatory restraints limit the freedom of exchange in credit markets, throughout components such as the existence of controls on interest rates or flows of credit supplied to the private sector. Data of the three variables range from 0 to 10, where zero corresponds to higher restraints and ten corresponds to supposedly ideal pro-market regulation. The complete list of all components of the three variables are specified in Table A II of the Appendix.

Control variables

As control variables we use the log of Gross Domestic Product per capita (Log GDPpc) in parity purchasing power and the ratio of stock market capitalization to GDP (market_cap). GDP per capita, which has been widely shown to be related to entrepreneurship (Van Stel, Storey, & Thurik, 2007; Acs, Desai, & Hessels, 2008), captures the overall economic context where entrepreneurial activity is embedded .

The ratio of stock market capitalization to GDP, also known as the Buffett Indicator, is a long-term valuation indicator for stocks. It is particularly relevant in our study as innovation, entrepreneurship and ODE are typically associated with more developed financial markets (see, for instance, Bjørnskov and Foss, 2008; Nikolaev *et al.*, 2018).

We also carry out a sensitivity analysis by controlling with other socioeconomic variables that are usually related to the nature of entrepreneurship in order to detect possible confounding factors that might affect the association between economic regulation and ODE. According to the empirical literature, we add variables from the World Bank's World Development Indicators and the Human Development Data of the United Nations Development Programme (UNDP). We also control by using particular GEM variables related to specific entrepreneurial environment, entrepreneurial activity, attitude towards entrepreneurship, productive structure, labour market, education and other key economic and financial aspects from the APS and the National Experts Survey (NES) [2]. See Table I for descriptive statistics of all variables used in the study and Tables A III and A IV of the Appendix for their definitions and sources, and for the pairwise correlation matrix, respectively.

Table I about here

Methodology

Data availability on 41 countries for 11 periods enables us to consider a panel data analysis in our estimation strategy. Remarkable differences in socioeconomic structures and entrepreneurship levels make use of panel data on macroeconomic conditions of great interest, so that omitted heterogeneities could be accounted for by the inclusion of the so-called country-specific effects.

One of our interests lies in accounting for the persistence over time of opportunity-motivated entrepreneurship in the specification of the model. We also aim at correctly identifying the effect of economic regulation on opportunity-motivated entrepreneurship, considering the possible reverse causality. To this end, we apply dynamic panel data with two lags of the dependent variable by using the one-step system Generalized Method of Moments' estimator (system GMM) (Arellano and Bover, 1995; Blundell and Bond, 1998).

Regarding control variables, we consider they could be treated as predetermined, allowing for no contemporaneous correlation with disturbances and for feedback from lagged ODE values to the current value for the respective control variables. Lagged information on ODE and the different economic regulation measures are treated as endogenous.

The validity of the system GMM estimator moment conditions can be tested by means of the overidentifying restrictions test proposed by Sargan (1958) and Hansen (1982) and by testing the null hypothesis of no third order serial correlation in the error term, given the two lags of the endogenous variable. We consider panel-robust standard errors to control for possible heteroskedasticity and serial correlation in errors originated by unobservable variables persistently correlated over time with ODE.

Hence, we formulate the following panel data model to analyse opportunity-motivated entrepreneurship, ODE_{ct}, for country *c* at time *t*:

$$ODE_{ct} = \zeta_c + \beta_1 ODE_{ct-1} + \beta_2 ODE_{ct-2} + \beta_3 ER_{ct} + \beta_4 GDPpc_{ct} + \beta_5 MC_{ct} + \beta_6 X_{ct} + \omega_{ct} (1)$$

where ζ_c captures individual-specific effects that are constant over time and not directly observed or included in the model, ODE_{ct-1} and ODE_{ct-2} are the lagged level of the dependent variable that controls for short term dynamics and conditional convergence in one and two periods respectively, ER_{ct} is the respective index of economic regulation, $GDPpc_{ct}$ is the log of GDP per capita, MC_{ct} is the ratio of stock market capitalization to GDP, X_{ct} are the other control variables, and ω_{ct} is a normally distributed error term. Since spurious regressions are susceptible to appear in time series (Parker, 2000), we perform a stationary analysis in order to assess the accuracy of the parameters. In particular, we consider the Phillips-Perron (Perron and Phillips, 1988) unit root test. The results for each variable in the model are shown in Table A

V of the Appendix, where it can be verified that the unit-root hypothesis is rejected for all variables.

In the analysis of ODE from a gender perspective, we have a short series of female/male ODE ratio (G-ODE) data available that does not allow performing a dynamic model. As an exploratory approach, we average the available data for each country (2013-2016) and create the variables Averaged Female/male ODE ratio (A_G-ODE), Averaged Business regulations, Averaged Labour market regulations and Averaged Credit regulations. We perform an Ordinary Least Square analysis as the best approximation given data availability:

$$\text{A\_G} - \text{ODE}_c = \beta_1 ER_c + \beta_2 GDPpc_c + \beta_3 MC_c + \beta_6 X_c + \omega_{ct} \qquad (2)$$

Results

The baseline results of the one-step system GMM estimator [3] are presented in Table II, providing evidence and answers for each of the three initial research questions, namely H1, H2 and H3. The coefficients of the *Business regulation* and *Labour market regulation* variables (1.50 and 1.65, respectively) are positive but not statistically different from zero, implying that they are not likely to account for the ODE. Therefore, *H1* and *H2* are not supported by our empirical evidence. In contrast, the *Credit market regulation* coefficient is statistically different from zero and positive, so that less regulation around the credit market seems to be associated to higher opportunity entrepreneurial activity. Specifically, the increase of one point in *Credit market regulation* seems to be associated to a significant increase of 2.97 percentage points in opportunity entrepreneurial activity. This result lends support to *H3*, which proposes that less credit market regulation implies higher rates of ODE.

Table II about here

With the aim of testing the robustness of our baseline model, we conduct a wide array of sensitivity testing by introducing several socioeconomic variables related to specific

entrepreneurial environment, entrepreneurial activity, attitude towards entrepreneurship, productive structure, labour market, education and other key economic and financial aspects, as well as the interaction of *Credit market regulation* with the additional control variable introduced in each line (see Table III). We show that the baseline results remain significant in most model specifications. That is, the coefficients of *Credit market regulation* (fourth column) are positive, significant and above 2 in relation to *ODE* for most cases, while *Business regulation* and *Labour market regulation* continue to be non-significant variables, corroborating the robustness of our foregoing findings related to *H1*, *H2* and *H3*. Moreover, the increase in the level of *Credit market regulation* only has a significant differential effect on ODE for some additional control variables (fifth column). *Credit market regulation* and ODE are more intensely associated in environments with good access to infrastructure (extra increment in *ODE* of 0.65 percentage points), high level of entrepreneurship (0.04 extra increase), good perceived opportunities to start a firm (0.02 extra increase), and low unemployment (0.08 extra increase if unemployment diminishes by one percentage point).

Table III about here

Next we analyse whether the effects of economic regulation on opportunity entrepreneurship in emerging countries differ from the effects in high-income economies (H4). As shown in Table IV, *Credit market regulation* remains as a positive and statistically significant factor in determining the ODE (2.62 percentage point increase in opportunity entrepreneurial activity in high-income countries and 2.82 in emerging countries). Besides the expected importance of credit market regulation, *Business regulation* also stands out as a positive and statistically significant variable, but only in emerging countries (2.47). Thus, according to our results, the ease of doing business could also be considered as an especially relevant driving factor in emerging countries, in addition to the one observed for rich economies. These outcomes lend support to *H4*.

Finally, we examine whether economic regulation is or not gender-neutral in terms of opportunity entrepreneurship (H5). We use an alternative model in which we consider the effects of regulation on the female/male ODE ratio for both high-income and emerging countries. Outcomes show that *Business regulation* and *Labour market regulation* (coefficients 0.06 and 0.05 respectively, see Table V) only significantly reduce the divide between female and male opportunity entrepreneurs in emerging countries. On the other hand, credit market regulation does not seem to have a significant effect on the female to male ODE ratio, whether in high-income or emerging countries. Hence, these results support H5 for business and labour market regulations.

Tables IV and V about here

Discussion

The purpose of this research is to assess the association between business, labour and credit regulations and opportunity-driven entrepreneurship, paying special attention to possible variations of this influence in both the overall prevalence of ODE and the gender gap in entrepreneurship by opportunity depending on the level of development.

To begin with, we find that credit market liberalisation accounts for ODE. Our study complements Angulo-Guerrero *et al.* (2017), since they find that more flexible economic regulation encourages opportunity entrepreneurship, even though they consider the regulatory aspects as a whole and do not delve into business, labour and credit regulation separately. We disentangle these three dimensions and find that only credit market liberalisation accounts for ODE in general terms, in line with Díaz-Casero *et al.* (2012), who acknowledge the links between financial freedom and ODE but only in developed countries. Nevertheless, our findings differ from those of Bjørnskov and Foss (2008) and McMullen *et al.* (2008), who do not find

an association between credit market regulation and entrepreneurship by opportunity.

It should therefore be underlined that using a private banking system to allocate credit to private parties and refraining from controlling interest rates seem to benefit entrepreneurship by opportunity. These facts might be considered as drivers for opportunity-driven entrepreneurs to overcome difficulties in raising the required funds to operate a successful business. Economies where the banking sector is dominated by public parties and governments interfere with controls on interest rates in the credit market do not appear to be effective in terms of fostering entrepreneurship by opportunity. This is also consistent with the ideas of Pissarides (1999) and Grittersová and Mahutga (2019) about how state ownership of banks, normally by limiting access or increasing the cost of credit for potential competitors of incumbent firms, can be perceived in this case as an indirect barrier to new opportunity-driven entrepreneurs. On the other hand, regulatory activities that retard entry into business and bureaucratic procedures do not seem to restrain competition or affect opportunity motivated entrepreneurship in general terms. In a similar line, allowing market forces to determine wages, establishing the conditions of hiring and firing, and refraining from the use of conscription do not exert a significant effect on entrepreneurship by opportunity. This way, our study brings new light in relation to Fuentelsaz *et al.* (2015), as in opposition to their findings, we do not find evidence that business and labour market freedom might contribute to ODE in general terms.

Departing from our findings on credit market liberalisation, we carry out a sensitivity analysis to delve into which socioeconomic environments are especially effective for ODE. Our robustness test reveals that credit market regulation and entrepreneurship by opportunity are more intensely associated in environments with good access to infrastructures, a high level of entrepreneurship, good perceived opportunities to start a firm and low unemployment. These findings are coherent with the idea that infrastructure investments change the environment in the sense that they provide a window of opportunity for entrepreneurs to enter the market

(Bennett, 2019), reducing barriers and facilitating connectivity, interaction and the exchange of knowledge and ideas that could potentially enhance the opportunity structure commented in the mixed embeddedness approach at sectoral, local and national levels (Kloosterman, 2000), propelling opportunity-driven entrepreneurial activity. Likewise, credit liberalisation seems to facilitate the appearance of opportunity-driven entrepreneurs, particularly in contexts with a high level of entrepreneurship and good perceived opportunities. Our results complement Mühlböck *et al.* (2018), who stress that a considerable proportion of entrepreneurs start a project even when there is no perception of business opportunities, especially in contexts particularly affected by economic downturns and rising unemployment. Thus, previous empirical studies show that entrepreneurship increases in environments with higher unemployment rates, especially NDE (see e.g. Block & Koellinger, 2009; Fairlie & Fossen, 2020), reducing the opportunity/necessity ratio. Our results strengthen those findings, revealing that greater credit liberalisation might contribute to an increase in ODE, even though in environments with higher unemployment rates this increase tends to be lower.

Another key finding indicates the importance of business regulation in emerging economies. Note that while Fuentelsaz *et al.* (2015) find that stricter business regulations disincentive ODE, their results are not analysed by groups of countries. We only find this association in emerging economies. This is probably because in an environment with great uncertainties, growing competition to find new opportunities and fast changes in market opportunities, as in the case of emerging economies, the ease to create a business stands as a crucial issue (Estrin *et al.*, 2018) for opportunity-driven entrepreneurs. It seems reasonable to accept, in line with Estrin and Mickiewicz (2012), that the business regulatory environment presents higher barriers in formal sectors in emerging countries than in high-income countries, so that improvement of business regulation might notably contribute to increase opportunity-based entrepreneurship. Nonetheless, stricter business regulation not only entails fewer administrative requirements or

bureaucracy costs, but also controlling extra payments, bribes or 'playing favourites' at the time a business is created. This way, our results appear to confirm that refraining from using governmental power to extract financial payments and reward some businesses at the expense of others may foster opportunity entrepreneurship, particularly in emerging economies. Thus, in markets where informal activities account for around 35% of GDP (World Bank, 2020), business regulation seems effective to foster opportunity-driven entrepreneurship as a system to control bribery. Specifically, in emerging markets high levels of corruption have a negative effect on opportunity-based entrepreneurship since it might diminish people's entrepreneurial enthusiasm (Liu *et al.*, 2019), which is a key driver of opportunity entrepreneurship.

Finally, we observe that business and labour regulations matter for closing the gender gap in opportunity-driven entrepreneurship in emerging countries. More flexible business regulation has a differential beneficial effect for women compared to men, facilitating particularly female opportunity-driven entrepreneurs to take their entrepreneurial projects forward in environments which decrease burdensome administrative costs and are less susceptible to bribes and corruption (Boudreaux and Nikolaev, 2019). Regarding the differential effects of labour market regulation, more flexible job environments in emerging countries seem to provide greater incentives for female opportunity-driven entrepreneurs than for male entrepreneurs to quit traditional employments with the aim of launching their entrepreneurial projects. Therefore, flexible regulation in business and labour markets seems to enable a better adaptation of female opportunity-driven entrepreneurs, rather than male entrepreneurs, to the changing environments of emerging countries. In contrast, despite recent studies that corroborate the relevant role of the effects of more flexible credit market regulations to increase the level of female entrepreneurship in all countries (see Boudreaux and Nikolaev, 2019), according to our results, a more liberalised credit market does not seem to be a key driver in reducing the female/male gap. Hence our findings partially support the liberal feminist theory

(Fischer *et al.*, 1993), since it is only in particular environments that female opportunity-driven entrepreneurs are less affected by business regulatory costs than male entrepreneurs and more flexible labour regulation helps to close the gap in opportunity entrepreneurship.

Conclusions

Drawing from the premise that policymakers should not only focus on increasing entrepreneurship indiscriminately but also on the nature of entrepreneurship, we examine potential links between business, labour and credit regulations and entrepreneurship by opportunity. We analyse the existence of possible different associations of economic regulation and both, opportunity entrepreneurship and its gender gap, in countries by development levels.

We find that credit market constraints are associated with a lower prevalence of entrepreneurship by opportunity in both high-income and emerging countries. Thus, economies with a liberalised credit market in which interest rates are determined by the market and credit is easily accessible in the private sector present higher rates of entrepreneurship by opportunity, while restrictive regulations limiting the right to obtain credit seem to discourage the emergence of new business opportunities and make it difficult for entrepreneurs to take advantage of any opportunities. Furthermore, the socioeconomic environment may also modulate this connection with credit liberalisation. Specifically, we find that fewer constraints in the credit market are significantly associated with even greater opportunity entrepreneurship when citizens perceive that there are good opportunities to start a business, as well as in contexts with a high level of entrepreneurial activity, good access to infrastructure and low unemployment rates.

Our results confirm that economic regulation does not perform equally across countries. In the case of emerging economies, not only credit market regulation but also business regulation stand out as especially relevant issues. The ever-changing environment of these nations seems to demand greater ease of doing business to promote opportunity entrepreneurship. Fewer

administrative requirements, absence of extra payments/bribes, lower cost of regulatory compliance and less time and money needed to obtain a license or start a new business appear as substantial issues related to ODE in emerging countries.

Economic regulation also plays a significant role in closing the gender gap in ODE in emerging economies. In particular, business and labour market freedom seems to exert an equalizing effect on the divide in entrepreneurship by opportunity between women and men. This highlights that reforms to improve business regulation, apart from standing out as an especially relevant aspect to promote the level of opportunity entrepreneurship, particularly in emerging countries, may contribute to reducing the gender gap in opportunity entrepreneurship as long as they allow reducing regulatory barriers that make it difficult for women to develop entrepreneurial opportunities in these countries. In addition, labour market institutional reforms seem to have a potential for narrowing the gender gap in opportunity entrepreneurship.

Lastly, it should be emphasized that this study sheds light on the links between three key areas of economic regulation and entrepreneurship by opportunity from a double gender and development perspective, deriving a number of potential policy implications from our analysis. In addition to the findings and implications discussed above, several questions are worth raising. On the one hand, our policy insights allow identifying regulatory policy reform priorities to enhance the prevalence of opportunity-driven entrepreneurship depending on a country's level of development, as well as which specific areas of regulatory policy would speed up closing the gender gap in opportunity entrepreneurship in both high-income and emerging economies. On the other hand, some limitations of our study may constitute opportunities for further research. Thus, our findings should be interpreted taking into consideration that the results are based on an unbalanced panel data set. Moreover, the limited availability of data for female/male opportunity-driven ratios prevents us from considering a panel data analysis in our estimation strategy to examine the role of economic regulation in

gender terms. On the basis of this research, further analysis dealing with every aspect of business, labour and credit regulations and focusing on each country's specific institutional settings would be particularly useful to provide more detailed guidance to policymakers.

Notes

1. Even though the number of countries participating in the GEM project is higher, the availability of data on the ODE and the explanatory variables introduced in the baseline model reduce the number of countries of the study to 41.
2. NES is an instrument used to collect the views of experts on a wide range of items designed to capture a different dimension of the specific Entrepreneurial Frameworks Conditions (EFC) in a country.
3. We check that the models are well-fitted, showing first- but not second- or third-order correlation, and that the instruments are valid, as we do not reject the adequacy of moment conditions.

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Table I. Descriptive statistics.

Abbreviation	Variable	Obs.	Mean	Standard deviation
ODE	Ratio ODE/TEA (Total Early-stage Entrepreneurial Activity)	341	50.14	12.56
Br	Business regulations	247	6.70	1.10
Lr	Labour market regulations	247	6.28	1.25
Cr	Credit market regulations	247	8.63	1.09
Log GDPpc	Log of Gross Domestic Product per capita	247	10.15	0.57
	Countries´ specific entrepreneurial environment			
market_cap	Ratio of stock market capitalization to GDP	247	67.44	54.70
bas_edu	Basic entrepreneurial education and training	222	2.00	0.39
post_edu	Post school entrepreneurial education and training	222	2.85	0.33
r&d	R&D transfer	222	2.46	0.38
phy_infraest	Physical infrastructure	222	3.77	0.45
social_norm	Cultural and social norms	222	2.79	0.49
	Entrepreneurial activity (rates)			
entrep_int	Entrepreneurial intentions	246	16.43	12.56
tea	Total early-stage entrepreneurial activity	246	10.52	6.22
estab_business	Established business ownership	246	7.61	4.48
	Entrepreneurial attitude (rates)			
perc_opp	Perceived opportunities	246	36.96	15.81
perc_cap	Perceived capabilities	246	46.46	12.53
fear_of_fail	Fear of failure	246	35.74	8.14
	Productive structure and labour market (rates)			
emp_agr	Employment in agriculture	247	9.88	9.82
emp_ind	Employment in industry	247	23.55	4.68
emp_serv	Employment in services	247	66.56	10.71
unempl	Of unemployment	247	8.37	5.63
lfpr	Labour force participation	247	60.83	6.64
pop1564	Population between ages 15–64	247	66.96	2.36
	General education level			
secondary	Secondary enrolment rate	223	104.48	17.35
mean_edu	Mean years of schooling	247	10.48	1.95
	Other key economic and financial variables			
Fdi	Foreign direct investment	247	6.09	11.54
credit_priv	Domestic credit to private sector	240	93.37	47.30
credit_fin	Domestic credit provided by the financial sector	240	129.39	68.63
	Gender analysis			
G-ODE	Female/male ODE ratio	48	0.95	0.12
Flfpr	Female labour force participation rate	48	51.83	8.69

Source: GEM Consortium, World Bank, Fraser Institute and UNDP.

Note 1: as ODE is lagged two periods in the dynamic panel data model, we include the descriptive statistics for all observations

Note 2: descriptive statistics for G-ODE are based on averaged data in the period 2013-2016 for each country. In comparison with the other variables used in the panel data analysis, data availability allows us to include Austria, Cyprus, Czech Republic, Denmark, Hong Kong, Qatar, Saudi Arabia, South Korea, United Arab Emirates and excludes Pakistan and Romania.

Table II. Economic regulation and opportunity-driven entrepreneurship. Baseline models

	ODE (High-income and emerging countries)		
Business regulation	1.504		
	[0.8967]		
Labour market regulation		1.651	
		[1.2942]	
Credit market regulation			2.968**
			[0.9312]
Log GDPpc	0.99	1.767	1.581
	[3.1154]	[2.7866]	[2.5636]
Lagged ODE (t-1)	0.201*	0.184*	0.164
	[0.0968]	[0.0903]	[0.0881]
Lagged ODE (t-2)	0.244**	0.248**	0.242**
	[0.0803]	[0.0872]	[0.0778]
Market capitalization of listed companies	-0.008	0.001	-0.01
	[0.0147]	[0.0174]	[0.0157]
Constant	8.98	0.847	-10.44
	[25.7329]	[23.8074]	[24.3029]
Number of countries	41	41	41
Observations	247	247	247
Overidentification Test p-value	0.3899	0.1969	0.2708
AR(1) p-value	0.0001	0.0002	0.0002
AR(2) p-value	0.8406	0.7343	0.6404
AR(3) p-value	0.5702	0.5832	0.6138

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

AR: Arellano and Bond Test of first- (1), second-(2), and third-order (3) serial correlation in the disturbances

Table III. Summary of sensitivity analysis including variations in the baseline specifications

	Business regulation	*Labour market regulation*	*Credit market regulation*	*Credit market regulation interactions*
Baseline	1.5040	1.6510	2.968**	
	[0.8967]	[1.2942]	[0.9312]	
including bas_edu	1.6350	1.8130	3.075**	-0.0890
	[0.9573]	[1.0686]	[1.0987]	[0.3734]
including post_edu	1.3980	0.7480	3.219**	0.0340
	[0.8702]	[0.9462]	[1.0998]	[0.318]
including r&d	1.8180	1.0880	2.771**	-0.4510
	[1.0413]	[0.9706]	[0.912]	[0.3521]
including phy_infrast	0.1720	0.4200	1.864*	0.651**
	[1.0332]	[0.8765]	[0.8365]	[0.2465]
including social_norm	1.5830	1.5920	2.780**	0.1110
	[0.9139]	[0.917]	[1.0698]	[0.2681]
including entrep_int	-0.0030	0.0680	-0.0330	0.0040
	[0.0868]	[0.0928]	[0.1023]	[0.0137]
including tea	0.2150	0.2900	0.2310	0.044*
	[0.1716]	[0.1517]	[0.1528]	[0.0195]
including estab_buss	0.3170	0.416**	0.4850	0.0380
	[0.2065]	[0.1592]	[0.2525]	[0.0374]
including perc_opp	0.8790	0.9560	1.3270	0.017**
	[0.9065]	[1.0256]	[0.7182]	[0.006]
including perc_cap	1.6400	1.4880	2.761**	-0.0120
	[0.8612]	[1.0082]	[0.9255]	[0.0118]
including fear_of_fail	1.4510	1.3730	2.775***	0.0020
	[0.8401]	[1.2969]	[0.8418]	[0.0153]
Including emp_agr	0.7580	1.1940	2.414**	0.0280
	[0.8541]	[1.192]	[0.7672]	[0.0251]
Including emp_ind	1.3260	1.1970	2.282***	0.0080
	[0.9394]	[1.2787]	[0.6853]	[0.0212]
Including emp_serv	1.4380	1.4500	2.436**	-0.0130
	[0.9067]	[1.2528]	[0.7518]	[0.0186]
Including unempl	1.2010	0.5660	2.105**	-0.079***
	[0.8061]	[1.1103]	[0.7941]	[0.0195]
Including lfpr	0.7030	0.9170	1.926***	0.0420
	[0.9643]	[1.2322]	[0.5799]	[0.0245]
Including pop1564	1.4220	1.2290	3.115**	0.0170
	[0.8217]	[1.2719]	[0.9611]	[0.0553]
Including secondary	1.5020	-0.3750	2.452**	-0.0060
	[0.9916]	[1.2523]	[0.8905]	[0.0101]
Including mean_edu	1.6320	1.5530	2.220**	-0.1690
	[0.9438]	[1.5667]	[0.6831]	[0.1383]
Including fdi	1.6120	1.3100	2.584**	0.0030
	[0.8459]	[1.0706]	[0.9618]	[0.0059]
Including credit_priv	1.2180	1.3780	2.365**	0.0000
	[0.8469]	[1.1301]	[0.8253]	[0.0045]
Including credit_fin	1.0050	1.5750	2.423**	-0.0010
	[0.8814]	[1.1514]	[0.8674]	[0.0031]

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Table IV. Summary of sensitivity analysis by groups of countries

	ODE (High-income countries)			*ODE (Emerging countries)*		
Constant	-91.753	-4.312	-58.817	-7.936	-0.894	-2.751
	[71.7812]	[69.1319]	[65.9669]	[23.0925]	[31.8246]	[35.8416]
Business regulation	-0.71			2.465**		
	[1.2659]			[0.9299]		
Labour market regulation		1.856			-0.316	
		[1.3333]			[0.9408]	
Credit market regulation			2.616**			2.822**
			[0.898]			[0.9825]
Log GDPpc	12.006	1.740	6.167	1.745	2.944	0.926
	[7.4975]	[6.9999]	[6.8769]	[2.4623]	[3.2463]	[3.8226]
Lagged ODE (t-1)	0.155	0.151	0.147	0.296**	0.278**	0.228*
	[0.0962]	[0.0915]	[0.0963]	[0.0985]	[0.0893]	[0.0964]
Lagged ODE (t-2)	0.315***	0.357***	0.322***	0.195*	0.171	0.159
	[0.0949]	[0.0884]	[0.0959]	[0.0977]	[0.0947]	[0.0875]
Market capitalization of listed companies (market_cap)	-0.018	0.006	-0.011	0.008	0.013	-0.004
	[0.0369]	[0.0361]	[0.032]	[0.0247]	[0.0277]	[0.028]
Number of countries	22	22	22	19	19	19
Observations	137	137	137	137	137	137
Overidentification Test p-value	0.2103	0.2562	0.5251	0.6178	0.4298	0.5336
AR(1) p-value	0.0022	0.0030	0.0032	0.0116	0.0120	0.0130
AR(2) p-value	0.2535	0.1570	0.2098	0.0116	0.0652	0.0923
AR(3) p-value	0.4022	0.339	0.4529	0.4873	0.4423	0.4391

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

AR: Arellano and Bond Test of first- (1), second-(2), and third-order (3) serial correlation in the disturbances.

Table V. Economic regulation and Female/Male opportunity-driven entrepreneurship ratio. Baseline models by groups of countries

	G-ODE (High-income countries)			G-ODE (Emerging countries)		
Constant	-0.723	0.067	0.081	0.569	0.350	0.610
	0.6407	0.5328	0.5294	0.4862	0.5114	0.5787
Business regulation, four-year average	-0.086			0.057*		
	0.043			0.0226		
Labour market regulation, four-year average		-0.009			0.047*	
		0.0206			0.0203	
Credit market regulation, four-year average			0.017			0.023
			0.0207			0.0186
Log GDPpc	0.218*	0.089	0.068	0.004	0.036	0.018
	0.0823	0.0522	0.0540	0.0521	0.0518	0.0621
Market capitalization of listed companies (market_cap)	0.016	0.006	0.002	-0.005	-0.017	-0.010
	0.015	0.0156	0.0144	0.0283	0.0299	0.0345
Number of countries	40	40	40	14	14	14

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.
Note 1: G-ODE refers to Female/male ODE ratio.
Note 2: in comparison with panel data analysis for ODE, data availability allows us to include Austria, Barbados, Cyprus, Czech Republic, Denmark, Finland, Hong Kong, Qatar, Saudi Arabia, South Korea, Sweden, Trinidad and Tobago, United Arab Emirates, United Kingdom and excludes Pakistan.

Online appendix

Appendix A I. Available data by country.

	Country	Years	Type of country		Country	Years	Type of country
1	Argentina	2005-2016	Emerging	22	Mexico	2010-2015	Emerging
2	Australia	2014-2016	High-income	23	Netherlands	2005-2016	High-income
3	Belgium	2005-2015	High-income	24	Norway	2005-2015	High-income
4	Brazil	2005-2016	Emerging	25	Pakistan	2010-2012	Emerging
5	Canada	2013-2016	High-income	26	Panama	2011-2016	High-income
6	Chile	2005-2016	Emerging	27	Peru	2006-2016	Emerging
7	China	2005-2016	Emerging	28	Philippines	2013-2015	Emerging
8	Colombia	2006-2016	Emerging	29	Poland	2011-2016	Emerging
9	Croatia	2005-2016	High-income	30	Portugal	2010-2016	High-income
10	France	2005-2014	High-income	31	Romania	2007-2011	Emerging
11	Germany	2008-2016	High-income	32	Russia	2008-2014	Emerging
12	Greece	2005-2016	High-income	33	Singapore	2011-2014	High-income
13	Hungary	2005-2016	Emerging	34	Slovakia	2011-2013	High-income
14	India	2006-2016	Emerging	35	Slovenia	2005-2016	High-income
15	Indonesia	2013-2016	Emerging	36	South Africa	2008-2016	Emerging
16	Ireland	2005-2016	High-income	37	Spain	2005-2016	High-income
17	Israel	2007-2010	High-income	38	Switzerland	2009-2016	High-income
18	Italy	2005-2014	High-income	39	Thailand	2005-2016	Emerging
19	Japan	2005-2014	High-income	40	Turkey	2006-2013	Emerging
20	Luxembourg	2013-2016	High-income	41	United States	2005-2016	High-income
21	Malaysia	2009-2016	Emerging				

Table A II. Components and sub-components of economic regulation

A. Business regulations
- A.01. Administrative requirements
- A.02. Bureaucracy costs
- A.03. Starting a business
- A.04. Extra payments / bribes / favouritism
- A.05. Licensing restrictions
- A.06. Cost of tax compliance

B. Labour market regulations
- B.01. Hiring regulations and minimum wage
- B.02. Hiring and firing regulations
- B.03. Centralized collective bargaining
- B.04. Hours regulations
- B.05. Mandated cost of worker dismissal
- B.06. Conscription

C. Credit market regulations
- C.01. Ownership of banks
- C.02. Private sector credit
- C.03. Interest rate controls / negative real interest rates

Source: Global Entrepreneurship Monitor (2018)

Table A III. Definitions and sources of the variables

Variable	Abbreviation	Definition	Source
Opportunity-Driven Entrepreneurship	ODE	Percentage of TEA (Total Early-stage Entrepreneurial Activity) of the adult population aged 18 - 64 who have started a business out of an opportunity. Total Early-stage Entrepreneurial Activity is the percentage of the adult population between the ages of 18 and 64 years who are in the process of starting a business or have already started a business (a nascent entrepreneur or owner-manager of a new business) which is less than 42 months old.	Global Entrepreneurship Monitor (1)
Business regulations	Br	Weighted average composed of quantifications of administrative requirements, bureaucracy costs, difficulties for starting a business, extra payments or bribes, licensing restrictions and cost of tax compliance designed to identify the extent to which regulations and bureaucratic procedures restrain entry and reduce competition in a country.	Fraser Institute (2)
Labour market regulations	Lr	Weighted average composed of quantifications of centralized collective bargaining, conscription and regulations related to hours, minimum wages and mandated cost of worker dismissal designed to measure the extent to which these guidelines affect labour market in a country.	Fraser Institute (2)
Credit market regulations	Cr	Weighted average composed of quantifications on the extent to which the banking industry is privately owned, credit is supplied to the private sector and whether controls on interest rates interfere with the credit market in a country.	Fraser Institute (2)
Log of GDP per capita based on purchasing power parity (PPP). (constant 2011 international $)	Log GDPpc	Logarithm of Gross Domestic Product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2011 international dollars.	The World Bank (3)
Market capitalization of listed domestic companies (% of GDP)	market_cap	Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values.	The World Bank (3)
Basic school entrepreneurial education and training	bas_edu	The extent to which training in creating or managing SMEs is incorporated within the education and training system at primary and secondary levels	Global Entrepreneurship Monitor (1)
Post school entrepreneurial education and training	post_edu	The extent to which training in creating or managing SMEs is incorporated within the education and training system in higher education such as vocational schools, college, business schools, etc.	Global Entrepreneurship Monitor (1)
R&D Transfer	r&d	The extent to which national research and development will lead to new commercial opportunities and is available to SMEs.	Global Entrepreneurship Monitor (1)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018);
(3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Table A III. Definitions and sources of the variables (cont.)

Variable	Abbreviation	Definition	Source
Physical Infrastructure	phy_infrast	Ease of access to physical resources—communication, utilities, transportation, land or space—at a price that does not discriminate against SMEs.	Global Entrepreneurship Monitor (1)
Cultural and Social Norms	social_norm	The extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income.	Global Entrepreneurship Monitor (1)
Entrepreneurial Intentions Rate	entrep_int	Percentage of population aged 18-64 (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within three years.	Global Entrepreneurship Monitor (1)
Total early-stage Entrepreneurial Activity (TEA) Rate	Tea	Percentage of population aged 18-64 who are either a nascent entrepreneur or owner-manager of a new business.	Global Entrepreneurship Monitor (1)
Established Business Ownership Rate	estab_business	Percentage of population aged 18-64 who are currently an owner-manager of an established business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than 42 months.	Global Entrepreneurship Monitor (1)
Perceived Opportunities Rate	perc_opp	Percentage of population aged 18-64 (individuals involved in any stage of entrepreneurial activity excluded) who see good opportunities to start a firm in the area where they live.	Global Entrepreneurship Monitor (1)
Perceived Capabilities Rate	perc_cap	Percentage of population aged 18-64 (individuals involved in any stage of entrepreneurial activity excluded) who believe they have the required skills and knowledge to start a business.	Global Entrepreneurship Monitor (1)
Fear of Failure Rate	fear_of_fail	Percentage of population aged 18-64 (individuals involved in any stage of entrepreneurial activity excluded) who indicate that fear of failure would prevent them from setting up a business.	Global Entrepreneurship Monitor (1)
Employment in agriculture (% of total employment) (modelled ILO estimate)	emp_agr	Share of employment in agriculture of total employment. Employment is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement. The agricultural sector consists of activities in agriculture, hunting, forestry and fishing, in accordance with division 1 (ISIC 2) or categories A-B (ISIC 3) or category A (ISIC 4).	The World Bank (3)
Employment in industry (% of total employment) (modelled ILO estimate)	emp_ind	Share of employment in industry of total employment. The industrial sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water), in accordance with divisions 2-5 (ISIC 2) or categories C-F (ISIC 3) or categories B-F (ISIC 4).	The World Bank (3)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018);
(3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Table A III. Definitions and sources of the variables (cont.)

Variable	Abbreviation	Definition	Source
Employment in services (% of total employment) (modelled ILO estimate)	emp_serv	Share of employment in services of total employment. The services sector consists of wholesale and retail trade and restaurants and hotels; transport, storage, and communications; financing, insurance, real estate, and business services; and community, social, and personal services, in accordance with divisions 6-9 (ISIC 2) or categories G-Q (ISIC 3) or categories G-U (ISIC 4).	The World Bank (3)
Unemployment, total (% of total labour force) (modelled ILO estimate)	Unempl	Share of the labour force that is without work but available for and seeking employment.	The World Bank (3)
Labour force participation rate, total (% of total population ages 15+) (modelled ILO estimate)	Lfpr	Proportion of the population aged 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period.	The World Bank (3)
Population ages 15-64 (% of total)	pop1564	Total population between ages 15 to 64 as a percentage of the total population. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	The World Bank (3)
School enrolment, secondary (% gross)	secondary	Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialised teachers.	The World Bank (3)
Mean years of schooling, (population aged 25 and older)	mean_edu	Average number of years of education received by people aged 25 and older, converted from educational attainment levels using official durations of each level.	United Nations Development Programme (4)
Foreign direct investment, net inflows (% of GDP)	Fdi	Net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.	The World Bank (3)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018); (3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Table A III. Definitions and sources of the variables (cont.)

Variable	Abbreviation	Definition	Source
Domestic credit to private sector (% of GDP)	credit_priv	Financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment. For some countries these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits).	The World Bank (3)
Domestic credit provided by financial sector (% of GDP)	credit_fin	Domestic credit provided by the financial sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits).	The World Bank (3)
Female/Male Opportunity-Driven TEA	G-ODE	Female/Male Opportunity-Driven TEA ratio	Global Entrepreneurship Monitor (1)
Female labour force participation rate	Flfpr	Proportion of the female population aged 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period.	The World Bank (3)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018); (3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Table A IV. Pairwise correlation matrix for variables in baseline model

	Ode	Br	Lr	Cr	lnGDP
Br	0.4742				
Lr	0.2346	0.5026			
Cr	0.3263	0.4838	0.3034		
lnGDP	0.492	0.6846	0.3293	0.3784	
market_cap	0.1808	0.3872	0.3872	0.255	0.2356

Table A V. The Phillips-Perron panel-data unit-root tests

Variable			Time trend not included		Time trend included	
			Statistic	p-value	Statistic	p-value
Opportunity-Driven Entrepreneurship (ODE)	Inverse chi-squared	P	310.773	0.000	361.499	0.000
	Inverse normal	Z	-6.519	0.000	-9.424	0.000
	Inverse logit t	L*	-11.008	0.000	-16.343	0.000
	Modified inv. chi-squared	Pm	17.864	0.000	-16.343	0.000
Business regulation	Inverse chi-squared	P	182.055	0.000	186.811	0.000
	Inverse normal	Z	-0.911	0.181	-3.029	0.001
	Inverse logit t	L*	-3.501	0.000	-5.863	0.000
	Modified inv. chi-squared	Pm	7.813	0.000	8.184	0.000
Labour market regulation	Inverse chi-squared	P	263.408	0.000	232.257	0.000
	Inverse normal	Z	-4.513	0.000	-3.285	0.001
	Inverse logit t	L*	-9.385	0.000	-8.564	0.000
	Modified inv. chi-squared	Pm	14.166	0.000	11.733	0.000
Credit market regulation	Inverse chi-squared	P	245.334	0.000	196.601	0.000
	Inverse normal	Z	-6.075	0.000	-1.895	0.029
	Inverse logit t	L*	-9.369	0.000	-6.601	0.000
	Modified inv. chi-squared	Pm	12.754	0.000	8.949	0.000
Ln GDP per capita based on purchasing power parity (GDPpc)	Inverse chi-squared	P	317.376	0.000	391.261	0.000
	Inverse normal	Z	-8.610	0.000	-8.806	0.000
	Inverse logit t	L*	-11.892	0.000	-16.595	0.000
	Modified inv. chi-squared	Pm	18.380	0.000	24.149	0.000
Market capitalization of listed domestic companies (market_cap)	Inverse chi-squared	P	238.247	0.000	271.665	0.000
	Inverse normal	Z	-4.436	0.000	-6.519	0.000
	Inverse logit t	L*	-7.705	0.000	-11.504	0.000
	Modified inv. chi-squared	Pm	12.201	0.000	14.810	0.000