De Jure Determinants of New Firm Formation: How the Pillars of Constitutions Influence Entrepreneurship*

by

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Abstract

This paper provides empirical evidence supporting the view that constitutions are the primary and fundamental institutional determinant of entrepreneurship. It shows that some of the provisions contained in national constitutions are positively and significantly associated to a standard measure of entrepreneurial dynamics, namely the rate of new business density. Using for 115 countries a novel dataset containing the characteristics of the constitutions enacted in the world, applying an IV-GMM treatment to deal with the endogeneity of constitutional rules, and controlling for *de facto* variables, the paper finds that provisions about the right to conduct/establish a business, the right to strike, consumer protection, anti-corruption, and compulsory education promote higher rates of new firm formation. Contrasting results are instead obtained for provisions concerning protection of intellectual property rights.

1.   Introduction

Historically some countries are characterized by a greater endowment of entrepreneurship capital that results in persistently high rates of new firm formation. This characteristic of a country might be linked to the widespread presence of individuals who come up with new ideas and put them into practice (Baumol, 2010), to the specialization in industries where the minimum efficient scale level of output is smaller (Acs and Audretsch, 1993), or to the availability of opportunities (Kirzner, 1973) and knowledge spillovers (Acs *et al.*, 2009). But there is also the possibility that the pillars of the legal and institutional systems designed in a country's constitution create a setting more or less favorable to the undertaking of entrepreneurial ventures. For example, the principles introduced by America's Founders at the Constitutional Convention sessions in 1787 to protect property rights and free markets clearly contributed to promote the conditions for the entrepreneurial dynamism lately witnessed by de Tocqueville in *On Democracy in America* (Chapter XIX): "What astonishes me in the United States is not so much the marvelous grandeur of some undertakings as the innumerable multitude of small ones".[1]

This paper studies the effect of a number of institutional principles - ranging from provisions for a counter corruption commission to the enforcement of economic rights, from the adoption of economic plans to the protection of the environment, from the national integration of ethnic communities to education - stated in the constitutional texts of 115 countries on the rate of entrepreneurship over the 2004-2013 period (the list of countries is reported in Appendix A.1). Some of these principles are among those most commonly associated to a higher propensity by individuals to start up a firm. Constitutions typically represent the highest, direct source of law. They regulate the relationship between government agencies and bodies and the citizenry. They also state the fundamentals rights a polity is willing to protect. The rules and the principles stated in a constitution are stable and the protection granted to rights strong. Requirements to amend a constitution are generally strict (supermajorities, special legal procedures), which reduces legislative discretion and makes change very onerous. That is why it is particularly interesting to study the impact of constitutional rules on the economic system. Knowing which principles foster development and growth can help countries to avoid mistakes that might be very costly. Furthermore, because of the particular status of the rights included in a constitution, the impact on economic variables is likely to be remarkable and it is important to identify it in a precise and complete manner.[2]

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[1] Cf. Larson and Winship (2005).
[2] Kelsen (1967) identifies in constitutions a source of 'higher' norms authorizing the creation of further 'lower' norms and statutes, hierarchically subordinate and that cannot oppose the higher, constitutional norms.

However, even if a country includes a given principle or right in its own constitution it might accord it different strength. Rights in a constitution might be "justiciable", meaning that they can be decided by a court or, in a nutshell, be legally enforceable. This is clearly the highest level of protection that can be granted to a right. On the other hand, rights can be simply "aspirational", which leaves little ground for their actual enforcement. This implies that the presence of a given principle or the fact that a given right is mentioned in a constitution does not imply that it is implemented *de facto*.

In order to control for the actual implementation of constitutional principles, besides considering the characteristics of constitutions and some general features of the countries, we also take into account additional country-specific factors, which are likely to influence firm demographics, our aim being to compare the impact exerted on the rate of entrepreneurship by *de jure* (constitutional variables) and *de facto* characteristics of countries' legal systems, where *de facto* variables proxy the actual state of affairs regarding either a single constitutional principle or a homogeneous group of them. [3]

Main findings show that: provisions dealing with the right to conduct/establish a business, the right to strike, consumer protection, presence of a counter-corruption commission, and compulsory education promote higher rates of new firm formation; provisions about economic planning and protection of the environment constrain new firm formation; and provisions concerning protection of intellectual property rights lead to ambiguous results. Since the Breusch-Pagan's test, the Wooldridge test and the Sargan test suggest the presence of heteroskedasticity, serial correlation and endogeneity in our data, we use a GMM treatment and adopt an instrumental variable estimation.

Particularly, institutions are endogenous and the direction of causality needs to be established carefully. On the one hand, countries endowed with institutions that favor economic activity result in higher entrepreneurial initiative. On the other hand, when a country is characterized by a high level of entrepreneurial capital, it is also more likely to develop institutions that favor entrepreneurship.

We instrument endogenous institutional variables using mortality rates in countries colonized by Europeans, ethnolinguistic fractionalization and geographic characteristics like the distance from the equator and the trade share of an economy. Such instruments, on top of being supported by sound economic arguments, are also relevant since they are strongly correlated with endogenous institutions but not correlated with the error term.

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[3] For a related study using both *de jure* and *de facto* variables see Feld and Voigt (2003).

The paper is organized as follows. Section 2 surveys the relevant literature, with special reference to the contributions dealing with the impact of constitutions on national economies. Section 3 presents the main research hypotheses and theoretical explanations. Section 4 describes the dataset and the empirical strategy. Section 5 illustrates the estimation model and the econometric strategy. Section 6 discusses the main findings. Section 7 contains the results of a robustness analysis performed to help diagnose misspecifications. Finally, Section 8 concludes with some suggestions for possible revisions/design of new constitutional texts and directions for future research.

2. Related Literature

According to Melton *et al*. (2013), the design features of constitutions, from their level of specificity to the number of rights enumerated and the clarity of their text, *do* matter in shaping the patterns of institutional development exhibited by different countries at different times.

In-depth analysis of the link between economic performance and constitutions dates back to the public choice literature analyzing the impact of different constitutional settings on the size of government, welfare expenditure and generally on the composition of public expenditure (see Buchanan and Tullock, 1962, Brennan and Buchanan, 1980, and, for a general overview, Mueller, 2003 and Voigt, 1999).

The work of the aforementioned scholars is however theoretical in nature. Until the early 2000s, very little empirical work had been done to discover the causal links between the constitutional characteristics of a country and its economic performance. This gap in the literature was filled by Persson and Tabellini (2003 and 2006). They analyze the impact that the form of government (defined as presidential system as opposed to a parliamentary system) and the electoral rule (majoritarian versus proportional) have on several economic variables dealing with fiscal policy, rent extraction by the government (perceived corruption and grafts) and economic productivity of the country (measured by labor and total factor productivity). They find that presidential systems and majoritarian electoral rules result in much lower government expenditure than parliamentary and proportional systems. Furthermore, public expenditure is definitely lower for presidential majoritarian systems than for parliamentary proportional ones. Finally, democratization promotes growth, especially when it goes hand in hand with economic liberalization.

Blume *et al*. (2009a and 2009b) extend Persson and Tabellini's study to a larger number of countries and to direct democracies. They confirm Persson and Tabellini's results partially. In their estimates, the impact of presidential systems on economic and fiscal indicators is definitely weaker,

whereas electoral rules generally maintain their effect. Moreover, direct democratic institutions influence fiscal policy and government efficiency.

Parker (2007) deals with the relationship between entrepreneurship and the law. He argues that the law influences organizational forms in entrepreneurship. For instance, high legal costs might foster entrepreneurship in the form of self-employment. Legal constraints like non-distribution of surplus, often matched to tax breaks favor social enterprises.

In this paper we deal with the impact of constitutions on entrepreneurship and, particularly, on the rate of new business formation.[4] The closest previous study is Zhang (2012), who analyzes empirically the link between institutional characteristics of a country, rent seeking and entrepreneurship.

Our paper is also related to the growing literature on the link between entrepreneurship and the development of the justice system (Quintin, 2008 and Visaria, 2009).

Judicial efficiency has a strong and statistically significant impact on the entry rate of new firms and on GDP (Chemin, 2009), while facilitating access to finance, reducing contract breach and fostering investments (Chemin, 2012). Higher judicial efficacy has a positive impact on the entry of new firms, while it leaves the exit rate unaltered (Garcia-Posada and Mora-Sanguinetti, 2015). In a study on Brazilian data, Lichand and Soares (2014) find that better access to justice affects entrepreneurship positively among individuals with higher level of education but not among those with lower educational levels. Since education is a proxy for wealth, their result seems to indicate that judicial change in Brazil pushed wealthier individuals towards entrepreneurial activities.

Desai *et al*. (2005) show that all institutional factors that affect credit markets have a significant impact on entrepreneurship in the emerging markets but not in the mature countries of Europe. More generally, regulatory burdens have a significant negative impact on economic activity (Djankov et al., 2002; van Stel et al., 2007 and Braunerhjelm et al., 2015). Particularly, product market regulations, hiring and firing costs, heavy regulations on entrepreneurial activity have a significant, negative impact on the entry of new small firms and, more generally, on firms' productivity (Scarpetta et al., 2002). A similar effect has working time regulations (Stephen *et al*., 2009).[5]

Corruption and a low endowment of moral awareness do not necessarily affect the rate of new firm formation, but rather shape the way entrepreneurial activities are carried out. This finding

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[4] The ratio of new business formation is just one of the possible variables that can be employed to measure entrepreneurship. For an explanation of the trade-off between alternative measures and for the reason why we chose to employ this particular measure in this paper, see Section 4.1 below.

[5] On regulation, firm dynamics and entrepreneurship see the Symposium published in 2015 in the *European Journal of Law and Economics*, volume 40, issue 1.

is obtained looking at the impact of the control of corruption on entrepreneurial activity (Anokhin and Schulze, 2009), at the moral awareness of entrepreneurs (Bryant, 2009), and at the influence exerted by inefficient financial and legal institutions and by weak enforcement on the likelihood of entrepreneurs to engage in corruption (Tonoyan *et al.*, 2010).

3. The Theoretical Underpinnings of the Effects of Constitutions on Entrepreneurship

Several factors affect the dynamics of entrepreneurship according to the literature. We have chosen aspects of constitutions that directly affect the main variables the literature on entrepreneurship has indicated as highly significant for the development of entrepreneurial firms in an economy. We test the impact of a set of institutional variables that define the economic environment of a country. Particularly, we take into account provisions regarding education, the consideration and protection of ethnic diversity, the protection of economic rights, and the protection of the environment.

The relationship between education and entrepreneurship has been studied with special attention to the link between human capital and individual entrepreneurs' earnings. This literature is linked to the endogenous growth literature, stressing how investments in human capital, innovation and, more generally, knowledge, foster economic growth.[6] Several studies estimate the rate of return for entrepreneurs of an extra year of education but the conclusions of these studies often diverge. According to some theories, more education has no impact on entrepreneurial earning or, in the worst case, depresses it. Other theories instead claim a positive relationship between education and earnings.

There is a general, anecdotal belief that too much education jeopardizes entrepreneurial creativity. Very successful entrepreneurs often dropped out of college or even of high school (Parker, 2009). The more you study, the story goes, the more you learn rigid mental schemes and rational arguments that suffocate your creative skill.

Signaling theory provides yet another explanation why entrepreneurs might get less education than employees. In a world of asymmetric information where abilities are private information, perspective employees try to signal their quality in the job market by acquiring more education (Spence, 1973). Given that entrepreneurs do not need signaling since they do not seek a potential employer but are self-employed, they have little incentives to invest in the formation of their human capital (Riley, 1979). These theories however explain why prospective entrepreneurs tend to invest little in education; they do not explain why education might have a low impact on entrepreneurs' earnings. Orzach and Tauman (2005) elaborate on signaling theories, presenting a

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[6]For a general and complete overview of endogenous growth theories see Aghion and Howitt (1997).

model in which individual ability is two-dimensional: on the one hand there is the human capital derived from education and on the other hand there is entrepreneurial talent. While the former is publicly observable, the latter is private information. People highly gifted in entrepreneurial talent signal such characteristic by investing little in education, thus somehow "committing" themselves not to look for a job as employees. This would be a losing strategy for untalented individuals. Therefore it represents a good signal to lenders. By gaining a preferential lane in the credit market, given their talent, these entrepreneurs have high chances of success and therefore high earnings.

According to these theories, we should expect that public investment in education has little if no impact on entrepreneurship. In any case, such impact should be negative. Particularly, in an occupational choice model, if education has low returns to entrepreneurship, we should find that education and de jure and de facto provisions about it impact negatively the rate of new business formation.

Other theories suggest a positive relationship between education and entrepreneurial earnings. Some studies argue that entrepreneurs too are screened by lenders, customers, etc. Therefore, in an adverse selection environment, they have possibly as much incentive to invest in education as employees (Parker and van Praag, 2006). Moreover, formal education might enhance the productivity of the self-employed, as well as that of employees (van Praag, 2005).

What are the predictions of empirical analysis? There seems to be a generally positive relationship between education and earnings from entrepreneurship, particularly when the endogeneity of educational choice is taken into account and an instrumental variables approach is taken. The impact of education is higher in developed countries than in developing ones. Moreover, on average, there seems to be the same return to education for the self-employed and for employees (see Parker 2009 and other studies reported therein). In line with such empirical evidence about the impact of education on entrepreneurship, we formulate the following hypothesis. Particularly, we consider two characteristics of constitutions related to education, namely, whether the constitution guarantees equal access to higher education and to what level (or year of age) the constitution makes education compulsory.

H1: The presence of special provisions regarding equal access and compulsory education in a country's constitution exerts a positive impact on the rate of new business formation.

The presence of ethnic minorities in a country and immigration has been a highly debated issue in the literature on entrepreneurship. A first, important question is whether the presence of various ethnicities has a positive impact on entrepreneurship. Some studies have pointed out positive and negative effects of the coexistence of different ethnicities on entrepreneurship (See

Parker, 2009). Generally, there is evidence that members of ethnic minority groups are subject to discrimination in paid employment, in the market for capital and in the product market. The first and the last types of discrimination would typically encourage entrepreneurship, whereas the last would impede it. Empirical studies find mixed evidence about the sign of the impact of discrimination on ethnic entrepreneurship, possibly showing that all these factors are at play and counteract each other. Discrimination in paid employment increases the attractiveness of self-employment for members of the minority group. Similarly, the presence of discrimination in the product market may facilitate self-employment within minorities. Ethnic groups may constitute enclaves in which individuals support each other economically. Within such enclaves, there might be protected niche markets catering for special needs like special clothing and food, religious goods and services. Entrepreneurs belonging to the specific ethnic group are likely to have better capacity to cater for such special needs. Clearly, discrimination in the capital market hits negatively on entrepreneurship (although it may favor the establishment of banks and other financial institutions founded by members of the discriminated group).

In theory, if the legal system of a country contains special provisions concerning the integration of ethnic minorities, such provisions would probably have the effect of reducing discrimination. As a result we could expect a positive impact on entrepreneurship if the negative effects of discrimination on entrepreneurship were predominant and a negative impact otherwise. As the negative elements seem to be predominant in importance and number (since capital market discrimination substantially reduce the opportunities to develop large firms and the positive effects from product market discrimination are likely to be small) we formulate the following hypothesis.

H2: The presence of constitutional provisions aiming at reducing ethnic fractionalization positively impacts on new business formation.

We then study the impact of two institutional characteristics that are likely to impact the rate of formation of new businesses heavily and negatively.

We first consider whether the constitution mentions the adoption of national economic plans. In a planned economy, private initiative has very little space to develop, which is likely to jeopardize entrepreneurial spirit.

H3: If a constitution mentions the adoption of national economic plans, the rate of new business formation is reduced.

We then consider whether a constitution explicitly refers to the protection and preservation of the environment. This is likely to result in the adoption of regulations constraining the behavior of firms, specifically requiring them to adopt costly procedures to avoid pollution. Such procedures

are generally characterized by economies of scale and therefore impact negatively on the profitability of small firms in particular.

H4: If a constitution explicitly mentions environmental concerns, the rate of new business formation is reduced.

Finally, we consider a group of variables classified in the dataset under the heading "Economic Rights". In this group, we find variables of different nature. The characteristic they share is their direct relationship with institutional aspects that are intrinsically connected to specific economic rights.

We include variables related to property rights and their use. In this subgroup we find variables like the presence of constitutional provisions for the right to transfer property freely *inter vivos* and the right to inherit. To our knowledge, we are the first to study the relationship between these characteristics of property rights and entrepreneurship. Our interest in these variables can be motivated as follows.

The right to transfer property freely *inter vivos* is a proxy for the existence of a secondary market for enterprises. In this respect, the presence of such legal provision represents a form of insurance for prospective entrepreneurs willing to invest in a new business venture. It also represents an institutional setting in which the value of an entrepreneurial venture can be established. A very successful enterprise can be transferred to new owners for a high price with low transaction costs, whereas some value can be extracted from an unsuccessful one, be that only the value of the assets sold separately. In either case, the existence of such right is deemed to have a positive effect on entrepreneurship.

Similarly, the possibility to inherit implies the ability for people not belonging to the entrepreneur's family of origin to obtain the control of the business. This should guarantee the best use of economic resources, enhancing the value of the firm, with consequent positive effects on the rate of return on the entrepreneur's investment and an increase in the rate of formation of new businesses.

H5: If a constitution establishes clear norms to transfer property *pre* and *post mortem*, the rate of formation of new businesses increases.

The protection of intellectual property rights is another factor of utmost importance for the formation and development of new firms. Particularly, the literature has stressed the role played by patents. In this paper, we also include trademarks and copyright. For this purpose, we develop a cumulative measure of intellectual property rights consisting of patent, copyright, and trademark.

Patents play an ambiguous role on the development of entrepreneurship. On the one hand, they have a positive value, in that they guarantee the just remuneration of R&D investment. This

fosters the establishment of new start-ups and of new small, highly technological firms (Spulber, 2014). It is in fact widely recognized that many radical innovations come from new start-ups (Zucker et al, 1998; Jorgenson, 2001). As a result, the rate of new firm formation should be positively impacted. On the other hand, however, a country with a strong protection of intellectual property is likely to be a mature country, relatively close to the technological frontier (Della Malva and Santarelli, 2016). The possibilities to innovate for new entrant firms are therefore limited, which implies a negative impact of patents on the rate of new firm formation (Acs et al., 2009).

It is also interesting to include copyright and its relationship with new firm formation in our cumulative measure of provisions concerning intellectual property rights. Traditionally, literature has disregarded it, since copyright typically protects literary, musical, artistic intellectual work. However, in most countries copyright protects computer software, and the software industry has been highly characterized by entry by start-ups (Zucker et al., 1998). Strong copyright protection has therefore encouraged on the one hand but limited on the other the development of new start-ups. The latter, negative effect is most likely to have bitten where small firms prospered by adapting existing software to the needs of other firms and private customers.

Trademark is a form of intellectual property protection that has received little attention in the literature on entrepreneurship. A trademark "is a word, symbol, or other signifier used to distinguish a good or service produced by one firm from the goods or services of other firms" (Landes and Posner, 1987). Trademarks therefore help firms to differentiate their products, creating market niches and inducing customer loyalty. They also help reducing consumers search costs, by allowing firms to build a reputation for the quality of their goods and services. Clearly, such function requires the legal protection of trademarks. If competitors could use the word or symbol identifying a firm's product or service freely, they could free ride on a firm's investment in reputation building.[7] Thus the impact of trademarks protection on entrepreneurship is positive.

We hypothesize that provisions about intellectual property rights protection negatively impact entrepreneurship. Our sample in fact includes all new firms, operating in all sectors, highly innovative and not. As mentioned above, only highly innovative sectors tend to benefit from strong protection of intellectual property, as this allows full exploitation of investment in R&D. Other sectors are constrained by protection of intellectual property rights that prevents spillovers (Acs et a.l., 2009). Being non-innovative sectors the majority, we believe that in our sample negative effects prevail.[8] Hence:

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[7] See Landes and Posner, 1987.
[8] In order to analyze the impact of IPR's on entrepreneurship, we could divide our sample per sectors, separating highly innovative sectors from other sectors. We should then observe a positive impact on the former sectors and a negative impact on the latter. This study is however beyond the scope of our paper and is left for future research.

H6: The protection of intellectual property rights in the constitution has a negative effect on the rate of new firm formation.

Furthermore, we consider other institutional characteristics that might facilitate new firm formation. We analyze whether the explicit inclusion in the legal system of a provision protecting the right to a free and competitive market facilitates entrepreneurship. We consider whether the constitution mentions the right to establish and conduct a business. Both these rights should exert a positive impact on entrepreneurship.

H7: The protection of market freedom and of the right to establish and conduct a business has a positive effect on entrepreneurship.

Finally, we consider factors that should depress the rate of new firm formation. The right to strike should reduce productivity of firms, thus reducing entrepreneurship.

The explicit mention of consumer protection should again have a negative impact, since in practice it is likely to force complex and costly warranty contracts and in general pushes firms to provide high quality.

In general, all these provisions, like the provisions about environment protection can be considered as a regulatory burden imposed to firms in general and to new start-ups in particular. This is highly likely to reduce the rate of formation of new firms, as we argued in Section 2. Particularly, it is likely to limit the entry of new firms in legal sectors. As pointed out by Baumol (1990), too heavy regulation increase barriers to entry but this, rather than discourage entrepreneurs, determine their decision to remain in the gray sector.

H8: Explicit constitutional protection of rights to strike and consumers rights negatively impact entrepreneurship.

Another factor that is likely to have a negative impact on the rate of formation of new firms is corruption. In a very corrupt country it may be very costly to set up a new firm: bribes might be necessary to "oil the system". Moreover, generally there is a positive correlation between the complexity of bureaucratic rules and the amount of red tape and corruption.[9] If a constitution contains provisions regarding corruption, special attention is possibly devoted to contain its effects and to enforce anti-corruption measures. However, the measures of corruption control we consider regard the existence and the functioning of a counter-corruption commission.[10]

H9: The anti-corruption provisions in a constitution increase entrepreneurship.

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[9] See Mauro (1995) for the relationship between corruption and growth. Since entrepreneurship has been identified as one of the main engines of economic growth (see, among others, Baumol, 2010), a negative impact of corruption on entrepreneurship might be one of the channels explaining the negative impact of corruption on growth.

[10] Within constitutions, corruption is mentioned together with other regulatory provisions. Therefore, provisions regarding corruption deal with regulatory burdens imposed to control bribery, grafts and other behavior by bureaucrats.

4.   Data Description and Empirical Strategy

The source of information about the characteristics of constitutions, our *de jure* determinants of entrepreneurship, is represented by the *Comparative Constitutions Project: A Cross-National Historical Dataset of Written Constitutions* (henceforth CCP) (Elkins *et al*., 2009), a repository of valuable data on the formal characteristics of written constitutions for most independent states since 1789. Initially funded by the National Science Foundation and the Cline Center for Democracy at the University of Illinois, the CCP has subsequently (in 2013) developed into the Constitute project, a joint initiative with Google Ideas aimed at providing an indexed repository of constitutional text for every constitution currently in force. The CCP provides data on both form and content of constitutions and tracks their main revisions over time. It is divided into 14 sections, each of which dealing with general and specific provisions contained in a national constitution. For our analysis we used information from Sections 9.5 (Corruption), 13.5 (Economic Rights), 14.1 (Environment), 14.5 (Economic Legislation), 14.6 (Race, Ethnicity, and Language), and 14.7 (Education).

In relation to the variables aimed at capturing the effect of cultural, economic, and technological characteristics of a country on the overall process of new firm formation (our *de facto* determinants of entrepreneurship), we relied upon the World Bank Development Indicators, the Transparency International Corruption Perception Index, and the Index of Economic Freedom.

4.1 Dependent and independent variables

Entrepreneurship capital involves a national milieu of agents who are willing to create new firms. Thus, a high rate of new firm formation may signal a greater endowment of entrepreneurship capital or a positive attitude towards self-employment. In the empirical literature on entrepreneurship, the rate of new firm formation and the endowment of entrepreneurship capital have been measured in different ways (for a survey, cf. Santarelli and Vivarelli, 2007). This literature has also shown that the employment of different measures of new firm formation may produce strikingly different results in empirical analyses. In particular, two alternative approaches can be adopted to compare start-up rates across different units of analysis (for a survey, see Santarelli *et al*., 2009): the *ecological* and the *labor market* approach.

The *ecological* approach standardizes the number of entrants relative to that of active firms, the aim being to capture the magnitude of start-up activity in relation to the size of the existing population of businesses. Thus, this index can be viewed as the ratio between the founders of new firms and existing entrepreneurs. The *labor market* approach standardizes the number of new firms

with respect to the size of the workforce or working age population. It implicitly assumes that all firms are the result of individual actions, since new entrepreneurs can be viewed as individuals previously either having or being potentially interested in having a dependent job, who exploit their knowledge of production processes and market features to switch to independent work (Santarelli and Sterlacchini, 1994; Gries and Naudé, 2011). Accordingly, each individual in the labor pool is considered as a potential entrepreneur, with the potentiality to set up his own business (Audretsch and Fritsch, 1994). We believe that the labor market approach is the best way to study a country's attitude towards entrepreneurship: in fact, we study individual private initiative and how it is influenced by the institutional framework, not industrial policy. Accordingly, using data from the World Bank Group Entrepreneurship Database[11], the dependent variable is a standard measure of the total start-up activity in a country proxyied by new business density (NBD), i.e. the number of new business registrations (private, formal sector companies with limited liability) in every year in each country per 1,000 residents aged 15-64. Thus our measure is different from that employed by Acs *et al*. (2009), who used self-employed as a percentage of the labor force in their study of the relationship between knowledge spillovers and entrepreneurship in OECD countries. Our measures capture principles clearly stated in the constitutions, for each of which one or more proxies have been used. Since we only consider whether such principles are specifically introduced in the constitution, the corresponding variables are dummies attaining value 1 if the principle is mentioned in the constitution and zero otherwise.

The independent variables are listed and described in Table 1. Given the panel nature of data it interesting to separate the "within" and "between" components of variance. Typically, constitutional changes are quite rare within a single country. Moreover, the longitudinal length of our dataset is relatively small (only one decade). Therefore, the variation in the regressors is almost entirely cross-sectional, and the within standard deviations of independent variables are quite small, nearly equal zero, which indicates their low variance over time. Thus, in our estimates, we will consider a cross-section of data averaging the variables that vary across time within each country.

Table 1 - List of variables and their descriptive statistics: standard deviation is decomposed into between and within components

Variable description	Code	Mean	Std	Min	Max
New Business density overall		4.868	5.269	0.0032	44.829
between			5.038	0.027	35.318
within			1.598	-4.644	18.74
Corruption					

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[11] Since the US economy is not covered by the database, we decided to exclude this country from analysis rather than extracting the relevant data from alternative sources.

Constitution contains provisions for a counter corruption commission	corruption	0.065	0.246	0	1
between			0.224	0	1
within			0.102	-0.834	0.898

Economic legislation

Adoption of national economic plans	Economic	0.187	0.391	0	1
between	plan		0.378	0	1
within			0.096	-0.712	0.987

Economic rights

Right to transfer property freely	Property	0.161	0.367	0	1
between	transfer		0.359	0	1
within			0.078	-0.438	1.061
Inheritance rights	Inheritance	0.297	0.457	0	1
between			0.448	0	1
within			0.098	-0.602	1.197
Right to free/competitive markets	Free market	0.208	0.406	0	1
between			0.398	0	1
within			0.083	-0.691	1.108
Right to conduct/establish a business	Business	0.376	0.484	0	1
between			0.476	0	1
within			0.096	-0.523	1.276
Right to strike	Strike	0.474	0.499	0	1
between			0.492	0	1
within			0.091	-0.425	1.374
Consumer protection	Consumer	0.218	0.413	0	1
between	right		0.398	0	1
within			0.114	-0.681	1.018
Intellectual property rights	Intellectual	0.251	0.433	0	1
between	property right		0.422	0	1
within			0.100	-0.549	1.151

Environment

Protection or preservation of the environment	Environment protection	0.754	0.431	0	1
between			0.416	0	1
within			0.111	-0.145	1.554

Race, ethnicity, and language

Provisions for national integration of ethnic communities, between	Ethnic integration	0.210	0.407	0	1
			0.397	0	1
within			0.094	-0.689	1.11

Education

Equal access to higher education	Higher education	0.260	0.438	0	1
between			0.431	0	1
within			0.083	-0.639	0.96
To what level compulsory education	Compulsory education	0.499	0.636	0	2
between			0.619	0	2
within			0.149	-0.701	2.299

Control variables

Labor force participation rate (% of total population +15 years old)	Labor force	62.188	10.937	30.5	89.6
Government size: the ratio of public expenditure over GDP	Government size	16.285	7.999	2.047	104.9
Percentage of internet users (reflecting infrastructure)	Internet user	28.666	27.364	0.024	96.21
GDP per capita (log)	GDP capita	8.836	1.726	5.638	24.431

***De facto* measures**

Corruption perception index	CPI	4.104	2.081	1	9.7
Economic freedom	Eco freedom	59.484	11.251	1	89.4
CO^2 emission (tons per capita)	CO2emis	4.961	7.136	0.018	61.989
Gross intake ratio into primary education	Gross intake	108.58	19.824	44.711	237.18

To control for country-specific characteristics that are likely to either stimulate or limit the endowment of entrepreneurship capital/new business density, we consider four general features of each country as control variables: 1) the labor force participation (for population aged 15+) (*Labor force*), under the assumption that since the largest fractions of new entrepreneurs is represented by individuals previously employed as wage workers, higher levels of this variable should be associated to higher rates of new business density (Storey and Jones, 1987); 2) the ratio of public expenditures over GDP (*Government size*), as a proxy of total tax pressure and the extent of regulatory interventions in the economy (Acs *et al*., 2009); 3) a measure of the quality of the infrastructures represented by the percentage of internet users (*Internet user*), to detect whether entrepreneurs do or do not start firms before a critical mass of a strategic infrastructure is accumulated; 4) in order to shed light on the relationship between entrepreneurship and the business cycle, also GDP per capita (*GDP capita*) is added as a control variable. The measure of GDP per capita - converted into current international US Dollars using purchasing power parity rates - is drawn from the World Bank databases. To capture *de facto* characteristics of the countries that may facilitate the enforcement of the constitutional prescriptions that we are taking into account, we introduce four additional variables: i) the perceived level of corruption as reported by Transparency International (*Cpi*), as a measure of the potentially negative impact of the abuse of public or collective responsibility for private ends (Bardhan, 1997); ii) the gross intake ratio in first grade of primary education (*gross intake;* source: World Bank database), as a measure of the actual implementation of the right to education and of its impact on the formation of human capital; iii) the annual Index of Economic Freedom (Source: Heritage Foundation, http://www.heritage.org/index/) (*Eco freedom*), as a measure of the observance of the constitutional prescriptions aimed at guaranteeing the fundamental economic rights. The Index measures economic freedom on the basis of four pillars: rule of law, limited government, regulatory efficiency and open markets; and iv) the amount of carbon dioxide (CO^2) in tons per capita (*CO^2emis,* source: World Bank database), as a proxy of the actual enforcement of the constitutional prescriptions in relation to the protection of the environment.

Looking at the correlation matrix in Table A2 in the Appendix, we select some interesting and possibly counterintuitive results. The economic freedom index is negatively correlated with the constitutional variables indicating the provision of an anti-corruption committee, the adoption of national economic plans, the right to strike. It is however surprisingly negatively correlated with the right to transfer property freely, with the right to establish a business and positively correlated with perceived corruption. The gross intake ratio in primary education is negatively correlated with the right to establish a business, with right to strike, with environmental protection and with the

corruption perception index. Finally, carbon dioxide emission per capita is negatively correlated with the right to establish a business, with the right to strike, with consumer protection and, unsurprisingly, with environment protection.

To estimate the impact of constitutions on entrepreneurship, one has to recognize that institutional variables and entrepreneurship evolve jointly: not only do institutions affect entrepreneurship, but also entrepreneurship may affect institutions. For example, it may be that countries with poor entrepreneurial profile lack the resources to build effective social infrastructure. In order to address this issue of endogeneity, we need a source of exogenous variation in constitution. We follow prior studies to construct instrumental variables (IVs) for endogenous institutional variables in the four pillars of constitutions: corruption, economic rights, environment, and race, ethnicity and education.

5.   Model development

To examine the quantitative importance of differences in constitutional factors as determinants of entrepreneurship across countries, we hypothesize the following structural model:

$$(1) \qquad Y_{it} = \alpha + \beta C_{it} + \gamma X_{it} + \epsilon_{it}$$

where Y denotes net business density of country i in year t; C_{it} is constitutional variables of country i in year t; X_{it} is a set of other control variables; ϵ_{it} is the usual error term.

Before estimating the equation, the Breusch-Pagan's test is employed to check for the presence of heteroskedasticity. Thus, since the test confirms heteroskedasticity, [12] the alternative estimation technique capable of correcting for heteroskedastic errors by White's method.

We also conduct serial correlation and endogeneity tests to check for the presence of autocorrelation and endogenous variables, which would yield biased estimations for a panel data structure. The Wooldridge test for autocorrelation in panel data indicates the presence of serial correlation in our dataset[13]. Although endogeneity bias usually arises in cross-sectional studies, it is rarely considered as a factor hindering economic analysis in the case of panel data estimations like ours, since fixed effects estimation would eliminate most forms of unobserved heterogeneity. In any case, the Sargan test has been used to check whether endogeneity is likely to bias our estimation. In

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[12] $\chi^2(1) = 641.85$; p-value $= 0.0000$
[13] $F(1, 113) = 22.184$; p-value$=0.000$

fact, the Sargan test indicates the presence of endogeneity of corruption, intellectual property right, free market.[14]

Thus, several features of this framework deserve careful treatment. First, a constitution is endogenous. Economies are not exogenously endowed with the institutions and incentives that make up their entrepreneurial environment, but rather institutions are determined endogenously, perhaps influenced by the level of entrepreneurship in an economy. In this sense, robust pooled OLS estimation fails to give unbiased and efficient estimators, and instrumental variable two-staged least square (2SLS) could be a wise choice. However, since our data incur the problem of heteroskedasticity, we apply the IV generalized method of moments (GMM) technique which is suggested to give more reliable and consistent estimation results (Baum and Schaffer, 2003). The IV-GMM treatment requires the availability and validity of exogenous instruments that are correlated with the independent variables for which endogeneity has been detected, but that are uncorrelated with the measure of new business density. Second, our specification for the determination of entrepreneurship in equation (1) is parsimonious, reflecting our hypothesis that constitution is the primary and fundamental determinant of entrepreneurship. Although we try to control for various potential determinants in our control variables, it is naturally impossible to control for all the possible variables that might be correlated with our IVs and business density.

For the sake of completeness, we estimate a robust pooled OLS model, a robust IV-GMM (that is our main specification) and, as a robustness check, a time-fixed effect OLS model. Given the rigidity in the constitutional modification processes and the relatively small longitudinal length of the dataset (only one decade), the first model is a regression with a cross section of data averaging the variables that vary across time within a country. Since the endogeneity test indicates the presence of endogeneity of three variables (corruption, intellectual property rights, and access to free market) at 1 percent significant level, the second model is a robust IV-GMM. Finally, to account for unobserved time-variant factors across countries, the third model is a time-fixed effect OLS. [15]

For IVs, we follow previous studies to obtain IVs for endogenous institutional variables. The under-identification and over-identification tests do support the reliability and validity of our selected IVs. First, following Acemoglu et al. (2001), we use "settler mortality rate" in countries

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[14] $\chi^2(1) = 16.542; p-value = 0.000$

[15] The F-test fails to support the joint significance of time dummies in the equation F(9, 990) = 0.56, Prob > F = 0.8326.

colonized by Europeans.[16] Their theory rests on three premises: (i) different types of colonization policies created different sets of institutions: 'extractive states' to exploit as much of the resources of the colony as possible and 'neo-Europes' to replicate European institutions; (ii) the colonization strategy was significantly influenced by the disease environment of the colony which caused high or low mortality rate; (iii) the colonial state and institutions persisted even after independence (reliability). They find out that the mortality rates faced by settlers more than 100 years ago explain over 25 percent of the variation in current institutions. The exclusion restriction test implied in our IV regression also suggests that indeed the mortality rates of European settlers more than 100 years ago have no effect on business density, other than their effect through institutional factors.[17]

Second, following Mauro (1995), we use an index of ethnolinguistic fractionalization which measures the probability that two persons drawn at random from a country's population will not belong to the same ethnolinguistic group as an instrument.[18] The criteria for characterizing groups as ethnically separate related mainly to historical linguistic origin and no economic or political variables were considered in its construction. The higher the index, the more fragmented the country. In terms of reliability of the IV, a fragmented country may witness ethnic conflict, which potentially leads to political instability and corruption as bureaucrats may favor members of their same group. In terms of validity of the IV, the extent to which countries are fractionalized along ethnolinguistic lines is historic and exogenous by nature.

Third, following Hall and Jones (1999), we use the geographical characteristics of an economy.[19] Specifically, we use the distance from the equator. With respect to reliability, these characteristics measure the extent to which an economy is influenced by Western Europe, the first region of the world to implement broadly an institution favorable to entrepreneurship. Western Europeans were more likely to migrate to and settle in regions that were sparsely populated and broadly similar in climate to Western Europe, which points to regions far from equator. With

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[16]The first-stage reduced form regression indicates that "settler mortality rate" is significantly associated with corruption and free market competition.

[17] According to these authors, the development of political institutions around the world was influenced by the European legal system only in those countries in which the European themselves settled. This argument has been criticized by Djankov et al. (2003) and Glaeser et al. (2004). The latter, in particular, claim that the instrument used by Acemoglu et al. (2001) to solve for the endogeneity of institutions is weak, being highly correlated with education (human capital) and being education a better instrument to explain institutional quality and economic growth. Acemoglu et al. (2005) defeat such criticism by showing that Glaeser et al. (2003) results reflect the recent worldwide increase in education and democracy. Simply controlling for time effects in the regression greatly reduces the impact of education on institutions. Further robustness checks for the performance of settler mortality rate as instrument in explaining institutions is provided by Acemoglu et al. (2012).

[18]The first-stage reduced form regression indicates the significance of ethnolinguistic fractionalization in explaining free market/competition and corruption.

[19]The first-stage reduced form regression indicates the significance of latitude in explaining property rights and corruption.

respect to validity, Europeans sought to exploit areas of the world that were rich in natural resources and valuable commodities, rather than searching for places with rich entrepreneurial opportunities. On the other hand, there is no tendency today for these areas to have richer entrepreneurial climate than other regions. The distance from the equator as the absolute value of latitude in degrees divided by 90 to place it on a 0 to 1 scale, is obtained from the Global Demography Project at the University of California, Santa Barbara (Tobler et al., 1995).

Finally, we also use as an instrument the variable constructed by Frankel and Romer (1996): the (log) predicted trade share of an economy, based on a gravity model of international trade that only uses a country's population and geographical features.[20] On the one hand, their findings show that geographic features account for a major part of the variation in market openness: the extent to which countries can access to each other's market. On the other hand, geographic features are determined by nature, and should have nothing to do with impeding or inducing start-ups.

We use over-identification tests to detect whether our IVs have a direct effect on business density. The results are encouraging for our approach, and thus our exclusion restriction is plausible (see Table 3).

6.   Empirical results

Table 2 summarizes the results of our estimates and compares them with the theoretical hypotheses formulated in Section 3.

Looking at the results of the estimates more in detail, from Table 3 we observe the consistency in the general pattern of estimation results obtained from all the estimated models: the time-average OLS, the IV-GMM and the time-fixed effect.

Controlling for endogeneity in the IV-GMM estimation, we still find that differences in constitutions across countries account for much of the difference in fostering entrepreneurship around the world. It is hard to escape the conclusion that differences in institutions and government policies play a key role in generating the wide variation in entrepreneurship across countries. Particularly, the provisions for a counter corruption commission, constitutional protection of

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[20]The first-stage reduced form regression indicates the significance of the predicted trade share in explaining property rights and corruption.

free/competitive markets, right to establish a business, right to strike, and higher levels of compulsory education are all factors enhancing the propensity to start up new businesses.[21]

Conversely, prescriptions for national economic plans, constitutional protection of inheritance rights and of intellectual property rights, the preservation of the environment, and equal access to higher education are associated to lower levels of new business density.[22]

Table 2: Theoretical hypotheses and results

VARIABLES	HYPOTHESES		RESULTS
	(Sign of impact on new firm formation)		
Higher education	**H1**	+	-
Compulsory education		+	+
Ethnic integration	**H2**	+	+ insignificant
Economic plan	**H3**	-	-
Environment protection	**H4**	-	-
Property transfer	**H5**	+	+ insignificant
Inherit		+	- insignificant
IPRs	**H6**	-	-
Free market	**H7**	+	+
Right to Establish Business		+	+
Strike	**H8**	-	+
Consumer right		-	+ insignificant
Counter Corruption Comm.	**H9**	+	+

In general, the majority of our hypotheses are supported, as Table 2 shows, with some interesting exceptions. In fact, looking first at the group of variables dealing with education, hypothesis H1 posits that provisions regarding education have a positive impact on the rate of new business formation. We find instead that, while constitutional guarantees of equal access to higher education are found to inhibit entrepreneurship, higher compulsory educational levels nurture entrepreneurial efforts. Compulsory educational levels here range from primary school to high

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[21] Although positive, the coefficient of the right to establish a business variable is non- statistically significant in the OLS and in the time-FE estimate.

[22] Although negative, the coefficients of inheritance rights are non-statistically significant in the OLS and in the time-FE model, whereas the coefficient of IPR's is non-statistically significant in the time-FE model. In turn, the coefficient of equal access to higher education is negative and barely statistically significant in the OLS model and negative but non-statistically significant in the year-FE model.

school, which provide basic knowledge and skills to citizens. Basic knowledge obviously is vital to deal with business start-up and its related risks. Numerous empirical studies support the stimulating effect of education on entrepreneurship (Van Praag, 2005; Santarelli and Tran, 2013). Since most countries make education compulsory up to secondary/intermediate level, we are dealing with a level of compulsory education that certainly impacts positively on individual skills and has little if any signaling/screening power. However, equal access to higher education reflects voluntary efforts to proceed to graduate and post-graduate education. In this sense, it also implies a higher opportunity cost for entrepreneurs: they may not be willing to sacrifice stable and well-paid jobs to take over risky ventures. These findings therefore provide support to the theories presented in Section 3.

Turning to our hypothesis H2, we find that constitutional provisions regarding ethnic integration do not have a statistically significant impact on the rate of new business formation in the IV-GMM, while they have a positive impact in the time-fixed effect treatment. Hypothesis H2 is therefore only marginally supported.

As for economic legislation, countries which are forced by their constitutions to adopt national economic plans are the least entrepreneurially active, confirming our hypothesis H3. It seems that centrally planned economies are less able to provide incentives to business founders and are generally characterized by slower entrepreneurial dynamics than free market economies. Consistently with the large and positive coefficient of the *free competitive market* – showing that pro-market institutional arrangements promote entrepreneurship - the negative and statistically significant coefficient of *national economic plan* confirms that when institutions do not support economic freedom entrepreneurship is severely impeded (Bell *et al*., 2008; Parker, 2009, Ch. 15). Furthermore, provisions about the protection or preservation of the environment do not facilitate entrepreneurship, which confirms our Hypothesis H4. The negative and statistically significant coefficient of the *preservation of environment* variable suggests that new firms are less capable to face the increased costs brought in by strict environmental regulations.

We then turn to the variables defining economic rights in our dataset. While variables proxying provisions about the right to transfer property freely never get a statistically significant coefficient, inheritance rights are found to exert a statistically significant negative impact in our IV-GMM. Then our hypothesis H5 cannot be confirmed. Our results indirectly support the view that the transition problem often facing entrepreneurial/family firms cannot be overcome by simply regulating transfers of property, since it is also linked to cultural (e.g. business founders reluctance

to hand over control of their firm to an outsider) and structural (e.g. inefficiency of financial markets) factors (Burkart et al., 2003).

Less straightforward results are found for the provisions concerning the protection of intellectual property rights, here consisting of patents, copyright and trademarks. Particularly, intellectual property rights have a strong and negative impact on the rate of new business formation. The coefficient is statistically significant at a 99% confidence interval in all models but the year-FE OLS. When we break down the *property right* variable into 3 separate components and re-estimate equation (1), we found the significant and positive effect of trademarks on stimulating firm entries while the other two components (copyright and patents) remain negative[23]. This implies that registrations of new brand names (new varieties of a product) are the preferred instrument for the protection of intellectual property rights by new firms outside high-tech industries. In the law and economics literature, trademarks have been shown to be a "signal" which facilitates and enhances consumers' decisions and creates incentives for firms to produce goods of desirable qualities (Landes and Posner, 1987; Economides, 1998). Trademarks are also a standard measure of the innovative performance of firms in traditional and intermediate industries, i.e. in industries in which the rate of new firm formation tends to be higher (cf. Mendonça *et al*., 2004). However, since most of the technological activities that are likely to lead agents to apply for either patent or copyright protection are undertaken by a limited number of large firms in specific industries, copyright and patents may not adequately reflect technological opportunities available to (very) small new firms (Santarelli *et al*., 2009). In fact, as a comment to their finding that patent activity is negatively associated to new firm formation in the USA, Choi and Phan (2006) argue that patents are an indicator of venture success rather than a cause of firm formation.

The right to establish / conduct a business leads to higher rates of entrepreneurship in our IV-GMM treatment (but not in the OLS models). The provisions denoted by this right are typical of institutional settings aimed at protecting entrepreneurs from the risk of appropriation, which confirms our hypothesis H7. Consistently, the variable *free competitive market* is also statistically significant and positive. A free and competitive market obviously creates a favorable business environment and level playing field to both incumbent and nascent entrepreneurs. The coefficient of the *right to strike* variable is also positive and significant*,* which surprisingly contradicts hypothesis H8.[24] This might be due to the fact that strikes tend to occur in large companies more than in small ones, where industrial relations are based on personal and close interaction and family bonds and

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[23] Estimation results can be obtained from the authors.
[24] Significance is at the 99% confidence level in all three model specifications.

friendship often ties workers and ownership. Moreover, the fact that a constitution mentions the right to strike implies that ordinary laws will probably clearly regulate strikes, which renders industrial relations generally more transparent and less costly to manage.[25]

Consumer protection is negative, albeit insignificant (only in the year-FE it is negative and statistically significant at the 90% confidence level). The main explanation for this finding might be that although an economy with consumer protection is characterized by high consumer trust and little incidence of lemons problems (Akerlof, 1970; Landes and Posner, 1985), the costs to manage customer relationships to prevent any legal issues are obviously high, which requires firms to focus more on costly market research before starting up new ventures and to set up costly warranty contracts. This certainly deteriorates the survival of new firms and makes entry and entrepreneurship in general more challenging.

As expected, provisions for a counter-corruption commission play a crucial role in fostering a highly entrepreneurial climate within the country, which confirms H9. Corruption has been always cited as the strongest impediment to business environment and national economic growth (Mauro, 1995).

Of the four control variables, GDP per capita only is always positive and statistically significant (although just at a 95% confidence level in the IV-GMM treatment). On the one side, this is consistent with the findings by many empirical studies and confirms that, on the aggregate level, GDP cycles *do* predict the entrepreneurial cycle. High GDP per capita reflects stronger demands, which leads to abundance of emerging entrepreneurial opportunities, and in turn induces new entries to capture such opportunities (Santarelli and Tran, 2013). On the other side, it suggests that a higher ratio of public expenditure over GDP may create a more favorable environment (e.g. through subsidies and tax breaks) for new start-ups.

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[25] Another possible explanation might rely in the positive relationship that the regulation and protection of the rights to strike has with democracy. Thus, the protection of the right to strike is a consequence of good democratic institutions, which in turn cause good economic outcomes. This second explanation however seems to be weakened by the lack of correlation between the Index of Economic Freedom and the right to strike variable (correlation between the two variables is a statistically insignificant -0.03). In fact, one of the components of the Index of Economic Freedom is rule of law. Democracy and rule of law seem to go hand in hand, at least in constitutional states (see Habermas, 1995). Then, according to our data, the better the rule of law, the less likely it is that the right to strike is mentioned in the constitution.

Table 3: Characteristics of the Constitutions and Entrepreneurship

Variables	Dependent variable: New Business Density					
	OLS with time average variables[26]		IV-GMM with robust standard errors[27]		Year-FE[28]	
	Coefficient	Robust SE	Coefficient	Robust SE	Coefficient	Robust SE
Corruption						
Counter corruption commission	2.554	0.294***	13.276	5.38***	4.493	0.267***
Economic legislation						
National economic plan	-1.999	0.146***	-1.367	0.651**	-1.779	0.195***
Economic rights						
Transfer property freely	0.242	0.261	0.177	0.572	0.239	0.321
Inheritance right	-0.058	0.149	-2.127	1.021**	-0.189	0.212
Free competitive market	3.872	0.216***	5.809	2.981**	3.955	0.229***
Right to establish a business	0.110	0.223	1.229	0.538**	0.235	0.347
Right to strike	0.531	0.182***	3.319	0.677***	1.799	0.305***
Consumer protection	-0.046	0.172	-0.324	1.107	-0.441	0.238*
Intellectual property rights	-0.689	0.169***	-7.762	2.283***	-0.165	0.218
Environment						
Preservation of environment	-2.09	0.266***	-3.635	0.593***	-3.466	0.408***
Race, ethnicity & language						
Integration of ethnic communities	0.077	0.168	0.662	0.458	0.4381	0.168**
Education						
Equal access to higher education	-0.352	0.194*	-1.91	0.702***	-0.432	0.313
Compulsory educational level	0.993	0.140***	1.496	0.386***	0.561	0.151***
Control variables						
Labor force participation rate	-0.008	0.002***	-0.012	0.023	-0.021	0.009**

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[26]Given the rigidity in constitutional modification processes and the relatively small longitudinal length of the dataset, the variation in the regressors of interest is almost entirely cross-sectional. Thus we consider a cross section of data averaging the variables that vary across time within a country.

[27] Since at least two instruments should vary over time (ethnolinguistic fractionalization and trade share of the economy), the IV GMM model could overcome the time invariance in the regressors of interest.

[28] As a robustness check, we consider year-FE to account for unobserved time-variant factors across countries. This is particularly crucial given that the time span considered includes years both before and after the 2008 financial crisis.

Government size	0.003	0.012	0.062	0.019***	0.064	0.011***
Percentage of internet users	0.031	0.005***	0.017	0.012	0.003	0.007
GDP capita	0.326	0.089***	0.296	0.146**	0.146	0.058***
De facto **variables**						
Corruption perception index (CPI)	1.055	0.082***	0.282	0.174*	0.087	0.014***
Economic freedom	0.008	0.004**	0.066	0.037*	0.009	0.004**
CO^2 emission (tons per capita)	-0.079	0.015***	-0.054	0.052	-0.004	0.014
Gross intake ratio in primary education	0.011	0.001***	0.008	0.005*		
Year 2005					0.281	0.388
Year 2006					0.456	0.427
Year 2007					0.854	0.482*
Year 2008					0.504	0.443
Year 2009					0.092	0.399
Year 2010					0.258	0.421
Year 2011					0.458	0.431
Year 2012					0.635	0.445
Year 2013					0.629	0.446
Intercept	1.969	0.892**	-4.533	3.081	-7.465	1.227***
F	$(21, 1951) = 123.36$ p-value = 0.000		$(21,1107)=16.58$ p-value=0.000		$(30,1099) = 67.8$ p-value=0.000	
R-squared	0.5105				0.5142	
Under-identification test			$\chi^2(2)=13.332$ p-value=0.001			
Over-identification test (Hansen J statistic)			$\chi^2(1)=0.508$ p-value=0.476			
Endogeneity test			$\chi^2(3)=16.542$ p-value=0.000			
Observations	1973		1129		1130	

Note: *: significant at 90% level; **: significant at 95% level; ***: significant at 99% level.

The rate of labor force participation gets a negative sign in all the three treatments although the coefficient is not statistically significant in the IV-GMM treatment and is significant only at the 95% confidence level in the year-FE one. Since we give priority to the IV-GMM model in interpreting our results, we do not advance any theoretical implications for this. The coefficient of the government size variable is always positive although statistically significant (at the 99% level) only in the IV-GMM and the year-FE models. The positive impact of an increase in tax pressure and regulatory burden might imply a shift from large to small firms.[29]

Finally, quality of infrastructure has a positive impact, although non-statistically significant in the year-FE treatment and significant only at a 90% confidence level in the IV-GMM one. The interpretation is straightforward.

Finally, three of our four *de facto* variables are statistically significant in all the three treatments (at least at a 90% confidence level) and are found to exert a positive impact on the rate of new business formation. The statistically significant and positive coefficient of the corruption perception index (although only at a 90% confidence level in the IV-GMM) might be surprising, given that provisions for an anti-corruption committee also have a positive impact. However, the two variables are not correlated (a statistically insignificant -0.05, from Table A2 in the Appendix). Thus, an anti-corruption committee might foster economic activity, reducing the costs of starting a new business and possibly shifting investment from small to large firms, usually more likely to become prey for corrupt officers. At the same time, however, in countries where the social acceptance of entrepreneurial activities is high, lower levels of corruption do not necessarily result in higher rates of new firm formation but the opposite might hold true (Anokhin and Schulze, 2009).[30] In this case, investments are likely to shift from large to small businesses.

Moreover, economic freedom and gross intake into primary education have a positive impact (although both only at a 90% confidence level in the IV-GMM). The impact of economic freedom is in line with the effect of constitutional variables promoting economic rights. The positive effect of the gross intake into primary education confirms the positive impact of constitutional provisions dealing with compulsory education. Since the CO_2 emissions variable gets a negative and statistically significant coefficient only in the OLS treatment, whereas it is insignificant in the other two estimates, we may simply argue that poorer and less developed

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[29] This result differs from Acs et al (2009). Besides considering a different measure for entrepreneurship, as mentioned in Section 4.1, they also limit their analysis to a set of 19 OECD countries, where tax rates are likely to be fair compared to other "extractive" economies in developing countries. The tendency to "stay small" to avoid expropriation might be particularly strong among the latter.

[30] In fact, one may argue that culturally-based characteristics of a country may well explain a number of observed economic phenomena (cf. Guiso et al., 2006).

countries which are typically the ones with higher emissions are likely to be endowed with less entrepreneurship capital.

7.   Robustness analysis

To control for possible specification errors, country fixed effects and omitted variables, we conduct a further sensitivity analysis. Rather than adding or removing regressors,[31] we re-estimate our model for the European countries alone (Table 4). The idea here is that, since constitutions were first adopted and fully implemented in Europe, the impact of their provisions on economic activity in general and entrepreneurship in particular should be even more stable than elsewhere.[32] In general, the regression coefficients of all the three treatments (time-average OLS, IV-GMM, and year FE) estimated for European countries alone were consistent with those for the whole sample of 115 countries.

Counter-corruption provision is dropped from the regression due to collinearity. All European countries appear not to have corruption provisions in their constitutions. In general, consistent with the analysis performed for all the 115 countries included in our database, we can observe consistent positive effects of constitutional provisions regarding right to establish a business, right to strike, and compulsory educational level (although the latter only at a 90% confidence level); as well as negative effect of preservation of environment, and equal access to higher education. However, intellectual property rights seem to exert an opposite impact on business density for European countries although they are just marginally statistically significant only in the year fixed effects treatment. Provisions regulating the protection of intellectual property are therefore found not to impede new start-ups in Europe. This is likely due to the fact that these constitutional provisions were first and fully enforced in European countries, which are endowed with more developed institutional and economic infrastructure. Thus IPRs are relatively more established and stronger in exposing their fundamental benefits and enable start-ups in Europe to reap full rewards from their emerging innovations without the fear of free-riding risks.

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[31] We have also performed that type of analysis, and results are very robust (estimations are available upon request from the authors).

[32] For this reason, we decided not to use other, more artificial and heterogeneous aggregations, such as the OECD countries.

Table 4: Characteristics of the Constitutions and Entrepreneurship (European countries only)

Variables	Time-average OLS		IV-GMM		Year-FE	
	Coefficient	Robust SE	Coefficient	Robust SE	Coefficient	Robust SE
Economic legislation						
National economic plan	-3.101	0.665***	-0.252	0.694	-0.358	0.538
Economic rights						
Transfer property freely	0.161	0.504	0.547	1.052	0.396	0.552
Inheritance right	-0.002	0.389	-0.371	1.113	-0.886	0.386**
Free competitive market	1.671	0.612***	2.436	2.538	1.515	0.502***
Right to establish a business	2.736	0.704***	2.539	0.679***	1.815	0.771**
Right to strike	6.661	1.053***	3.703	0.739***	5.058	0.934***
Consumer protection	-0.115	0.595	-0.707	0.716	-0.618	0.506
Intellectual property rights	0.495	0.487	2.671	2.33	0.825	0.432*
Environment						
Preservation of environment	-7.72	0.625***	-6.989	0.753***	-6.847	0.746***
Race, ethnicity & language						
Integration of ethnic comm.	1.126	0.347***	0.383	0.42	0.805	0.333**
Education						
Equal access to higher educ.	-4.039	0.621***	-4.041	1.016***	-3.367	0.732***
Compulsory educational level	1.646	0.321***	0.974	0.552*	1.828	0.354***
Control variables						
Labor force participation rate	-0.084	0.026***	-0.052	0.036	-0.047	0.024**
Government size	0.042	0.067	0.139	0.086	0.136	0.043***
Percentage of internet users	0.097	0.025***	0.003	0.012	0.014	0.026
GDP capita	0.707	0.262***	0.014	0.626	0.554	0.316*
De facto **measures**						
Corruption perception index	3.26	0.495***	0.158	0.229	0.068	0.253
Economic freedom	0.102	0.027***	0.119	0.058**	0.171	0.039***
CO^2 emission	-0.263	0.074***	-0.049	0.074	-0.091	0.077
Gross intake ratio	0.023	0.005***	0.005	0.005	0.006	0.005
Year dummies					$F_{(9,390)} = 0.75$	
Intercept	12.704	2.529***	-6.174	3.818	-16.41	4.404***
F	$_{(20, 483)} = 46.09$***		$_{(20, 399)}=21.56$***		$_{(29, 390)} = 15.53$***	
R-squared	0.5962				0.5378	
Under-identification test			$\chi^2(3)=22.63$***			
Endogeneity test			$\chi^2(2)=11.04$***			
Observations	504		420		420	

*Note: *: significant at 90% level; **: significant at 95% level; ***: significant at 99% level.*

This leads to the consideration that IPRs and, more generally, rights included in constitutions, generally originated in Europe (particularly Western Europe) and are therefore likely to be fully enforced there. Conversely, developing countries often imported such rights in a process of legal transplantation (see Mattei, 1997 and Sacco, 1991). This renders their enforcement more problematic and uncertain, for transplanted legal rules might be at odds with other existing legal statutes and be even seen as a threat to the legal culture and history of a country. The social and political costs of enforcement might then be prohibitive. Legal traditions may be so far apart from each other that society would simply resist the new transplanted rule (see Legrand, 1997; Carbonara and Parisi, 2007). In such a case we might even witness a "countervailing effect" (Carbonara et al., 2012) of the transplanted rule, where the introduction of intellectual property might lead to less *de facto* protection, with a negative impact on both non-innovative entrepreneurship (for the reasons explained above) and innovative entrepreneurship (now paradoxically less protected).

Besides, several authors (including Posner, 2005) have suggested that IP protection has been overstretched, with the consequence that it produces negative results. Developing or recently developed countries might be more sensitive to institutional arrangements and to their changes (see Desai et al., 2005, showing that Central and Eastern European countries are significantly more sensitive to institutional arrangements than more mature Western European ones). An extremely strong protection in countries still far from the technological frontier might have a very large, negative impact that is not observed in more mature and less sensitive economies.

The two control variables which exhibited a positive and significant coefficient in the IV-GMM treatment for all countries (GDP per capita and Government size) turn out to be insignificant when we limit our analysis to European countries alone. This suggests that *a)* in countries where GDP per capita is generally high, higher values of this ratio are associated to a more concentrated industrial structure which is likely to bring about also higher entry barriers; *b)* above a certain threshold increases in the ratio of public expenditure over GDP might create overall conditions less favorable to new firm formation. Possibly, such effects in European countries are not so strong to reverse the sign of the coefficients, but enough to counteract the positive effects experienced in other, less wealthy countries.

As far as our *de facto* variables are concerned, the main differences with respect to the analysis performed for all the 115 countries is that the corruption perception index and the gross intake ratio in primary education are non-statistically significant in the IV-GMM treatment. These findings are probably indication that corruption and school dropout rates are less severe problems in Europe than they are in the developing countries.

8. Concluding remarks

This paper has provided evidence supporting the view that constitutions may influence the behavior of economic agents. Dealing with the issue of the institutional determinants of entrepreneurship and using both *de jure* and *de facto* measures, it has shown *a)* that some of the provisions contained in national constitutions that create favorable conditions for entrepreneurship are positively and significantly associated to a standard measure of entrepreneurial dynamics such as the rate of new business density, and *b)* that other provisions which may be likely to impose a burden on or to just limit entrepreneurial freedom are negatively and statistically significantly associated to new business density.

In addition to a positive analysis, our findings may also have a normative function. We identified some of the principles that constitutions should include when fostering a high entrepreneurial dynamics is a priority. Particularly, for a counter corruption commission, constitutional protection of free/competitive markets, right to establish a business, right to strike, and higher levels of compulsory education promote higher rates of new firm formation and should therefore be given high stance.

The different findings concerning the impact of provisions dealing with protection of intellectual property rights in Europe and in the whole sample provides an interesting path for future research. Such research would explore the effect of IPRs in different sectors, looking at the impact in high tech industries as compared to less innovative ones, where imitation and spillovers are likely to be more important. It would also try to understand the theoretical and empirical reasons behind the positive association between stronger protection of IPRs and entrepreneurship in countries with older constitutions and more certain enforcement (Europe). Finally, it would deal with the different effect exerted on entrepreneurship by provisions dealing with each of the three main types of IPRs protection.

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Appendix 1 – List of countries[33]

Canada; Dominican Republic; Jamaica; Mexico; Belize; Guatemala; El Salvador; Costa Rica; Panama; Colombia; Peru; Brazil; Bolivia; Chile; Argentina; Uruguay; United Kingdom; Ireland; Netherlands; Belgium; Luxembourg; France; Switzerland; Spain; Portugal; Germany; Poland; Austria; Hungary; Czech Republic; Slovak Republic; Italy; Malta; Albania; Montenegro; Macedonia; Croatia; Bosnia and Herzegovina; Slovenia; Greece; Cyprus; Bulgaria; Moldova; Romania; Russia; Estonia; Latvia; Lithuania; Ukraine; Belarus; Armenia; Georgia; Azerbaijan; Finland; Sweden; Norway; Denmark; Iceland; Niger; Burkina Faso; Sierra Leone; Ghana; Togo; Nigeria; Gabon; Democratic Republic of the Congo; Uganda; Kenya; Rwanda; Ethiopia; Zambia; Malawi; South Africa; Namibia; Lesotho; Botswana; Madagascar; Mauritius; Morocco; Algeria; Tunisia; Turkey; Iraq; Egypt; Syria; Jordan; Israel; Qatar; United Arab Emirates; Oman; Tajikistan; Kyrgyz Republic; Kazakhstan; South Korea; Japan; India; Bhutan; Pakistan; Bangladesh; Sri Lanka; Maldives; Nepal; Thailand; Cambodia; Laos; Malaysia; Singapore; Brunei; Philippines; Indonesia; Timor; Australia; New Zealand; Vanuatu; Tonga.

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[33] The World Bank Group Entrepreneurship Database covers 132 countries, but for 17 of them information on either the constitution or the control variables was not available. They have therefore been dropped from analysis.

Table A.2 – Pairwise correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	1.000																					
2	0.12*	1.000																				
3	-0.24*	-0.03	1.000																			
4	0.04	0.06*	0.03	1.000																		
5	0.01	-0.03	0.21*	0.13*	1.000																	
6	0.29*	-0.02	0.02	0.15*	0.27*	1.000																
7	-0.01	-0.06*	0.05	0.11*	0.26*	0.29*	1.000															
8	-0.003	-0.12*	0.17*	0.15*	0.12*	0.37*	0.36*	1.000														
9	0.04	-0.03	0.24*	0.13*	0.14*	0.43*	0.21*	0.38*	1.000													
10	0.12*	-0.15*	0.09*	0.05*	0.04	0.24*	0.15*	0.2*	0.29*	1.000												
11	-0.27*	0.05	0.12*	0.09*	0.16*	0.23*	0.32*	0.38*	0.27*	0.15*	1.000											
12	0.01	0.03	-0.04	-0.07*	0.12*	0.24*	0.21*	0.11*	0.17*	0.11*	0.21*	1.000										
13	-0.02	-0.03	0.15*	0.08*	0.07*	0.2*	0.31*	0.26*	0.2*	0.06*	0.21*	0.05	1.000									
14	-0.01	-0.09*	0.21*	0.07*	0.23*	0.26*	0.19*	0.44*	0.27*	0.25*	0.36*	0.22*	0.25*	1.000								
15	0.41*	-0.05	-.15*	-0.07*	-0.06	-0.04	-0.17*	-0.22*	-0.12*	-0.01	-0.32	-0.05	-0.03	-0.15*	1.000							
16	0.00	0.12*	0.04	0.15*	-0.05	-0.02	-0.09*	0.02	-0.02	-0.05	0.17*	0.04	-0.02	0.00	0.05	1.000						
17	0.12*	-0.05	-0.04	0.1*	-0.02	-0.02	-0.09*	-0.06*	-0.01	-0.06*	-0.04	-0.09*	-0.01	-0.14*	0.19*	-0.12*	1.000					
18	0.42*	-0.07*	-.18*	-0.09*	0.04	0.07*	-0.08*	-0.09*	-0.01	0.05	-0.2*	0.04	0.01	-0.04	0.81*	-0.02	0.14*	1.000				
19	0.26*	0.07*	-.12*	-0.07*	0.04	0.07*	-0.05	-0.11*	-0.00	0.01	-0.09*	-0.03	-0.02	0.06*	0.41*	-0.11*	0.04	0.48*	1.000			
20	0.47*	-0.1*	-.25*	-0.1*	-0.06*	0.1*	-0.08*	-0.03	0.02	0.01	-0.25*	0.03	-0.04	-0.07*	0.74*	0.04	0.03	0.69*	0.32*	1.000		
21	0.08*	0.06	0.04	-0.00	0.02	-0.00	-0.11*	-0.01	0.03	-0.02	-0.07*	0.02	-0.01	-0.03	-0.01	0.11*	-0.03	-0.03	-0.06	-0.02	1.000	
22	0.12*	0.06*	-.14*	-0.04	0.07*	-0.01	-0.11*	-0.21*	-0.07*	-0.06*	-0.11*	-0.03	-0.09*	-0.02	0.36*	0.03	0.03	0.53*	0.39*	0.31*	0.02	1.000

*: significant at 1% level

List of variables: 1) business density; 2) counter-corruption; 3) national economic plan; 4) property transfer; 5) inheritance; 6) free market 7) right to establish a business; 8) right to strike; 9) consumer protection; 10) property right; 11) environment protection; 12) ethnic integration; 13) access to higher education 14) compulsory educational level; 15) corruption perception index (CPI);16) laborforce; 17) government size;18) internet users; 19) GDP per capita; 20) economic freedom index; 21) gross intake ratio in primary education; 22) carbon dioxide emission per capita.

Table A.3: Variance Inflation Factors (VIFs)[34]

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
VIF	1.13	1.39	1.22	1.43	1.7	1.64	2.12	1.72	1.22	1.8	1.23	1.59	1.55	5.07	1.36	1.24	3.94	1.69	3.96	1.1	1.72
Tolerance	0.88	0.71	0.81	0.7	0.58	0.61	0.47	0.58	0.81	0.55	0.81	0.62	0.64	0.16	0.73	0.8	0.25	0.59	0.25	0.91	0.58

List of variables: 1) business density; 2) counter-corruption; 3) national economic plan; 4) property transfer; 5) inheritance; 6) free market 7) right to establish a business; 8) right to strike; 9) consumer protection; 10) property right; 11) environment protection; 12) ethnic integration; 13) access to higher education 14) compulsory educational level; 15) corruption perception index (CPI);16) labor force; 17) government size;18) internet users; 19) GDP per capita; 20) economic freedom index; 21) gross intake ratio into primary education; 22) carbon dioxide emission per capita.

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[34] Examining the tolerances of VIFs is probably superior to examining the bivariate correlations. A commonly used rule of thumb is that VIFs of 10 or higher (or equivalently, tolerances of 0.1 or less) may be reason for concern (see, among several others, O'Brien, 2007). Looking at our collinearity statistics, none of the variables has VIF greater than 6 and their tolerances are all above 0.1. Thus, collinearity should not be a serious problem for our analysis. However, some authors (albeit a minority) suggest that the tolerance threshold for VIF is 5 (Rogerson, 2001) or even 4 (Pan and Jackson, 2008). A clear and universally accepted criterion has not been indicated so far. Following Wooldridge (2013, p. 99) one may therefore conclude that "setting a cutoff value for VIF above which we conclude multicollinearity is a 'problem' is arbitrary and not especially useful".