



The Relationship Between Formal and Informal Institutions and Entrepreneurship Rates Across European Regions

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Abstract. Researchers and policymakers have been interested in promoting entrepreneurship in Europe because of its positive implications for employment, productivity, and economic growth. We use Hayton, George, and Zahra's (2002) *Model of Culture's Association with Entrepreneurship* to consider the implications of economic conditions, informal institutions (culture), and formal institutions for regional entrepreneurship rates. Measuring regional entrepreneurship as self-employment rates, our multilevel analysis shows a significant negative relationship between country-level labor market regulations (strictness) and entrepreneurship rates, a negative relationship between Individualism (vs. Collectivism) and entrepreneurship rates, and a negative relationship between regional unemployment and entrepreneurship rates across 186 European regions in 20 countries. We discuss implications for theory, linking formal and informal institutions and economic conditions with entrepreneurship, and for regional policy, particularly in Europe.

Keywords: institutions, culture, regional entrepreneurship rates, self-employment, EU.

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1. Introduction

The well-documented positive link between entrepreneurship and employment creation, productivity, and economic growth (Audretsch and Thurik, 2000; Van Praag and Versloot, 2007; Vyas and Vyas, 2019), has encouraged research about entrepreneurship in many disciplines, including economics, political science, and management (Hayton, George, and Zahra, 2002; Hayton and Cacciotti, 2013). This positive link has also guided public policy to promote entrepreneurship at the

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country and within-country regional levels. In particular, the European Union (EU) has designated promoting *regional entrepreneurship rates* as the primary tool for economic growth (Bosma and Schutjens, 2007, 2011).

We build on the societal aspects of the Hayton et al. (2002) *Model of Culture's Association with Entrepreneurship* and provide a study that integrates economic conditions and formal and informal institutions associated with entrepreneurship in a single study. Hayton and colleagues' (2002) model has strongly influenced research about international entrepreneurship (IE) across countries (Hayton and Cacciotti, 2013). The model theorizes that cultural values influence institutional and economic context as well as individual characteristics that prevail in a society. Mediated by both these societal and individual characteristics, culture influences a society's rate of entrepreneurship.

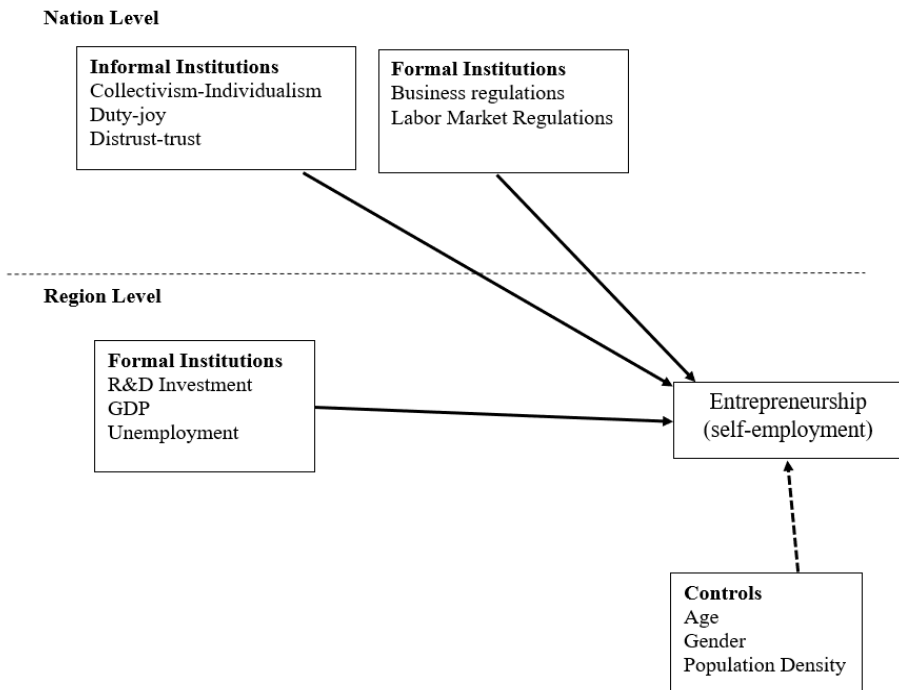
The main categories of constructs in Hayton and colleagues (2002) model continue to appear in models of societal characteristics and entrepreneurship. For example, we see special issues considering how government policies affected entrepreneurship (Ribeiro-Soriano and Galindo-Martin, 2012) and special issues focusing on the relationship between the cultural values of groups (e.g., countries, regions, organizations) and entrepreneurship (Krueger, Linan, and Nabi, 2013). Despite these special issues and calls to integrate formal and informal institutional factors that Hayton and colleagues (Hayton et al., 2002; Hayton and Cacciotti, 2013) propose to be associated with entrepreneurship in a single study, we have yet to see a study that tests the societal portion of Hayton et al.'s (2002) model.

The purposes of our empirical study require some adaptations of Hayton and colleagues' (2002) quite comprehensive model. Our model, shown in Figure 1, adapts Hayton and colleagues' (2002) model in several ways. The most substantial adaptation is that our model explicitly recognizes the nested nature of country and within-country regional factors. Even though country boundaries are commonly used to circumscribe formal and informal institutions, regional context is an important factor when examining entrepreneurship rates across regions (Acs and Audretsch, 1988; Wennekers and Thurik, 1999; Verheul et al., 2002; Wennekers, 2006). Many international entrepreneurship researchers view entrepreneurship as a 'regional event' and examine a variety of factors to understand regional differences in entrepreneurship rates (Reynolds et al. 1994; Armington and Acs 2002; Fritsch and Falck 2007; Feldman 2001; Bosma et al. 2008; Sternberg 2009; Stam 2010). Researchers also agree that both country and regional context affect an individual's decision to start a new business (Sternberg, 2009).

A second adaptation is that we use the terms informal and formal institutions rather than Hayton and colleagues' terms of cultures and institutions. Institutions include external, adaptable formal (e.g., rules, laws, constitutions) and informal (e.g., norms of behavior, conventions, self-imposed codes of conduct) constraints (Levie and Autio, 2008; Stephan and Uhlaner, 2010; Wennekers, 2006). We use institutional language partly because advances in institutional theory in the

entrepreneurship literature make the use of the term *institution* without a qualifier (i.e., formal or informal) ambiguous (Ribeiro-Soriano and Galindo-Martin, 2012; Bowen and De Clercq, 2008; Djankov et al., 2002; Van Stel, Storey, and Thurik, 2007). Treating culture as an aspect of institutions also supports Hayton and colleagues’ discussion of culture’s implications for (formal) institutions. Our final adaptation of their model is to deal exclusively with self-employment rates in contrast to their model’s inclusion of a more comprehensive list of entrepreneurship indicators such as new venture creation, small and micro business, and corporate venturing. In keeping with our study of *societal* entrepreneurship rates rather than entrepreneurship choices by *individuals*, we also adapt Hayton and colleagues’ model by treating the characteristics of individuals as explanatory variables having effects that have been documented in other studies (Hayton and Cacciotti, 2013) rather than measuring them directly.

Figure 1. Informal and Formal Institutions’ Association with Entrepreneurship



We address the need for an integrated analysis of economic context and informal and formal institutional factors at country and region levels by studying entrepreneurship rates among within-country regions in Europe. Within-country regional differences in entrepreneurship rates are well documented (Audretsch et al., 2002; Fritsch and Mueller 2004; Fritsch and Storey, 2014; Porter, 2003; Verheul et al., 2002). European Union and member country governments

implement policies intended to increase prosperity and encourage entrepreneurship both at country and region levels. As detailed in the methods section, we use data from the European Social Survey (ESS), Economic Freedom of the World Report, Eurostat, and Beugelsdijk and Welzel's (2018) cultural dimension scores derived from the World Values Survey (WVS) (Inglehart et al., 2014) and European Values Study (EVS) data to examine the relationship of informal and formal institutions with entrepreneurship rates. We use a multilevel-modeling analysis program, Hierarchical Linear Modeling (HLM, 7.03). Doing so avoids both the loss of regional information by aggregation to the country level and the duplication of country data and artificial inflation of significance levels by disaggregation country data to the within-country regional level (Peterson, Arregle, and Martin, 2012).

In the next section, we provide an occupational choice rationale for entrepreneurship rates and develop hypotheses about regional and country-level indicators affecting entrepreneurship levels across within-country regions. Then, we describe the samples and data sources and explain their use in our HLM analysis. Our concluding discussion considers which economic conditions and informal and formal institutions were found to be most important for entrepreneurship rates and suggests policy and research directions, while recognizing research limitations.

2. Literature Review and Hypotheses

Recognizing the varied definitions of entrepreneurship, we conceptualize entrepreneurship rates as an aggregate occupational choice in a society (Patzelt and Shepherd, 2011; Shinnar and Young, 2008; Stephan and Uhlaner, 2010; Wennekers, 2006) and measure it by the percentage of the workforce that is self-employed (Hofstede et al., 2004; Wildeman et al., 1998). This approach proposes that when making such an important decision as occupation choice, citizens in the aggregate are utility maximizers and decide to pursue self-employment (versus waged employment) based on the perceived returns of alternative occupations (Baker, Gedajlovic, and Lubatkin, 2005; Stephan and Uhlaner, 2010; Sternberg, 2011; Verheul et al., 2002; Wennekers, 2006). This decision does not take place in a vacuum. Individuals are embedded in country-specific and region-specific institutional arrangements and economic contexts that impact the evaluation of costs and benefits associated with employment alternatives (Baker et al., 2005; Wennekers, 2006). At the individual level, economic context affects potential entrepreneurs' evaluation of both the risks/rewards and the appropriability of those rewards from self-employment versus waged employment (Baker et al., 2005; Blau et al., 1956; Wennekers et al., 2007). State or regional governmental policies can affect economic development (Goetz and Freshwater, 2001). When these occupational choices are aggregated to the regional and country levels,

research suggests that such formal institutional differences are likely to explain differences in entrepreneurship rates (Aldrich and Wiedenmayer, 1993; Baumol, 1990; Busenitz, Gomez, and Spencer, 2000; Salimath and Cullen, 2010).

As Figure 1 indicates, entrepreneurship rates are proposed to be influenced by economic context, informal institutions, and formal institutions. We understand institutional arrangements as being "... humanly devised constraints that structure human interaction. They are made up of informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct) and formal constraints (e.g., rules, laws, constitutions), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies" (North, 1994: 360). We restrict our conceptualization of formal institutions to those regional and country policies that theory and research suggest affect prevailing occupational choices (Wennekers, 2006; Levie and Autio, 2008; Stephan and Uhlaner, 2010; Murdock, 2012).

We conceptualize culture as a summary of norms and logics underlying informal institutions (Stephan and Uhlaner, 2010; Wennekers, 2006). The most-used definitions of culture are a "set of rules or standards which, when acted upon by the members of a society, produce behavior that falls within a range of variance the members consider proper or acceptable" (Haviland, 1978, p. 12) and the "*collective programming of the mind* which *distinguishes* the members of one human group from another" (Hofstede, 1980, p. 25).

Individuals experience primary and secondary socialization within the society into which they are born. This socialization means that while citizens inevitably have a deep understanding and intuition for their society's institutions, their personal acceptance of their society's norms and their own specific roles in their society vary (Gibson, Maznevski and Kirkman, 2009; Peterson and Barreto, 2014; Peterson, Soendergaard, and Kara, 2018). They feel the inexorable push towards the adoption of the taken-for-granted norms, scripts, and practices (Berger and Luckmann, 1967), and this results in any particular society being different from other societies (Kara and Peterson, 2012).

Ever since Weber argued that Protestant values lead to people developing their own enterprises (Weber, 1930), researchers of international entrepreneurship have been interested in the link between cultural values and entrepreneurship as Figure 1 indicates. Studies that focus on the aggregate measure of entrepreneurship mostly rely on Hofstede's (1980) conceptualization of culture and his dimension scores to examine outcomes such as new firm formation, national rates of innovation (Hayton et al., 2002; Hisrich, 2013; Hofstede et al., 2004; Uhlaner and Thurik, 2007; Wennekers et al., 2007), individual characteristics of entrepreneurs (Hayton et al., 2002; Mitchell et al., 2000; Mueller and Thomas, 2000; Scheinberg and MacMillan, 1988; Shane, Kolvareid, and Westhead, 1991; Thomas and Mueller, 2000) and corporate entrepreneurship (Hayton et al., 2002; Makino and Neupert, 2000; Steensma, Marino, and Weaver, 2000).

Hopp and Stephan (2012) examined the complex relationship between informal and formal institutions at the community level. They treat community as the “common geographic definition of a community and define the community as a proximal spatial area which is smaller than a state or country” (Hopp and Stephan, 2012, p. 918). Wennekers (2006) argued that formal institutional and cultural contextual variables affect variation in entrepreneurship (Hayton and Cacciotti, 2013), specifically self-employment rates, across countries. Murdock (2012) examined the impact of entrepreneurship policy across the EU. We build on these conceptualizations and propose that, when it comes to self-employment rates across regions of Europe, both national and regional factors play an important role. In the next section, we present hypotheses for such links.

Even though formal institutional arrangements can affect rates of entrepreneurship, these arrangements are embedded in cultural configurations (Hofstede, 2001; Keating, 2008a, 2008b). While recognizing controversy about the influence of country culture, we expect the prevailing country culture to affect entrepreneurship rates across regions within the country. European nation-states, even more than those in other parts of the world, were established around ethnic groups and alliances of ethnic groups in the late 18th through the 19th centuries (Ariely, 2013; Krasner, 2001). They are continually being reshaped, generally in the direction of increasing the correspondence of governmental to ethnic boundaries (Gellner, 1983/2006). A functional, institutional, and critical event (FICE) model summarizes forces that continue to contribute to the cultural coherence of nation states (Peterson, Soendergaard, and Kara, 2018). Functional forces include the advantage of boundaries for managing inter-ethnic conflicts, the transaction cost advantages of doing business with co-ethnics, and the desire of ethnic groups for military protection. Institutional forces include the legitimacy of nation-states as a basis for global organization, institutions that promote imitation within a country, and systems of norms in ideological and religious institutions of an ethnic group. Major events defining founders, heroes, and national transition points are incorporated into national traditions. At the same time, we also recognize the influence of forces toward global culture, multiple-nation cultural regions, and cultural groups within and across country boundaries (Peterson, Soendergaard and Kara, 2018). Our premise is that there is enough reason to consider countries to be culturally significant units of analysis to deem it useful to assess their significance for (within-country regional) entrepreneurship.

2.1. Economic Context and Entrepreneurship

Economic context is one of the environmental factors that affects entrepreneurship (e.g. Carree et al., 2002; Thurik et al., 2008; Acs, Audretsch, and Evans, 1994; Bosma, De Wit, and Carree, 2005). A country’s institutional

framework can accommodate regional variability and semi-autonomy, and it can also design internal economic development programs that favor particular regions. For example, special economic zones can limit the implementation of tariff laws (e.g., Chinese special economic zones; maquiladora zones in Mexico) and particular regions can promote business through public and private R&D investment (Busom et al., 2014). Moreover, EU programs target particular within-country regions to increase their economic development (Halkier, 2012). For example, the European Regional Development Fund grants awards to EU regions to promote innovation and research, digital infrastructure, and small- and medium-sized enterprises. EU regions also have access to additional financial assistance from a variety of sources, such as the Cohesion Fund, the European Social Fund, the Business Support Fund, and the Instrument for Pre-accession Assistance (European Commission, 2014).

Hayton and colleagues (2002) identify economic characteristics such as capacity for innovation, economic growth, and industry infrastructure as affecting entrepreneurship. We exclude industry infrastructure since we are not studying any single industry. But, we include unemployment rates because researchers have examined unemployment as an external factor affecting entrepreneurship. We study the relationship between economic development, R&D investment, unemployment rates, and entrepreneurship at the region level. As detailed in the methods section, the region-level quality of these aspects of economic contextual factor is reflected in the availability of regional data for them.

R&D Investment and Entrepreneurship. The 19th and 20th century saw a variety of innovations that made products and services of the time obsolete and opened doors for new industries, lines of business, products, and services (Schumpeter, 1911/1934; Jensen, 1993). Such technological advances and innovations affect types and rates of entrepreneurship (Verheul et al., 2002; Wennekers and Van Stel, 2017). Expenditure to sustain innovative technology, patenting, and R&D can increase entrepreneurship rates by increasing entrepreneurial opportunities (Dakhli and De Clercq, 2004; Furman, Porter, and Stern, 2002; Wennekers 2006). Governments both invest in research and development and create policies to encourage private investment in R&D. Spillover of innovations by private corporations and universities can create opportunities for third-party firms and entrepreneurs (Acs, 1992; Acs, Audretsch, and Evans, 1994; Acs et al., 2009; Audretsch and Feldman, 1996; Jaffe, 1989). For example, closure of an R&D facility in Sweden led to 69 new firm foundations by the displaced employees (Källner and Nyström, 2018). In addition, the industry cluster literature indicates that various companies or economic players might relocate to a particular region to benefit from the geographic proximity to each other (Cortright, 2006). Knowledge spillovers also can lead to creation of new products and services across different industries (Acs and Varga, 2005; Romer, 1990; Thursby and Thursby, 2007). For example, firm founding rates are higher in some geographic regions (Stuart and Sorenson,

2003), resulting from agglomeration effects, such as production enhancements and heightened demand (Marshall, 1920). In light of the previous discussion, we propose:

Hypothesis 1: Higher regional levels of R&D investment will be positively associated with regional entrepreneurship rates.

Economic Development and Entrepreneurship. IE researchers generally draw from Lucas (1978) to argue that an increase in wages could lead to an increase in the opportunity cost for the potential entrepreneur and thus they will be less likely to pursue self-employment (Carree et al. 2002; Wennekers 2006). The decision of a potential entrepreneur might hinge on the risk associated with pursuing self-employment versus the safety of waged employment (Iyigun and Owen, 1998). A higher opportunity cost affects the supply of potential entrepreneurs. Acs, Audretsch and Evans (1994) found support for a negative relationship between economic development (per capita GDP) and self-employment. Similarly, Spencer and Gomez's (2004) results support this negative relationship.

Since our sample consists of regions in Europe, an area of the world with many very prosperous regions, some only moderately prosperous regions, and many opportunities for employee mobility, we expect to find a negative relationship between the level of regional economic development and the rate of entrepreneurship. High wages in economically more developed regions means that self-employment will not be attractive for waged employees and that people will emigrate to those regions from less developed regions for waged employment. People choosing to remain in less developed regions for reasons of family ties, personal preference or local identity will tend to need to accept the relatively low wages. The lower wages imply lower opportunity costs of entrepreneurship and hence in less developed regions self-employment will be relatively more attractive. In light of this discussion, we propose:

Hypotheses 2: The level of regional economic development will be negatively associated with regional entrepreneurship rates.

Unemployment and Entrepreneurship. The unemployment rate is another economic variable that affects entrepreneurship levels. Whereas the preceding economic development rationale applies to regional differences in higher paying and lower paying jobs, unemployment applies to regional differences in opportunities for either waged or self-employment. Pursuing entrepreneurial opportunities might be attractive to unemployed people, since the opportunity cost is low (e.g. Storey, 1991; Thurik et al., 2008). The IE literature, however, supports both a positive and a negative relationship between unemployment and entrepreneurship levels. On one hand, according to the 'unemployment-push' hypothesis, individuals have a choice when it comes to how to earn income

(unemployment, self-employment or employment) and self-employment might be attractive to unemployed people since the opportunity cost would be low, thus supporting a positive relationship (Storey, 1991). On the other hand, according to the 'prosperity-pull' hypothesis, a negative relationship between regional unemployment and entrepreneurship rates may prevail when high unemployment rates signal bad start-up conditions, i.e. low demand for products and services (Thurik et al., 2008).

Despite the low opportunity cost of unemployed people to start their own businesses, the balance of the entrepreneurship literature suggests a negative region-level relationship between unemployment and entrepreneurship. Garofoli's (1994) results support a negative relationship. Similarly, Audretsch and Fritsch (1994) found a negative relationship between unemployment and new firm start-ups across 75 German regions. Armington and Acs (2002) suggested that we might only see a positive relationship between unemployment and entrepreneurship in industries with low capital requirements.

When we examine the relationship at the regional level, we expect to find a negative relationship between levels of unemployment and levels of self-employment. Thus, we propose:

Hypotheses 3: The level of regional unemployment will be negatively associated with regional entrepreneurship rates.

2.2. Formal Institutional Arrangements and Entrepreneurship

We analyze the complexity of business regulations and the comprehensiveness of labor market regulations at the country level as aspects of regulatory and legal systems. As detailed in the methods section, the country-level quality of these aspects of regulations is reflected in the exclusive availability of country-level data for them.

For many purposes, policy decisions relevant to business are better understood and studied at the country level rather than the within-country regional level. For example, tariffs, taxes, contracts, and many other aspects of business within a particular country are subject to the same laws. In Hayton et al.'s (2002), Wennekers' (2006), and Verheul and colleagues' (2002) frameworks, the formal institutional context is conceptualized at the country level. Similarly, Murdock (2012) examined growth policies such as business regulations and government spending at the country level. Even where tax rates vary by region (e.g., Germany, Spain), the complexity of the regulations governing tax collection and redistribution is a country characteristic. Quality of labor market regulations (Jeng and Wells, 2000), tax policies (Da Rin, Nicodano, and Sembenelli, 2006), government sponsored funds and programs, and bankruptcy laws (Armour and Cumming, 2006) have also been studied at the

country level. We included formal institutional arrangements specifically business regulations and labor market regulations at country level since these factors show more variation across countries than across within-country regions (Bosma and Schutjens, 2011; Davidsson and Wiklund, 2001; Sternberg, 2011).

Regulatory Complexity and Entrepreneurship. Regulatory complexity is the “paperwork and administrative formalities that entrepreneurs must confront” (Bowen and De Clercq, 2008: 752) and can decrease the rate of entrepreneurship in a country. Governments might require multiple procedures for registering a business, which could reach 19 in Mozambique and two in Canada, and the cost to a potential business owner can reach US\$3946 in Italy and US\$256 in Mozambique (Djankov et al., 2002). Such formal institutional complexity increases barriers to entry (Djankov et al., 2002), deterring potential entrepreneurs from starting new businesses or existing entrepreneurs from expanding rapidly (Johnson, Kaufmann, and Shleifer, 1997). Potential entrepreneurs might decide to continue working as waged employees instead of pursuing self-employment since high regulatory complexity, such as administrative requirements, bureaucracy costs to start a business, and tax compliance, could decrease the attractiveness of starting a new business (Grilo and Irigoyen, 2006).

Several studies examined the link between regulatory complexity and entrepreneurship. For example, Klapper, Laeven, and Rajan (2004) tied low rates of new business creation in Italy to high costs of fulfilling regulations for setting up a new business (which was 20 percent per capita of Italy’s GNP). Similarly, one of the findings of Dreher and Gassebner (2013) was that regulatory complexity (more specifically, the number of procedures required to start a new business) reduced entrepreneurial activity (measured by the percent of the adult population who are nascent entrepreneurs). Fonseca, Lopez-Garcia, and Pissarides’ (2001) results also supported the link between high start-up costs and lower rates of entrepreneurship across 18 countries. In another study, Capelleras et al. (2008) compared a lightly regulated British economy and a highly regulated Spanish economy. The authors indicate that highly versus lightly regulated economies differed in size, number, and growth rate of startups. However, registered and unregistered businesses must be considered because these effects might disappear. Kim et al. (2010) examined the relationship between legal system (property rights protection and regulatory complexity), financial system (equity-based versus bank-based), education system (average level of education), and trust relations (level of corruption) as predictors of venture creation decisions. When it comes to the link between regulatory complexity and venture creating, the results indicate a positive relationship between less regulatory complexity and venture creation. In light of this discussion, we propose:

Hypothesis 4: Higher country levels of regulatory complexity will be negatively associated with entrepreneurship rates.

Labor Market Regulations and Entrepreneurship. Macro level entrepreneurship frameworks, including Grilo and Thurik's (2004), point out a relationship between labor market regulations and entrepreneurship. Labor market regulations have been studied as restricting economic freedom (Ghosh, 2017; Bjørnskov and Foss, 2008). The idea is that stringent regulations regarding hiring and firing, minimum wage, centralized collective bargaining, hours, and worker dismissal create a burden for the entrepreneur and negatively affect entrepreneurship rates. In stricter institutional environments, entrepreneurs might not be able to adjust to market forces or firm needs (Audretsch et al. 2002). The ever-changing landscape of entrepreneurship requires quick adjustment to market forces. However, stricter labor market regulations prevent this adjustment from occurring in entrepreneurial endeavors.

The other effect of stricter labor market regulations is that waged employees will have stronger protections and safety nets making pursuit of self-employment a less attractive option (Van Stel et al. 2007; Henrekson et al., 2010). Labor protections regarding wages, working hours, and insurance can increase the opportunity cost of leaving waged employment to pursue self-employment. In addition, retirement funds and national pension systems might affect this opportunity cost (Andersen, 2005). For example, Bosma et al. (2005) investigated the relationship between employment protection and total early-stage entrepreneurial activity (TEA) rates in 16 EU-countries. The authors stated that when it is costly for employers to dismiss workers and benefit schemes for employees are relatively high, rates of TEA are low.

In another study, Brunetti, Kisunko, and Weber (1997) state that the private sector sees taxes, labor and safety regulations, and access to finance as the main obstacles to entrepreneurship. In light of this discussion, we propose:

Hypothesis 5: The strictness of country labor market regulations will be negatively associated with entrepreneurship rates.

2.3. Informal Institutional Arrangements and Entrepreneurship

Hayton and colleagues' (2002) original model and subsequent IE research (Hayton and Cacciotti, 2013) relies heavily on Hofstede's cultural framework. In the present article, we will consider a closely related, updated set of culture indicators provided by Beugelsdijk and Welzel (2018). These scholars proposed a culture dimension framework using data from the WVS and EVS that collapses Hofstede's six dimensions (Hofstede, Hofstede and Minkov, 2010) into three: collectivism-individualism, duty-joy, and distrust-trust (Beugelsdijk and Welzel, 2018: 1471).

Beugelsdijk and Welzel's (2018) *collectivism-individualism* dimension captures Hofstede's individualism-collectivism dimension and a notion of power

distance. Hofstede states that individualism is a continuum (collectivism is the other end) where “individualism pertains to societies in which the ties between individuals are loose ... as its opposite [collectivism] pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups” (Hofstede, 1991: 51), whereas power distance is defined as the “extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally” (Hofstede, 1991: xix). Higher scores in Beugelsdijk and Welzel’s (2018) collectivism-individualism dimension correspond to higher scores on Hofstede’s individualism dimension and lower scores on the power distance dimension. (Hence, in terms of the variable label, collectivism refers to low values and individualism to high values of the variable).

Beugelsdijk and Welzel’s (2018) *duty-joy* dimension captures Hofstede and Minkov’s long-term orientation (LTO) and indulgence versus restraint (IVR) dimensions. Hofstede defines LTO as the “extent to which a culture programs its members to accept delayed gratification of their material, social, and emotional needs” (Hofstede, 2001: xx) whereas IVR refers to enjoying life and having fun (Hofstede et al., 2010). Higher scores on the duty-joy dimension imply higher scores on Hofstede’s indulgence and short-term orientation dimensions. (Hence, in terms of the variable label, duty refers to low values and joy to high values of the variable).

Beugelsdijk and Welzel’s (2018) *distrust-trust* dimension captures Hofstede’s uncertainty avoidance dimension, which is defined as “the extent to which the members of a culture feel threatened by ambiguous or unknown situations” (Hofstede et al., 2010: 191). Higher scores on the distrust-trust dimension correspond to lower scores on Hofstede’s uncertainty avoidance dimension. (Hence, in terms of the variable label, distrust refers to low values and trust to high values of the variable).

To propose hypotheses, we will draw from existing macro IE research that uses these cultural dimensions. In order to explain prior culture research about entrepreneurship rates, such research needs to be distinguished from research about other entrepreneurship aspects and indicators that Hayton and colleagues (2002, 2013) review.

Collectivism-Individualism and Entrepreneurship. Macro IE research points to both a positive and a negative relationship between individualism and entrepreneurship rates depending on the entrepreneurship measure used. When entrepreneurship is measured as innovation or venture capital, we see a positive relationship between individualism and entrepreneurship (e.g. Shane, 1992, 1993); researchers explain this link such that the people in individualistic societies rely on their own abilities and value autonomy and financial security, all of which facilitate innovation. On the other hand, when entrepreneurship is measured as self-employment, research supports a negative relationship between individualism and entrepreneurship. Higher levels of collectivism might help entrepreneurs start a business by obtaining funding from close friends and family

(Aldrich and Waldinger, 1990). In addition, by relying on referrals from friends and family, businesses in collectivist societies might generate enough income to survive or rely on their social capital to innovate and stay competitive (Alrubaishi and Robson, 2019). In highly collectivistic societies, individual initiative to start a business can be acceptable and welcomed if the business benefits the family or the community as a whole (Cha, 1994). The new business could provide employment for family members or provide a product/service that the town needs.

For example, Acs, Audretsch, and Evans's (1994) results support a negative relationship between self-employment and individualism across 12 countries. In another study, Hofstede et al. (2004) propose a negative correlation between individualism and self-employment. Similarly, Hunt and Levie's (2003) results support a negative relationship between high levels of individualism and necessity-driven entrepreneurial activity. Similar empirical results can be found in Asian (Franke, Hofstede, and Bond, 1991) and Scandinavian countries (Peterson, 1988).

The relationship between power distance and entrepreneurship has differing outcomes depending on the aspect of entrepreneurship studied. When innovation is used as a proxy for entrepreneurship, we see a negative relationship between higher levels of power distance and national level entrepreneurship due to tight control of information, resources, and centralized decision making (Shane, 1992; Shane, 1993; Sun, 2009; Kaasa and Vadi, 2010; Rinne, Steel, and Fairweather, 2012). However, when self-employment is used as a proxy for entrepreneurship, we see a positive relationship between power distance and national entrepreneurship rates due to self-employment emerging as a result of dissatisfaction in highly structured, bureaucratic, high power distance countries (Hofstede et al., 2004). Individuals might choose self-employment to increase their status in society and to have more prestige and influence (Shane, Kolvereid, and Westhead, 1991). Given the self-employment proxy used in the current paper, we propose:

Hypothesis 6. Country Individualism (versus Collectivism) will be negatively associated with entrepreneurship rates.

Duty-Joy and Entrepreneurship. Initially, we had set out to draw from IE literature that examined the relationship between LTO, IVR, and entrepreneurship to inform our hypotheses regarding duty-joy and entrepreneurship. However, we did not find any manuscripts that examine this relationship. Thus, we will link Hofstede's dimension research about other topics besides entrepreneurship with IE research to formulate our hypothesis. Norms in a short-term-oriented society support quick results, whereas norms in long-term-oriented societies support thrift, persistence, patience, and delayed gratification (Hofstede, Hofstede and Minkov, 2010). In a short-term-oriented society, shame

is not a common feeling and reciprocation of favors and gifts take place frequently (Hofstede, 2001). In general, survival rates of start-ups are rather low (Fritsch and Mueller, 2008) and failure is a part of entrepreneurship. Consequently, individuals in short-term-oriented societies are more likely to attempt entrepreneurial ventures because shame relating to failure is relatively low compared to long-term-oriented societies where individuals might fear the shame that failure brings. In addition, individuals and institutions in short-term oriented countries focus on the bottom-line, which could also promote higher survival rates for entrepreneurial ventures. Short-term orientation can also result in entrepreneurs keeping up with ever changing trends. Moreover, societies with higher scores on indulgence might result in a customer base that is willing to spend money on new ideas, trends, and ventures, allowing higher rates of entrepreneurial ventures. Hofstede and colleagues define indulgence as “a tendency to allow relatively free gratification of basic and human desires related to enjoying life and having fun. Its opposite pole, restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms” (Hofstede et al., 2010, p. 281). It is possible that individuals in a culture that values restraint would focus on saving money instead of spending it on what is fun. In light of the previous discussion, we propose:

Hypothesis 7. Higher country support for Joy (versus Duty) will be positively associated with entrepreneurship rates.

Distrust-Trust and Entrepreneurship. We will use research that has examined the relationship between uncertainty avoidance and entrepreneurship to inform our hypotheses for Beugelsdijk and Welzel’s (2018) distrust-trust dimension. Uncertainty avoidance refers to the acceptable ways of dealing with uncertainty that are maintained by an individual’s family, school, and other social institutions. The uncertainty avoidance dimension should not be thought of as cultural values that focus on avoiding risk because risk is something that can be calculated (Hofstede, 2001: 148). Applying this to entrepreneurship, we are not examining the link between calculating risk or avoiding risk and entrepreneurship; it is simply ways of dealing with uncertainty.

When entrepreneurship is measured as innovation, research supports a negative relationship (e.g. Shane, 1992) between uncertainty avoidance and entrepreneurship. A possible explanation is that cultural support for innovation requires uncertainty tolerance of the associated delays and failures that come along with innovation attempts. If entrepreneurship is measured as self-employment (as in the current paper), extant literature suggests a positive link between uncertainty avoidance and entrepreneurship. One possible explanation is that self-employment may provide a way of dealing with the uncertainties of prolonged unemployment. Another is that individuals in a high-uncertainty avoidance society might be dissatisfied with the restrictions of working for any

employer and might be pushed to pursue self-employment (Wennekers et al., 2007).

Acs et al. (1994) examined the predictors of self-employment across countries. The authors included economic development, changes in industry composition, prevalence of high technology, unemployment, and female labor-force participation, as well as country culture. Acs et al.'s (1994) results indicate a positive relationship between uncertainty avoidance and entrepreneurship. Similarly, Hofstede et al.'s (2004) and Wennekers et al.'s (2007) results support the hypothesized positive relationship between uncertainty avoidance and entrepreneurship. In light of this discussion, we propose:

Hypothesis 8. Higher country levels of Trust (versus Distrust) will be negatively associated with entrepreneurship rates.

3. Method

3.1. Sample

Our data base was developed by combining data available in the 4th, 5th, and 6th waves of the European Social Survey (ESS), Eurostat, and the Economic Freedom of the World report, with the culture dimension scores that Beugelsdijk and Welzel's (2018) develop from the WVS and EVS. We used the regions that the European Union (EU) uses for making decisions about the allocation of regional funds. The regions used for these allocation decisions vary by country based on either level 2 or 3 of the Nomenclature of Territorial Units for Statistics (NUTS). For example, the EU distributes regional funds at the NUTS 2 level in Bulgaria. Consequently, for Bulgaria we recoded the ESS data that was available at the NUTS 3 level to the NUTS 2 level. Similarly, the EU distributes funding at the NUTS 2 level in Belgium. However, data from the 4th wave of the ESS for Belgium was only coded at the NUTS 1 level, thus we were not able to use Belgium data from the 4th wave of ESS since no information was available to recode its data at the NUTS 2 level. Our initial dataset consisted of 32 countries. In addition to removing countries for which data could not be recoded to the appropriate NUTS level, we eliminated some regions due to small sample size ($n < 30$) in ESS data and/or due to lack of Eurostat data. The final dataset consisted of the 186 regions in 20 countries shown in Table 1.

Table 1. Range of Sample Sizes (Individuals) for Regions of Each Country

Country	N of Regions	N of Respondents per Region Range, Mean
Austria	4	621 – 826, 714
Belgium	11	87 – 531, 286
Bulgaria	6	436 – 1051, 735
Czech Republic	8	590 – 910, 713
Denmark	5	589 – 1196, 937
Finland	4	882 – 1029, 978
France	21	49 – 513, 162
Germany	16	49 – 1361, 505
Greece	4	59 – 715, 231
Hungary	7	486 – 1201, 655
Italy	12	30 – 78, 57
Netherlands	12	99 – 418, 288
Norway	7	425 – 1001, 647
Poland	16	122 – 648, 290
Portugal	5	205 – 2275, 1144
Romania	8	159 – 250, 199
Slovakia	4	573 – 1137, 873
Spain	16	51 – 961, 326
Sweden	8	235 – 1007, 618
UK	12	215 – 729, 556

3.2. Variables

Region-level dependent variable: We calculated the percentage of respondents in the workforce at the region level who are self-employed using the 4th (2008), 5th (2010), and 6th (2012) waves of ESS. We used the ‘employee relations’ question which asks if the respondent is an “*employee, self-employed, or working for your own family’s business*”. We excluded individuals working for their own family’s business since working for the business may not mean owning it (Westhead and Howorth, 2006).

Country-level independent variables: We used the culture dimension scores that Beugelsdijk and Welzel (2018) developed from the WVS and EVS for collectivism-individualism, duty-joy, and distrust-trust. Beugelsdijk and Welzel (2018) used 495,011 participants across all the waves of WVS and EVS. The Collectivism – individualism dimension is based on five items such as ‘One of my main goals in life has been to make my parents proud’ and ‘Private ownership of business’. The Duty – joy dimension is based on five items such as ‘thrift as a desirable trait for children’ and ‘Importance of leisure time’. The Distrust – trust dimension is based on three items: ‘Confidence in politics’, ‘Confidence in

justice', and 'Most people can be trusted'. We refer to Beugelsdijk and Welzel (2018) for full details regarding the coding (and sometimes reverse coding) of the various items.

We retrieved data from the Economic Freedom of the World's annual report (Gwartney, Lawson, and Hall, 2012) for business regulations complexity and labor market regulations at the country level. The business regulations index includes items such as administrative requirements, starting a business, and cost of tax compliance. A higher value of the index means more complex/burdensome business regulations. The labor market regulations index includes items such as minimum wage, hiring and firing regulations, and hours regulations. A higher value means more strict/burdensome labor market regulations. We used a one-year forward lag and a five-year average (2007-2011) to uncover the effects of business regulations and labor market regulations on entrepreneurship rates.

Region-level independent variables. To represent regional innovation, we used Eurostat's R&D investment per inhabitant data. We used Eurostat's regional gross domestic product (GDP) per capita at current market prices (purchasing power standard per inhabitant) to measure economic development (Noorderhaven et al., 2004; Schultz 1990; Wennekers et al., 2007; Yamada 1996). We used Eurostat data for long-term unemployment (12 months or more) stated as a percentage of the active population (Hofstede et al., 2004; Wennekers, 2006). We used a one-year forward lag and a five-year average (2007-2011) to uncover the effects of region level R&D investment, GDP per capita, and unemployment on entrepreneurship rates.

Control variables: We controlled for age and gender which are well documented (albeit mainly at the micro level) to be associated with entrepreneurship, but that are unrelated to the present model of informal and formal institutional predictors. Percentage of population that is male and average age were calculated using 4th, 5th, and 6th waves of ESS. We also controlled for the population density. The link between population density and entrepreneurship is well-documented (Wennekers, 2006; Lee et al., 2004). Higher levels of population density result in access to markets, better business infrastructure, supplies, and specialized workforce, which positively affect entrepreneurship levels. We retrieved population density data from Eurostat. We used five-year average (2007-2011) which results in a one-year lag between population density and entrepreneurship rates.

3.3. Data Analysis

Due to the nested nature of our data (i.e., regions are nested within countries), we used hierarchical linear modeling (Raudenbush and Bryk, 2002) (HLM) software, version 7.03, to examine the hypothesized relationships. We used grand mean centering to reduce multicollinearity (Hofmann and Gavin, 1998; Kreft, De

Leeuw, and Aiken, 1995). To calculate variance explained, we used Kreft and De Leeuw's (1998) formula.

We ran a null model to examine the variance in self-employment rates that is due to regional versus national difference to make sure there was enough variance at each aggregation level to warrant the use of multilevel analysis. Next, we included our control variables in Model 1: region level age, gender, and population density. The effects of region level economic context are examined in Model 2 by entering region level R&D investment, GDP per capita, and unemployment levels. We entered variables for country level formal institutions in Model 3: business regulations and labor market regulations. Model 4 examines effects of country level informal institutions, collectivism-individualism, duty-joy, and distrust-trust, on self-employment rates. Our sample consists of European countries and culture dimensions scores of these countries show significant and high correlations. Consequently, we have entered cultural dimension scores one at a time to prevent multicollinearity and inflation of standard errors (Raudenbush and Bryk, 2002). Table 2 shows descriptive statistics and correlations of variables used.

Table 2. Descriptive Statistics and Correlations of Variables

	Min-Max	Mean	s.d.	1	2	3	4	5	6	7
Level 1 Variables ^a										
1. Self-employment rate	1.32-33.33	12.40	5.54	1						
2. Average Age	40.42-61.11	48.39	3.24	-.05	1					
3. Gender (% male)	33.33-62.50	47.25	4.68	.04	-.34**	1				
4. R&D Investment	3.70-2652.60	449.98	486.46	-.05	-.04	.26**	1			
5. GDP per capita	7160-55000	24196.24	9257.72	.09	-.09	.25**	.70**	1		
6. Unemployment rate	0.40-11.10	3.20	2.02	.04	.01	-.17*	-.37**	-.40**	1	
7. Pop. Density	3.30-6753.70	333.80	785.00	.02	-.17*	.04	.24**	.51**	.14	1
Level 2 Variables ^b										
1. Collectivism-Individualism	29.70-100.00	58.83	18.83	1						
2. Duty - Joy	10.90-87.80	55.87	21.53	.77**	1					
3. Distrust - Trust	17.30-64.20	38.03	13.33	.81**	.85**	1				
4. Business Regulation	5.58-8.19	6.60	0.73	.70**	.84**	.77**	1			
5. Labor Market Regulation	4.27-8.30	6.54	1.17	-.18	-.30	-.25	-.15	1		

^a N=186; ^b N=20; *** p<0.001, **p<0.01, * p<0.05

GDP: Gross domestic product

4. Results

The results of the null model indicate that 70.34% of the total variance in self-employment rates resides between groups (τ_{00} = 70.34, χ^2 (20) = 335.73, p<0.001; ICC: 0.7034). Since we will be examining the direct effects of country-

level formal and informal institutions on region-level self-employment rates, it is important to see adequate variance at each aggregation level to justify further HLM analysis. Model 1 was set up to examine the effects of control variables on self-employment rates. Results, shown in Table 3, indicate that the relationship between average age and self-employment rate is significant ($\beta = 0.43$; $p < 0.001$).

Region level economic context variables were entered in Model 2. R&D investment and GDP per capita were not related to self-employment rates; Hypotheses 1 and 2 were not supported. Regional unemployment rates were negatively associated with regional self-employment rates ($\beta = -0.35$; $p < 0.01$). Hypotheses 3 was supported.

For Model 3 and Model 4, we only kept the region level economic context and control variables that have significant relationships to entrepreneurship levels. For Model 3, we included nation-level formal institutional variables: business regulations and labor market regulations. Business regulations did not have statistically significant relationship to entrepreneurship levels; Hypothesis 4 was not supported. Labor market regulations ($\beta = -2.59$; $p < 0.05$) were negatively associated with regional entrepreneurship rates supporting Hypothesis 5; this model explains 27.36% of the between groups variance.

Model 4 tested the direct effects of country level informal institutions on regional entrepreneurship rates. We entered one culture dimension at a time along with control and region-level variables that showed a statistically significant relationship to entrepreneurship rates in our previous models. Collectivism – Individualism ($\beta = -0.12$; $p < 0.05$) was negatively related to regional entrepreneurship rates as shown in Model 4a. Per Beugelsdijk and Welzel's (2018) model, higher collectivism-individualism dimension scores correspond to higher individualism (and lower collectivism). Thus, our hypothesis predicting a negative relationship between individualism (versus collectivism) and entrepreneurship (Hypothesis 6) is supported. Model 4a explains an additional 5.27% of the between groups variance. The results of Model 4b and 4c indicate that Duty-Joy and Distrust-Trust are not related to entrepreneurship rates; Hypothesis 7 and Hypothesis 8 are not supported.

Table 3. HLM Results for Entrepreneurship

<i>Model:</i>	1	2	3	4a	4b	4c
	β (s.e.)	β (s.e.)	β (s.e.)	β (s.e.)	β (s.e.)	β (s.e.)
Controls						
Average Age	0.43*** (0.11)	0.43*** (0.11)	0.38*** (0.11)	0.38+ (0.19)	0.38+ (0.20)	0.38+ (0.20)
Gender (% male)	0.0897 (0.0689)					
Population Density	0.00051 (0.00033)					
Economic Context						
GDP per capita		-0.000039 (0.000047)				
R&D Investment		0.00048 (0.001079)				
Unemployment rate		-0.35** (0.17)	-0.46** (0.16)	-0.46** (0.15)	-0.43** (0.15)	-0.45** (0.15)
Formal Institutions						
Business Regulation			-2.66 (1.61)			
Labor Market Regulation			-2.59* (0.98)	-2.69* (1.08)	-2.45+ (1.22)	-2.76* (1.13)
Informal Context						
4a. Collectivism-Individualism				-0.12* (0.053)		
4b. Duty-Joy					-0.017 (0.044)	
4c. Distrust-Trust						-0.141 (0.092)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$; $N = 186$ regions; 20 countries.

Standard errors (s.e.) between parentheses.

GDP: Gross domestic product.

5. Discussion

5.1. Implications for Future Research

The present study supports the value of comparative international entrepreneurship research, that (1) includes both formal and informal (cultural) characteristics, (2) examines both within-country regional and national context using a nested model, and (3) uses recently developed culture dimension variables.

First, responding to calls to examine the effects of formal and informal institutions on entrepreneurship, our results support these calls. Stricter levels of labor market regulations and higher levels of individualism on the culture dimension of collectivism-individualism are negatively related to entrepreneurship. Labor market regulations such as regulations regarding hiring and firing, minimum wage, centralized collective bargaining, hours, and worker dismissal create a burden for the entrepreneur. When it comes to the negative relationship between Collectivism-Individualism and entrepreneurship (i.e. a positive association between collectivism and entrepreneurship), we expect that societies that tend to value strong, cohesive in-groups, and referrals from friends and family can create a supply of customers. Also, individuals in a highly collectivist society can start a business to support family and/or the community as a whole.

Second, we adopted Hayton et al.'s (2002) model to reflect the nested nature of regional and national contexts of region level entrepreneurship. Even though entrepreneurs establish their endeavors where they were born (Boswell, 1973) or reside (Haug, 1995) and regional contextual factors affect one's decision to pursue self-employment, national contextual factors also play a role in that decision. R&D investment and economic development of a region were not related to entrepreneurship rates, when entrepreneurship is measured as self-employment. The positive relationship between age and entrepreneurship rates indicates that the human capital (education, knowledge, networks, and capital) needed for self-employment are acquired with age. Unemployment was negatively associated with entrepreneurship rates, consistent with the 'prosperity-pull' hypothesis. On balance, self-employed in European regions seem to be motivated by benign economic conditions rather than by a lack of alternative employment options. Our findings also support the notion that even though entrepreneurship is a 'regional event', both nation and region level factors affect regional entrepreneurship levels (Sternberg, 2009; Backman and Karlsson, 2013).

Such regional effects need to be analyzed appropriately in ways that recognize the nested nature of the conceptualized relationship. Multilevel procedures like HLM can correctly account for the effects of regional and national institutional factors on entrepreneurship. Governmental policies and programs that are intended to promote entrepreneurship compete against national culture (Setti, Osowska and Jaworski, 2019). Any examination of region and nation level contextual factors requires careful conceptualization and analysis of this multilevel relationship.

Third, the study supports the promise of recently developed societal culture dimensions. The majority of IE studies use few dimensions; individualism-collectivism and uncertainty avoidance have received the most attention. Beugelsdijk and Welzel's (2018) framework collapses Hofstede's six culture dimensions into three and provides the opportunity to capture the effects of all the dimensions of a culture framework. Our study uncovered a relationship between the collectivism-individualism dimension and regional self-employment rates.

5.2. Implications for Entrepreneurship Policy

At a time when it is unclear if universal policy initiatives may be effective to increase entrepreneurship (Calá, Arauzo-Carod, and Manjón-Antolín, 2017; Dvouletý and Lukeš, 2016; Figueroa-Armijos and Johnson, 2016; Levie et al., 2014) or economic growth (Åstebro, 2017), policy implications of our research become more important. There is a significant entrepreneurship deficit in Europe (compared to U.S. and East Asia) (Henrekson and Sanandaji, 2018)² and EU policy makers are emphasizing the importance of entrepreneurship. The EU determined regional entrepreneurship as the primary tool for economic growth and competitiveness. The European Commission's Entrepreneurship 2020 Action Plan details actions that must be taken "to bring Europe back to growth and create new jobs" (The European Commission, 2017). The Commission provides tools such as a database of good practices, a guide on crowdfunding, and a self-assessment for small- and medium-sized enterprises to current and potential entrepreneurs. The Commission evaluates existing EU laws to reduce burdens and simplify laws to improve entrepreneurship. In addition, the Commission provides regional policy makers information and funding to increase regional competitiveness. Bergmann and Sternberg (2007) detail Germany's policies that support entrepreneurship at the national, state, and local levels. Huggins and Williams (2011) state that regional policy makers are under pressure to improve regional competitiveness, and the EU pours money into regional initiatives. At the same time, careful research must be conducted to examine if the initiatives that increase self-employment affect other outcomes, such as patent applications. Moreover, policies might affect an individual's decision to pursue self-employment differently depending on the current income of the individual (Ramesh et al., 2018). Notwithstanding that self-employment is not an ideal measure of (Schumpeterian) entrepreneurship (Henrekson and Sanandaji, 2018), results of our study suggest that policy makers must consider the effects of national culture before introducing entrepreneurship policies.

5.3. Limitations

The study's research and policy contributions need to be considered in light of the study's limitations, including the global generalizability of EU results, the use of self-employment rates as a criterion (Vyas and Vyas, 2019), the sample size relative to the requirements of HLM, and the potential for additional influences of regional culture and national formal institutions. These limitations, along with recent changes in the EU (notably, massive immigration) and characteristics of other multiple-nation groups, suggest directions for future research.

2. We are aware that Henrekson and Sanandaji (2018) do not refer to self-employment (the measure used in our paper) when they discuss (Schumpeterian) entrepreneurship.

Even though we predicted a positive relationship between R&D investment and entrepreneurship rates, our results did not support such a relationship. It is possible that our measure of entrepreneurship, self-employment, is not related to government, private sector, and university investments in R&D. Innovation and spillover effects might not be reflected in self-employment numbers, possibly because most self-employed are not involved in innovation activities. Our prediction of a negative link between economic development and entrepreneurship rates was not supported either.

We used the percentage of the workforce that is self-employed as our measure of entrepreneurship. However, Total Entrepreneurship Activity (TEA), venture capital activity, the listing of new businesses on the stock exchange, and the number of patents granted could also be used to proxy for entrepreneurship (Spencer and Gomez, 2004), although not all of these proxies are widely available at the regional level. It would be beneficial to examine the relationship between the quality and/or strength of formal institutional arrangements and either venture capital activity or levels of innovation. Similarly, using a different conceptualization of institutional arrangements, such as neo-institutional theory (Scott, 2008), can uncover different relationships. Alternative ways of examining the effects of cultural differences, such as by using Schwartz's value dimensions, can be beneficial (Krueger et al., 2013). The generalizability of the results also needs to be interpreted within the context of the European Union. Our study of entrepreneurship activity across 186 regions in 20 countries indicates that formal and informal institutional arrangements affect entrepreneurship rates across regions in Europe. Further research should consider whether these limiting conditions on the uniform effects of national formal institutions apply to other phenomena besides entrepreneurship and other multi-country areas besides Europe (Peterson, Soendergaard, and Kara, 2018).

International entrepreneurship research can benefit from IB's increasing attention to regions as well as countries (Peterson, Soendergaard, and Kara, 2018). International management research that identifies regional cultural differences can inform future IE studies that examine the effects of within-nation cultural differences on entrepreneurship rates: more specifically, the relationship between institutions (both formal and informal) and entrepreneurship rates. In general, we anticipate that the significance of within-country cultural regions is smallest in the extreme north of Europe (e.g., Scandinavia) and is greatest in the south (e.g., Spain and Italy) (Kaasa, Vadi and Varblane, 2014). Moreover, we might see greater within-country cultural differences in federated nations, such as Spain, Belgium, and Germany (Soendergaard, Kara, and Peterson, 2019). Spigel (2013) stated that we need to link local, regional, and national culture in entrepreneurship research, and recent studies support within-nation regional cultural differences (Peterson et al., 2017).

6. Conclusion

Our study provides a region-level adaptation and test of major components of Hayton et al.'s (2002) *Model of Culture's Association with Entrepreneurship*. Our results indicate that researchers and policy makers can ignore neither formal institutional factors nor national culture when examining the factors that affect regional self-employment rates. In particular, we have found negative associations with regional self-employment rates for a country's strictness of labour market regulations and a country's level of individualism (vs. collectivism). The results of our study also pave a way for further discussions about the relative importance of country culture compared to formal institutions. These contributions can shape the public policy debate about the optimal uses of governmental resources, including EU funds for programs that foster within-country regional entrepreneurship. A nation's formal institutions might provide a uniform regulative framework for all parts of a nation (Whitley, 1999), but within-country variations in programs that promote entrepreneurship may also be meaningful.

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