Is the effect of venture capital availability on entrepreneurial choice dependent on the innovation level, governmental support and culture of a country?

Master Thesis

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Abstract

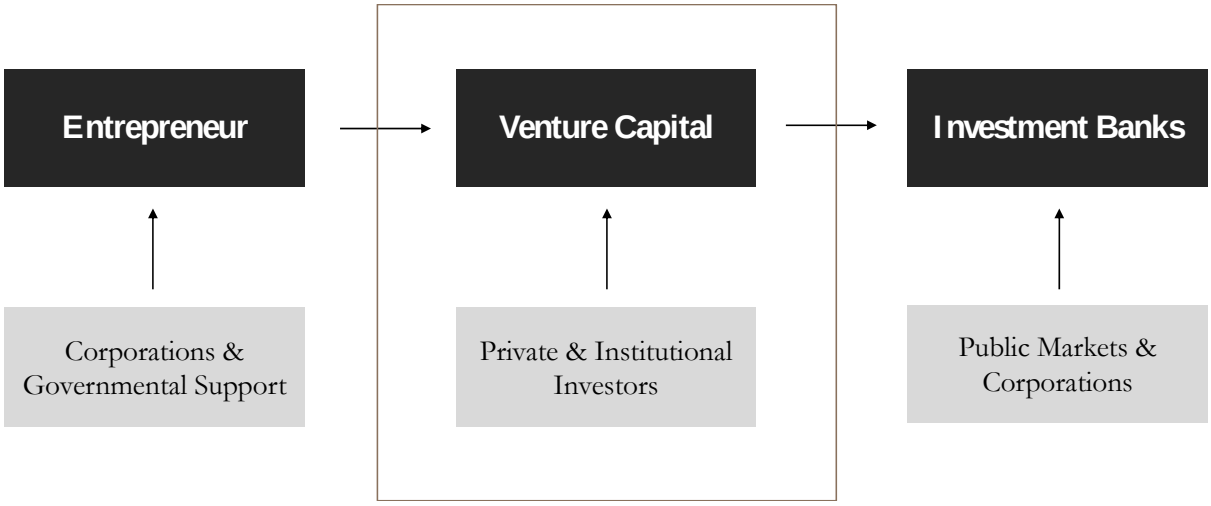
While the concepts of entrepreneurship and venture capital have been thoroughly analysed in the existing literature, the relationship between the two has rarely been examined. This paper studies the relationship between the ease of access to venture capital at the country-level and entrepreneurial choice at the individual level. Based on insights from existing literature, this paper specifically investigates whether there is evidence to suggest that the aforementioned relationship is dependent on three other country characteristics: innovation level, entrepreneurial government programs and culture and social norms. Using a dataset consisting of entrepreneurs and wageworkers across 34 countries, multilevel binomial logistic regressions are performed since the dataset has a nested structure. I test the hypotheses set out in this paper using interaction terms between venture capital availability (VCA) and the aforementioned country-characteristics posited as dependencies of the relationship between VCA and entrepreneurial choice. This paper abstains from assuming a causal relationship between VCA and entrepreneurial choice due to limitations in methodology. The main finding of this paper is that in countries where VCA is high and the government is supportive of entrepreneurship, individuals are more likely to choose entrepreneurship over wage-work.

1. Introduction

This research paper aims to investigate the dynamics of the relationship between venture capital availability at a country level and entrepreneurial choice at the individual level. Specifically, I aim to examine whether the following three factors can be considered as prerequisites or conditions wherein venture capital availability (VCA) can influence the individual-level decision to become self-employed[1]: the existence of government programs supporting small- and medium-sized enterprises (SMEs); the existence of culture and social norms accommodating entrepreneurship as a career path; and country-level innovation.

In order to explain the economic significance of this research question, it is important to define the role of the venture capitalist in the economy. Figure 1 provides a simple summary of how the venture capital industry works: the entrepreneur goes to the venture capitalist with an idea; the venture capitalist, funded by private and/or institutional investors such as pension funds and insurance companies, invests in the entrepreneur in exchange for an equity stake in the company. Once the company reaches an adequate level of maturity, the venture capitalist implements an exit strategy ideally through an Initial Public Offering (IPO) or a merger or acquisition (M&A). As such, venture capitalists act as market-makers for the other three players by stepping in to fund growth where they see potential in companies whose balance sheet, size and current level of credibility make them too risky for a bank to finance or for the public markets to invest in (Gompers & Lerner, 1999; Armour and Cumming, 2006).

Figure 1: Venture Capital Industry



While the above framework is commonly acknowledged, there are three misconceptions about the role of venture capital: a) venture capitalists invest in early-stage start-ups, b) venture capitalists fund R&D, and c) venture capitalists invest in good ideas. Even though some VC goes into "seed-funding"[2], more than 80% of VC investment goes into the adolescent stage of the company as "first-stage" or "expansion-stage" funding and less than 1% of newly-formed start-ups manage to receive VC funding every year (Kuratko, 2016;

[1] In this paper, the terms "entrepreneur" and "self-employed" are used interchangeably, however, there are slight differences in the specific definitions of each term. These nuances are explained and discussed in more detail in the Literature Review and Theory Development section.
[2] The stage where the company is often at most just a product idea with the potential to grow into a business.

Goldstein, 2020; Block, Thurik, Van der Zwan & Walter, 2013). As such, the VC investment does not go towards funding R&D; it goes towards building the infrastructure necessary for the company to grow, e.g., manufacturing, marketing and sales. This leads into the clarification of the third misconception: venture capitalists do *not* invest in good ideas; "they invest in good industries" (Zider, 1998). Good industries are essentially the "hot areas of interest" at that specific point in time; they are characterised by high growth potential and they are the areas that *already* receive heavy R&D spending (Kuratko, 2016; Zider, 1998). This highlights the importance of seeing VC as part of a wider ecosystem, and not a stand-alone factor that can help incentivise entrepreneurship.

My *a priori* is that for VC to induce entrepreneurial activity, the right backdrop needs to exist, which leads into the formation of the three hypotheses tested in the following sections. Firstly, there needs to be a wider culture accommodating, respecting and encouraging entrepreneurship such that "potential entrepreneurs" exist. Secondly, government programs should exist to support early-stage entrepreneurial activity in order to turn "potential entrepreneurs" into nascent entrepreneurs and subsequently business owners. Thirdly, the country or region in question should be directly or indirectly related to high-growth industries, with high R&D expenditures and innovation output, in order to qualify for VC funding.

In order to investigate the aforementioned hypotheses, I use a dataset consisting of 18,757 respondents over 34 countries: the 22 Member States of the European Union (EU), Croatia, Turkey, Norway, Switzerland, Israel, Russia, United States, Brazil, India, China, South Korea and Japan. The sample used consists of individuals who are either entrepreneurs or wageworkers, and the dependent variable is a choice variable indicating whether an individual is an entrepreneur or a wageworker. A multilevel binomial logistic regression model is performed to study the effects of both individual-level and country-level variables on entrepreneurial intent. In this paper, I control for socio-economic characteristics at the individual-level (e.g. age, gender, household size, educational attainment, etc.) and at the country-level I include the variables *VCA, Entrepreneurial Government Programs, Culture & Social Norms, Innovation Level* and *Development stage.* The hypotheses mentioned above, and more thoroughly developed in the Literature Review & Theory Development section, are tested through the use of interaction terms between VCA and the relevant country-level variables.

Researching this topic is important primarily from a policy perspective. Understanding the factors affecting an individual's decision to pursue an entrepreneurial career in the context of his/her own country, as well as comprehending how these individual-level and country-level characteristics interact with and depend on each other is crucial for policy-making decisions regarding entrepreneurial activity. For example, if a policy maker is considering relaxing institutional investment restrictions to increase the amount of funds available to VC firms, as a means to increase entrepreneurial activity, it would be important to know whether such a policy would be effective in the context of that specific country. Based on my *a priori*, the policy maker should consider VC availability as a tool enabling the effective functioning of a wider ecosystem, as visualized in Figure 1. If the other main players in this ecosystem do not have the right incentives, then using VC as a policy tool should not be effective in increasing entrepreneurial activity (assuming that this is the policy incentive). As Gilson (2003) very aptly stated, "[…] capital, VCs and entrepreneurs must all be present simultaneously in order for a thriving market to develop. This presents policymakers with a formidably difficult engineering problem". The question is, to what extent can venture capital availability encourage entrepreneurship, and do countries at different levels of development require

different levels of entrepreneurship to have a well-functioning market? The occurrence of such queries when reviewing existing literature led to the formation of this paper's research question: Is the effect of venture capital availability on entrepreneurial choice dependent on the innovation level, governmental support and culture of each country?

The findings of this empirical study could be relevant for policy making decisions regarding entrepreneurship and economic growth. In a number of declarations and policy documents, the European Union has promoted the benefits of venture capital as a lever for innovation and economic growth, using the US venture capital model as the epitome of a successful and well-functioning system (Hege, Palomino and Schwienbacher, 2003). Economic growth has widely been associated with growth in Total Entrepreneurial Activity (TEA)[3] (Bottazzi & Da Rin, 2002; Samila & Sorenson, 2011) meaning that policy makers might target TEA to induce socioeconomic growth and development in their countries (Zahra, 1999). As such, it is important to comprehend what tools are available to the policy makers. In this study, I use self-employment as a proxy for TEA; specifically, my dependent variable is a binary choice variable measured at the individual-level reflecting whether an individual is self-employed or an employee. In other words, the statistical analysis implemented in this paper attempts to model the probability that, under given individual-level and country-level circumstances, an individual will choose to become an entrepreneur, as proxied by self-employment.

To date, there is a lot of literature exploring the determinants of entrepreneurial choice at the individual level (e.g. Baldegger et al., 2019). In terms of the venture capital industry, the overwhelming majority of the existing literature consists of the following: papers analysing the determinants of VC fundraising (Gompers & Lerner, 1999); papers analysing the effect of VC on innovation (Kortum & Lerner, 2000), or qualitative papers expanding on the structure of the venture capital industry, since it only started flourishing less than half a century ago (Gompers & Lerner, 2004; Black & Gilson, 1998). There exist studies that examine country-level drivers of entrepreneurship (Carree, Van Stel, Thurik & Wennekers, 2002; Block et al., 2013), which include some measure of venture capital availability or entrepreneur financing as an explanatory variable, but little to no empirical work has gone into exploring the interaction between venture capital availability and other relevant country-level characteristics. My contribution to the literature with this research paper is treating VCA as the main explanatory variable of entrepreneurial propensity; in a study that treats it as part of a wider ecosystem rather than a control variable in the context of an analysis with a wider motivation; while using a statistical model which accommodates both individual-level and country-level discussion.

The paper is organised as follows. The Literature Review & Theory Development section summarises key insights from existing literature on VCA and entrepreneurship; and thoroughly develops the three hypotheses posed in this study, with reference to relevant theoretical models and existing literature. The Data & Methodology section discusses the dataset utilised for this study in more detail; provides some informative descriptive statistics; and discusses the use of the multilevel approach. What follows is the Results section, which presents the main findings of the econometric analysis and discusses relevant robustness checks. Finally, the Discussion and Conclusion section the main results of the analysis are discussed in light of the literature review, and potential limitations of the study are acknowledged.

[3] TEA is the percentage of 18-64-year-old population that is either a nascent entrepreneur, or the owner of a business.

2. Literature Review & Theory Development

This section is arranged as follows: I begin by separately defining and explaining my main concepts, entrepreneurship and venture capital, setting out important attributes of each and building up on relevant theoretical and empirical findings. Thereafter, I describe and explain the linkages between the aforementioned concepts and propose the dependencies of the relationship between entrepreneurship and venture capital: country innovation level, entrepreneurial government programs and culture and social norms. Finally, I synthesise the theoretical and empirical backbone of the three hypotheses put forward in this study and briefly describe the methods used to statistically test these hypotheses in the subsequent econometric analysis.

2.1 Entrepreneurship

Over the years, entrepreneurship has taken many different definitions. Casson (1982) described an entrepreneur as "someone who specialises in making judgmental decisions about the co-ordination of scarce resources", a definition that closely relates entrepreneurship with positions of management. Gartner (1990) defined entrepreneurship as "the process of new business creation", aligning the role of the entrepreneur with the role of the business owner. Ten years later, Shane and Venkataraman (2000) described entrepreneurship as the study of "how, by whom and with what consequences opportunities to produce future goods and services are discovered, evaluated and exploited", positing entrepreneurship as almost a synonym for innovation.

To understand the heterogeneity between the above definitions, it is useful to consider entrepreneurship in terms of its occupational notion and its behavioural notion. In the occupational sense, an entrepreneur is an individual owning and managing a business on their own account and risk, while in the behavioural sense, an entrepreneur is an individual seizing an economic opportunity (Sternberg and Wennekers, 2005). Based on the aforementioned distinctions, Wennekers and Thurik (1999) distinguish between three types of entrepreneurs (versus executive managers); these distinctions are illustrated and summarised in Table 1 below:

Table 1: Three types of entrepreneurs

Behavioural Notion \ *Occupational Notion*	*Self-employed*	*Employee*
Entrepreneurial	**Independent entrepreneur**	**Corporate entrepreneur**
Managerial	**Managerial business owner**	**Executive manager**

The independent entrepreneur, or otherwise known as the Schumpeterian entrepreneur, owns and directs his/her own firm which tends to be small in size. This type of entrepreneur

markets an innovative product or service and is involved in destroying the existing structures of the industry he/she operates in. Secondly, the corporate entrepreneur, or intrapreneur[4], embodies the notion of entrepreneurship by risking his/her time, reputation and even job in order to seize an economic opportunity and lead an entrepreneurial venture *within* a larger firm. Intrapreneurs sometimes leave the firm to create their own start-up, subsequently becoming Schumpeterian entrepreneurs. Lastly, managerial business owners tend to own and manage their own small firms; this category includes shopkeepers and individuals in professional occupations such as doctors. This third type of entrepreneurship is *less* associated with innovation and fast-growing industries, but it is nonetheless essential for the functioning of the economy (Kirchhoff, 1994). As it is apparent from Table 1, the fourth quadrant represents an individual who does not embody entrepreneurship, neither in the behavioural nor in the occupational sense. These are the executive managers, who are employees in the occupational sense, and they also simply enact the role of management, they do not seize economic opportunities in doing so.

The context of this study is mainly concerned with the Schumpeterian entrepreneur, whose ventures are closely linked to innovation, fast-growth industries, and are therefore eligible for venture capital funding. However, a big bottleneck in the field of entrepreneurship is that it is often measured as per its occupational side, i.e. self-employment (Wennekers and Thurik, 1999; Acs and Audretsch, 2005). Inherently, this measure includes the 'managerial business owners' who are not directly relevant to the research question and simultaneously excludes the 'intrapreneurs' who, although not self-employed by occupation, represent the essence of entrepreneurship at its core. The dependent variable in this study is subject to the same hinderance: it reflects entrepreneurship only in its occupational sense, which is self-employment vs. wage-work. For lack of a better measure, for the purpose of this paper the terms 'self-employed' and 'entrepreneur' are used interchangeably. This is a limitation of the measurement method for the dependent variable which is further discussed in the Discussion and Conclusion section.

When discussing entrepreneurship, there are multiple schools of thought that can be adopted, both micro and macro viewpoints. An example of a micro viewpoint of entrepreneurship is the 'Entrepreneurial Trait School of Thought', which focuses on traits and characteristics common to successful entrepreneurs. This school of thought studies successful entrepreneurs to identify traits and characteristics they have in common, with the overarching goal of creating a 'profile' for the successful entrepreneur; this can be used to increase success opportunities for emulators (Kuratko, 2016). For example, some traits often exhibited by successful entrepreneurs are creativity, technical knowledge and determination. A factor that is often the subject of debate (and is also included as a control variable in this study) is educational attainment. On the one hand, some researchers argue that high levels of educational incubation inhibit creativity, which is one of the well-established determinants of entrepreneurial success (Aronsson, 2004. On the other hand, some researchers argue that education enables the acquisition of technical skills which is theorised to increase the probability of entrepreneurial success. A lot of research has also gone into the socio-economic profiling of entrepreneurs, for example, gender, age, household-size and family influence (e.g. the existence of a parent-entrepreneur). Socioeconomic factors are included as control variables in the econometric analysis of this paper and are discussed in more detail in the Data and Methodology section.

[4] The concept of intrapreneurship is discussed in more detail later on in Section 2.3.

Examples of macro viewpoints of entrepreneurship include the Environmental School of Thought and the Financial/Capital School of thought. The former is primarily concerned with environmental forces that influence the entrepreneurial intent of individuals, such as institutions and cultural values relating to entrepreneurship. Institutions include property right regimes, competition rules, government regulation and incentives such as flat or steep tax rates. Relevant cultural values include the degree of open-mindedness, risk tolerance and the long-term orientation towards entrepreneurship[5] (Wennekers and Thurik, 1999; Kuratko, 2016). As mentioned above, another macro viewpoint of entrepreneurship that is relevant to this study is the Financial/Capital School of Thought which positions the capital-seeking process at the forefront of the analysis. This approach typically separates a venture's lifecycle into three stages: start-up or acquisition, ongoing and decline or succession. For each venture stage, the financial management considerations become the primary determinants of the degree of entrepreneurial activity that exists. Inspired by Kuratko (2016), Table 2 below provides a brief overview of the financial management considerations relevant to each venture stage.

Table 2: Financial considerations per venture stage

Venture Stage	**Financial Considerations**
Start up or acquisition	Seed capital Venture capital
Ongoing	Cash management Investments Financial analysis and evaluation
Decline or succession	Profit question Corporate buyout Succession question

This school of thought suggests that the capital-seeking process is a major consideration for potential entrepreneurs. As such, the ease of accessing funding and managing the financial considerations summarised in Table 2 can be considered as a determining factor in an individual's decision to pursue entrepreneurship. This school of thought can therefore be considered as the conceptual foundation of the main research question relating venture capital availability and entrepreneurial choice.

2.2 Venture Capital

I begin this section by providing a thorough definition of what venture capital is and outline its most important characteristics. As visualised in the flow diagram in Table 1, venture capital is a financial intermediary, meaning that it uses capital invested by private and institutional investors and directly invests it in a portfolio of *private* companies. Venture capitalists are often confused with angel investors (or angels), the most crucial difference between the two being that angels invest *their own* capital whereas venture capitalists use investors' capital. VCs usually have an investment horizon of 5-10 years and their primary goal is to maximise financial return by exiting the investment ideally through an IPO (i.e. public market) or a sale to another corporation (e.g. mergers and acquisitions).

[5] This is referred to as a structural attribute of each country's culture reflecting the general attitude of individuals within a country towards the pursuit of an entrepreneurial career path.

The VC's obligation to provide return to its investors means that VC's have a clear focus on financial return and the commitment to exit their investments within the pre-determined time horizon. As such, it is crucial for VCs to invest in small business with a real shot at attaining sufficiently high growth rates within 5-10 years after the initial investment to provide satisfactory returns for the VC's investors. This also explains why VCs only intend to invest in fast-growing, high-technology, innovative industries which produce products and services that can penetrate large markets, create large-scale disruptions in existing markets and/or create large new markets with high adoption rates.

The main attribute of venture capital which separates it from other more traditional forms of funding is that it is "smart capital" (Schäfer and Schilder, 2009). This means that venture capitalists provide corporate finance *in combination* with consulting services, management support, monitoring, networking and industry-expert advice, which actively increases the probability of success of the start-up (Block, Colombo, Cumming and Vismara, 2018; Schäfer and Schilder, 2009; Zider, 1998; Hellmann and Puri, 2002). In some cases, venture capitalists occupy at least one position in the board of directors of the companies included in their portfolios. This allows them to provide expert advice, influence the strategic direction of the firm and draw upon their network and reputation to attract high-quality talent that a start-up would otherwise not have access to (Schäfer and Schilder, 2009). A lot of empirical work has gone into investigating the involvement of VCs with their portfolio companies, concluding that VCs do indeed spend a lot of time and effort familiarising themselves with the business models of their portfolio companies in order to effectively assist, advice and monitor their progress (Kaplan and Strömberg, 2004; Macmillan, Kulow, and Khoylian ,1988; Sapienza, 1992; Sapienza, Manigart, and Vermeir, 1996). These value-added services aid the sustainable growth of the companies in a VC's portfolio.

Having said this, however, venture capitalists manage their risks by investing in the adolescent stage of a start-up; during this period of accelerating growth it is often not possible to distinguish the financial trajectory of the eventual 'losers' and eventual 'winners'. Venture capitalists invest in current, innovative and fast-growing industries; in doing so, they limit their risk exposure to the ability of a *company's* management to deliver, not the ability of the *industry* to deliver. As per Zider (1998), "As long as venture capitalists are able to exit the company and industry before it tops out, they can reap extraordinary returns at relatively low risk". Reconciling with the Financial/Capital School of Thought on entrepreneurship, VCs exit their investments long before the 'Decline or Succession' stage, at which point the financial performance of the 'winners' starts to diverge from the performance of the 'losers'.

There is also a fair amount of empirical literature examining the performance of VC-backed firms in relation comparable non-VC-back firms suggesting that VC-backed firms outperform non-VC backed firms (Jeong, Kim, Son and Nam, 2020). Specifically, recent research found evidence suggesting that VC-backed IPOs outperformed non-VC-backed IPOs and that VC-backed firms perform better in the long-run (Campbell and Frye, 2006; Megginson and Weiss, 1991). For example, Celikyurt Sevilir and Shivdasani (2012) show that having VCs in the board of directors strengthens a firm's internal innovation capabilities and growth potential by providing strategic guidance; drawing upon their network to introduce the firm to important strategic allies and encouraging M&A activity. As such, aside from funding, entrepreneurs have a lot more to gain from a VC's involvement in the development of the firm.

Due to its direct relationship with entrepreneurship and innovation, venture capital has been recognised as a driver of economic growth and innovation (Hege, Palomino and Schwienbacher, 2003), with the US venture-capital industry becoming an envied example of how a sound venture capital industry can become the engine of economic growth (Zider, 1998). For example, easy access to venture capital has frequently been cited as a key success factor for Silicon Valley, amongst other factors like easy access to renounced research institutions and a large talent pool (Butler, Lockett and Ucbasaran, 2006). Many countries in Europe have attempted to emulate this venture-capital model, albeit with little success, highlighting the multitude of pre-requisites in place for the venture-capital industry to flourish (Hege, Palomino and Schwienbacher, 2003). In fact, Ibanez (1989) identified three factors that make Europe a more difficult place for venture capital to flourish: 1) the smaller size of the market for goods and services; 2) the lack of institutional and governmental support for small businesses; and 3) the cultural stigma associated with individuals that choose to follow the entrepreneurial career path. Although this statement dates back to 1989, to a large extent it holds true to this day. The last two factors are more thoroughly examined below, in relation to the hypotheses synthesised in this paper.

2.3 Entrepreneurship and Venture Capital

From Section 2.1 and 2.2, it becomes apparent that what ties the concepts of entrepreneurship and venture capital is their common association with innovation and economic growth. Specifically, venture capital availability can be instrumental in economic growth by catalysing entrepreneurship and accelerating technological progress (Butler, Lockett and Ucbasaran, 2006). Venture capital has been known to finance and support growth-oriented entrepreneurial firms, and in doing so facilitating the process of innovation (Sapienza, 1992; Sapienza, Manigart and Vermeir, 1996). Despite the instrumental role VCs have played and continue to play in facilitating the commercialisation of important innovations, economic growth and even employment growth through their investment in high-performing entrepreneurial ventures, there is little research directly addressing the relationship between venture capital availability and entrepreneurship.

In the following paragraphs, I outline and explain the three main dependencies of the relationship between venture capital and entrepreneurship as identified through existing literature. I propose that the effect of VCA on an individual's likelihood to choose entrepreneurship over wage-work is stronger in more innovative countries, in countries where the government is supportive of entrepreneurship and in countries where culture and social norms are positive towards entrepreneurship. While a few other dependencies can also be considered (e.g. the size of the market and the size of the public stock market), I choose to examine the aforementioned three dependencies because they are the most commonly cited; and they provide adequate heterogeneity between countries to enable the effective use of multilevel modelling[6].

As briefly discussed in the introduction, literature directly addressing the relationship between VCA and entrepreneurial propensity is scarce. However, there is a lot of literature examining the dynamic of the relationship between 'entrepreneurship' and 'intrapreneurship', from which some useful insights can be drawn for the purposes of this study. In the context of such literature, an *entrepreneur* is an individual who pursues an idea *outside* a firm by creating a

[6] For example, in terms of the size of the market and the size of the public stock market, we are likely to observe little heterogeneity between countries in Europe which make up the majority of the sample of countries used for this study.

start-up, an *intrapreneur* is an individual who pursues an idea by creating a new venture *inside* his/her current firm (Zahra and Wright, 2011; Subramanian, 2005). A common notion across such empirical and theoretical papers is that VCA is part of the "external environment" to the firm; when VCA improves, the external environment becomes more attractive to a current wageworker with an entrepreneurial intent, increasing the probability that the current wageworker chooses to pursue a new venture through entrepreneurship rather than intrapreneurship, or no venturing at all (Subramanian, 2005; Hellman and Perotti, 2011; Kacperczyk, 2012; Cassiman and Ueda, 2006). A couple of these papers are discussed below in more detail.

Kacperczyk (2012) finds that there is an inverse relationship between entrepreneurship and intrapreneurship. Examining specifically the mutual fund industry[7], the author found that when the external environment became more conducive to entrepreneurship, there was a wave of entrepreneurial exit[8] from incumbent companies, identified as a statistically significant decrease in intrapreneurship and an explosion in new hedge fund formations. This indicates that former employees took advantage of the improved entrepreneurial environment to pursue their ideas *outside* of the existing firm (Kacperczyk, 2012). This paper mentions access to capital and financing as one of the main prohibitors of entrepreneurial exit by the wageworker with an entrepreneurial intent, which subsequently leads said individual to intrapreneurial ventures or to no venturing at all. Following this line of logic, within countries that provide better venture capital availability, and therefore an external environment that is more conducive to entrepreneurship, we should expect to observe individuals with a higher likelihood of pursuing entrepreneurial paths.

On the more theoretical side, Subramanian (2005) introduces a model of employee-firm interaction and propose a mechanism through which VCA can increase entrepreneurial activity: when VCA increases, the cost of raising capital *decreases* for an employee with an innovative entrepreneurial idea, thus increasing the opportunity cost of remaining at the current firm as an employee, subsequently increasing the probability that the employee exits the firm to form a start-up. Simultaneously, increased accessibility to venture capital increases the probability of success of a new start-up outside the incumbent firm, not only in the form of financial support but also strategic guidance and industry-specific expertise provided by the venture capitalists. This again stands to increase the probability of entrepreneurial exit.

It would seem reasonable to expect a positive relationship between VCA and entrepreneurial propensity. However, it is important to highlight two assumptions on which such literature hinges: a) the existence of an innovative industry, or more generally, an environment wherein *new* ideas are born in a consistent fashion (Subramanian, 2005; Hellman and Perotti, 2011), and b) entrepreneurship takes the form of said new ideas becoming new businesses/start-ups. In other words, existing literature mostly deals with the narrower term "opportunity entrepreneurship". At this point we should specify that entrepreneurship can take two forms: "necessity entrepreneurship" and "opportunity entrepreneurship". As per Fairlie and Fossen (2018), "We define individuals who are initially unemployed before starting businesses as 'necessity entrepreneurs', and define individuals who are not unemployed (i.e. wage/salary workers, enrolled in school or college, or are not actively seeking a job) before starting businesses as 'opportunity entrepreneurs'". In addition, opportunity entrepreneurs are sometimes referred to as "innovative" entrepreneurs and are more closely linked to the

[7] The mutual funds industry provides a unique setup where both intrapreneurship and entrepreneurship can be observed; this is why the author chooses to examine this industry.
[8] Entrepreneurial exit refers to the exit of an employee from an incumbent firm to form a start-up.

creation of growth-oriented businesses, which venture capitalists would be interested in financing (Fairlie and Fossen, 2018; Block et al., 2016). While a direct mapping would be less than accurate, opportunity entrepreneurs are more associated with the Schumpeterian entrepreneur, while necessity entrepreneurs are more associated with managerial business owners, as examined in Section 2.1.
In light of the above argumentation, we can deduce the following. VCA is addressed towards the opportunity or Schumpeterian entrepreneurs who are most likely to be present in innovative industries and countries, wherein the potential for new ideas is consistently present. Therefore, it would logically follow that improving VCA would be more effective in incentivising entrepreneurship in countries that are more innovative. In the statistical analysis that follows, I use the Global Innovation Index (GII) to measure the extent to which each country is innovative. The components that make up the GII are more thoroughly explained in the Data and Methodology section. This theoretical backbone developed above, together with the empirical observation that venture capitalists invest in innovative, fast-growing industries, leads to the first dependency of VCA's effectiveness in increasing entrepreneurship, and the first hypothesis of this study:

Hypothesis 1 (H1): The effect of venture capital availability on an individual's likelihood to choose entrepreneurship over wage-work is stronger in more innovative countries.

In other words, we expect that the effect of VCA on entrepreneurial propensity is dependent on the extent to which a country is innovative. Statistically, we test this hypothesis by introducing an interaction term between the country-level characteristics VCA and Innovation Level, where the latter is measured by the Global Innovation Index (GII) for each country in the sample (VCA × GII). If the coefficient of this interaction term is positive and statistically significant, then we find support for the aforementioned hypothesis.

Consistent with the theoretical literature reviewed above, entrepreneurial ideas are costly to explore. For example, Krasteva, Sharma and Wagman (2014) distinguish between the "exploration" and "development" of new ideas. At the exploration stage, a non-verifiable idea is turned into a working prototype, and at the development stage, the prototype is turned into a marketable product (Krasteva, Sharma and Wagman, 2014). Based on the aforementioned definitions, it reasonably follows that 'seed-funding' is usually required at the exploration stage, while 'first-stage' or 'expansion-stage' funding is required at the development stage. All of the theoretical papers referred to by this point, with the exception of Hellmann and Perotti (2011), are based on models that assume that new entrepreneurial ideas are born by employees *within* an already established firm. As such, the exploration process is funded using the resources of the corporation wherein the new idea was born. Empirically, start-ups are often the result of ideas that were seed-funded by their respective parent firms (Hellmann and Thiele, 2011; Krasteva, Sharma and Wagman, 2014). This raises the following question: how is the exploration stage of new ideas born *outside* established firms financed and supported? Such ideas are often financed by governments (Zider, 1998).

This is relevant for the purpose of this study because the majority of venture capital is follow-on funding for ideas researched and explored using expenditure by corporations and the government (Kuratko, 2016; Zider, 1998). In fact, less than 1% of newly formed start-ups receive VC funding every year (Kuratko, 2016; Goldstein, 2020; Block, Thurik, Van der Zwan & Walter, 2013), with more than 80% of VC investment going towards companies at their adolescent stage. Therefore, if an individual with an entrepreneurial idea cannot even obtain access to seed-funding, it is unlikely that venture capital availability will factor into

his/her decision on pursuing an entrepreneurial path. This highlights the second dependency of VCA's effectiveness in increasing an individual's entrepreneurial propensity in a country: the existence of entrepreneurial government programs or financial support by corporations. Regarding the latter, I was unable to obtain an appropriate measure of the extent to which corporations in a country support the exploration of their employees' new ideas. With the exception of high-profile employers such as Google, Microsoft, Amazon and IBM who are known to generously support the exploration of their employees' ideas, such policies are internal and therefore not readily available to the public (Krasteva, Sharma and Wagman, 2014). In the case of government support for entrepreneurship, an appropriate measure was obtained (as more thoroughly discussed in the Data and Methodology section), which enables the testing of the second hypothesis:

Hypothesis 2 (H2): The effect of venture capital availability on an individual's likelihood to choose entrepreneurship over wage-work is stronger in countries where there are good entrepreneurial government programs.

We expect that the effect of VCA on entrepreneurial propensity is dependent on the extent to which an individual is able to access government support in pursuing a new venture, in his/her respective country. Similar to the first hypothesis, I test the existence of this dependency using an interaction term between VCA and Entrepreneurial Government Programs (VCA × Government Programs). Obtaining a positive coefficient for this interaction term in the regression results would indicate that there is evidence to support the outlined hypothesis.

The first two hypotheses deal with the dependencies of VCA on *formal institutions* in encouraging entrepreneurship; the last hypothesis posits that the effectiveness of VCA in inducing entrepreneurship is also dependent on *informal institutions.* By definition, formal institutions are a set of political, economic and contractual rules that regulate individual behaviour and shape human interaction, while informal institutions are a set of values, attitudes, beliefs and underlying assumptions prevalent among individuals in a society (North, 1990). We posit that culture and social norms are informal institutions that moderate the way VCA influences entrepreneurial activity in a country. Literature addressing the dependencies of venture capital activity on informal cultural aspects in scarce, implicitly positing that venture capital activity is only influenced by formal institutional factors (for exception, see Zacharakis et al., 2007; Li and Zahra, 2012).

For example, the venture capital system in the United States is viewed as the prime example of a mature venture capital market, and many countries in Europe and elsewhere have attempted to replicate it (Hege, Palomino and Schwienbacher, 2003). However, venture capital funding is still a nascent industry in Europe and there exists a big performance gap between the United States and Europe (Hege, Palomino and Schwienbacher, 2003; Li and Zahra, 2012; Zacharakis et al., 2007). Ibanez (1989) posited that "The single most important feature a government has to look over in promoting venture capital is the general positive attitude towards entrepreneurs and private enterprise". In contrast with European countries, wherein national talent tends to gravitate towards high-prestige jobs in the government and big corporations, the US has established a "value system supportive of entrepreneurship" due to a culture and social norms free of restraints related to class and craft (Ibanez, 1989; Lee and Peterson, 2000). This is some anecdotal evidence in support of the argument that for venture capital availability to increase the probability that an individual pursues entrepreneurship, there needs to exist a culture which supports and accommodates entrepreneurship in the first place.

Li and Zahra (2012) identify two cultural dimensions that are relevant in the relationship between VCA and entrepreneurship: uncertainty avoidance and collectivism. The former indicates low risk tolerance, while the latter indicates a tendency to rely on informal relationships and personal networks. Such cultural characteristics have important effects on innovation and entrepreneurship (Hayton et al., 2002; Mueller and Thomas, 2001; Shane, 1992; Lee and Peterson, 2000). Given the high levels of risk and information asymmetry involved in venture capital activity, it can be excepted that cultural values and social norms play a significant role in the relationship between VCA and entrepreneurial orientation (Li and Zahra, 2012). In their empirical study, Li and Zahra (2012) use venture capital activity as their dependent variable[9] find empirical evidence suggesting that the positive effect of formal institutions on venture capital activity is weaker in uncertainty-avoiding societies and in more collectivist societies. Following in the same line of argumentation, I make the third and final hypothesis of this study:

Hypothesis 3 (H3): The effect of venture capital availability on an individual's likelihood to choose entrepreneurship over wage-work is stronger in countries where culture and social norms are positive towards entrepreneurship.

Similar to the previous hypotheses, the existence of this dependency is tested using an interaction term between VCA and Culture & Social Norms (VCA × Culture & Social Norms), where Culture & Social Norms is measured using an index more thoroughly explained in the Data and Methodology section. Finding evidence to support H3 entails obtaining a positive and statistically significant coefficient for the aforementioned interaction term.

Finally, I abstain from formulating an explicit hypothesis about a causal relationship between VCA and the likelihood to choose entrepreneurship over wage-work because of the limitations of my statistical analysis. Indicatively, such limitations include the potential endogeneity problem between VCA and entrepreneurial choice, as well as the measurement method of entrepreneurship. The aforementioned are discussed in detail in Section 5. Nevertheless, based on the literature reviewed above, the three hypotheses set out above posit that VCA effectiveness in increasing entrepreneurship is dependent on country-level characteristics such as Innovation Level, Entrepreneurial Government Programs and Culture & Social Norms.

[9] Measured as the logarithm of the total *number* of VC investments scaled by the active population (in millions) in a country, where active population is defined as the number of people between 15 and 64.

3. Data and Methodology

3.1 Data

The data stems from the European Commission's Flash Eurobarometer Survey on Entrepreneurship (No. 354) conducted between the 15 June and the 8 August 2012. This is the most recent survey on entrepreneurship for which a comprehensive dataset is available and includes all the variables needed for this analysis. The survey was conducted through telephone interviews for 42,080 randomly selected respondents aged 15 and above, and covers the 27 EU Member States[10], as well as Croatia, Turkey, Iceland, Norway, Switzerland, Israel, Russia, United States, Brazil, India, China, South Korea and Japan. The following six countries were excluded from the analysis due to missing data for some country-level variables: Luxembourg, Bulgaria, Cyprus, Czech Republic, Malta and Iceland. Hence, in total the analysis sample contains 34 countries.

The sampling technique of the Flash Eurobarometer is believed to be representative of the population of each country included in the study. The consortium that carried out the survey utilised in this study) employs a multi-stage random sample design: it uses contact telephone numbers of responders to Eurobarometer studies as "seed numbers". The seed-numbers identify a working block of telephone numbers within different NUTS2 regions and regions of different urbanisation levels in each country, in order to formulate a sample that is geographically representative of the respective countries. The telephone numbers included in the survey for each country are generated by randomly replacing the last two digits of the seed-number. For each household included in the sample, the respective respondent was chosen randomly based on the Last Birthday Rule[11]. To ensure that the sample chosen for each country is representative of the population, a comparison between the sample and universe was carried out for all countries. As such, we can confidently assume that the sample used for this study is representative of the population.

The sample utilised for this study is a subset of the entire dataset described above, consisting only of individuals who indicated 'self-employed', 'employee' or 'manual worker' in the following question: "As far as your current occupation is concerned, would you say you are self-employed, an employee, a manual worker or would you say you are without a professional activity?". In other words, I exclude the respondents who indicated that they are without a professional activity[12] and the ones who refused to answer this question. For the purpose of this analysis, I analyse the binary decision to be an entrepreneur versus being a wageworker. Therefore, I classify the "self-employed" responses as observations of 'entrepreneurs', while the 'employee' and 'manual worker' responses[13] are classified as "wageworkers". Following the exclusion of observations with missing values, the final sample studied in this paper consists of 18,757 observations.

[10] Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Ireland, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovakia, Slovenia, Finland, Sweden, United Kingdom.

[11] The Last Birthday Rule, also commonly referred to as the Most Recent Birthday method, is a random selection method implemented at the initial contact during the telephone interview. The initial contact, who becomes the informant, is asked who had his/her birthday last in the household; the member of the household pointed out becomes the survey respondent.

[12] The response 'without employment' includes individuals who are 1) looking after the home, 2) students, 3) retired, or 4) seeking a job.

[13] The response 'employee' includes individuals who are 1) professionals (e.g. employed doctor, lawyer, etc), 2) general management, direct or top management, 3) middle management, 4) civil servants, 5) office clerk, or 6) other employee (e.g. salesman, nurse, etc). The response 'manual worker' includes individuals who are 1) supervisor/ foreman (e.g. team manager), 2) manual worker, and 3) unskilled manual worker.

3.1.1 Dependent variable

The dependent variable in this analysis is the binary choice variable *entrepreneur* which takes value 1 if the individual is self-employed, and value 0 if the individual is a wageworker. As discussed above, this is a variable measured at the individual level, captured by the survey question "As far as your current occupation is concerned, would you say you are self-employed, an employee, a manual worker or would you say you are without a professional activity?". Since the dependent variable is binary, I perform a hierarchical binomial logistic regression to examine the effect of individual-level (Level 1) and country-level (Level 2) variables on the decision to become an entrepreneur or be a wageworker. The econometric approach is discussed in more detailed in Section 3.2.

3.1.2 Independent variables

As set out by the hypotheses, the variables of interest are measured at country-level (Level 2). The main variable of interest in this analysis is *Venture Capital Availability (VCA)* and its interactions with the following three explanatory variables: *Entrepreneurial Government Programs (EGP), Culture and Social Norms (CSN)* and *Innovation Level (IL).*

Venture Capital Availability (VCA) is an index taking values 1 to 7 in response to the question "In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital?" with 1 being "Extremely difficult and 7 being "Extremely easy". This index reflects the opinion of an average of 100 business executives per country, as part of the Executives Opinion Survey used for over 40 years to capture "crucial information that is not otherwise available on a global scale" (Schwab, 2013). This variable is taken from the 2012 TCdata360 database of the World Bank. This dataset is widely acknowledged, making it a credible and reliable measure for the main variable of interest. For example, it is used for the calculation of the Global Competitive Index (GCI) and it is the prime data source for a plethora of reports outlining economic and business insights, such as The Financial Development Report (Schwab, 2013). An alternative measure for venture capital availability that could have been used is the nominal value of venture capital investments made in each year in each of the countries in our sample. I choose to use the VCA index because it better reflects the *ease* of securing a venture capital investment, which is what this analysis is attempting to capture.

Entrepreneurial Government Programs (EGP) is an index taking values 1 to 5 rating "The presence and quality of programs directly assisting SMEs at all levels of government". This variable is obtained from the Global Entrepreneurship Monitor (GEM) National Expert Survey (NES) 2012. The respondents providing this rating are national experts. This variable is used as a proxy to measure the extent to which start-ups are able to access government funding and support as a potential seed-investment. The GEM NES also provides data on other variables that could be considered proxy-measures for the extent to with the government of a country is supportive of entrepreneurship, such as *Government Support and Policies* which rates from 1 to 5 "The extent to which public policies support entrepreneurship and view entrepreneurship as a relevant economic issue", as well as *Tax and Regulation* which rates from 1 to 5 "The extent to which public policies support entrepreneurship, i.e. taxes or regulation are either size-neutral or encourage new and SMEs". The variable *Entrepreneurial Government Programs* is used in the main analysis of this paper because the research question refers to government support explicitly and directly designed to aid entrepreneurs, making it a more appropriate measure. The latter two variables are used as robustness checks (See Section 4.3).

Culture and Social Norms (CSN) is an index taking values 1 to 5 in response to the statement *"The extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income",* also obtained from the GEM NES 2012. This variable is used as an indication of the extent to which the country has an entrepreneurial culture. An alternative measure for entrepreneurial culture is another index sourced from the GEM Adult Population Survey (APS) (2012), which reflects the "Percentage of 18-64 population who agree with the statement that in their country, most people consider starting a business as a desirable career choice". Arguably this could be a more appropriate measure of the entrepreneurial culture of a country since it is an aggregate measure of how individuals within a country perceive their culture, as opposed to a rating by national experts who might not accurately reflect the perception of the general population. For consistency, the main results presented in this paper use *CSN* as rated by national experts as the measure of this explanatory variable, while the latter is used as a robustness check.

Innovation Level (IL) is a variable constructed by the Global Innovation Index (GII) for 2012, which takes values 1 to 100. It is the average of a number of innovation input and output sub-indices, reflecting a country's capacity for and success in innovation. The data source of this variable is Cornell INSEAD WIPO 2012[14]. This is a commonly used index to compare the innovation level of countries. Since venture capital investments are made in innovative firms and industries, this measure is used as a proxy to reflect the extent to which the industries present in each country can be considered innovative, and therefore eligible for the nature of entrepreneurship that venture capitalists would want to support.

Note that all aforementioned indices are standardised to a scale of 0 to 100 prior to entering the regression to ease the interpretation of the results.

3.1.3 Control variables

Individual-level control variables (Level 1)

Following the approach of Block et al. (2013), I include individual-level socioeconomic characteristics as control variables that could influence an individual's decision to become an entrepreneur. While Block et al. (2013) also include a variety of individual-level psychological characteristics as control variables, I limit the analysis of this paper to the socioeconomic aspect at the individual level. I account for *gender* (male=1; female=0) and *age* (in years; all participants in the survey are 15 years old and above). Additionally, I include the control variable *parent self-employed* which takes value 1 if at least one of the two parents are self-employed and 0 otherwise. I control for this occurrence because it is rational to assume that an individual whose parents own/owned a business would be more likely to either take over the family business, and therefore identify as self-employed in that respect, or to generally engage in other entrepreneurial activity. In addition, I control for *household size* as, according to existing literature, having dependents could induce risk-aversion and increase the need for financial stability, thereby driving individuals towards being employees rather than being entrepreneurs. A limitation of how this variable is measured is that the question in the survey is phrased as "Could you tell me how many people aged 15 or more live in your household?". Ideally, we would need a record of how many people live in the household in total, meaning including people aged 15 or younger, or a direct measure of how many

[14] GII is based on both subjective and objective data derived from sources including the International Telecommunication Union, the World Bank and the World Economic Forum.

dependents each respondent has. This information is not available in the Flash Eurobarometer Survey (No. 356) used for this study, as such we use the aforementioned measure as a proxy for the actual household size.

Furthermore, I control for *educational attainment*. The raw data from the survey indicates the age at which each respondent stopped full-time education. The measure of educational attainment is recoded to reflect years of schooling for each participant, by subtracting the assumed age of starting full-time education (6 years old, see Block et al., 2013) from the age each respondent left full-time education. A potential limitation of the aforementioned way of measuring educational attainment is that approximately 6% of our sample indicates more than 25 years of schooling (between 25 and 91 years of schooling). Such values are unlikely to justly reflect the educational attainment of the respondents. Therefore, to capture the essence of educational attainment, I construct a categorical variable which takes the following four categories: *No formal education* (years of schooling=0); *Some secondary education* (0<years of schooling<11); *High School Graduate* (10<years of schooling<14); and *Tertiary Education* (years of schooling>13). Using either one of the two aforementioned measures for educational attainment yields the same pattern of results in the main regressions.

Finally, I use the control variable *entrepreneurial education*. This is a dummy variable taking value 1 if the respondent agrees that the education received encouraged entrepreneurial initiative and value 0 if the respondent disagrees with this notion. I constructed this dummy variable by considering how the participants rated four statements claiming that education received increased entrepreneurial initiative, awareness and interest. For example, "My school education is helping/has helped me to develop my sense of initiative and a sort of entrepreneurial attitude". The replies were coded on a 5-point Likert scale (-2= "Totally disagree" to 2= "Totally agree). I created an index by taking the average of the responses to these four questions; where this index was non-negative (i.e. weighed on the "Agree" statement) the dummy variable *entrepreneurial education* was coded as 1; where the index took a negative value, the dummy variable *entrepreneurial education* was coded as 0.

Country-level control variables (Level 2)

At country level, I control for the *development stage* of each country as specified in the World Economic Situation and Prospects 2012, prepared by the UN/DESA (United Nations Department of Economic and Social Affairs). As per the UN classification, the variable *development stage* is a categorical variable with three categories: 1) Developed economies; 2) Economies in Transition; and 3) Developing Economies. Economies in transition are Croatia and Russia; developing economies consist of Brazil, China, India, Israel, South Korea and Turkey and the rest of the countries in this sample are classified as developed economies. At the country level, Block et al. (2013) control for GDP (ppp) per capita. Given that the main focus of analysis in this paper is accessibility to venture capital, I deem it more important to control for the development stage of a country instead of its per capita income, as VCA is likely to be more closely influenced by the former due to its dependencies on the existence of a sound institutional framework (Scheela and Chua, 2003).

3.2 Econometric approach

Since the dataset used in this analysis has a nested structure, i.e. individual-level observations nested within countries, and the dependent variable is a binomial choice variable, a Multilevel Binomial Logistic regression model was deemed as most appropriate (Sommet & Morselli, 2017). Multilevel modelling is principally applied in social and medical science where observations often have a nested structured (Langford, Leyland, Rasbash and Goldstein,

1999). Although not as abundantly used in the field of economics, this statistical approach has recently gained the interest of researchers attempting to capture the influence of both country-level (Level 2) and individual-level (Level 1) factors on entrepreneurial activity (Block et al., 2013). Since we're mainly interested in the effect of country-level variables on the individual outcome of being an entrepreneur or being a wageworker, we use the Random-Intercept model. A Random-Slopes model would allow the relationship between Level-1 variables and the dependent variable to vary *across* countries. This model was used in order to allow for the possibility that education has a different relationship with entrepreneurial intent *across* counties, yielding exactly the same results as the simpler Random-Intercept model. Since this paper focuses on the country-level analysis and using a 'simpler' model does not affect the findings, the Random-Intercept model is chosen.

A main assumption of a single-level model (in this case a simple binary logistic model) is that all observations in the sample are independent, meaning that one observation does *not* provide any additional information about another observation. This assumption is violated when a nested data structure exists. Statistically, the violation of this assumption deflates the standard errors and increases the probability of a Type I error.

In order to appropriately use this model, we need to ensure that certain assumptions are satisfied. Firstly, in order to estimate standard errors accurately, as a rule of thumb, the data structure needs to be such that there are at least 10 Level-2 units and 30-50 Level-1 units per cluster, depending on how conservative the approach is (Sommet & Morselli, 2017; Aarts et al., 2014). From Appendix B, we can see that this assumption is in fact satisfied as we have 34 Level-2 units (countries), with an average of 552 Level-1 units (individuals) clustered within each Level-2 unit.

Secondly, there needs to be sufficient between-country variation in the dependent variable. From the table in Appendix 1, we can see that there are some pronounced differences in the distribution of entrepreneurs versus wageworkers between countries. For example, Brazil has the highest proportion of entrepreneurs (48%), followed by India (45%); both percentages are *more* than double the average percentage of entrepreneurs in each country (calculated at 21%). On the lower end of the distribution, we have Sweden with merely 9% of the sample being entrepreneurs, followed by Russia with 11%. At this point, it is worth noting that these four countries are likely to be home to different kinds of entrepreneurship (necessity driven vs. opportunity driven). This highlights the importance of controlling for the development stage and the innovation level of each country in the regressions.

A more formal way of testing whether there is an adequate level of heterogeneity between Level-2 units in the dependent variable is to calculate the Intraclass Correlation Coefficient (ICC). The ICC can take values between 0 and 1 and it indicates the level of homogeneity between Level-2 units, with 0 being very homogeneous and 1 being very heterogeneous. As a rule of thumb, if the ICC is higher than 0.05, then a multilevel model is appropriate, although some literature suggests that any non-zero value of the ICC should indicate a necessity for a multilevel model (Sommet & Morselli, 2017). The ICC in this case is 0.07 (>0.05) which suggests that a multilevel logistic model is more appropriate than a simple logistic model.

As a way to reduce potential multicollinearity concerns and to make the intercept more interpretable, the Level-1 variables were subject to group-mean centring. As such, the constant would reflect the probability that entrepreneurship is chosen as a career path for an

individual with a group average score on all Level-1 variables. Using centred or uncentred data yields no substantial differences in the results.

4. Results

4.1 Univariate Analysis

The dataset analysed in this paper consists of 34 Level-2 units (i.e. countries), with an average of 552 Level-1 units (survey respondents) clustered within each Level-2 unit. As per Appendix B, which provides means, standard deviations and pairwise correlations for all variables used in this study, this sample consists of 20% entrepreneurs, the remaining 80% being wageworkers. The average VCA index is 43.85 (or 3.07 before standardisation). The index 3.07 indicates that on average, for the countries included in our sample, it difficult for a start-up entrepreneur with an innovative but risky project to obtain venture capital funding. The top scoring countries in terms of VCA are Israel, Sweden, Norway, the US and Finland, in descending order, with Israel and Finland scoring 4.45 and 3.91, respectively. The countries that scored the lowest in VCA are Greece, Italy, Hungary, Slovenia and Croatia, with Greece and Croatia scoring 1.83 and 2.12, respectively.

From Appendix B, largely speaking, the independent variables do not seem to be highly correlated. With the exception of three cases, all pairwise correlations are lower than 0.47. The highest pairwise correlation is between VCA and Culture and Social Norms, suggesting that VCA is positively associated with the degree to which culture and social norms accommodate entrepreneurship. In addition, the variance inflation factor (VIF) is comfortably below the suggested threshold of 10 with a mean value of 1.66, while the VIF for all variables is below 3.74 for Model 3 (Hair, Anderson, Tatham & Black, 1995), confirming that there is no serious concern about multicollinearity.

4.2 Multivariate Analysis

In Table 3, Models 1 to 4 display the results of the multilevel binary logistic regression analysis. Specifically, Model 1 only includes individual-level variables, Model 2 only includes country-level variables, and Model 3 combines both individual-level and country-level variables. Model 4 is the same as Model 3, except it includes the interaction terms between VCA and the relevant independent variables, namely *CSN*, *EGP* and *GII*. Model 4 is the main specification of interest as the interaction terms directly relate to the hypotheses set out in the Literature Review and Theory Development section.

4.2.1 Individual-level determinants

In the case of the individual-level variables, the coefficients and their statistical significance remain largely unchanged across all specifications (Model 1, 3 and 4) which highlights their robustness. Specifically, we find a statistically significant relationship between age and entrepreneurial career path (β=0.033; $p<0.01$). Since the coefficient is positive, we can infer that the older an individual is, the more likely it is that he/she will choose entrepreneurship as a career path instead of paid employment, ceteris paribus. In addition, gender has a positive and statistically significant coefficient (β=0.523; $p<0.01$) suggesting that male individuals are more likely to be entrepreneurs than females, ceteris paribus. This is consistent with existing literature supporting that females have lower entrepreneurial intent than men, ceteris paribus. In the case of the dummy variable indicating whether either one of the individual's parents is an entrepreneur, we again find a positive statistically significant relationship (β=0.622; $p<0.01$), suggesting that an individual whose mother or father are entrepreneurs is more likely to be an entrepreneur too than an individual whose parents are both wageworkers, ceteris paribus.

As expected, the dummy variable *entrepreneurial education* indicating whether an individual agrees with the notion that his/her education nurtured the entrepreneurial spirit is positive and statistically significant (β=0.248; $p<0.01$). This suggests that individuals whose education was entrepreneurial in this sense are more likely to be entrepreneurs than individuals who did not perceive their education to be encouraging of entrepreneurial initiative, ceteris paribus. While this finding seems intuitive, it should be interpreted with caution as the relationship between *entrepreneurial education* and the dependent variable *entrepreneur* might be endogenous. As discussed in the Data and Methodology section, this variable is measured as the respondent's *opinion* about their education and might therefore be subjective. As such, it is possible that an individual's intrinsic entrepreneurial aptitude (the unobserved omitted variable) drives both an individual's decision to become an entrepreneur, and it also positively influences one's perception of how entrepreneurial the education received was. Finally, *educational attainment* and *household size* yield statistically insignificant coefficients (β=-0.002; $p>0.10$; β=0.023; $p>0.10$, respectively). As discussed in the Data and Methodology section, *educational attainment* was also coded as a categorical variable (0= *No formal education;* 1= *Some secondary education;* 2= *High School Graduate;* 3= *Tertiary Education*). This specification also yielded statistically insignificant results.

4.2.2 Country-level determinants

Since our variables of interest are measured at country-level, the coefficients obtained for country-level variables are relevant for determining whether there is support for the three hypotheses set out in the Literature Review and Theory Development section. In this section I present the results, while more detailed analysis of the implications of said results is presented in the Discussion section.

VCA

VCA is statistically insignificant across all specifications, suggesting that an individual in a country with high VCA is *no more likely* to become an entrepreneur than an individual in a country with lower VCA, ceteris paribus (from Model 4, β=-0.101; $p>0.10$). This is in line our *a priori* that venture capital availability in itself is inadequate in encouraging entrepreneurship. The statistical significance of the VCA's interaction terms discussed below reveal whether VCA increases one's propensity to become an entrepreneur when *in combination* with other country-level variables.

GII

Regarding GII, the coefficient is negative and statistically insignificant in Model 2 and 3 (β=-0.0206; $p>0.10$, and β=-0.0229; $p>0.10$, respectively), which suggests that we do not find adequate evidence to support that within innovative countries (as measured by the GII) individuals have a higher propensity to become entrepreneurs, ceteris paribus. In Model 4, the coefficient of GII becomes positive, but remains statistically insignificant (β=0.0834; $p>0.10$). At the same time, the coefficient of the interaction term between GII and VCA is negative and statistically significant (β=-0.00231; $p<0.10$). This result is in complete contradiction with Hypothesis 1 which proposes that GII positively moderates the relationship between VCA and entrepreneurial propensity in a country. At the contrary, the inference we can make from the negative coefficient of the interaction term is that GII *negatively* moderates the relationship between VCA and an individual's entrepreneurial propensity. This implies that the more innovative a country is, the weaker the effect of VCA on an individual's propensity to become an entrepreneur, ceteris paribus. The potential implications and possible explanations for this contradiction to Hypothesis 1 are addressed in the Discussion section. In conjecture with the fact

that the coefficient of GII and VCA are statistically insignificant, the statistically significant negative interaction term suggests that the magnitude and existence of both effects is interdependent.

Table 3: Multilevel Binomial Logistic Model - Main Table of Results

VARIABLES	Model 1	Model 2	Model 3	Model 4	H
Level-1 determinants					
Parent entrepreneur	0.623***		0.624***	0.624***	
	(0.042)		(0.042)	(0.042)	
Educational attainment	-0.002		-0.002	-0.002	
	(0.003)		(0.003)	(0.003)	
Gender (=1 if male)	0.525***		0.523***	0.523***	
	(0.039)		(0.039)	(0.039)	
Entrepreneurial education	0.249***		0.249***	0.249***	
	(0.040)		(0.040)	(0.040)	
Age	0.033***		0.033***	0.033***	
	(0.002)		(0.002)	(0.002)	
Household size	0.022		0.023	0.022	
	(0.020)		(0.020)	(0.020)	
Level-2 determinants					
VC Availability		-0.008	-0.005	-0.118*	
		(0.010)	(0.010)	(0.062)	
Culture & Social Norms		0.014	0.014	0.001	
		(0.010)	(0.010)	(0.032)	
Government Programs		0.002	0.002	-0.162***	
		(0.011)	(0.011)	(0.055)	
GII		-0.021	-0.020	0.086	
		(0.014)	(0.014)	(0.061)	
Development stage					
In transition		-0.761**	-0.590	-0.778**	
		(0.368)	(0.370)	(0.340)	
Developed		-0.352	-0.169	-0.326	
		(0.243)	(0.245)	(0.227)	
VCA× GII				-0.002*	H1
				(0.001)	
VCA× Government Programs				0.004***	H2
				(0.001)	
VCA× Culture & Social Norms				0.001	H3
				(0.001)	
Variance	0.204***	0.144***	0.146***	0.107***	
	(0.053)	(0.038)	(0.039)	(0.029)	
Constant	-1.396***	-0.652	-0.936*	3.362	
	(0.080)	(0.562)	(0.566)	(2.471)	
Observations	18,757	18,757	18,757	18,757	
Number of groups	34	34	34	34	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

EGP

In Models 2 and 3, the main effect of Government Programs is statistically insignificant and of similar magnitude (β=0.00184; *p>0.10*, and β=0.00212; *p>0.10*, respectively). Upon the addition of the interaction terms in Model 4, however, the coefficient of Government Programs becomes *negative* and strongly statistically significant (β=-0.159; *p<0.01*). Paradoxically, this would suggest that when a country increases the availability of support for entrepreneurial ventures, the propensity of an individual to become an entrepreneur (versus being a wageworker) decreases, ceteris paribus. At the same time, the interaction term between Government Programs and VCA in Model 4 is positive and strongly statistically significant (β=0.00378; *p<0.01*). This suggests that the apparent negative relationship between Government Programs and propensity to become an entrepreneur is *positively moderated* by the strong presence of VCA. In summary, the interaction term is positive and statistically significant while the main effect of VCA is statistically insignificant in Model 4. Treating VCA as the main variable of interest, these results suggest that the better the entrepreneurial government programs in a country, the stronger the positive effect of VCA on an individual's propensity to become an entrepreneur, ceteris paribus. The fact that the main effect of VCA in Model 4 is statistically insignificant introduces the idea that the positive effect of VCA on the individual's entrepreneurial propensity in a country is only as strong as the availability of entrepreneurial government programs in said country. This provides support for Hypothesis 2 and the notion that VCA works as part of a wider system, discussed in Section 1 and 2.

CSN

The coefficient of the Culture and Social Norms variable in Model 2 and 3 is positive but statistically insignificant (β=0.0140; *p>0.10*, and β=0.0147; *p>0.10*, respectively). This result suggests that we find no evidence to suggest that within countries were culture and social norms are accommodating and encouraging of entrepreneurship individuals have a higher propensity to become entrepreneurs, ceteris paribus. The addition of the interaction term between Culture and Social Norms and VCA in Model 4 does *not* change the aforementioned result; the coefficient of Culture and Social Norms in Model 4 is positive but statistically insignificant (β=0.0129; *p>0.10*). Similarly, the coefficient of the interaction term between Culture and Social Norms and VCA is positive and statistically insignificant (β=0.000131; *p>0.10*). As such, we do *not* find support for Hypothesis 3, postulating that Culture and Social Norms positively moderates the relationship between VCA and entrepreneurial propensity, at the country level. In other words, we find no evidence to support the hypothesis that the more accommodating a country's culture and social norms are towards entrepreneurship, the stronger the positive effect of VCA on an individual's propensity to become an entrepreneur, ceteris paribus.

Development Stage

Finally, I present the regression results for the country-level control variable Development Stage. In Models 2,3 and 4, the coefficient of the category 'In transition' is negative and statistically significant (β=-0.761; *p<0.05*, β=-0.790; *p<0.05* and β=-0.941; *p<0.01*, respectively). As such, we can infer that within countries that are classified as 'In transition', individuals have a lower propensity to become entrepreneurs compared to countries that are classified as 'Developing'. For the 'Developed' category, the coefficient in Model 2 and 3 is negative but statistically insignificant (β=-0.352; *p>0.10* and β=-0.366; *p>0.10*, respectively). However, in Model 4, the coefficient of 'Developed' becomes statistically significant (β=-0.496; *p<0.05*), suggesting that in countries that are classified as 'Developed', individuals

have a lower propensity to become entrepreneurs compared to countries that are classified as 'Developing'. Model 4 could be eliciting a relationship between entrepreneurial propensity and country development stage as follows: as a country moves from 'developing' to 'in transition', individuals are less likely to become entrepreneurs, ceteris paribus; when a country transitions to 'developed' thereafter, an individual's propensity to become an entrepreneur increases, ceteris paribus, although it remains below that of individuals in developing countries. This finding is in complete agreement with Wennekers and Thurik (1999) who posit that self-employment has a U-shaped relationship with economic development.

4.3 Robustness Checks and Further Analysis

A number of tests were conducted to check the robustness of the results described above. As per the Data and Methodology section, we carry out robustness checks on the coefficients of some variables of interest by using different methods of measuring them. Firstly, we check for any substantial differences in the way experts and the adult population within a country perceive the extent to which their country's culture encourages and accommodates entrepreneurship. As discussed further in the Data and Methodology section, we replace the variable '*Culture and Social Norms*' (sourced from the NES) with the variable '*Entrepreneurship as desirable career'* (sourced from the APS) and run exactly the same regressions. The results obtained are largely the same as the results presented in the main analysis. Secondly, we use the variable "*Government Support and Policies*" as an alternative measure for the extent to which a government is supportive of entrepreneurship. The results obtained are identical to the results of the regressions presented in the main analysis, where the measure "*Entrepreneurial Government Programs"* is used.

Furthermore, measuring our variables of interest for the year 2012, which is the same year as the dependent variable is recorded, could make our results prone to reverse causality. For example, it could be argued that low propensity for entrepreneurship in a country *causes* the creation of entrepreneurial government programs and institutional changes to accommodate entrepreneurship. Additionally, since we are examining the individual- and country-level variables that factor into one's decision to pursue entrepreneurship, it would make sense to measure the aforementioned variables some years prior to the observed entrepreneurial activity. Having said this, such country-level variables tend to not vary significantly with time, which makes the year of measurement a less significant consideration. To alleviate such concerns, we run exactly the same regressions using independent variables measured for 2007, i.e. 5 years prior to when the dependent variable was recorded. The results did not show any notable differences.

Thirdly, I investigate whether VCA and its interaction terms reveal a different relationship with entrepreneurial propensity when studying only the sub-sample of "Developed" countries (as per the World Economic Situation and Prospects 2012). The rationale behind carrying out this analysis is that it is more likely that the nature of entrepreneurship is more comparable between countries in the developed world. Specifically, we would expect to encounter more "opportunity-driven" entrepreneurship, making these countries a potentially more apt sample to study in the context of venture capital. The sub-sample of "Developed countries" is made up of 26 countries and 14,454 observations. The results coefficients of the variables relating to our three hypotheses were robust, showing no substantial differences from the results of the main regression.

Finally, I run a robustness check altering the specification of the variable of interest *VCA*. I dichotomise the variable *VCA,* i.e. I transform *VCA* from a continuous variable to a binary variable taking values 0 for "Low Venture Capital Availability" and 1 for "High Venture Capital Availability". I use the median as the cutpoint, where the VCA index takes the value 2.95. The sample is also reduced to the observations for which the VCA index is either in the bottom 25th percentile (i.e. below 2.38), or the top 25th percentile (i.e. above 3.77). I avoid using the observations for which the VCA measure is in the middle 50 per cent due to the arbitrariness of determining the cutpoint for the dichotomisation of VCA within that range (Fedorov, Mannino, and Zhang, 2009; Royston, Altman and Sauerbrei, 2006). By examining *only* the tails of the VCA distribution, we ensure that the groupings 'High VCA' and 'Low VCA' are valid and distinct, and we avoid Type I error that could be caused through multiple testing to determine the "optimal cutpoint" (Fedorov, Mannino, and Zhang, 2009; Royston, Altman and Sauerbrei, 2006). Furthermore, transforming the variable of interest into a dummy variable and doing an 'extremes' analysis is a way to deal with a potentially noisy dataset in terms of the VCA measurement (Fedorov, Mannino, and Zhang, 2009; Royston, Altman and Sauerbrei, 2006). Due to the fact that VCA is measured as national experts' *opinion* on the accessibility of venture capital at the country-level, it is possible that there is some measurement error due to the inherent subjectivity of experts' opinion.

After dropping the middle VCA observations, the sample size is reduced to 12 countries[15] and 7,297 observations, which still satisfies the requirements of a multilevel model. The results, presented in Table 4 seem more conclusive than the results of the main regression, although both point in the same general direction. The most significant difference is that in this regression, the coefficient of the dummy variable *VCA* is *negative* and statistically significant (β=-7.158; $p<0.05$), indicating that an individual residing in a country with high VCA is less likely to become an entrepreneur compared to an individual residing in a country with low VCA, ceteris paribus. The coefficient of the interaction term between *VCA* and *Entrepreneurial Government Programs* remains positive and statistically significant, reinforcing its robustness, while the interaction term between VCA and *GII* is statistically insignificant in this regression.

[15] Top tail: Israel, Sweden, Norway, United States, Finland, Netherlands, United Kingdom. Bottom tail: Greece, Italy, Hungary, Slovenia, Croatia.

Table 4: Multilevel Binomial Logistic Model – Robustness Check

VARIABLES	Model 1	Model 2	Model 3	Model 4	H
Level-1 determinants					
Parent entrepreneur	0.662***		0.662***	0.661***	
	(0.067)		(0.067)	(0.067)	
Educational attainment	-0.004		-0.004	-0.004	
	(0.004)		(0.004)	(0.004)	
Gender (=1 if male)	0.551***		0.552***	0.550***	
	(0.063)		(0.063)	(0.063)	
Entrepreneurial education	0.210***		0.210***	0.211***	
	(0.064)		(0.064)	(0.064)	
Age	0.034***		0.034***	0.034***	
	(0.003)		(0.003)	(0.003)	
Household size	0.033		0.033	0.034	
	(0.033)		(0.033)	(0.033)	
Level-2 determinants					
High VCA		0.901*	0.874	-7.158***	
		(0.491)	(0.537)	(2.683)	
Culture & Social Norms		0.019*	0.018	-0.029	
		(0.011)	(0.012)	(0.047)	
Government Programs		0.004	0.006	-0.141***	
		(0.022)	(0.024)	(0.050)	
GII		-0.088***	-0.087**	0.094	
		(0.032)	(0.035)	(0.073)	
Development stage					
In transition		0.279	0.306	0.265	
		(0.541)	(0.594)	(0.387)	
Developed		0.432	0.488	0.275	
		(0.387)	(0.426)	(0.233)	
VCA× GII				-0.105	H1
				(0.079)	
VCA× Government Programs				0.178***	H2
				(0.052)	
VCA× Culture & Social Norms				0.062	H3
				(0.048)	
Variance	0.205**	0.064**	0.079**	0.017	
	(0.090)	(0.032)	(0.038)	(0.014)	
Constant	-1.453***	0.961	0.854	1.819	
	(0.136)	(1.268)	(1.394)	(1.424)	
Observations	7,297	7,297	7,297	7,297	
Number of groups	12	12	12	12	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Discussion and Conclusion

The final section of this paper is organised as follows. Section 5.1 discusses and attempts to explain the results of the econometric analysis described in the previous section. Section 5.2 acknowledges and discusses the limitations of this empirical study, evaluating the implications of said limitations on the interpretation of the findings. Finally, I conclude by drawing attention to the most significant findings of this paper and suggesting their potential policy implications.

5.1 Discussion

As per the Results section, VCA is statistically insignificant across all specifications, suggesting that an individual in a country with high VCA is *no more likely* to become an entrepreneur than an individual in a country with lower VCA, ceteris paribus. Although, the main effect of VCA is statistically insignificant, this result should be read with caution as the coefficients obtained for VCA (as well as its interaction terms) are very small. As such, it could be the case that there is in fact an association between VCA and entrepreneurial choice, but it is too small to be supported by the statistical analysis.

Nevertheless, this finding is crucial for the interpretation of the coefficients of the interaction terms of VCA. Had the main of effect of VCA been positive and statistically significant, the interaction terms would have to be interpreted as moderating effects. The fact that the main effect of VCA is statistically insignificant while two of its interaction terms are statistically significant indicates that the existence and magnitude of the effect of VCA is dependent on these two country characteristics; namely, entrepreneurial government programs and the innovation level. This result is in line with the literature review presented in Section 1 and 2, reinforcing this paper's *a priori* that for VCA's influence on entrepreneurial choice is subject to a number of dependencies. In addition, it enables us to refer to the following coefficients of VCA's interaction terms as dependencies and not mere moderating factors.

Hypothesis 1: GII

In Model 4, which includes the interaction terms relevant to the three hypotheses of this study, the coefficient of the interaction term between GII and VCA (GII × VCA) is *negative* and statistically significant (β=-0.00231; $p<0.10$). This is in complete contradiction with Hypothesis 1 which proposes that the effect of VCA on an individual's likelihood to choose entrepreneurship over wage-work is stronger in more innovative countries. The negative coefficient of this interaction term would suggest that the effect of VCA on an individual's likelihood to choose entrepreneurship over wage-work is *weaker* in more innovative countries. Taking into account the fact that the main effect of both VCA and GII is statistically insignificant, the negative and statistically significant interaction effect indicates the presence of both high innovation levels and VCA in a country in fact serve to *decrease* the probability than an individual in that country chooses to follow an entrepreneurial career path, ceteris paribus.

While this finding might seem counter-intuitive following the line of argumentation in the literature review, there is a potential explanation. The result that in countries with strong VCA and high GII the average individual is less likely to choose entrepreneurship does not imply that the government should discourage innovation and venture capital activity in order to induce entrepreneurship. Instead, this might be an indication that in countries where VCA and the GII is high, *real* entrepreneurship increases. As per Section 2.1, real entrepreneurship encompasses both the Schumpeterian entrepreneurs, who are self-employed by occupation, as

well as the corporate entrepreneurs or intrapreneurs, who are *not* self-employed by occupation and are therefore not accounted for in this study's measure of entrepreneurship.

I propose two mechanisms through which this seemingly striking result is observed. As per the theoretical models reviewed in Section 2.3, countries ranking high in GII reflect an environment where ideas for new products and economic opportunities consistently arise. The first mechanism is as follows. The innovation level of a country improves, creating more entrepreneurial opportunities for the Schumpeterian entrepreneur. VCA increases as venture capitalists attempt to take advantage of the financial return to be borne by the potential new start-ups. Simultaneously, the external environment for the entrepreneurial employee becomes more attractive. It might now be more profitable for existing firms to accommodate and encourage *intrapreneurship* rather than allow the entrepreneurial exit of their employees and risk eroding their profit margins due to the increased competition. Subsequently, even though *real* entrepreneurship increases, the observed entrepreneurship in the form of self-employment decreases. While this mechanism might seem complex, it is supported by a number of theoretical papers modelling the ideal employment contracts from the perspective of the employer, taking into account parameters that reflect the attractiveness of the external environment (Subramanian, 2005; Hellman and Perotti, 2011; Kacperczyk, 2012; Cassiman and Ueda, 2006).

The second proposed mechanism is the following. As GII is a composite measure of both innovation input (such as R&D) as well as innovation output (such as patents), it could be the case that most of the innovation input is financed by corporations, meaning that the innovation output is also largely enjoyed by said corporations. As such, this innovative environment is mostly observed *within* the bounds of already existing firms. The rise in corporate venture capital programs[16] and initiatives by corporations to fund internal venturing in the last twenty years (Chesbrough, 2002), might indicate that a corporate venture capital ecosystem is created, which masks the increase in *real* entrepreneurship in the form of a largely unobserved increase in intrapreneurship. This result underlines the importance of measuring real entrepreneurship, not simply entrepreneurship in terms of its occupational sense. This is not possible with the current data, but it could be considered for future research.

Hypothesis 2: EGP

As per the Results section, the main effect of EGP is *negative* and statistically significant (β=-0.159; $p<0.01$) in Model 4, while the interaction term between EGP and VCA (CSN × VCA) is positive statistically significant (β=0.00378; $p<0.01$). The negative main effect of EGP would paradoxically suggest that when a country increases the availability of governmental support for entrepreneurs, the probability that an individual in that country chooses entrepreneurship over wage-work decreases, ceteris paribus. This counter-intuitive finding is unlikely to be revealing of a causal effect; instead, this is likely to indicate that countries with naturally low levels of entrepreneurship have better government programs in order to incentivise entrepreneurship. Given that entrepreneurship is frequently referred to as a "structural" characteristic of a country's economy (Van Stel, Carree and Thurik, 2005), government intervention is likely to be effective in increasing entrepreneurial activity for that country *over time.* In a cross-sectional analysis, however, economies with structurally low

[16] Corporate venture capital (CVC) behaves in largely similar ways to independent venture capital. Corporate venture capital is essentially the financing of internal ventures (intrapreneurship) or external start-ups by an existing corporation. Ventures financed through CVC tend to be relevant in some way to the parent company's operations.

levels of entrepreneurship are unlikely to be comparable to countries with naturally high levels of entrepreneurship. For example, if the Russian government, starting today, decided to begin funding start-ups and supporting new entrepreneurs through government policies, tax and regulation, entrepreneurship is likely to rise in the space of the next five years[17], however, it is unlikely to reach India's levels of entrepreneurship.

Regarding the interaction term between EGP and VCA, the positive and statistically significant coefficient provides support for Hypothesis 2: the effect of VCA on an individual's likelihood to choose entrepreneurship over wage-work is stronger in countries that have good EGP. This is the most robust finding of this study, as the coefficient of the interaction term remained positive and statistically significant throughout all robustness checks and changes in specifications (see Section 4.3). This result is in line with the insights discussed in the literature review, reinforcing the argument that a government's positive attitude towards entrepreneurship (in the form of entrepreneurial government programs, taxes and regulation) is a dependency for VCA and its influence on entrepreneurial choice.

Hypothesis 3: CSN

The coefficient of the interaction term between CSN and VCA (CSN × VCA) in Model 4 is positive but statistically insignificant (β=0.0129; $p>0.10$). As per the Results section, this means that we do not find support for Hypothesis 3 which proposes that the effect of VCA on an individual's likelihood to choose entrepreneurship over wage-work is stronger in countries where CSN are positive towards entrepreneurship. There are a couple of ways this finding could be explained.

Firstly, since education is so closely linked to cultural values and societal behaviours, it could be the case that the effect of CSN is partly reflected in the individual-level characteristic *entrepreneurial education*. As such, the main effect of CSN as well as its interaction with VCA appear to be statistically insignificant. This potential explanation was put to the test by removing the individual-level variable *entrepreneurial education* from the specification of the model and performing the regression again. The coefficient of the interaction term between VCA and CSN, however, remained statistically insignificant. Alternatively, the lack of statistical significance might be related to the magnitude of VCA's effect on entrepreneurial choice at the margin. Because of the requirement to exit their investments, VCs do not invest in "lifestyle" businesses, i.e. businesses that provide a good income to the entrepreneur but have no real shot at a sale with significant financial return or an IPO (Metrick and Yasuda, 2010). While an entrepreneurially accommodating culture is likely to encourage self-employment but removing the stigma associated with individuals that follow an entrepreneurial path (Ibanez, 1989), the vast majority of these entrepreneurial ventures are likely to be "lifestyle" businesses. Referring back to the literature review, "lifestyle" businesses relate more to the managerial business owner rather than the Schumpeterian entrepreneur. Although it might be true that the combination of a culture that is positive towards entrepreneurship and VCA inspires entrepreneurial intent, a very small percentage of this entrepreneurial intent translates into an entrepreneurial venture backed by VCs. As per Schröder (1992), out of every 100 incoming business plans, 20 do not even make it to Screening, the first phase of the selection process, due to poor quality of the business plans. Out of the remaining 80 business plans, only 20 actually make it through the screening process; between 5 and 7 of those make it to the negotiation stage and a mere 1-4 end up with

[17] I refer to a 5-year period specifically because the robustness check explained in Section 4.3, which revealed largely similar results to the main regression discussed, measured EGP at a 5-year time-lag (i.e. EGP measure was used for 2007, whereas the dependent variable was measured in 2012).

a deal. Therefore, the magnitude of the marginal difference in observed entrepreneurship between countries with entrepreneurial CSN but low VCA and countries with entrepreneurial CSN and *high* VCA might be too small to be statistically significant in a sample of our size.

5.2 Limitations

This study is not without limitations. Although the hypotheses synthesised imply testing for a causal effect, the limitations inherent to this analysis restrict the interpretation of the findings to associations. Firstly, there is an endogeneity concern caused by the potential reverse causality between VCA and entrepreneurship. Since entrepreneurs are viewed as the 'demand' for venture capital (Samila & Sorenson, 2011), while ease of access to venture capital might incentivise individuals to pursue entrepreneurship, high levels of entrepreneurship in a country could also attract venture capitalists, increasing VCA. There are additional reverse causality concerns, such as the relationship between entrepreneurship and EGP mentioned above: good EGP can incentivise entrepreneurship, but low levels of entrepreneurship can also lead to the existence of good ESG as a government response. We address this concern by using lagged independent variables, i.e. a five-year lag between the measurement of the dependent variable and the measurement of the variables of interest. While my results seem robust even after lagging the variables of interest, a five-year lag period might not be adequate to address reverse causality concerns[18]. As such, the findings of this paper should be read with caution, and while causal effects are reasonably supported by insights from existing literature, inferences made from this paper should be limited to associations.

Secondly, a significant limitation in studying the effect of venture capital availability on entrepreneurship is our available measure of entrepreneurship: self-employment. For the purpose of this study, I would ideally use real entrepreneurship as the dependent variable; this would mean that I would exclude managerial business owners from my observations of entrepreneurship and include corporate entrepreneurs in my observations of entrepreneurship. This is because intuitively, as well as based on theory, venture capital availability should only influence the type of entrepreneur it concerns: i.e. the Schumpeterian entrepreneur and the corporate entrepreneur or intrapreneur. This slight mismatch between what the dependent variable is meant to be measuring, i.e. real entrepreneurship, and what it is actually measuring, i.e. self-employment, limits the degree to which a causal effect can be inferred, and it potentially causes the statistical analysis to underestimate the association between VCA and real entrepreneurship. The aforementioned limitation makes a good case for future surveys and on entrepreneurship to include more specific definitions of the term and separate its occupational nature from its behavioural nature. This will allow future researchers to study real entrepreneurship rather than constraint the discussion to self-employment.

5.3 Conclusion

In summary, the main findings of this paper are the following. Firstly, in countries with high GII and VCA, individuals are less likely to follow an entrepreneurial path. As discussed in Section 5.1, this finding could be an indication that while an innovative environment attracts the attention of venture capitalists, new and innovative ideas are largely explored through intrapreneurial ventures. Secondly, I found no support for the hypothesis in countries where VCA is high and the culture is considered positive towards entrepreneurship individuals are more likely to become entrepreneurs. Finally, the results of this study found support for the

[18] A bigger lag-period was considered, but this would substantially decrease my sample size as measurements of a number of variables of interest are not available for the years prior to 2007.

hypothesis that in countries where VCA is high and the government is supportive of entrepreneurship, individuals are more likely to choose entrepreneurship.

Concluding, the most robust finding of this research paper is the positive and statistically significant coefficient of the interaction term between EGP and VCA, revealing that in countries where venture capital availability is high and the government has a positive and accommodating attitude towards entrepreneurship, individuals have a higher probability of choosing entrepreneurship as a career path. This highlights the crucial role of the government in enabling not only the sound functioning of the venture capital system, but also the innovation capabilities of the country, given the direct association of venture capital and innovation. There is an array of government tools that can be used to directly or indirectly support the venture capital industry. Indirectly, the government could initiate financial programs such as direct lending to nascent entrepreneurs (i.e. people involved in the creation of new ventures) and/or small enterprises as seed-capital. Alternatively, governments could implement loan guarantee schemes whereby governments fully or partially cover loans given to small enterprises by banks. Such government programs could help provide the necessary capital to push individuals with innovative ideas towards an entrepreneurial career path that would otherwise not be possible. Such programs exist in countries like the US, Canada and the UK (Reference).

In order to directly aid the venture capital industry, governments could provide financial support to venture capital firms in a way similar to the creation of Small Business Investment Companies (SBICs) in the United States. SBICs are venture-capital-like investment companies funded through a combination of privately raised capital and government loan funds. SBICs are frequently cited as the foundation for what is now the much-envied US venture capital market (Ibanez, 1989). Alternatively, the government could set up state-guarantee schemes similar to the Particuliere Participatie Maatschappijen (PPM) in the Netherlands which grants subsidies to private venture capital firms.

While the limitations of this econometric analysis prevent us from credibly concluding that a country's innovation level, governmental support towards entrepreneurship and culture and social norms are *dependencies* for VCA to induce entrepreneurship, the following can be safely inferred. Regarding a country's innovation level, the obtained results suggest that countries with a high GII and strong VCA are associated with less entrepreneurship. I concluded that this finding is unlikely to be indicative of a causal relationship; instead, this is likely to be indicative of the presence of *real* entrepreneurship in the form of corporate entrepreneurship. In the case of culture and social norms, this analysis did not establish an association between countries with encouraging cultural values and high levels of VCA and the individual-level entrepreneurial choice. This paper, however, did highlight that VCA seems to have a better chance at encouraging entrepreneurship when the government has the right framework in place: presence and quality of programs directly assisting SMEs at all levels of government; policies that view entrepreneurship as a relevant economic issue and an entrepreneur-friendly tax structure.

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6. Appendices

Appendix A

Country	Wageworkers		Entrepreneurs		Total
Austria	406	78%	114	22%	520
Belgium	401	83%	81	17%	482
Brazil	319	52%	300	48%	619
China	530	87%	81	13%	611
Croatia	319	81%	76	29%	395
Denmark	395	86%	64	14%	459
Estonia	434	84%	81	16%	515
Finland	379	83%	80	17%	459
France	469	88%	62	12%	531
Germany	411	81%	96	19%	507
Greece	312	66%	158	34%	470
Hungary	469	86%	61	14%	530
India	252	55%	207	45%	459
Iceland	374	74%	130	26%	504
Israel	523	79%	143	21%	666
Italy	375	77%	115	23%	490
Japan	414	79%	110	21%	524
Latvia	447	84%	85	16%	532
Lithuania	401	86%	66	14%	467
Netherlands	394	74%	137	26%	531
Norway	567	87%	86	13%	653
Poland	422	79%	113	21%	535
Portugal	379	81%	90	19%	469
Romania	419	86%	67	14%	486
Russia	512	89%	65	11%	577
Slovakia	422	76%	137	24%	559
Slovenia	365	88%	50	12%	415
South Korea	434	74%	154	26%	588
Spain	440	82%	95	18%	535
Sweden	531	91%	51	9%	582
Switzerland	465	78%	128	22%	593
Turkey	276	69%	112	31%	388

United Kingdom	484		80		564
		85%		15%	
United States	1,180		362		1,542
		76%		24%	
Total	**14,920**		**3,837**		**19,068**
		80%		**20%**	

Appendix B

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1 Entrepreneur	0.20	0.40	-											
2 Parent-entrepreneur	0.27	0.44	0.14*	-										
3 Education	15.86	6.76	0.01	0.03*	-									
4 Male	0.49	0.50	0.11*	0.02*	-0.03*	-								
5 Entrepreneurial education	0.49	0.50	0.07*	0.05*	0.06*	0.07*	-							
6 Age	43.36	12.63	0.12*	0.00	0.08*	-0.04*	-0.07*	-						
7 Household size	2.46	0.98	0.03*	0.01	-0.07*	0.02*	0.08*	-0.13*	-					
8 VCA	43.85	11.02	-0.02*	0.01	0.19*	0.01	0.01	0.11*	-0.13*	-				
9 Culture & Social Norms	57.30	12.11	0.04*	0.03*	0.18*	0.03*	0.00	0.07*	-0.06*	0.68*	-			
10 Government Programs	54.76	8.67	-0.04*	0.07*	0.01	0.01	-0.05*	0.10*	-0.13*	0.28*	0.22*	-		
11 GII	50.42	9.11	-0.08*	0.06*	0.13*	-0.03*	-0.12*	0.20*	-0.23*	0.63*	0.47*	0.64*	-	
12 Development stage	2.58	0.78	-0.10*	-0.07*	-0.04*	-0.08*	-0.12*	0.19*	-0.20*	-0.02*	-0.23*	0.24*	0.38*	-

*p<0.05

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