Labor Market Regulation and Gendered Entrepreneurship: a Cross-National Perspective

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Abstract

This research examines the extent to which labor regulatory context matters for entrepreneurial activity under a gender perspective, using institutional economics and feminist theories as the analytical framework. We conduct a panel data analysis for 86 countries during the period 2004-2018 by differentiating between high-income and developing economies. Our findings highlight that while the links between labor regulation and entrepreneurial activity seem negligible in high-income economies, in developing economies labor flexibility is closely associated with female entrepreneurship. However, unlike the market-oriented view on the positive association between labor market flexibility and entrepreneurship, our results point out that in these economies more flexible labor regulation is related to lower early-stage female entrepreneurial activity, even though this relationship tends to vanish as the level of economic development of the country increases. This study contributes theoretically, helping to advance the analysis of gender differences in entrepreneurial activity from an institutional approach, and practically, providing evidence to policy makers on possible gender differences in the application of country-level labor market regulation in terms of entrepreneurial activity.

Plain English Summary

Our analysis reveals that the application of labor regulation, apparently formulated in a gender-neutral manner, might lead to gender differences in entrepreneurial activity, especially in developing countries. We find that the link between labor market regulation and entrepreneurship tend to weaken for men and women as the country's level of economic development increases, becoming negligible in high-income countries. However, in developing countries more flexible labor regulation is closely related to lower female early-stage entrepreneurial activity. This is because women's greater opportunity costs and risk aversion, along with gender biases that usually characterize labor markets in numerous developing economies, might prevent them from taking advantage of their capabilities and opportunities for new ventures. Consequently, improving labor regulation in these countries in aspects such as minimum wages, laws inhibiting layoffs, severity requirements or restraints on hiring and hours worked, might be particularly advisable in terms of female entrepreneurship, rather than the traditional prescription of increasing labor flexibility suggested by the liberal paradigm.

Keywords

Labor market regulation, entrepreneurship, gender, cross-country analysis

JEL classification: L26, J08, J16, B54

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1. Introduction

Entrepreneurship is a gendered activity in which men and women do not count equally (Verheul et al., 2006; Kobeissi, 2010; Poggesi et al., 2016). Female and male entrepreneurs differ in both developed and developing economies, as they do not have the same constraints or incentives when launching an entrepreneurial project (Estrin & Mickiewicz, 2011; Noguera et al., 2013).

Overall, it is accepted that entrepreneurship essentially depends on individual characteristics as well as on a general context that shapes the entrepreneurial activity, tending to differ significantly between countries depending on their level of economic development and other contextual circumstances (Acs et al., 2008, 2011; Bárcena-Martín et al., 2021)[1]. Traditionally, the specific literature has focused on studying entrepreneurship in very concrete contexts, generally associated with developed countries (Welter et al., 2017). However, in recent decades the idea that the institutional context –jointly with other contextual facets ranging from temporal (Lippmann & Aldrich, 2016) to sociocultural (Thornton et al., 2011; Morales et al., 2019)– modifies the environment, and consequently the outcomes of entrepreneurship have acquired relevance (De Vita et al., 2014; Urbano & Alvarez, 2014).

From an institutional perspective, North (1990, 2005) stresses the importance that both formal and informal aspects have in economic performance. Formal institutions include elements such as legislation and policies, while informal institutions focus on social norms, culture, attitudes

[1] Elam et al. (2019) emphasize that current prevalence rates of female entrepreneurship vary across countries according to the level of economic development: while in low-income countries the percentage of adult working-age women who are either in the process of starting a new business or have had businesses for less than 42 months –Total Entrepreneurship Activity (TEA) rate– is 10.2%, in high-income countries this rate slips to 8.4%. In comparison with men, female entrepreneurial activity is over 80% of men's TEA rate in low-income economies, while women's TEA represents less than 66% of men's in high-income countries. Thus, in low-income countries the TEA rate is greater and females account for a higher share of TEA than in high-income countries.

or values, among other aspects. The institutional approach has thus provided a wealth of evidence to understand how institutions influence entrepreneurial activity through contextualization, and which institutions are particularly relevant in terms of entrepreneurship (see, e.g., Urbano et al. 2019, for a systematic literature analysis over the last 25 years on how the institutional factors shape entrepreneurial activity).

One of the key formal institutional elements when establishing a regulatory framework to boost entrepreneurship is labor market regulation, even though the policy guidelines are not clear. Whilst earlier empirical evidence on the relationship between labor legislation and entrepreneurship shows that stringent regulation decreases individuals' likelihood of becoming entrepreneurs (Robson, 2003; Van Stel et al., 2007; Bosma, 2009; Bosma & Schutjens, 2009; Ardagna & Lusardi, 2010), other studies provide mixed evidence (Román et al., 2011; Boudreaux & Nikolaev, 2019). Most of these contributions focus on the role of labor regulation on entrepreneurship without distinction by gender, and when they delve into particular effects on female and male entrepreneurs, such as Boudreaux and Nikolaev (2019), they do not find significant gender differences in the links between labor market regulation and entrepreneurship. Thus, it is not surprising that numerous studies draw attention to specific characteristics of women entrepreneurs when participating in labor markets, such as their training or family status (e.g. the role as wife and mother) (Brush et al., 2009; Al-Dajani & Marlow, 2010; Thébaud, 2015; Elam et al., 2019), overlooking potential gendered effects of the labor regulatory framework and taking for granted that it is neutral in terms of gender equality.

In this vein, Foss et al. (2019), after reviewing a 30-year period of research on women's entrepreneurship, suggest that future analysis of this topic needs to take a closer look at the links between institutional environments and female entrepreneurship. More specifically, they point out the need to investigate the relationship between regulatory frameworks and the prevailing level of female entrepreneurial activity. In a similar line, Manolova et al. (2017) underline the contextual differences between countries and stress that future research should look deeper into how formal institutions such as regulatory bodies might impact women entrepreneurs across countries, taking into consideration that entrepreneurship is a context-specific force (Welter, 2011; Mason & Brown, 2014).

This is where this present research comes in. Given the possibility that the application of labor regulation might entail gender differences in entrepreneurial activity despite its formulation from a gender-neutral conception (Bárcena-Martín et al., 2021), this paper contributes to the literature by providing a cross-national analysis of the links between labor regulatory context and entrepreneurial activity under a gender perspective. To our knowledge, this is the first attempt to explore the different influences that labor market regulation might imply on female and male entrepreneurship across countries. We examine whether this relationship changes depending on the country's level of development. In particular, by considering entrepreneurship as an occupational choice embedded within the institutional context of prevailing labor market regulation at the country level (Kim et al., 2016), we assess the extent to which stricter labor regulatory frameworks might favor female entrepreneurship compared to male entrepreneurship across countries with different levels of economic development. We focus on

the period 2004-2018 and work with an unbalanced panel of 86 countries, consisting of 42 high income countries and 44 developing economies, which are also examined differentially in an attempt to obtain particular findings by level of economic development. We thus provide institutional theory with new evidence on the extent to which regulation of employment matters for entrepreneurial activity under a gender perspective, highlighting relevant interactions between institutional and feminist theories. Additionally, at the policy level our findings offer policy makers insights on the role of the national labor regulatory context in closing the gender gap in entrepreneurship in both developed and developing economies.

The structure of the paper is as follows. The next section provides the theoretical framework of the investigation on the basis of institutional economics and feminist theories. Section 3 describes data and methodology. Section 4 presents and discusses the results. Finally, Section 5 contains the conclusions.

2. Theoretical Framework

Institutional economics highlights how institutions can stimulate or hamper entrepreneurial activities by providing an adequate context or by imposing barriers. The diverse institutional elements (regulative, normative, cultural-cognitive) affect organizations at all their stages (Scott, 2013), so that aspects such as economic regulation, government policies or belief systems might influence each stage of the entrepreneurial process from the recognition of the opportunity to the creation of new firms (Urbano et al., 2019).

Even when institutional theory emphasizes the importance of both formal and informal dimensions in entrepreneurship, recent works suggest that informal institutions may affect entrepreneurship more strongly than formal institutions (Thornton et al., 2011; Urbano et al., 2019). The role of informal institutional factors in entrepreneurship has been largely explored (see, e.g., Hechavarría, 2016; Stephan & Pathak, 2016; Urbano et al., 2016), underlining in particular how socio-cultural factors may influence the decisions about launching an entrepreneurial project (Estrin & Mickiewicz, 2012; Urbano & Alvarez, 2014). Thus, factors such as fear of failure, perceived capabilities and perceived opportunities are considered as some of the most relevant socio-cultural drivers of entrepreneurial engagement (Arenius & Minniti, 2005; Anokhin & Schulze, 2009; Noguera et al., 2013; Aparicio et al., 2016). In the case of female entrepreneurship, these factors seem to be especially decisive, since women frequently show higher rates of fear of failure than male entrepreneurs (Koellinger et al., 2013); tend to display a reduced perception of their own entrepreneurial skills, irrespective of their real abilities; and usually present distinct socialization practices, so that their process of perceiving entrepreneurial opportunities may be different from men's (DeTienne & Chandler, 2007), influencing the rate of female entrepreneurship (Verheul et al., 2005).

However, the links between entrepreneurship and formal institutions that determine the economic regulatory framework, from labor to business, trade, investment or financial regulation, have been found to be much less clear (see, for instance, Bárcena-Martín et al., 2021). Focusing on labor market regulation, this refers to aspects of the regulatory framework of a country's labor market such as requirements concerning minimum wages, laws inhibiting layoffs, severance stipulations or measurable regulatory restraints on hiring and hours worked

(Miller et al., 2020). Overall, building a labor regulatory framework without *unnecessary impediments to entrepreneurship* (Isenberg, 2010) sounds wispy; hence, finding a balance between over- and under- labor market regulation is a challenge that should be pursued. On one hand, from a market-oriented perspective, labor market freedom seems necessary for the efficient allocation of resources to their most productive uses, and greater flexibility may be helpful for market stakeholders to acclimate to changing contexts. According to the European Commission (2017), more flexible labor regulation boosts business activity by promoting corporate growth and facilitating the adaption to changing market trends. Consequently, more flexible labor regulation helps both entrepreneurs and workers to adopt convenient and efficient choices, especially in periods of economic downturn, such as the Global Financial Crisis (2008-2012) or the more recent pandemic crisis, allowing market stakeholders to react faster to the challenges and opportunities that emerge during periods of crisis (Bjørnskov, 2016; Lithuania Free Market Institute, 2019). On the other hand, advocates of stricter labor regulation sustain that labor market flexibility allocates excessive decision-making power to employers, increasing employee vulnerability and affecting productivity (World Bank, 2018). Thus, adequate enforcement of stricter labor legislation might contribute both to improving income distribution and to reducing market failures and increasing efficiency (Ronconi, 2019).

Despite the fact that labor regulation is generally established from a gender-neutral perspective, from a gender point of view the question arises whether this regulation might entail differential effects on female and male entrepreneurship. Most feminist theories that seek to explain differences in performance by gender essentially defend equality between women and men. The main difference resides in their focus. The literature highlights three main theoretical approaches, namely feminist empiricism, feminist standpoint, and post-structural feminism (Harding, 1987; Calas & Smircich, 1996). *Feminist empiricism* states that even though women and men have the same capabilities, women are not given the same opportunities, so that if they had similar chances they would achieve equal results (Holmes, 2007). Hence, this approach focuses on discriminatory structures as the basis of women´s subordination. *Feminist standpoint* assumes that women, in contrast to men, have undergone personal experiences of how structures oppress them because of their female condition. Therefore, they have the right to interpret women´s experiences of oppression (hence the concept of 'standpoint') and the commitment to make them visible through their research (Harding, 1987). Finally, *post-structuralist feminism* is based on the idea that discrimination is rooted not just in sex, but in any social category (Hooks, 1984). Gender differences are produced through language, and 'Woman' as well as 'Gender' are social constructs developed through culture, history and geography (Holmes, 2007).

It should be emphasized that *feminist empiricism* is often used in conjunction with a liberal feminist agenda, such that overall higher economic freedom is expected to reduce gender inequality. Through its adaptation to entrepreneurship based on the work of Fischer et al. (1993), this approach usually focuses on women´s prevalence in business and their characteristics in comparison to men, contrasting specific indicators such as growth rates, company sizes, profitability or survival time (Anna et al., 2000). In this sense, the research of female and male entrepreneurial activity would fit under this perspective, even though it also has connections with certain premises of the feminist standpoint and post-structuralist feminist

theories[2]. Consistent with its liberal principles, this theoretical view holds that more flexible labor market regulation tends to contribute to reducing the entrepreneurship gap between men and women, as stringent labor market regulation might disproportionately affect women entrepreneurs (Cockburn, 1991; Marlow & Patton, 2005; Boudreaux & Nikolaev, 2019). Consequently, it could be expected that labor market freedom should contribute to giving women the same opportunities as men and balance entrepreneurship rates.

Thus, on the basis of these institutional and feminist approaches, potential adverse effects of stricter employment regulation on entrepreneurship could be expected, and not necessarily in a similar way for women and men due essentially to three main factors: risk aversion, opportunity costs, and chilling effects on new entrepreneurs.

The first factor is related to *risk aversion.* The perception of individuals when opting for an occupational choice is that stricter regulation, particularly in terms of minimum wages, laws inhibiting layoffs or mandatory severance requirements, would discourage companies from firing them if they get a paid job, which might help ensure a regular flow of income when they choose to become employees (Fu et al., 2018). Thus, potential entrepreneurs estimate the expected utility of being employed in the labor market when deciding to become either self-employed or an employee, and tend to be reluctant to enter risky environments when choosing an occupation, since they think that starting an entrepreneurial project can either succeed or fail (Campbell et al., 2017; Liebregts & Stam, 2019). That might make individuals choose paid employment rather than self-employment, reducing their entrepreneurial intentions. In terms of female entrepreneurship, women are found to be more sensitive to these contextual circumstances, since their perceived risk aversion is usually greater than men´s (Estrin & Mickiewicz 2011).

The second factor refers to employee *opportunity costs*: labor market rigidity makes people who are already enjoying stable employment more reluctant to abandon their job, given the uncertainty of returning to a similar one if something goes wrong (Stuart & Sorenson, 2003; Henrekson, 2007; Henrekson & Roine, 2007; Parker, 2007). Thus, stricter labor market regulation might discourage employees to become entrepreneurs, as they would feel they are leaving a safety cushion, i.e., imposing opportunity costs upon entrepreneurship (Liebregts & Stam 2019). Moreover, stricter regulation might lead to a self-selection of the most skilled women in the labor markets, since higher wages might increase the opportunity costs of launching an entrepreneurial project for the best-performing female workers, this being less marked in the case of men (Rosti & Chelli 2005). Consequently, less skilled women may opt to begin entrepreneurial activities (Minniti & Naudé 2010), while highly talented women are commonly less prone to launch new businesses[3] (Elam et al., 2019).

[2] Policies based on the feminist standpoint perspective might focus on changing social structures in order to cater to women´s requirements. Gender quotas to increase the representation of women on corporative boards or gender-specific business training for entrepreneurs are some examples.

[3] This fact is usually accompanied by the fewer possibilities that talented women have to reach positions of high responsibility in companies in comparison to their male peers. This way, the growing public debate and literature on the pertinence of introducing gender quotas in both public and privates spheres highlights the benefits that particularly more talented women could receive (World Bank, 2015; ILO, 2016; Paoloni & Demartini, 2016).

Finally, the third key factor has to do with the *'chilling effect' on new entrepreneurs*. Individuals who consider becoming entrepreneurs have to contemplate the prospects of succeeding as employers. The costs related to labor market regulation may act as a deterrent of their entrepreneurial intentions, as potential entrepreneurs believe said costs might considerably impact on their company's cost function (Liebregts & Stam 2019)[4]. Thus, the price of complying with the requirements of stricter labor regulation can make entry into the market of newly created companies particularly costly, stalling new entrepreneurs (Klapper et al., 2006; Van Stel et al., 2007; Román et al., 2011). Overall, women are more prone to own solo businesses, have fewer employees, and generally show lower growth aspirations in their businesses than men (Elam et al., 2019), so the chilling effect is expected to discourage more men than women, since the labor costs might have a greater impact on their businesses.

Together with the previous factors whereby labor market regulation might be expected to affect men and women differently in the prevalence rates of entrepreneurial activity, some authors stress certain specific elements. For instance, Boudreaux and Nikolaev (2019) point out that labor market regulation might influence women´s entrepreneurship particularly in low-quality jobs, as labor regulation tends to be stricter in these environments, making workers hang on to current jobs and decreasing their incentives to become self-employed or to launch new entrepreneurial projects. Hence, since women tend to be overrepresented in lower productivity sectors (Teow et al., 2018) given that social systems push women to take these jobs (Clark Muntean & Özkazanç-Pan, 2015), labor market regulation might influence women more intensely than men.

To sum up, our theoretical framework leads us to formulate the following hypotheses:

H1. Stricter labor market regulation is expected to be connected with lower rates of entrepreneurship for both men and women.

H2. Labor market flexibility is linked differently to the prevalence of female and male entrepreneurship, such that the links are stronger for women in comparison to men.

Moreover, in connection with each country-specific institutional environment, its level of economic development might also be significant in the total prevalence of female entrepreneurship rates (De Vita et al., 2014). Thus, in low-income countries women are considered as key drivers in the process of entrepreneurship related to the increase of female-headed households across the Global South, together with their essential family role (Horrell & Krishnan, 2007). This causes women to face higher opportunity costs when they turn their attention away from pressing matters to detect or seek new business opportunities (Gifford, 1998) and induces women entrepreneurs to be less likely than men to perceive business opportunities around them (Elam et al., 2019). Furthermore, sometimes the inappropriate labor regulation in many low-income countries might push women to launch entrepreneurial projects because of the nonexistence of an adequate labor market. In fact, women in low-income countries tend to show less fear of failure when compared to women in high-income economies, usually presenting higher entrepreneurship rates than in high-income countries. This is related

[4] For example, redundancy pay reduces a company´s cash-flow expectation and might enhance the risk of future economic losses (Kanniainen & Vesala 2005).

to the fact that for many women becoming entrepreneurs is the only feasible way to have a job, in addition to the fact that certain strong socio-cultural factors might reduce their access to established channels of formal employment (De Vita et al., 2014). These aspects are particularly present in the case of disadvantaged and less educated women, as the reasons behind the occupational choice of those women are quite different from the reasons of those who choose to launch an entrepreneurial activity to exploit an opportunity, even when they have access to alternative income-generating projects (Langowitz & Minniti 2007). Additionally, economic development usually goes hand in hand with a rise of real wages, which makes wage-work more interesting in comparison with self-employment. In this line, different studies (Schultz, 1990; Bregger, 1996) have traditionally pointed out what statistics corroborate: self-employment rates decrease as the level of economic development increases. Therefore, it seems relevant to analyze whether the connection between a more flexible labor market and the general prevalence of entrepreneurship by gender pointed out in H1 and H2 varies depending on the countries' level of development. This leads us to establish the following hypotheses:

H3. Stricter labor market regulation is expected to be connected with lower rates of entrepreneurship, with this relationship being moderated by the level of development of countries, such that the relationship is more intense for developing countries.

H4. Female entrepreneurial activities in developing countries tend to be particularly conditioned by labor regulation, as compared to men's.

Our work thus investigates whether changes in labor market regulation, one of the key structures of the institutional context, contributes to generating conditions in which men and women may balance entrepreneurship rates in the economically developed and developing world. On the basis of institutional economics and the liberal principles of feminist empiricism, we wonder whether less stringent regulation contributes to greater gender equality in terms of entrepreneurial activity. To the best of our knowledge, this is the first study in the literature that addresses the interplay of the labor regulatory context and entrepreneurship under a gender perspective across countries at different levels of economic development.

3. Data and Methodology

3.1. Data

Our sample consists of an unbalanced panel of 86 countries over the period 2004-2018, whose country-level data sources are the Global Entrepreneurship Monitor (GEM) –Adult Population Survey (APS)–, Heritage Foundation (HF) and World Development Indicators (WDI). The sample of countries includes 42 high-income countries and 44 developing countries (middle- and low-income economies) across the globe (see Table A1 of the Online Appendix).

3.1.1. Dependent variable

We use Global Entrepreneurship Monitor (2022) data on the Total Early-stage Entrepreneurial Activity (TEA) index by gender, labeled as *female TEA* and *male TEA*, which indicate the percentage of the adult working-age population aged 18-64 by sex in a country that is in the process of starting, or has already started, a business (a nascent entrepreneur or owner-manager of a new business) that is less than 42 months old. GEM is internationally recognized as a

trusted source of comparable data across a large variety of countries and their data on entrepreneurial activity are widely used in the literature (Reynolds et al., 2005; Urbano & Alvarez, 2014). Data used in this study collected through the APS are administered to a minimum of 2,000 adults in each economy, ensuring that they are nationally representative.

3.1.2. Explanatory variable

We take into consideration the labor freedom index provided by the Heritage Foundation (Miller et al., 2022), in association with the Wall Street Journal, on the legal and regulatory framework of a country's labor market, one of the quantitative measures on *labor flexibility* used most among scholars, policy makers, and international organizations. This measure, used in the Heritage Foundation's Index of Economic Freedom to capture labor market regulatory efficiency, includes aspects such as regulations concerning minimum wages, laws inhibiting layoffs, severance requirements, and measurable regulatory restraints on hiring and hours worked (Miller et al., 2022). Data ranges from 0 to 100, where 0 corresponds to highest restraints and 100 corresponds to the maximum level of labor market flexibility.

This variable relies on World Bank Doing Business as the main source for national level data on labor market regulation, in line with Van Stel et al. (2007) and Fu et al. (2018), who utilize the employment rigidity index from the World Bank's Ease of Doing Business (WBEDB) in their country-level analysis. Note that the Doing Business 2011 study (World Bank & International Finance Corporation, 2010) discontinued the three sub-indices of 'Employing Workers', namely the difficulty of hiring index, the rigidity of hours index, and the difficulty of redundancy index, reporting only raw data. Later, for the 2014 index the three-sub indices were reconstructed by the Heritage Foundation according to the methodology used previously by the Doing Business study.

3.1.3. Control variables

In our baseline models we use control variables from the WDI and GEM APS. From the World Bank dataset (World Bank, 2022), we include the log of Gross Domestic Product per capita (*logGDPpc*) in parity purchasing power (constant 2011 international dollar) as a proxy of the level of economic development, widely used in comparative entrepreneurship studies (Van Stel et al., 2007; Acs et al., 2008). In line with previous research (Reynolds, 2011; Hechavarría & Ingram, 2019), we also control for the annual percentage growth rate of GDP (*GDP growth*), as well as female and male labor force participation rates between ages 15-64 (*female labor force* and *male labor force*) and female and male unemployment rates (*female unemployment* and *male unemployment*). Likewise, in our model we also include the country's *population* size, taking into consideration that it might impact entrepreneurship by affecting the supply of individuals who are active in the labor force. Finally, we also use *Year* dummies in our models.

Our main explanatory variable on labor market flexibility is also interacted with the log of Gross Domestic Product per capita (*labor flexibility*logGDPpc).* Alternatively, we introduce a dummy variable indicating if it is a high-income country (*high-income country)*, which interacts with the variable labor market flexibility (*labor flexibility*high-income country)* in order to obtain further insights on the possible different links between labor flexibility and female and male entrepreneurial activity across different levels of economic development. See Table A2 of

the Online Appendix for descriptive statistics of all variables used in the baseline specifications, Table A3 for the mean values of TEA for females and males by country and Table A4 for the pairwise correlation matrix, respectively.

3.2. Methodology

Our data is an unbalanced dynamic longitudinal panel. Given the differences in context and entrepreneurship between countries, the use of panel data techniques that allow controlling for country effects not captured by the variables in the model is advisable. Dynamic panel data models account for the high persistence of the level of entrepreneurship. We formulate the following panel data model with one lag of the dependent variable by using the one-step system Generalized Method of Moments' estimator (system GMM) (Arellano & Bover, 1995; Blundell & Bond, 1998) to analyze separately female TEA and male TEA, for country c at time t:

$$TEA_{ct} = \zeta_c + \beta_1 TEA_{ct-1} + \beta_2 LF_{ct} + \beta_3\ GDP_{ct} + \ \beta_5 x_{ct} + \ \omega_{ct} \qquad (1)$$

where ζ_c represents the fixed term for each country that captures permanent individual-specific effects over time not automatically considered in the model, TEA_{ct-1} controls for short term dynamics and conditional convergence, as it is the lagged level of the variable TEA, LF_{ct} is the corresponding index of labor flexibility, GDP_{ct} is the log of Gross Domestic Product per capita, x_{ct} are control variables, and ω_{ct} is a normally distributed error term.

We extend the model presented in (1) to include a new variable, $LF_{ct} * \ GDP_{ct}$, labor market flexibility interacted with the log of Gross Domestic Product per capita, defining a second baseline specification (2) that allows qualifying conclusions obtained in model (1):

$$TEA_{ct} = \zeta_c + \beta_1 TEA_{ct-1} + \beta_2 LF_{ct} + \beta_3\ GDP_{ct} + \beta_4\, LF_{ct} * \ GDP_{ct} + \ \beta_5 x_{ct} + \ \omega_{ct} \qquad (2)$$

We extend the model presented in (2) to include a new variable, $high - income\ country$, HIC_{ct}, a dummy variable identifying high income countries (specified in Table A3 in the online Appendix), defining a third baseline specification (3).

$$TEA_{ct} = \zeta_c + \beta_1 TEA_{ct-1} + \beta_2 LF_{ct} + \beta_3\ GDP_{ct} + \ \beta_5 x_{ct} + \beta_6\ HIC_{ct} + \beta_7\, LF_{ct} * HIC_{ct} + \\ + \omega_{ct} \qquad (3)$$

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 second order serial correlation in the error term.

Notwithstanding that TEA is bounded by the unit interval, we search for the presence of unit roots. We perform a stationary analysis in order to assess the accuracy of the parameters. In particular, we consider the Phillips-Perron (Perron & Phillips, 1988) unit root test, and verify that the unit-root hypothesis is rejected (results available upon request).

4. Results and Discussion

4.1. Baseline Models

The results for equation (1) and (2), models 1 and 2 respectively, are presented in Table 1, while results for equation (3), model 3, are in Table 2. The models are properly adjusted, since the residuals in the first difference are allowed to be serially correlated (AR1). However, this assumption does not apply in the case of the second difference. In this case, the test shows statistically non-significant results for second-order autocorrelation in the second differences (AR2) and the statistics of over identifying restrictions.

To start with, in model 1 we find that more restrictive labor market regulation[5] seems to be associated with higher rates of female and male early-stage entrepreneurial activity ($\beta_2 = -0.116$ and -0.117, respectively for females and males), pointing out the importance of labor market regulation for entrepreneurial activity, irrespective of the entrepreneur's gender. Therefore, our empirical evidence does not support H1, differing from previous studies such as Robson (2003), Van Stel et al. (2007), Bosma (2009), Bosma and Schutjens (2009), or Ardagna and Lusardi (2010), which sustain that stringent labor market regulation may hinder entrepreneurship. Our results seem to indicate that stricter labor market regulation, which might discourage firms from firing but also from hiring workers, could contribute to creating a push-effect towards entrepreneurial activities despite the risk aversion of potential entrepreneurs, as their opportunity costs diminish (Golpe et al., 2008). Moreover, other studies argue that stricter labor regulation might make employers circumvent labor market policies by contracting work out via the route of dependent self-employment, a growing practice in numerous developed and developing economies (Román et al., 2011; Williams & Horodnic, 2019). Our estimates also indicate that the level of economic development (GDP) is negatively associated to entrepreneurial activity ($\beta_3 = -0.398$ and -0.395, for females and males, respectively). These results are consistent with the prevalent literature (see, e.g., Elam et al., 2019, and Bosma et al., 2020), demonstrating that higher-income countries usually present lower levels of TEA.

According to model 1, H2 would be rejected, as there are no significant differences in the relationships between labor market flexibility and female and male entrepreneurship. Nonetheless, we can qualify these conclusions by introducing an interaction between the labor market flexibility and the level of economic development variables (model 2). Our estimations highlight significant links for female entrepreneurial activity. In particular, we observe that although in principle restrictive labor market regulation seems to be associated with higher rates of female entrepreneurship ($\beta_2 = -2.621$), as economic development increases this relationship tends to smooth out ($\beta_4 = 2.477$); that is, the greater the level of development the lower the association between labor flexibility and female entrepreneurship rates. For males, there also seems to be an attenuation ($\beta_2 = -2.773$), but the association of labor force flexibility and entrepreneurship with greater economic development does not seem significant ($\beta_4 = 2.598$). Likewise, in model 2 we confirm that both female and male early-stage entrepreneurial activity tends to decrease in economies with higher GDP per capita ($\beta_3 = -2.903$ and -3.066, respectively), as in the previous model. This way, when controlling for economic development, we clearly support H2, given that the regulation of employment is linked differently to the prevalence of female and male entrepreneurship. Thus, while stricter labor market regulation is not significantly related to male entrepreneurship, a flexible labor

[5] Recall that 0 corresponds to highest restraints and 100 corresponds to the maximum level of labor market flexibility.

market is linked to the lower prevalence of female entrepreneurial activity, and this association tends to lose strength when the level of development is greater. However, from a theoretical point of view, as we reject H1, our results do not seem to support the principles of the *liberal feminist agenda,* since less labor regulation does not contribute to an increase of female entrepreneurship rates. Our findings seem to go in a different direction than the principles exposed by Cockburn (1991), Marlow and Patton, (2005) or Boudreaux and Nikolaev (2019). They point to the idea that female entrepreneurship is more sensitive than male entrepreneurship to the contextual circumstances, even more in less economic developed countries, to some extent because women's perceived risk aversion and opportunity costs are greater than men´s (Estrin & Mickiewicz, 2011). Furthermore, our results would be consistent with the ideas of Minniti and Naudé (2010) and Elam et al. (2019), as generally less skilled women tend to begin entrepreneurial activities to a greater extent than better-educated women. This circumstance might arise not only within countries but also in the comparison of countries, since high-income countries usually present higher educational levels than low-income countries (Graetz et al., 2020). Likewise, contrary to what was expected in the literature review, we highlight that the 'chilling effect' on new entrepreneurs seems to condition women more than men, even when female entrepreneurs are more prone to own businesses with fewer employees and generally show lower growth aspirations in their businesses than men. This could be due to the fact that in developing countries the dissuasive effect of complying with the regulations is less pronounced than the 'push effect' towards entrepreneurship of not having a job (Clark Muntean & Özkazanç-Pan, 2015).

After this discussion, there are sufficient arguments to partially support H3 in the sense that we find that the influence of the labor regulatory context is not uniform through diverse economic levels. Nevertheless, we consider it appropriate to complement the analysis addressing a cross-country examination by differentiating by level of economic development (model 3 in Table 2). We distinguish between developed and developing economies through the inclusion of a dummy variable indicating if the country is a high-income one, as well as its interaction with the variable *labor flexibility*. Model 3 shows significant links between labor market rigidity and female entrepreneurial activity ($\beta_2 = -0.647$) for developing countries, while the interaction between labor flexibility and the high-income country dummy reveals that labor market regulation seems to have a differential significant positive effect ($\beta_7 = 0.700$) on female early-stage entrepreneurs that counteracts the negative effect and nullifies the effect of labor flexibility for female entrepreneurial activity in high-income countries. Nonetheless, labor flexibility has no significant effect for males in high-income countries ($\text{not significant } \beta_2 = -0.228$) nor in developing countries ($\text{not significtant } \beta_7 = 0.259$). These results thus corroborate H3, as the association between labor market regulation and the level of entrepreneurship is modulated by the level of development of the countries, even though the sign of this association is not the expected one, as discussed with regard to H1.

In this vein, our findings corroborate that in developing countries regulation tends to condition particularly women's entrepreneurship more intensely than men's. Thus, we support H4. It might be argued that in the developing world labor market regulation does not seem negligible in terms of entrepreneurship, especially affecting female entrepreneurs. More labor flexibility might entail a less favorable environment to start a new business for women in comparison to

men, connected not only with their different perception of risks, capacities and opportunities, but also to gender biases that are especially marked in these countries, such as gender-based occupational stereotypes (Eccles et al., 1993; Eccles, 1994) and occupational segregation (Lerner et al., 1997), leading women to engage in less uncertain traditional activities.

As the period analyzed includes the Global Financial Crisis (2008-2012), we run the same specification as model 2 for separate regressions, one for the years of the Global Financial Crisis and the other for the other years. Table 3 reveals that labor market regulation has no gender effects on the early-stage entrepreneurs in the years of the Global Financial Crisis, while for the expansionary period there are significant links between labor market flexibility and female entrepreneurial activity, once again varying with the countries' level of development. This corroborates that during financial and economic crises there is a disruption of the regular performance of the labor market, as the patterns of hiring, employment and dismissals are modified by the crisis. In our case, the estimates confirm that labor regulation is not a determining factor in female or male entrepreneurial activity in times of crisis, possibly depending on aspects such as the difficulties in accessing to credit or the uncertainty of the economic environment (Galindo-Martín et al., 2021), while in the non-crisis period labor market flexibility significantly reduces female TEA, a link that is smoothed by the country's level of development.

Table 1. Labor flexibility and female and male early-stage entrepreneurial activity. Models 1 and 2.

	Model 1				Model 2			
	female TEA		*male TEA*		*female TEA*		*male TEA*	
	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value
Lagged female TEA (t-1)	-0.051	[0.232]			0.120	[0.268]		
Lagged male TEA (t-1)			0.150	[0.126]			0.086	[0.179]
labor flexibility	-0.116**	[0.053]	-0.117**	[0.054]	-2.621***	[0.984]	-2.773	[1.871]
logGDPpc	-0.398*	[0.211]	-0.395***	[0.149]	-2.903***	[1.064]	-3.066*	[1.676]
GDPgrowth	0.010	[0.006]	0.009	[0.006]	0.006	[0.005]	0.005	[0.005]
female labor force	-0.092	[0.183]			0.035	[0.186]		
male labor force			-0.321	[0.403]			0.003	[0.428]
female unemployment	0.091	[0.396]			0.143	[0.380]		
male unemployment			-0.149	[0.223]			-0.196	[0.297]
population	-0.002	[0.002]	-0.002	[0.002]	-0.003	[0.002]	-0.004	[0.003]
*labor flexibility*logGDPpc*					2.477***	[0.919]	2.598	[1.734]
Time dummies	Yes		Yes		Yes		Yes	
Constant	0.677***	[0.235]	0.916***	[0.323]	3.111***	[1.129]	3.406*	[2.029]
Observations	576		576		576		576	
Number of countries	86		86		86		86	
Wald	145.89	0.000	136.09	0.000	145.82	0.000	83.57	0.000
n instrum	25		25		26		26	
AR1	-0.94	0.349	-2.79	0.005	-1.16	0.247	-1.69	0.092
AR2	-1.54	0.123	-0.69	0.491	-1.04	0.299	-0.85	0.396
Hansen	3.38		3.53		5.81		4.28	
Over identifying restrictions Test	0.496		0.473		0.214		0.370	
R2	0.108		0.243		0.245		0.261	

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.
AR1: Arellano-Bond Test AR (1); AR2: Arellano-Bond Test AR (2)

Table 2. Labor flexibility and female and male early-stage entrepreneurial activity. Model 3.

	Model 3			
	female TEA		*male TEA*	
	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value
Lagged female TEA (t-1)	0.247	[0.310]		
Lagged male TEA (t-1)			0.105	[0.177]
labor flexibility	-0.647**	[0.312]	-0.228	[0.338]
high-income country	2.325	[1.670]	-0.666	[1.283]
*labor flexibility*high-income country*	0.700**	[0.325]	0.259	[0.350]
logGDPpc	0.728	[0.731]	-0.607	[0.535]
*logGDPpc *high-income country*	-2.898	[1.794]	0.388	[1.403]
GDPgrowth	0.006	[0.008]	0.007	[0.005]
female labor force	0.286	[0.398]		
male labor force			0.068	[0.375]
female unemployment	-0.292	[0.574]		
male unemployment			-0.037	[0.361]
population	-0.002	[0.002]	-0.003	[0.002]
Time dummies	Yes		Yes	
Constant	-0.113	[0.669]	0.933	[0.624]
Observations	576		576	
Number of countries	86		86	
Wald	239.88	0.000	1093.58	0.000
n instrum	27		27	
AR1	-1.24	0.214	-1.75	0.080
AR2	-0.71	0.475	-0.63	0.531
Hansen	0.64		5.62	
Over identifying restrictions Test	0.887		0.132	
R2	0.132		0.412	

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.
AR1: Arellano-Bond Test AR (1); AR2: Arellano-Bond Test AR (2)

Table 3. Labor flexibility and female and male early-stage entrepreneurial activity for Global Financial Crisis and rest of years.

	Global Financial Crisis (2008-2012)				Rest of years			
	female TEA		*male TEA*		*female TEA*		*male TEA*	
	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value	Coefficient	[Std. Error] p value
Lagged female TEA (t-1)	0.127	[0.264]			0.337	[0.311]		
Lagged male TEA (t-1)			0.281	[0.244]			0.379	[0.377]
labor flexibility	-1.067	[1.747]	-0.394	[5.762]	-3.870**	[1.569]	-2.208	[2.636]
logGDPpc	-1.561	[1.873]	-0.763	[6.011]	-3.953**	[1.549]	-2.303	[2.500]
GDPgrowth	0.005	[0.007]	0.013	[0.029]	-0.004	[0.005]	-0.000	[0.005]
female labor force	-0.016	[0.449]			0.096	[0.179]		
male labor force			-0.653	[3.694]			0.049	[0.913]
female unemployment	-0.174	[0.173]			-0.251	[0.308]		
male unemployment			-0.230	[0.243]			-0.479	[0.975]
population	-0.001	[0.003]	0.000	[0.012]	-0.004*	[0.002]	-0.004*	[0.002]
labor flexibility_logGDPpc	*1.030*	[1.617]	0.408	[5.206]	*3.609***	[1.461]	2.055	[2.467]
Time dummies	Yes		Yes		Yes		Yes	
Constant	1.717	[1.916]	1.386	[3.793]	4.261***	[1.645]	2.554	[3.318]
Observations	163		163		325		325	
Number of countries	59		59		76		76	
Wald	264.76	0.000	914.69	0.000	472.14	0.000	1210.79	0.000
n instrum	16		16		20		20	
AR1	-1.6	0.111	-2.05	0.04	-1.06	0.288	-0.87	0.382
AR2	-0.56	0.575	-1.22	0.224	-2.12	0.034	-2.31	0.021
Hansen	2.42		3.04		4.42		15.96	
Over identifying restrictions Test	0.659		0.551		0.352		0.003	
R2	0.401		0.328		0.307		0.463	

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

AR1: Arellano-Bond Test AR (1); AR2: Arellano-Bond Test AR (2)

4.2. Robustness Analysis

To assess the robustness of the results, we introduce several control variables in our baseline specifications. In particular, we check for the robustness of the results of model 2 and 3 on labor flexibility by introducing additional time-varying variables (see Tables 4 and 5) that control for some additional formal and informal institutional aspects. On the one hand, we work with the main variables on formal institutions that form a country's economic regulatory framework other than labor market flexibility provided by the Heritage Foundation's Index of Economic Freedom, namely *business freedom*, *trade freedom*, *investment freedom* and *financial freedom* (for a detailed description of these variables, see Miller et al., 2022). On the other hand, we consider some of the main sociocultural drivers of entrepreneurial behavior highlighted in the literature as key informal institutional variables that affect entrepreneurial activity (see, e.g., Noguera et al., 2013): *fear of failure*, *perceived capabilities* and *perceived opportunities*. These variables, from the GEM APS, provide country-level values in relation to the extent to which individuals indicate that fear of failure prevents them from setting up a business; consider that they have the knowledge, skills and experience to start up a business; and see good opportunities to start a firm in the area where they live, respectively (Global Entrepreneurship Monitor, 2022).

Overall, we continue to observe (Table 4) that labor flexibility is negatively associated with female early-stage entrepreneurial activity, with this association diminishing as the level of economic development of countries increases, while male early-stage entrepreneurial activity is not associated with labor flexibility. Of all additional control variables used, only *financial freedom* is significant for male entrepreneurship. When we introduce a dummy variable indicating if it is a high-income country and interact it with *labor flexibility* (Table 5), results continue to show that in general labor market regulation has no effects on the early-stage entrepreneurs for males, while labor flexibility is associated to lower female early-stage entrepreneurial activity in developing countries, although this association tends to disappear in high-income countries. The only exception is when we control for perceived capabilities, where no association is found between labor flexibility and rate of entrepreneurship, neither male nor female. Regarding control variables, we find that no time varying variables are significant. This way, these results confirm that labor market regulation in high-income countries tends not to be associated to female or male entrepreneurial activity, which leads one to think that other contextual factors are more importantly linked with entrepreneurship.

Table 4. Labor flexibility and female and male early-stage entrepreneurial activity. Robustness checks for Model 2

Model 2

	labor flexibility				*labor flexibility*logGDPpc*				Time varying control variable				
	female TEA		*male TEA*		*female TEA*		*male TEA*			*female TEA*		*male TEA*	
	Coeff.	[Std. Error]	Coeff	[Std. Error]	Coeff	[Std. Error]	Coeff	[Std. Error]		Coeff	[Std. Error]	Coeff	[Std. Error]
Robustness 1	-2.429**	[1.017]	-2.333	[1.552]	2.309**	[0.954]	2.202	[1.444]	*business_freedom*	0.005	[0.049]	-0.044	[0.082]
Robustness 2	-2.530***	[0.953]	-1.73	[1.357]	2.398***	[0.896]	1.633	[1.260]	*trade_freedom*	0.079	[0.143]	-0.173	[0.158]
Robustness 3	-2.606**	[1.019]	-2.432	[2.078]	2.459***	[0.951]	2.298	[1.929]	*investment_freedom*	-0.002	[0.050]	-0.067	[0.070]
Robustness 4	-1.616	[1.046]	-0.742	[1.560]	1.531	[0.975]	0.731	[1.471]	*financial_freedom*	-0.019	[0.072]	-0.179**	[0.089]
Robustness 5	-2.344**	[0.958]	-3.773	[2.416]	2.210**	[0.895]	3.551	[2.272]	*fear_failure*	-0.017	[0.058]	0.085	[0.105]
Robustness 6	-2.369*	[1.285]	-1.862	[3.467]	2.237*	[1.197]	1.743	[3.238]	*perceived_capabilities*	0.038	[0.083]	0.069	[0.161]
Robustness 7	-2.388***	[0.842]	-2.58	[1.654]	2.258***	[0.782]	2.42	[1.535]	*perceived_opportunities*	-0.011	[0.024]	0.012	[0.040]

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

Note: Robustness 1 includes the variable *business_freedom in Model 2*; Robustness 2 *trade_freedom;* Robustness 3 *investment_freedom;* Robustness 4 *financial_freedom;* Robustness 5 *fear_failure;* Robustness 6 *perceived_capabilities;* and Robustness 7 *perceived_opportunities.*

Table 5. Labor flexibility and female and male early-stage entrepreneurial activity. Robustness checks for Model 3

Model 3

	labor flexibility				Time varying control variable				
	female TEA		*male TEA*			*female TEA*		*male TEA*	
	Coeff.	[Std. Error]	Coeff	[Std. Error]		Coeff	[Std. Error]	Coeff	[Std. Error]
Robustness 1	-0.476*	[0.249]	-0.166	[0.207]	*business_freedom*	-0.060	[0.112]	-0.044	[0.076]
Robustness 2	-0.555*	[0.313]	-0.108	[0.212]	*trade_freedom*	-0.134	[0.305]	-0.053	[0.214]
Robustness 3	-0.216*	[0.131]	-0.060	[0.162]	*investment_freedom*	0.002	[0.055]	-0.008	[0.059]
Robustness 4	-0.482**	[0.245]	-0.343	[0.468]	*financial_freedom*	-0.111	[0.146]	-0.330	[0.263]
Robustness 5	-0.428*	[0.252]	-0.205	[0.278]	*fear_failure*	0.100	[0.130]	0.028	[0.072]
Robustness 6	-0.632	[0.391]	-0.132	[0.290]	*perceived_capabilities*	-0.031	[0.205]	0.096	[0.111]
Robustness 7	-0.519**	[0.242]	-0.259	[0.278]	*perceived_opportunities*	-0.018	[0.040]	-0.009	[0.047]

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

Note: Robustness 1 includes the variable *business_freedom in Model 3;* Robustness 2 *trade_freedom;* Robustness 3 *investment_freedom;* Robustness 4 *financial _freedom;* Robustness 5 *fear_failure;* Robustness 6 *perceived_capabilities;* and Robustness 7 *perceived_opportunities.*

5. Conclusions

This study investigates potential gendered effects of country-level labor market regulation on entrepreneurial activity in the framework of institutional economics and feminist theories. While from a market-oriented approach it is usually assumed that there is a positive association between labor market flexibility and the level of entrepreneurial activity across countries, we demonstrate the existence of differentiated links between labor market regulation and early-stage entrepreneurial activity for women and men depending on the country's level of economic development.

According to our results, in high-income countries the links between labor flexibility and entrepreneurial activity are negligible, highlighting that in advanced economies labor market regulation, unlike other facets of context addressed by the literature, does not play a significant role in determining new ventures. In contrast, in developing countries the regulation of labor seems to be especially associated with female entrepreneurship. More flexible labor regulation is related to lower female early-stage entrepreneurial activity, even though this relationship tends to dilute as the country's level of economic development increases. Following liberal feminist theories, it would be expected that as labor market freedom increases, women might have higher incentives than men to become entrepreneurs. However, our results suggest that at low stages of development such mechanisms do not seem to work, or may even operate in the opposite direction. Thus, even though labor market freedom could contribute to giving women the same opportunities as men's, more labor flexibility might discourage women from starting new businesses. Women's greater opportunity costs and risk aversion, along with gender biases that characterize labor markets in numerous developing economies, might prevent them from taking advantage of their capabilities and opportunities for new ventures. In contrast, stringent labor market regulation, which discourages firms from firing but also from hiring workers, might contribute to reducing the high opportunity costs of potential female entrepreneurs and impelling their entrepreneurial initiatives as a form of job opportunity and empowerment in the context of developing countries. In this vein, our findings point out that the application of labor regulation apparently formulated in a gender-neutral manner might lead to gender differences in entrepreneurial activity.

Our research provides a series of implications at both theoretical and practical levels. With regard to the theoretical contribution, this work may help advance the analysis of gender differences in entrepreneurial activity from an institutional perspective, and its specific connection to the labor regulatory framework across countries in both developing and developed economies. Our results provide novel nuances to the general conclusion of the existing literature regarding the association between labor flexibility and more entrepreneurship. We move this idea forward by showing that labor market regulation, as a formal institution, can have different effects depending on the degree of development of the countries. Furthermore, despite being apparently gender-neutral, labor regulation can have differentiated effects for men and women in its application. Consequently, our study contributes to the understanding of the differences between countries in terms of the effect of a regulatory context on entrepreneurial activity, highlighting once again that, from an institutional standpoint, societies evolve as a result of different interventions but also through interactions

between diverse contexts at different levels. On the other hand, from the point of view of feminist theories, our work departs somewhat from the argumentative line of liberal feminist theories, and particularly, feminist empiricism, which postulate that state action undermines the so called 'level playing field' (Harding, 1987; Calas & Smircich, 1996). Our paper provides insights explaining that less regulation does not contribute to reducing the gender gap in entrepreneurship between men and women.

Regarding policy implications, our results reveal that improving labor regulation in aspects such as minimum wages, laws inhibiting layoffs, severance requirements or restraints on hiring and hours worked by taking into account the country-specific reality of women, especially in developing countries, might be particularly advisable in terms of female entrepreneurship, rather than the traditional prescription of increasing labor flexibility following the liberal paradigm. Those measures might lead to reducing the entrepreneurial gender gap –which might contribute to improving income distribution within countries (Ronconi, 2019)– seem to go in line with the claims made by advocates of state regulation. We add new evidence to support their demands: apart from reducing the excessive decision-making power of entrepreneurs and market failures (World Bank, 2018; Ronconi, 2019), stringent labor regulation might contribute to increase female entrepreneurial activity in developing countries. In addition, our results seem to point to the importance of the 'push effect' toward entrepreneurship that labor market regulation might produce in the developing world, a relatively novel and generally overlooked finding in the institutional literature: stricter labor market regulation might not only ensure the labor conditions of employees (Fu et al., 2018), but also might favor female entrepreneurial activity.

Recognizing that labor regulation may affect entrepreneurship of men and women differently due essentially to women's greater opportunity costs and risk aversion, additional government initiatives could also be proposed so that their interaction with the labor regulatory framework might contribute to increase the number of entrepreneurs, particularly women, in developing countries. Thus, policies supporting female entrepreneurship through media coverage via television, radio, podcasts and social media of successful female entrepreneurs can motivate them to consider entrepreneurship as a desirable career option, as Gurses and Ozcan (2015), Srinivasan and Venkatraman (2018) and Olanrewaju et al. (2020) argue. Another key line of action to promote entrepreneurship is to provide tools to identify resources and capacities to reduce the fear of failure and opportunity costs. This could be accomplished, as indicated by Leih and Teece (2016), by offering to students programs, courses and activities on entrepreneurship, from a very pragmatic perspective, with special emphasis on the role of women and gender equality. Having inspiring entrepreneurial role models as educational visitors to share their experiences is also a way to counteract the fear of failure effect (Nowinski and Haddoud, 2019 and Aparicio et al., 2021). Moreover, according to Acs et al. (2014) and De Cock et al. (2020), policies to promote entrepreneurship should pay attention to the networks that are driven by the pursuit of opportunity at the individual level, allowing the creation of new firms, in particular in developing countries. In this regard, the expansion of commercial banks seems highly advisable as a mechanism for incentive programs that provide advisory services, especially in certain low economic development contexts (Coad et al., 2016; Gai and Minniti, 2015).

Some limitations of the study must be emphasized. Regarding the sample, we work with an unbalanced panel data set, that is, countries are not followed for the same years of analysis. Thus, our findings should not be interpreted as definitive, even though we control for the year analyzed. More precise estimations by using balanced samples from a larger group of countries and longer analysis periods would provide more accurate estimators.

Furthermore, our analysis is performed at the country level, but different levels (countries, regions, individuals) can be distinguished in the analysis of entrepreneur activity and the role of the institutional context (Shinnar et al., 2012; Dheer and Lenartowicz, 2018; Krueger, 2020). In order to have a deeper understanding of the contextual drivers of entrepreneurial activity and particularly the labor regulatory framework, it would be necessary to account for the multilevel influence of individual-level and country-level, or regional-level, institutional arrangements through multilevel models that allow for interaction between factors. This estimation strategy might facilitate an analysis of how individual- and contextual-factors complement each other to explain the decision to start a new business.

Lastly, in order to provide more detailed guidance to policy makers in country-specific contexts, further research would be needed to better understand the particular factors interacting with labor market regulation in a concrete context, and the precise elements of labor regulation – from minimum wages to restraints on firing– that are more decisive in reducing gender differences in entrepreneurial activity.

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Online Appendix

Table A1. Sample of countries

High-income countries	Developing countries
1 Australia	1 Algeria
2 Barbados	2 Angola
3 Belgium	3 Argentina
4 Canada	4 Bosnia and Herzegovina
5 Chile	5 Botswana
6 Croatia	6 Brazil
7 Cyprus	7 Bulgaria
8 Denmark	8 Burkina Faso
9 Estonia	9 Cameroon
10 Finland	10 China
11 France	11 Colombia
12 Germany	12 Dominican Republic
13 Greece	13 Ecuador
14 Hungary	14 Egypt
15 Iceland	15 Ghana
16 Ireland	16 Guatemala
17 Israel	17 India
18 Italy	18 Indonesia
19 Japan	19 Iran
20 Latvia	20 Jamaica
21 Lithuania	21 Kazakhstan
22 Luxembourg	22 Lebanon
23 Netherlands	23 Madagascar
24 New Zeeland	24 Malawi
25 Norway	25 Malaysia
26 Panama	26 Mexico
27 Poland	27 Morocco
28 Portugal	28 Namibia
29 Qatar	29 Nigeria
30 Saudi Arabia	30 North Macedonia
31 Singapore	31 Pakistan
32 Slovak Republic	32 Peru
33 Slovenia	33 Philippines
34 South Korea	34 Romania
35 Spain	35 Russia
36 Sweden	36 Serbia
37 Switzerland	37 South Africa
38 Trinidad and Tobago	38 Suriname
39 United Arab Emirates	39 Thailand
40 United Kingdom	40 Tunisia
41 United States	41 Turkey
42 Uruguay	42 Uganda
	43 Vietnam
	44 Zambia

Note: Economies are divided among income groups according to 2018 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: high income, $12,375 or more; and developing countries, less than $12,375.

Table A2. Descriptive statistics

	All countries		***High-income countries***		***Developing countries***	
Variable	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
female TEA	9.1	7.0	6.4	4.0	13.6	8.6
female unemployment	9.0	6.4	8.4	5.1	9.9	8.1
female labor force	61.6	13.3	66.1	8.6	53.9	16.2
male TEA	13.3	7.3	10.9	5.1	17.5	8.5
male unemployment	7.6	5.1	7.7	4.4	7.4	6.1
male labor force	79.3	5.4	79.4	4.8	79.2	6.3
labor flexibility	61.9	14.4	63.4	15.7	59.4	11.4
logGDPpc	10.1	0.7	10.5	0.4	9.4	0.6
GDPgrowth	2.6	3.4	2.0	3.2	3.7	3.4
population	$84{,}8*10^6$	$233*10^6$	$34.7*10^6$	$62.9*10^6$	$170*10^6$	$358*10^6$

Source: Own elaboration

Table A3. Mean values for female and male TEA by country

High-income countries				Developing countries			
	Countries	**mean female TEA**	**mean male TEA**		**Countries**	**mean female TEA**	**mean male TEA**
1	Australia	0,094	0,148	1	Algeria	0,043	0,093
2	Barbados	0,166	0,197	2	Angola	0,203	0,235
3	Belgium	0,029	0,057	3	Argentina	0,116	0,166
4	Canada	0,114	0,167	4	Bosnia and Herzegovina	0,048	0,105
5	Chile	0,170	0,236	5	Botswana	0,270	0,311
6	Croatia	0,049	0,104	6	Brazil	0,156	0,164
7	Cyprus	0,058	0,089	7	Bulgaria	0,043	0,054
8	Denmark	0,030	0,061	8	Burkina Faso	0,281	0,353
9	Estonia	0,106	0,180	9	Cameroon	0,250	0,279
10	Finland	0,044	0,075	10	China	0,125	0,158
11	France	0,033	0,067	11	Colombia	0,184	0,258
12	Germany	0,035	0,061	12	Dominican Republic	0,152	0,226
13	Greece	0,048	0,089	13	Ecuador	0,275	0,298
14	Hungary	0,050	0,098	14	Egypt	0,068	0,180
15	Iceland	0,069	0,147	15	Ghana	0,281	0,236
16	Ireland	0,054	0,114	16	Guatemala	0,182	0,238
17	Israel	0,069	0,114	17	India	0,073	0,121
18	Italy	0,028	0,055	18	Indonesia	0,138	0,132
19	Japan	0,026	0,053	19	Iran	0,076	0,184
20	Latvia	0,070	0,141	20	Jamaica	0,153	0,193
21	Lithuania	0,063	0,143	21	Kazakhstan	0,103	0,114
22	Luxembourg	0,071	0,113	22	Lebanon	0,177	0,286
23	Netherlands	0,057	0,103	23	Madagascar	0,211	0,203
24	New Zeland	0,136	0,217	24	Malawi	0,274	0,288
25	Norway	0,042	0,103	25	Malaysia	0,069	0,078
26	Panama	0,138	0,157	26	Mexico	0,126	0,148
27	Poland	0,064	0,113	27	Morocco	0,046	0,098
28	Portugal	0,063	0,108	28	Namibia	0,344	0,322
29	Qatar	0,079	0,080	29	Nigeria	0,381	0,368
30	Saudi Arabia	0,081	0,129	30	North Macedonia	0,038	0,093
31	Singapore	0,067	0,111	31	Pakistan	0,015	0,187
32	Slovak Republic	0,078	0,133	32	Peru	0,224	0,259
33	Slovenia	0,034	0,078	33	Philippines	0,202	0,154
34	South Korea	0,054	0,118	34	Romania	0,054	0,108
35	Spain	0,048	0,070	35	Russia	0,034	0,050
36	Sweden	0,044	0,079	36	Serbia	0,040	0,085
37	Switzerland	0,059	0,084	37	South Africa	0,065	0,092
38	Trinidad and Tobago	0,150	0,209	38	Suriname	0,015	0,027
39	United Arab Emirates	0,080	0,098	39	Thailand	0,189	0,199
40	United Kingdom	0,049	0,097	40	Tunisia	0,041	0,082
41	United States	0,094	0,140	41	Turkey	0,051	0,133
42	Uruguay	0,099	0,183	42	Uganda	0,309	0,304
				43	Vietnam	0,155	0,134
				44	Zambia	0,407	0,391

Source: Own elaboration

Table A4. Pairwise correlation matrix

	female TEA	*female unemployment*	*female labor force*	*male TEA*	*male unemployment*	*male labor force*	*labor flexibility*	*logGDPpc*	*GDPgrowth*
female unemployment	-0.1421***								
female labor force	-0.0152	-0.3382***							
male TEA	0.9106***	-0.0862**	-0.1154***						
male unemployment	-0.2404***	0.8848***	-0.0906**	-0.2071***					
male labor force	0.237***	-0.5214***	0.3299***	0.2121***	-0.5636***				
labor flexibility	0.0422	-0.1718***	0.2264***	0.0222	-0.1506***	0.2149***			
logGDPpc	-0.595***	-0.1538***	0.3744***	-0.5576***	-0.0406	0.0883**	0.2034***		
GDPgrowth	0.2172***	-0.2146***	-0.0683	0.2082***	-0.2784***	0.1644***	0.0645	-0.2157***	
Population	0.0582	-0.168***	-0.1386***	0.0259	-0.151***	0.1274***	-0.0093	-0.2562***	0.2802***

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

Source: Own elaboration