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MASTER THESIS IN INDUSTRIAL DYNAMICS AND STRATEGY

A multi-level analysis, using an institutional approach, on the effect of environmental policy, institutional quality and culture on environmental entrepreneurship.

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Abstract

The effect of environmental policy stringency on the environmental entrepreneurial orientation of early-stage entrepreneurs is evaluated using an institutional framework approach. Firstly, the direct and interaction effect of environmental policy, quality of formal institutions, and culture is evaluated. Using data from the Global Entrepreneurship Monitor (GEM) 2009, the Environmental Policy Stringency (EPS) index developed by the OECD, governance indicators of the WorldBank and cultural determinants developed by Hofstede, a multilevel analysis is conducted. The results of the random-intercept model, covering 2163 early-stage entrepreneurs across 21 countries, suggest that the direct effect between the stringency of environmental policy and the cultural dimensions of individualism and long-term orientation on the environmental orientation of early-stage entrepreneurs is weak or insignificant. However, partial evidence supporting the institutional support theory was found, indicating that the quality of formal institutions on the country-level is positively significantly associated with an increase of the environmental orientation of early-stage entrepreneurs on the individual level. However, these results were highly influenced by the inclusion of certain developing countries. Potentially suggesting that environmental entrepreneurship is fostered by a minimal level of formal institutional quality. Furthermore, the estimates of the interaction effect between environmental policy and the other institutional variables did not yield any significant interaction effects.

Contents

1 Introduction

While classical economic theory suggests that economic activity is at the root of our current global environmental problems, a new stream of research has begun to focus on entrepreneurship as a solution for environmental problems (Dean & McMullen, 2007). Through efficient resource usage, investing in and adaptation of green innovations, entrepreneurs are capitalizing on existing environmental relevant market failures. Classical entrepreneurship theory suggest that entrepreneurs are mainly motivated by their own financial value creation. The environmental entrepreneurship domain, in conjunction with the social- and sustainable entrepreneurship domain[1] gives a clear dissent, suggesting that entrepreneurs through entrepreneurial activity can both create personal financial value, value for society and value for the environment. Environmental entrepreneurs base their economic activities on sustainable and environmentally friendly principles in their search to minimize their impact or to relieve the impact of others on the environment (Schaltegger & Wagner, 2011). A deeper understanding of environmental entrepreneurship and its contextual drivers is of major importance to the process of greening our economies, while still providing employment and economic value to society (D. Choi & Gray, 2008).

The surge of interest in and creation of sustainable start-ups can be partially explained by the increased global attention for sustainability. Environmental entrepreneurship is becoming of greater interest as there is a surge in the demand for green products (Gliedt & Parker, 2007). The environmental entrepreneurial literature focuses mainly on how opportunities for environmental entrepreneurship come into existence. A general trend in the literature is that environmental entrepreneurs often employ entrepreneurial activities in the void created by certain market failures (Cohen & Winn, 2007; Dean & McMullen, 2007). Furthermore, a major theme in the literature attempts to address what constitutes environmental entrepreneurship, and differentiate types of environmental entrepreneurship (Hockerts & Wüstenhagen, 2010) and their motivation (Kirkwood & Walton, 2010). Aforementioned themes all primarily focus on individual level context of the environmental entrepreneur. To understand country-level differences, researchers have focused on the institutional context in explaining environmental entrepreneurial activity. In general, governmental regulation is seen as necessary to address market failures such as environmental pollution (Pigou & Aslanbeigui, 1938). Therefore it is no surprise that an institutional approach is often utilized when looking at cross-country differences of green entrepreneurship. Hörisch, Kollat, and Brieger (2017) for example, use formal and informal institutions to explain the environmental orientation of entrepreneurs, and Meek, Pacheco, and York (2010) focus on societal norms such as consumption norms and family interdependence in combination with formal state incentives. Societal norm and informal institutions are predominantly formed by culture through shared values and beliefs of a specific group (Mueller & Thomas, 2001). Furthermore, cultural dimensions have played a central role in investigating different levels of social entrepreneurial prevalence among different countries (Stephan, Uhlaner, & Stride, 2015). Therefore, to complement the institutional perspective, also cultural determinants of environmental entrepreneurship will be discussed.

While both Meek et al. (2010) and Hörisch et al. (2017) focus on explaining environmental entrepreneurship partially through governmental environmental legislation, both studies utilize a different regulatory measure as a proxy

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[1]The distinction between environmental, social and sustainable entrepreneurship will be discussed in section 2.2

for the whole environmental policy. Only looking at governmental incentives (Meek et al., 2010) or environmental taxes (Hörisch et al., 2017) undermines the complexity of environmental policy. However, different environmental policy instruments only know limited testing regarding environmental entrepreneurial entry. Different environmental policy instruments exist to stimulate organisations and individuals to retain themselves from environmentally harmful behaviour and support investments in polluting mitigating practices and technologies. For example, legislators can opt for a market-based environmental policy approach through environmental taxes or introduce command-and-control regulations forcing the adoption of a specific pollution abatement technology or setting emission standards. Therefore, this study utilizes a composite indicator to measure environmental policy stringency, which takes into account both economical and command-and-control type regulation. Furthermore, the findings of Hörisch et al. (2017) suggest that environmental policy in general does influence the environmental orientation of entrepreneurs, but only in developed countries. This suggests that potentially institutional quality plays a role in this relationship. Institutional quality refers to the ability of institutions to direct behaviour. In practice, this results in the ability of governments to produce sound and effective policies, together with the trust of society that governmental action is fair and effective. Institutional quality and environmental entrepreneurship need further investigation. Especially since research from the social entrepreneurship literature suggests that institutional quality is important, suggesting that social entrepreneurs in general benefit from a strong rule of law and general higher institutional quality (Estrin, Mickiewicz, & Stephan, 2013). Utilizing an institutional framework perspective, the following research question will play a central role:

What is the effect of environmental policy on environmental orientation of early-stage entrepreneurs, and how do the quality of formal institutions and culture effect this relationship?

This study applies a multi-level regression analysis on the 2009 Global Entrepreneurship Monitor Adult Population Survey (2009 GEM-APS). The Global Entrepreneurship Monitor project focuses on characteristics, motivations and ambitions of individuals starting a business. Furthermore, the 2009 special topic of the GEM-APS focuses on social entrepreneurship, with additional questions about environmental value creation, making the dataset relevant for this studies research into environmental entrepreneurship. Using a multi-level random intercept model allows for the research of contextual country-level determinants on individual-level outcomes. This methodology is similar to the methodology of Hörisch et al. (2017), who also employs the GEM-dataset. This study tries to extend the existing knowledge regarding institutional effects on environmental entrepreneurship by focusing on the complete system of environmental policy in combination with the quality of formal institutions and cultural dimensions.

Insights into the country-level institutional drivers of environmental entrepreneurship will contribute to the scientific literature in the following manners. Firstly, this study will address this research gap regarding the effect of environmental regulatory instruments on environmental entrepreneurship. Demirel, Li, Rentocchini, and Tamvada (2019) call directly for more research into the effect of strong regulatory institutions on green entrepreneurship, with specific attention to enforcement. Secondly, expanding upon the existing literature by utilizing both formal and informal institutions in explaining cross-country differences in environmental entrepreneurship. Thirdly, by taking into account the quality of formal institutions and cultural determinants, in combination with regulatory measures, the scope of institutional drivers of environmental entrepreneurship will be widened.

The results from the multilevel regression analysis using a random intercept show no evidence linking the stringency of any environmental policy instrument to the environmental orientation of early-stage entrepreneurs. However, a positive significant effect of formal institutional quality was found. Suggesting that the general institutional framework is more important than the specific environmental regulatory incentives for environmental entrepreneurship. The results did not provide evidence for any interaction effects between environmental policy and other components of the institutional framework or any direct effect of informal cultural influences on environmental entrepreneurship.

This paper is constructed in the following manner. In section 2 the theoretical background will be given, from which a framework and related hypotheses will be constructed. Section 3 will discuss the relevant data used and the methodology used to test the proposed hypothesis in this study. Section 4 will display the main results of this study, together with some robustness analysis and further analysis. Section 5 will link back the results of this study, placing the results in the existing literature and discuss the limitations of this study and potential areas of future research.

2　Theoretical framework

In the following section, a theoretical background will be given regarding this study. To start with, section 2.1 will introduce the concept of entrepreneurship and evaluate the definition of an entrepreneur and the importance of entrepreneurship for society. This definition will be extended in section 2.2 regarding green, social and sustainable entrepreneurship, discussing the differences and similarities of these domains. This section will also discuss the problems related to measuring environmental entrepreneurship. Hereafter, section 2.3 will dive deeper into the environmental entrepreneurship literature, discussing the specific characteristics and challenges associated with environmental entrepreneurship. For example, the entrepreneurial motivation of environmental entrepreneurs, the constrains of social, human and financial capital of environmental entrepreneurs, the perceived financial barriers and the institutional context will be discussed. The following, section 2.4 will further dissect the institutional theory, and its regulatory, normative and cognitive dimensions will be discussed. Next, specific attention will be given to the governmental support theory, governmental void theory and legitimacy theory regarding environmental entrepreneurship. Section 2.5 will discuss different types of environmental policies, and their effects on entrepreneurship and more specific environmental entrepreneurship. Furthermore, different types of environmental policy instruments will be discussed and categorised. Section 2.6 will discuss the potential influence of the quality of formal institutions on environmental entrepreneurship and the effect of quality of formal institutions on the effect of environmental policy on environmental entrepreneurship. Section 2.7 will entail the literature concerning the effect of cultural dimensions on environmental entrepreneurship. Lastly, section 2.8 will display the conceptual framework of this study.

2.1　Entrepreneurship

As one of the first, Schumpeter and Backhaus (1947) referred to entrepreneurial action as "creative destruction"; new innovative entrepreneurs destroying old rusty systems. Innovation in production, products, markets and/or organisations leads entrepreneurs to a competitive advantage. This new role of the entrepreneur, as an agent of innovation, catalysed the scientific community towards further research into entrepreneurship. Next to the role of the entrepreneur in the entrepreneurial process, attention has been given to the effect of entrepreneurship on the economy. Van Stel, Carree, and Thurik (2005) argue that entrepreneurship is an important driver of economic development. More specifically, research has shown that entrepreneurship has a positive effect on wealth and employment in a country (Acs, 2006). For this reason its not strange to see many politician trying to foster economic development by introducing policies stimulating entrepreneurship. Regarding economic development and entrepreneurial activity a U-shaped relationship was found (Carree, Stel, Thurik, & Wennekers, 2002). Governmental action in the form of policy is an important instrument affecting entrepreneurship, as governmental regulations can both support and limit entrepreneurial activity (Bruton & Ahlstrom, 2002).

There seems to be a consensus that there are cross-country differences in entrepreneurial activity (Verheul, Wennekers, Audretsch, & Thurik, 2002). To explain these differences on a societal-level, research has focused on institutional affects on entrepreneurship. The environment in which the entrepreneur operates is important for the entrepreneurial opportunity and the potential success of the new venture (Stevenson & Jarillo, 1990). However, macro-economic factors are not the sole drivers of cross-country differences in rates of entrepreneurship (Stel, Storey, & Thurik, 2007).

In recent research, institutional factors have received increased attention in explaining these differences (Jackson & Deeg, 2008; Simón-Moya, Revuelto-Taboada, & Guerrero, 2014).

Recently, the role of firms, and the entrepreneur as an actor in the firm, as the driver of sustainability, has been examined more closely (Bansal & Roth, 2000). With areas such as social, sustainable and green entrepreneurship gaining terrain. Central in these domains is the entrepreneur as potential contributor to solve societal problems (Cohen & Winn, 2007). Furthermore, social, sustainable and green entrepreneurship have in common that they focus on entrepreneurial behaviour in the dual motivation of profit and diminishing market failures, relating to societal or environmental problems (Dean & McMullen, 2007).

2.2 Environmental entrepreneurship

Green entrepreneurship as a field of research finds its roots in around 1990, when green problems took a bigger stage on the public agenda (Anderson, 1998). In this section, the development of green entrepreneurship as a field of research will be discussed. To start, the boundaries of the field of environmental entrepreneurship will be defined. To do so, the adjacent fields of social and sustainable entrepreneurship will be discussed. Understanding the differences and similarities between environmental, social and sustainable entrepreneurship is of importance, as the environmental entrepreneurship literature is still developing, and the theories and research developed in the other two subjects are necessary to get a more complete understanding.

2.2.1 Environmental entrepreneurship

Dean and McMullen (2007) define environmental entrepreneurship as the following: "Environmental entrepreneurship is defined to be: the process of discovering, evaluating, and exploiting economic opportunities that are present in environmentally relevant market failures"[p. 58]. From this definition, the two most important elements of environmental entrepreneurship can be distinguished. Firstly, the entrepreneurial motivation for these entrepreneurial activities must not only be searched in the entrepreneurs own financial gains, but also in the creation of environmental value for society. Secondly, there is a focus on exploiting a market opportunity created by market failures in environmentally relevant markets. Cohen and Winn (2007) underpin the relevance of these market failures as an important source of entrepreneurial opportunity for the environmental entrepreneur. Interestingly, the environmental entrepreneur is by definition an entrepreneur who aims to solve an environmentally related market failure (Dean & McMullen, 2007). The definition of an environmental entrepreneur is closely related to the definition of an entrepreneur as defined by Schumpeter, as both are viewed as an innovator, exploiting market failures and forcing change upon the stagnant equilibrium.

More recently, a systematic literature review regarding the definition of environmental entrepreneurship was performed by Antolín-López, Martínez-del Río, and Cespedes-Lorente (2019). Their finding suggests that the concept of green entrepreneurship is a multicomponent construct hinging on three main components. The first component focuses on the duality of goals, with researchers focusing on green entrepreneurs attaining both environmental and economic goals, operating within this environmental-economical trade-off. Secondly, research seems to focus on seeing green entrepreneurship as green agents, meaning that research often tries to connect green entrepreneurs with either the creation or diffusion of greenly oriented innovations. Lastly, the environmental entrepreneurship literature

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seems to focus on value creation, with researchers arguing that green entrepreneurs seem to be focused on efficiency gains through improved resource use. To conclude, both definitions emphasise the importance of the duality of goals, both financial and environmental, and the entrepreneur is considered a problem solver, through the creation and implementation of green innovation, environmental externalities are mitigated.

2.2.2 Social entrepreneurship

Hemingway (2005) defines social entrepreneurship as an entrepreneurial action within a corporation with the primary focus to facilitate social change, for example, through merging the social agenda in the corporate strategy. Social entrepreneurship entails the process of entrepreneurs exploiting entrepreneurial opportunities focusing on creating social value. An example often put forward as a typical example of a social firm is the Grameen bank (Light, 2006; Mair & Marti Lanuza, 2006; Seelos & Mair, 2005). This for-profit bank provides microfinancing to entrepreneurs in underprivileged areas to combat poverty. However, the degree of focus on social benefit creation exists in a spectrum (Gundry, Kickul, Griffiths, & Bacq, 2011). Research suggests that social entrepreneurship, more than green and sustainable entrepreneurship, focuses on how entrepreneurial opportunities are exploited outside the regular for-profit commercial business dimension (Thompson, Kiefer, & York, 2011). It is argued that green entrepreneurship is also a type of social entrepreneurship, since value is created for the whole of society (Bozhikin, Macke, & da Costa, 2019). This argument follows from the fact that both types of entrepreneurship try to be sustainable for society.

2.2.3 Sustainable entrepreneurship

Dean and McMullen (2007) define sustainable entrepreneurship as: "the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are greenly relevant" [p. 58]. Dean and McMullen (2007) build on the theory of Shane and Venkataraman (2000) that entrepreneurship consists of a process with a central role for opportunity discovery. Again, there is a focus on seeing and defining sustainable entrepreneurship through the entrepreneurial opportunities created by market imperfections. The nature of public goods and externalities are named as such market imperfections, suggesting that entrepreneurial opportunities trying to solve such market imperfections lead to more sustainability. Cohen and Winn (2007) add to this list of potential sources of sustainable entrepreneurial opportunities, such as inefficient firms, externalities, flawed pricing mechanisms, or information asymmetry. Furthermore, suggesting that such correction of market imperfections leads to improvements on at least one of three major aspects; economic, social and green consequences, and thus constitutes sustainable entrepreneurship.

2.2.4 Similarities and differences

Central to the similarity between social, sustainable and green entrepreneurship is the focus on the potentially beneficial outcome of these entrepreneurial behaviours to society (Thompson et al., 2011). Another major similarity between these types of entrepreneurs is their wide range of motivations. The majority is not primarily driven by financial motivations but by an altruistic motivation, driven to improve society (Allen & Malin, 2008; Dees, Elias, & Bowie, 1998). These types of entrepreneurship challenge the existing paradigm that entrepreneurship is driven by self-interest and personal value creation. These fields of research emphasise the importance of looking at the entrepreneurial entry (Dean & McMullen, 2007), as newcomers often have a better chance to successfully shape their

identity to focus on social, sustainable or green innovations. This entry-focused perspective is also supported by theory of Hockerts and Wüstenhagen (2010), who credit green entrants ('Emerging Davids') with forcing incumbent firms ('Greening Goliath's') to follow sustainable aspirations. Emphasising that sustainability in the end depends on market and non-market strategies in influencing the ability to transform industries, practices, and regulations. Vuorio, Puumalainen, and Fellnhofer (2017) might have the simplest categorisation of these three types of entrepreneurship. Where economic value creation is a means to an end to create more value. Social entrepreneurship is about social value creation, green entrepreneurship is about green value creation, and sustainable entrepreneurship claims to combine social, green and economical value creation. However, some social entrepreneurs do not follow this distinction because of their total lack of economic value orientation such as philanthropic organisations.

A difference in the approach of environmental entrepreneurs, setting them apart from social and sustainable entrepreneurs, is their choice of organization method. Environmental entrepreneurs directly address ecological degradation, and utilize this entrepreneurial opportunity to try and build a profitable organization. While social and sustainable entrepreneurs focus more on community-based and non-profit forms of organisation (York, O'Neil, & Sarasvathy, 2016).

2.2.5 Measuring environmental entrepreneurship

A central problem in the social-, sustainable- and environmental entrepreneurship literature is measuring the specific type of entrepreneurship. This problem arises because these types of entrepreneurship exist within a spectrum. Different entrepreneurs have different intensity of social, sustainable and environmental value creation goals. Lepoutre, Justo, Terjesen, and Bosma (2013) note that much of the social entrepreneurship literature's attention has been given to social entrepreneurial case studies, but broad cross-country research on trends has been neglected. In their quest for a specific measurement of social entrepreneurship, they distinguish entrepreneurs in their social mission, revenue model and drive towards innovation. Moreover, they suggest that looking at self-identifying social entrepreneurship does not encompass the complete spectrum of social entrepreneurship as for-profit entrepreneurs, with a strong social mission, often do not self-identify themselves as social entrepreneurs, while the definition of social entrepreneurship does suggest they belong to this category. To overcome such problems in the green entrepreneurship context, two main methodologies exist to measure green entrepreneurship. First of all, there is the outcome approach utilized by Meek et al. (2010), this type of methodology labels certain company's in specific industries as a proxy for green entrepreneurship. In Meek et al. (2010), for example, solar firm founding rates are taken as a proxy for green entrepreneurship. The intention of the entrepreneur is of no influence in this measuring methodology. While it has its benefits, a major limitation of specific industry findings is that they are not representative for a broader spectrum of green entrepreneurs. Measuring a broader spectrum of green entrepreneurship is possible in the process focus of Hörisch et al. (2017) and Koe and Majid (2014). Their measurement methodology focuses on the environmental orientation of an entrepreneur. The methodology of this study, building on the theory of planned behaviour of Ajzen (1991), has the benefit that environmental orientation is seen as an important factor influencing environmental entrepreneurial behaviour without the limitations of measuring the behaviour itself. Central to this theory is that intention is a relevant and good predictor of human behaviour. A downside is that intention and actual behaviour in some situations differ (Kautonen, Van Gelderen, & Tornikoski, 2013). Next to the problem of measuring environmental entrepreneurship,

measuring entrepreneurship in general also comes with its difficulties. Building on the entrepreneurship theory of Schumpeter and Backhaus (1947) and the occupational perspective of entrepreneurship, entrepreneurship in this study is defined by actively owning and/or operating a business which is 42 months or younger.

2.3 The environmental entrepreneur

As discussed in the previous section, environmental entrepreneurs differ from regular commercial entrepreneurs. In this section, the defining concepts of an environmental entrepreneur will be explained. Literature concerning environmental entrepreneurs knows three distinct themes. The first theme involves the ethical motivations and opportunity recognition of environmental entrepreneurs. The second theme mainly focuses on the social, human and financial needs related to environmental entrepreneurship. The last theme deals with the institutional context and its influence on the decision to become an environmental entrepreneur.

2.3.1 Entrepreneurial motivation

An important element that distinguishes environmental entrepreneurs from regular entrepreneurs is their motivation for entrepreneurship. As aforementioned, part of being an environmental entrepreneur focuses not only on personal value creation, but also on creating ecological value. However, this does not mean environmental entrepreneurs are not motivated by financial motives, but research has shown that environmental entrepreneurs show less interest to financial success (Allen & Malin, 2008). And looking at what environmental entrepreneurs seek in their financial remuneration, their general focus is on earning a sufficient salary to maintain their family (Kirkwood & Walton, 2010). When comparing environmental entrepreneurs with regular commercial entrepreneurs, Kirkwood and Walton (2010) find that both are motivated by earning a living, passion, being their own boss and seeing a market gap. Yet, environmental entrepreneurs are also driven by the desire to create green value. Motivation to create green value exists through strong ethical reasoning, to make the world a better place is important for environmental entrepreneurs (Linnanen, 2002).

Central in the environmental entrepreneurship literature is this duality of goals attained by environmental entrepreneurs. York et al. (2016) underwrites the importance of this by coupling both financial and ecological value in the motivation for environmental entrepreneurship. Furthermore, expanding this reasoning to the sustainable entrepreneurship field, growth is almost never a primary goal for sustainable entrepreneurs. Their focus is on creation of sustainable value through economic, social and green value creation, their environmental values and financial motivations are intertwined (Kearins & Collins, 2012). Balancing these duality of goals is not always easy, Tracey and Phillips (2007) argue that there is an ongoing conflict between social and commercial goals, and that this conflict is inherent to the identity of a social entrepreneur. York and Venkataraman (2013) disagrees with the notion of a trade-off between commercial and environmental goals, instead they argue that environmental entrepreneurs see economic opportunities because of their green values and therefore the trade-off is non existing. Furthermore, environmental entrepreneurial orientation is linked to a greater sense of altruism (Patzelt & Shepherd, 2011), which corresponds with the idea that an individual does not only account for his own benefits and costs, but also to those of society as a whole. Seen the literature dealing with the duality of goals, it can be observed that the altruistic motivation of environmental entrepreneurs is triggered by the understanding of the individual that their local natural environment

is threatened. Furthermore, green orientation can be caused by greater green and communal knowledge, through the enhanced opportunity recognition caused by increased green and communal knowledge.

Since altruistic motivation seems to be important for environmental entrepreneurship, research has focused on gender differences in environmental orientation, as women tend to be more altruistically motivated (W. Simmons & Emanuele, 2007). Women tend to be underrepresented in commercial entrepreneurship (de Bruin, Brush, & Welter, 2008). However, evidence tends to show that women are relatively more attracted to sustainable entrepreneurship compared to commercial entrepreneurship. Hechavarria, Ingram, Justo, and Terjesen (2012) is one of the only studies directly investigating the link between gender and social and environmental entrepreneurship. They theorize that through gender role theory, normal entrepreneurship focuses more on masculinity in expectations and identity (Connell & Messerschmidt, 2005). Furthermore, Hechavarria et al. (2012) suggest that male entrepreneurs tend to be more financially driven, while female entrepreneurs are more social and environmentally motivated. Their research found evidence for this effect of gender on social entrepreneurship, even when controlled for sectors, as some sectors tend to be more socially driven than others.

2.3.2   Social, human and financial capital

The propensity to act upon social entrepreneurial opportunities seems to be positively related to education (Kachlami, 2014). A possible explanation provided by Kachlami (2014) is that higher education leads to better entrepreneurial capabilities with a better understanding of how to work with the double-edged sword of social entrepreneurship. Meaning that higher educated entrepreneurs can easier spot opportunities with both financial and social positive outcomes compared to lower educated entrepreneurs. Partially, this finding in the social entrepreneurship context is also relevant in the sustainability context. Thelken and Jong (2020) found evidence for a positive effect of education on sustainable orientation through value activation strategies. However, it is the question whether this also translates to a similar relationship in the environmental entrepreneurship context. Hechavarria et al. (2012) did find evidence of a positive relationship between higher education and an increase of social and green orientation. But, this research is not conclusive as Hörisch (2015) found a negative effect of belonging to the highest percentile of education on the green orientation of entrepreneurs.

Kuckertz and Wagner (2010) investigated the influence of sustainable orientation on entrepreneurial intentions. Their research included a large-scale survey amongst engineering and business students and alumni of three universities. The results suggest that students concerned with ethical, social and green issues are more likely to have an entrepreneurial intention. Interestingly, the researchers suggest that this positive effect vanishes when business experience is taken into account. Therefore, the researchers suggest a negative relationship between business skills and green orientation. This effect is also supported by research of Lenox and York (2012), their outcomes suggest that green orientation declines when business skills are acquired. The researchers hypothesise that this is because individuals become more market oriented when business skills are acquired.

Starting up a company requires financial capital. Environmental entrepreneurs alike commercial entrepreneurs often find themselves financially constrained in their search for capital to undertake entrepreneurial activities. Research has

indicated that environmental entrepreneurs in particular, are constrained by their limited access to external financing (Linnanen, 2002). Linnanen (2002) put forward lack of financial markets, lack of business and lack of management experience as possible explanations for this lack of access to external capital. Furthermore, it is possible that external financiers are less keen on financing environmental orientated start-ups as they forsee a collision between the entrepreneurs' ecological motives and their own financial motives. External financiers are hindered because of the large spillover effects of societal value creation inherent to environmental entrepreneurship (Dean & McMullen, 2007). This appropriation problem constitutes the double externality problem associated with innovations regarding environmental issues or natural resources (Jaffe, Newell, & Stavins, 2005). Hoogendoorn, Van der Zwan, and Thurik (2019) researched the perceived barriers to sustainable entrepreneurship. Their research has shown that sustainable entrepreneurs indeed perceive barriers to be more hampering compared to commercial entrepreneurs. Perceived barriers were specifically in the lack of financial, administrative and informational support. Interestingly, the researchers found no difference in risk attitudes when comparing sustainable entrepreneurs to normal commercial entrepreneurs. However, their research has shown the importance of investigating the institutional context in conjunction with barriers for both sustainable and environmental entrepreneurs.

2.3.3 Institutional context

Lastly, a major theme in the environmental entrepreneurship literature concerns the institutional context influencing the environmental entrepreneur. This theme is largely built upon the institutional theory proposed by North et al. (1990). The institutional theory deals with the question of how individuals and organisations act upon rules and norms in their environment. Institutions in this theory are seen as the "rules of the game" (Ingram & Silverman, 2000). The rules of the game dictate behaviour of organizations through their regulatory, social and cultural environment (Bruton, Ahlstrom, & Li, 2010). Central in this theory is that individuals and organisations feel an internal pressure of conformity (DiMaggio, 1988) to abide by these rules, and these rules are almost seen as taken for granted (Zucker, 1977). By abiding by the institutional rules, individuals and organisations hope to find legitimacy for their actions (DiMaggio & Powell, 1983). In recent times the institutional theory has made its way into the social, sustainable and environmental entrepreneurial context (e.g., Meek et al., 2010; Stephan et al., 2015). Research focus has been on explaining the effect of social norms (Meek et al., 2010) and the combination of formal and informal institutions (Hörisch et al., 2017) on environmental entrepreneurship.

2.4 Institutional theory

One of the reasons the institutional theory has taken a more prominent role in entrepreneurial research is because it gives power to the role of social and regulatory forces in explaining entrepreneurial action (Barley & Tolbert, 1997). The foundation of the institutional theory finds itself explaining the importance of private property and a strong rule of law as determinants of economic activity (Sonin, 2003). Recently, research has shifted more on how these rights may be rightfully executed. An important study in the field of institutional effects, performed by Djankov, La Porta, Lopez-de Silanes, and Shleifer (2002), found that heavier entry regulation on the country-level is associated with lower levels of entrepreneurial entry together with higher levels of corruption and a bigger unofficial economy. Bureaucrats, politicians and incumbent firms profit from regulation hindering the entry of new firms. As social and environmental problems constitute collective problems at a societal level, it is understandable that institutional theory

is predominantly used in explaining societal-level outcomes of social, green and sustainable entrepreneurship (Lenox & York, 2012). North et al. (1990) provided an often used distinction in institutional theory, namely between formal and informal institutions. Scott (1995) further distinguishes two forms of informal institutions. The formal distinction is substituted by a regulatory dimension, and the informal distinction is dissected into a cognitive and normative dimension. This three-pillar model will be further examined below, and the relevant research will be discussed in light of each dimension. Before, the general applicability of the institutional theory in the entrepreneurship literature will be discussed.

For example, Sahasranamam and Nandakumar (2018) have utilized institutional theory to examine the effect of formal institutions such as the financial, political and educational system on the relationship between individual capital and social entrepreneurial entry. Firstly, their findings suggest that individual capital in different forms, such as financial, human and social are positively linked to social entrepreneurial entry. Secondly, they highlight the importance of the formal institutional context on these relationships. Suggesting that it is important for countries to foster a philanthropic oriented financial system to stimulate capital investment in social entrepreneurial entry. Additionally, in the social entrepreneurship literature, Stephan et al. (2015) emphasises the need to research formal and informal institutions jointly. Based on the data of the Global Entrepreneurship Monitor their results suggest that a joint configuration of regulatory (governmental activism), normative (social supportive culture) and cognitive (post-materialist values) institutions provide more explanatory power in the examination of explaining cross-country differences in social entrepreneurial engagement. Furthermore, they highlight the importance of cultural support on social entrepreneurial orientation. An example of such an orientation is utilized by Griffiths, Gundry, and Kickul (2013), who examined macro-level factors, such as social, political and economical factors, influencing social entrepreneurship entry. Interestingly, their findings suggest that the most important factor explaining cross-country differences in social entrepreneurial entry was female participation in the labour force.

2.4.1 Regulatory dimension

As governments increasingly see entrepreneurship through firm creation as a positive effect on innovation and economic growth, more research attention has been given to the relationship between regulation and entrepreneurship. The regulatory dimension entails laws, regulations, rules and other governmental policies that try to affect individual behaviour (Veciana & Urbano, 2008). These rules can both aim to support or restrict behaviour. Crucial to the regulative dimension is conformity to the set rules, this is usually established by central organisations who establish these rules according to legal or quasi-legal requirements. An example in which the regulative dimension is found to play an important role in explaining social entrepreneurship is the research of Estrin, Mickiewicz, and Stephan (2013), their research found that social entrepreneurial entry is higher in countries with a strong rule of law especially regarding the protection of private property. This builds on the idea that social entrepreneurship, even more than commercial entrepreneurship, benefits from predictability and a nonarbitrary government. Furthermore, their results attempt to give a more detailed understanding of the institutional void theory; with both an approach to institutional quality and governmental activism. This strengthens the concept of this study's methodology by approaching environmental entrepreneurship from both an institutional quality and institutional void and support perspective.

2.4.2 Normative dimension

The normative dimension entails behaviour that is guided by institutions that follows from appropriate or expected behaviour. The normative system is based on the influence of institutions on behaviour of organisations to comply to this expected behaviour (Scott, 1995). Important components influencing this expected behaviour and in turn the complying behaviour are social norms and values (Bruton et al., 2010).

Social norms and their influence on green entrepreneurship entry is the central topic of research by Meek et al. (2010). Their research investigates the effect of consumption norms, norms of conformity, norms of support and norms of family interdependence on green entrepreneurial entry. Firstly, their findings suggest that areas with higher green conscious consumption norms are related to higher green entrepreneurial entry in the solar industry. Secondly, their results regarding family interdependence norms suggest that regions where family interdependence is important know more green entrepreneurship due to the fact that they want to secure their health and well-being by doing good both economically and environmentally. Next to the direct effect of social norms on green entrepreneurial action, the researchers found that societal norms influence the effect of formal institutions on green entrepreneurship. Their results argue that decentralized norms have an influence on centralised governmental policies trying to foster green firm creation. This suggests that governmental policy aimed to stimulate environmental entrepreneurial entry is more efficient in areas with lower levels of conformity.

Furthermore, the effect of supportive norms in the green entrepreneurship literature is not coherent with the research from the social entrepreneurship field. In the latter, the relationship between social supportive cultural norm and social entrepreneurial entry has been researched by Stephan et al. (2015). They determine social supportive cultural norm by: friendliness, supportiveness, cooperation and helpfulness. Their research did not find any significant results linking social supportive cultural norms to social entrepreneurship, but their research did unveil the importance of investigating formal institutions in light of informal institutions. Important for environmental entrepreneurs is how society views the environmental condition. This green consciousness is linked with both post-materialism and green pressure (Ronald, 1995). Hörisch et al. (2017) uses green pressure and post-materialism as measures of the normative dimension to investigate the effect of informal institutions on the environmental orientation of entrepreneurs. Their research concluded that green pressure, measured as the ecological footprint per capita, is positively correlated with green orientation. Furthermore, their research regarding the normative dimension entailed evidence supporting the legitimacy theory. Ahlstrom and Bruton (2001) suggest that inside the institutional framework, legitimacy theory can shed light on the process concerning the liability of newness. This theory suggests that if the entrepreneurs' social status is lower in a community, higher green orientation can be observed. The reasoning behind this phenomenon is that entrepreneurs try to legitimise their entrepreneurial actions by adding an green dimension to their entrepreneurial activities. They do so to secure legitimacy for their own actions towards friends and family and signal the legitimacy of their firms towards relevant stakeholders.

2.4.3 Cognitive dimension

The last pillar of the institutional theory is the cognitive dimension. This dimension operates at the individual level through language and culture. Together with the normative dimension, the cognitive dimension is closely connected

to the values and norms of a society. However, where the normative dimension entails the behaviour expected from society upon the individual through conformity, the cognitive dimension focuses more on social values and norms transmitted to the individual level through cultural appropriation. Research into the cognitive dimension builds upon the fact that societal level values are the aggregate of individual level beliefs and values (Schwartz, 2006). In entrepreneurial research, the cognitive dimension has become increasingly important in researching how societies accept entrepreneurs. However, not all researches indicate the importance of the influence of the cognitive dimension on entrepreneurial action. Urban and Kujinga (2017) found no clear evidence of the cognitive dimension influencing social entrepreneurial intentions in an emerging market context.

2.4.4   Institutional entrepreneurship

A new stream of research has focused upon the question how entrepreneurs themselves actively try and change the dynamics of the institutional context they operate in. Entrepreneurs who initiate a change of existing institutional rules are classified as institutional entrepreneurs (DiMaggio, 1988). They actively seek to change regulative, normative or cognitive rules concerning market failures to support their entrepreneurial actions utilizing these opportunities (Dean & McMullen, 2007). Now the connection with environmental entrepreneurs can be made, as they also operate within these same market failures (Cohen & Winn, 2007). Pinkse and Groot (2015) have established the importance of institutional entrepreneurship in the environmental entrepreneurial context. As sustainable entrepreneurs in the Dutch clean energy sector faced significant market barriers, they had to become politically active to overcome these market barriers. In such cases, a collective action paradigm is needed to change regulative institutions to facilitate environmental entrepreneurship. This is of special importance for environmental entrepreneurs due to the public good nature of environmental value (Patzelt & Shepherd, 2011; Schaltegger & Wagner, 2011).

To conclude, the institutional context is important for environmental entrepreneurship. Both the institutional void theory and institutional support theory have been examined. Even though there is a growing body of literature researching the effect of regulation, specifically environmental regulation, on environmental entrepreneurship, still some major questions remain unanswered. The aforementioned literature suggests that the appropriate model to test such a relationship consists both of formal and informal institutions (Meek et al., 2010), and deal with the quality of formal institutions (Dean & McMullen, 2007).

2.5   Environmental policy and environmental entrepreneurship

The major reasoning for environmental policy is to limit potential polluting economic activities. Economic activity with harmful consequences for the environment is a problem because the party exhibiting polluting economic activities does not bear the full consequences of its actions, but the society as a whole does (Jaffe et al., 2005). Environmental regulation has a direct effect on entrepreneurial activity, for example through limiting entry or providing incetives for innovation.

2.5.1 Environmental policy and entrepreneurship

Regarding the effects of environmental regulation on firm entry, research suggests that through an increase in compliance costs, entrepreneurial entry is hindered. For example, Helland and Matsuno (2003) have shown that stringent environmental regulation causes an increase in compliance costs, and that these compliance costs act as a barrier to entry. Dean, Brown, and Stango (2000) found a similar result, arguing that this effect is disproportionately burdensome on the formation of small manufacturing businesses. The increase in compliance cost also has an effect on innovation. Regarding this relationship the Porter-hypothesis states the following: "properly designed environmental regulation can trigger innovations that may partially or more than fully offset the costs of complying with them" (Porter & Van der Linde, 1995, p. 98). Following this hypothesis, green innovation will not be hampered but will follow from environmental policy. However, Hoogendoorn, Guerra, and van der Zwan (2015) suggest that the effect of more stringent environmental regulation mainly attributes to an increase in green products and service offering, but no effects on greening processes were found. This effect can be attributed to the customer focus of these greening firms.

The literature puts forward three main mechanisms through which the environmental orientation of entrepreneurs may be effected by environmental policy. The mechanisms proposing a positive effect between stringent environmental policy and environmental orientation are the institutional support theory and the legitimacy theory, while the institutional void theory provides a conceptual argument for a negative effect.

Institutional support theory

The Institutional support theory was introduced by Stephan et al. (2015) relating governmental action in the social entrepreneurship domain. This theory suggests that higher governmental activism supports social entrepreneurial activity, through providing resources and information to advance social entrepreneurial behaviour. This cross-country research provided evidence supporting the institutional support theory. Their results suggest that governmental activism does not cause a crowd-out effect of social entrepreneurship, but rather complements social entrepreneurial efforts. Environmental entrepreneurship may be stimulated through environmental policy incentives and tax breaks. Meek et al. (2010) found evidence that solar founding rates are positively related to state incentives in the solar industry. Suggesting that formal institutions have a direct effect in the founding of firms exercising environmental conscious behaviour. While this study looks at environmental entrepreneurial entry in certain "green" industries, it can be deducted that governmental activism also has a more economy-wide effect. However, both Stephan et al. (2015) and Meek et al. (2010) focus on the effect of formal institutions in relationship with informal institutions, suggesting that future research should focus on investigating formal institutions in cohesion with informal institutions.

Legitimacy theory

Legitimacy can be defined as: "a generalized perception or assumption that the action of an entity is desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 95). The legitimacy theory suggests that individuals and organisations act according to what is expected of them to gain legitimacy. Where formal institutions may actively change a more broad institutional legitimization of environmental entrepreneurial behaviour by introducing more stringent environmental regulation. Hörisch et al. (2017) found higher environmental orientation of entrepreneurs in countries where entrepreneurial status is lower, suggesting that entrepreneurs use environmental orientation of their entrepreneurial activities in a quest for desired

legitimacy.

Institutional void theory

Institutional voids have previously attracted attention of economic research because of their negative influence on the efficiency of markets. This theory made a major impact in the field of opportunity recognition of social entrepreneurship (Khanna & Palepu, 2000). Institutional void theory refers to the absence of adequate governmental measures to address societal problems. The theory suggests that this inability to address societal problems increases the demand for entrepreneurs to seize this opportunity and act as a substitute of the governmental action (Mair & Marti Lanuza, 2009). Mair and Marti Lanuza (2006) identified the startup reasons of around 200 social enterprises often were associated with the lack of proper healthcare, social services or green protection. Estrin, Mickiewicz, and Stephan (2013) looked at governmental activism, in the realm of social entrepreneurship often measured through the size of the government (governmental spending / GDP per capita), their results indicated that lower governmental activism caused higher social entrepreneurial entry.

The first to link the governmental void theory with environmental entrepreneurship was Dean and McMullen (2007), who argued that market failures deviate the equilibrium from Pareto efficiency and therefore there is room for value creation. Sources of market failures described by Dean and McMullen (2007) are existing negative externalities, monopoly powers, inappropriate governmental intervention and imperfect information. Proposing the challenge to environmental entrepreneurs to overcome the green imperative by overcoming the problems associated with the public goods character and positive externalities linked to environmental entrepreneurial action. Evidence supporting this theory in the environmental entrepreneurship space is limited. Hörisch et al. (2017) did find a small negative effect of environmental tax income, which the researchers used as a proxy for governmental ability to address environmental problems on environmental orientation of entrepreneurs in OECD countries. Suggesting that higher environmental tax income has a negative impact on green business creation in well-developed countries. Which potentially suggests that, in developed countries, environmental entrepreneurs see opportunities in less stringent environmental policies. Looking at environmental policy stringency instead of income from environmental taxes also gives an answer to the call of Hörisch et al. (2017) that the environmental entrepreneurship field is in need for other measures of governmental support.

From the previous, it is expected that more stringent environmental regulation will increase the environmental orientation of entrepreneurs. Even though the research, regarding the institutional support theory mainly focuses on highly regulated capital intensive industries. More stringent environmental policy is expected to support environmental entrepreneurs in their operations. This institutional support effect is strengthened by the Legitimacy theory, where environmental policy will positively influence the legitimization of environmental entrepreneurial action. This positive effect is expected to offset the negative effect of environmental regulation on environmental orientation suggested by the Governmental void theory, whereby, environmental entrepreneurs are a substitute for governmental action. Therefore, the following hypothesis is suggested:

H1: Environmental policy stringency has a positive effect on the environmental orientation of early-stage entrepreneurs.

2.6 Quality of formal institutions and environmental entrepreneurship

In assessing the effect of formal institutions on environmental entrepreneurship, it would be a mistake to only take into account a regulatory dimension. This because the quality of formal institutions is also found to affect entrepreneurial decision making. For example, for commercial entrepreneurship, a strong and predictable legal system is essential in promoting entrepreneurial activity (Estrin, Korosteleva, & Mickiewicz, 2013). Institutional quality is crucial for entrepreneurs to undertake risky new projects. A lack of institutional quality may even result in entrepreneurial attention towards unproductive activities (Baumol, 1990; Glaeser & Shleifer, 2003). In his seminal work Djankov et al. (2002) directly links entry barriers for firm creation to higher corruption levels, suggesting that entrepreneurial rents of incumbent firms flow to policy makers to pass or sustain entry deterring regulation.

Social entrepreneurship literature seems to suggest that social entrepreneurs benefit from a higher quality of institutions. Estrin, Mickiewicz, and Stephan (2013) argue that some social entrepreneurs strive in a dysfunctional context. In general, a strong rule of law context is both beneficial for social and commercial entrepreneurs as it offers a level playing field, but social entrepreneurs benefit relatively more when it comes down to the quality of institutions. Similarly, Hoogendoorn (2016) found a positive influence of institutional quality on the prevalence of social entrepreneurial start-ups in a country relative to commercial entrepreneurship, and their results indicated both a positive influence of government public spending and rule of law. However, both results do not seem to be robust if the stage of economic development is taken into account.

Focusing on the effect of institutional quality on natural resource rent-seeking behaviour, Nguyen, Kim, and Su Dinh (2020) show that institutional quality reduces rent-seeking activities of entrepreneurs, suggesting that quality institutions create opportunities in other areas not involving environmental depletion. Next to this, Hoogendoorn et al. (2019) researched the difference in perceived institutional barriers comparing sustainable oriented entrepreneurs with commercial entrepreneurs. Their results suggest that sustainable oriented entrepreneurs perceive the institutional environment as being more burdensome, especially a lack of financial, administrative and informational support. This supports the concept that an environmental entrepreneur would benefit from a high-quality institutional environment. This notion is also supported by Hörisch et al. (2017) that environmental entrepreneurs benefit from a business-friendly environment, a potential explanation for this effect could be the lack of formal business skills possessed by environmental oriented entrepreneurs (Kuckertz & Wagner, 2010; Lenox & York, 2012).

The above stated evidence from the social entrepreneurship literature, in combination with evidence linking institutional quality with an increase in sustainable orientation, forms the hypothesis that environmental entrepreneurs benefit from a higher quality institutional environment.

H2a: Quality of formal institutions has a positive effect on the environmental orientation of early-stage entrepreneurs.

Furthermore, institutional quality also has a direct effect on environmental regulation. For example, Damania, Sterner, and Whittington (2020) found that less corruption lowers environmental policy stringency using data from both developed and developing countries. Supporting this claim is the research of Pellegrini and Gerlagh (2006) who investigated

which institutional factors are determinants of environmental policy. Their results indicated that democracy had an insignificant effect, but high corruption was a substantial determinant of less stringent environmental policy. If environmental policy is indeed less stringent because of corruption, this leaves a bigger potential for environmental entrepreneurs to act as a substitute for failing governmental action, especially since more stringent policy is demanded by the public.

It is important in combination with environmental regulation because without a strong rule of law, regulation will simply be ignored, and with a strong rule of law environmental legislation enforcement punishes firms for not being green (Demirel et al., 2019). Levie and Autio (2011) show that even though, rule of law did not have a direct effect on entry, it moderates the influence of regulation on entry rates. Their research investigated the effect of a regulative burden in entrepreneurial entry. But their results can also shed light on the potential moderating effect of rule of law on the effect of environmental regulation on green entrepreneurship. A strong rule of law is also beneficial for entrepreneurs not only attaining commercial goals. A strong rule of law influences the relationship between entrepreneurial experience and the propensity of attaining social value goals (Brieger & De Clercq, 2019). This effect is also supported by the Institutional void theory, as Puumalainen, Sjögrén, Syrjä, and Barraket (2015) suggest that the quality of formal institutions need to be sufficiently developed for societal problems and market failures to lead to social entrepreneurship. We propose a similar effect for environmental entrepreneurship, due to the similarities between social and environmental entrepreneurship.

H2b: Quality of formal institutions positively moderates the effect of environmental policies on environmental orientation of early-stage entrepreneurs

2.7 Culture and environmental entrepreneurship

According to the Institutional Theory, it is important to see formal institutions in conjecture with informal institutions. Informal institutions refer to slowly changing, culturally transited, and social constructed institutions (Stephan et al., 2015). Culture defines these socially constructed rules by forming individual values and beliefs of a specific group (Mueller & Thomas, 2001). This definition is closely related to the definition of informal institutions in the Institutional theory proposed by North et al. (1990). Culture refers to a system within a society of common values and norms guiding individual behaviour of members in society (Granato, Inglehart, & Leblang, 1996). With Hofstede referring to culture as: "the collective programming of the mind that distinguishes the members of one group or category of people from another" (Hofstede, 2001, p. 9). The importance of culture for environmental entrepreneurship is also underlined by Cojoianu, Clark, Hoepner, Veneri, and Wojcik (2020) who emphasise that next to regulatory movements, social movements are of major importance to environmental entrepreneurs, with culture being an important driver of social movements (Swidler, 2000). Furthermore, culture is important through the effect of formal institutions is society, as culture can influence the effect of formal institutions (Acs, 2006).

Primarily the effect of culture on commercial entrepreneurial activity has been researched through three main mechanisms, namely the aggregate psychological trait explanation, social legitimation and the dissatisfaction explanation (Davidsson, 1995). The aggregate psychological trait explanation theory suggest that culture favours certain en-

trepreneurial behaviour through individual values and beliefs. This approach entails that if more individuals possess individual values connected with entrepreneurship, more individuals will display entrepreneurial behaviour (Shane, 1993). This approach differs from the social legitimation approach because in the social legitimation approach the social norms and institutions at large are important. For example, for entrepreneurial behaviour social legitimation follows through the social status of entrepreneurs in society (Etzioni, 1987). The dissatisfaction explanation on the other hand entails that if culture is unfavourable for certain (entrepreneurial) characteristics of the individual, the individual feels less integrated in a society and this starts with his entrepreneurial process (Noorderhaven, Thurik, Wennekers, & Van Stel, 2004).

Cross-cultural characteristics of society can be measured through cross-cultural value surveys, with Hofstede, the World Values Survey and the Global Leadership and Organization Behaviour Effectiveness (GLOBE) project being the most prominent survey. Central in these surveys is the measurement of individual inclinations towards a broad range of objectives, which are aggregated to construct different dimensions characterising culture. Hofstede's cultural dimensions framework is perhaps the most prominently used in cross-cultural research into entrepreneurship.

This study employs the framework provided by Hofstede, primarily because this framework has been most utilized in cross-country studies researching the activity of commercial entrepreneurship and social entrepreneurship. Two dimensions from Hofstede's framework are especially likely to impact environmental entrepreneurship both directly and indirectly through formal institutions, namely, individualism and future orientation (Holmes Jr, Miller, Hitt, & Salmador, 2013). Firstly, individualism through the lack of social cohesion and the valuation of societal goals (Triandis, 1988), with a regulatory structure dealing with conflicts of personal interest and societal at large. Secondly, future orientation, reflecting the conflict between immediate gratification and long-term sustainability (Hofstede & Bond, 1988), influencing cultural determinant of valuation of environmental action, and the long-term aspirations of formal institutions regarding the preservation of the natural environment. These two dimensions have been selected for two main reasons. Firstly, because they employ the most fundamental theoretical foundation for both influencing environmental orientation directly and indirectly through formal institutions (Samarasinghe, 2012). Secondly, especially individualism and to a lesser degree future-orientation, has found empirical evidence in explaining entrepreneurial activity in the social entrepreneurship space (Canestrino, Ćwiklicki, Magliocca, & Pawełek, 2020). In the following sections, these two cultural dimension will be further analysed with their impact on entrepreneurial action and environmental orientation.

2.7.1 Individualism vs collectivism

The individualism versus collectivism dimension concerns the degree to which members of society have strong ties with each other. Societies characterised by individualism have loose ties among their members and those members are primarily concerned with their personal interests. Collectivist societies on the other hand, value communal interests (Triandis, 1988). However, this does not mean that societies characterised by collectivism do not value individual interests, but collectivist societies safeguard individual interest by promoting communal interests (Hofstede, 2001).

Regarding the effect of an individualistic society on the prevalence of general entrepreneurship, the literature is ambigu-

ous. Some researchers have found evidence for individualism supporting entrepreneurial activity (Autio, Pathak, & Wennberg, 2013), arguing that entrepreneurs are characterised by individualism and therefore through the supply-side theory, there is a larger supply of potential entrepreneurs. Baum et al. (1993) argues that the motivation to become an entrepreneur also differs across individualistic and collectivist societies. In both societies, entrepreneurs value the need for autonomy in their decision to become an entrepreneur, however, in collectivist societies entrepreneurs possess a higher need for affiliation. The researchers argue that in collectivist societies the success of the entrepreneur depends more on social capital and financial capital from family and friends. Pinillos and Reyes (2011) argue that the effect of individualism on entrepreneurial activity is moderated by the level of economic development, suggesting a negative relationship between individualism and entrepreneurship rates in lower developed countries and a positive relationship in high developed countries.

Because of the primary focus on attaining collective goals in collectivism, the social entrepreneurship literature suggests a negative effect between the degree of individualism and the prevalence of social entrepreneurial activity relative to commercial entrepreneurship. Entrepreneurs who perceive their society to be friendly and supportive, encourage social entrepreneurial behaviour (Stephan et al., 2015). However, Kedmenec and Strašek (2017) found no significant effect of individualism on the level of social entrepreneurial activity, arguing that individualism only affects the motivation and not the level of social entrepreneurship. This builds on the research of Finkelstein (2010) who found no difference in willingness to volunteer, but only in the reason to volunteer between individualists and collectivists. The supply side theory of entrepreneurship does suggest that collectivism enhances environmental entrepreneurial activity. This theory implies that for any type of entrepreneurship to exist, individuals who are willing and capable need to exploit these entrepreneurial opportunities (Audretsch, Grilo, & Thurik, 2007). In a society characterized by an individualistic culture, less individuals will possess characteristics linked with attaining both economical and environmental goals, meaning that there are less individuals motivated to act upon environmental entrepreneurial opportunities . Furthermore, individualistic culture through the supply-side theory of entrepreneurship enlarges the supply of potential commercial entrepreneurs while lowering the supply of environmental entrepreneurs. Furthermore, according to S. Choi and Kim (2005) collectivists cultures stimulate consumers to demonstrate environmentally conscious purchasing behaviour, to help prioritise societal goals and in general be more concerned with environmental issues, supporting environmental entrepreneurial opportunities. Therefore, the following hypothesis is constructed:

H3a: Early-stage entrepreneurs will be less environmental orientated in countries with more individualism.

In individualistic societies, governments need formal rules because of the lack of collective punishment (Steensma, Marino, Weaver, & Dickson, 2000). Translating this to environmental entrepreneurship yields the argument that individualistic societies need stringent environmental policy, to enforce environmental conscious behaviour, directly influencing formal institutions. We propose that individualistic culture influences the effect of formal institutions on environmental entrepreneurial orientation.

The impact of individualism on legitimization is ambiguous. Social legitimization is important for environmental entrepreneurial orientation, because entrepreneurs turn to environmental orientation to diffuse the institutional pres-

sure of legitimization (S. A. Simmons, Wiklund, & Levie, 2014). Lee, Simmons, Amezcua, Lee, and Lumpkin (2020) found evidence of such mechanism through the positive effect of the stigma of business failure on social entrepreneurial entry, with social supportive culture decreasing this negative effect. Suggesting that legitimization of entrepreneurial activities, through social desirable orientation is lower in countries with a collectivist culture. However, one could also argue that the effect proposed by legitimization is more important in collectivist societies, since altruistic motivations are more embedded in society and are therefore more expected to be incorporated in the legitimization of entrepreneurial activity. This builds upon the idea that in collectivists societies people identify themselves more with the group they belong to, suggesting they follow the norms and values of the group. Regarding the effect of individualism in society on the support for entrepreneurs, Pathak and Muralidharan (2016), researching social entrepreneurial entry, argues that, in collectivists societies desired, entrepreneurial action will be accompanied by structural support of information and resources from local social networks. An example of the importance of collectivists entrepreneurial action is provided by Doh and Guay (2006), who emphasise that environmental entrepreneurship benefits from collective cross-sectoral entrepreneurial partnerships and that these partnerships can be stimulated by governmental arrangements. Thus, implying that individualism lowers the proposed positive effect of the institutional support theory on environmental orientation. This results in the following hypothesis:

H3b: Individualism negatively moderates the effect of environmental policies on environmental orientation of early-stage entrepreneurs

2.7.2 Long-term orientation versus short-term orientation

The dimension of long- versus short-term orientation proposed by Hofstede and Minkov (2010) is about the question: how to be virtuous? Different societies will provide different answers to this question, some will refer to actions honouring traditions, while others will refer to actions to become more prosperous. In Hofstede and Minkov (2010) own words: "Long Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift. Its opposite pole, Short Term Orientation, stands for the fostering of virtues related to the past and the present, in particular, respect for tradition, preservation of "face" and fulfilling social obligations." In societies characterised by long-term orientation, individuals value developing capabilities more than immediate gratification (Minkov, 2007). Long Term Orientation influences entrepreneurial activity mainly through three main mechanisms, namely, through the supply of entrepreneurs, social legitimization and through institutions (Lortie, Barreto, & Cox, 2019).

Compared to individualism, long-term orientation has gotten far less attention in the entrepreneurial research domain. Research does suggest that through thrift and perseverance, entrepreneurial activity is encouraged by societies attaining a long-term orientation, while short-term orientation reflects personal stability and consistency which can hinder risk-taking entrepreneurial actions (Beugelsdijk & Noorderhaven, 2004). However, the evidence relating long-term orientation is not conclusive, with a positive relationship on the regional level, but no relationship on the national level (Lortie et al., 2019). Furthermore, looking at the effect of long-term orientation on orientation of entrepreneurial action, research in family businesses found that long-term orientation is positively associated with innovativeness, pro-activeness and autonomy, while a negative association was found regarding risk taking and competitive aggres-

siveness (Lumpkin, Brigham, & Moss, 2010).

Focusing on the research regarding long-term orientation and social entrepreneurship, the research suggests that Long Term Orientation is beneficial for social entrepreneurial activity, as social entrepreneurship, even more than commercial entrepreneurship, entails short-term investments and costs and long-term benefits (Arnocky, Milfont, & Nicol, 2014). In cross-cultural studies this positive association has found empirical support, with Canestrino et al. (2020) finding a positive correlation between long-term orientation and social entrepreneurial activity.

Connecting long-term orientation with environmental entrepreneurship, a similar positive relationship can be supposed. Short Term Orientation reflects stability and consistency, thus society avoids drastic change with a reluctance to adapt (Minkov & Hofstede, 2012), this goes against the perception of environmental entrepreneurs, who propose themselves as an alternative solution for environmental issues, which by nature is uncertain (York & Venkataraman, 2013). This suggests that in Short Term Oriented societies, the potential supply of entrepreneurs able to act upon environmental entrepreneurial opportunities is lower and the demand for such entrepreneurial actions is lower. The supply theory argument is supported by Chui and Kwok (2009), who argue that long-term orientated societies see material success and spiritual fulfillment as an integrated whole, suggesting to attain both economic and environmental goals is more compatible with high future oriented societies. The argument of increased demand for environmental entrepreneurs is supported by Parboteeah, Addae, and Cullen (2012) who found that in future oriented societies individuals have a higher propensity to support sustainable initiatives. This results in the following hypothesis:

H4a: Early-stage entrepreneurs will be more environmental orientated in countries with are more Long-term oriented.

Furthermore, Long Term Orientation influences institutions in society, which have the potential to effect environmental entrepreneurial orientation. Following the institutional support theory, there are two main mechanisms in which future orientation has the potential to aggravate the effect of institutions on environmental entrepreneurship. First, institutions in societies with a high degree of long-term orientation are more likely to invest in supporting environmental entrepreneurs through, for example, environmental knowledge creation, as these societies see this as a fruit full investment for the long term. The knowledge spillover theory of entrepreneurship suggests that local knowledge spillovers do not only affect the competitiveness of firms, but also alter the process of firm creation in that area (Audretsch, Belitski, & Desai, 2015), suggesting environmental entrepreneurs benefit from a more long-term approach of institutions to support environmental entrepreneurship. Secondly, whether market incentives work to stimulate sustainable behaviour also depends on the perception of time (Kitzmueller & Shimshack, 2012). The more long-term oriented a society is, the more entrepreneurs will value investments to reduce their costs in the future.

H4b: Long-term orientation positively moderates the effect of environmental policies on environmental orientation of early-stage entrepreneurs
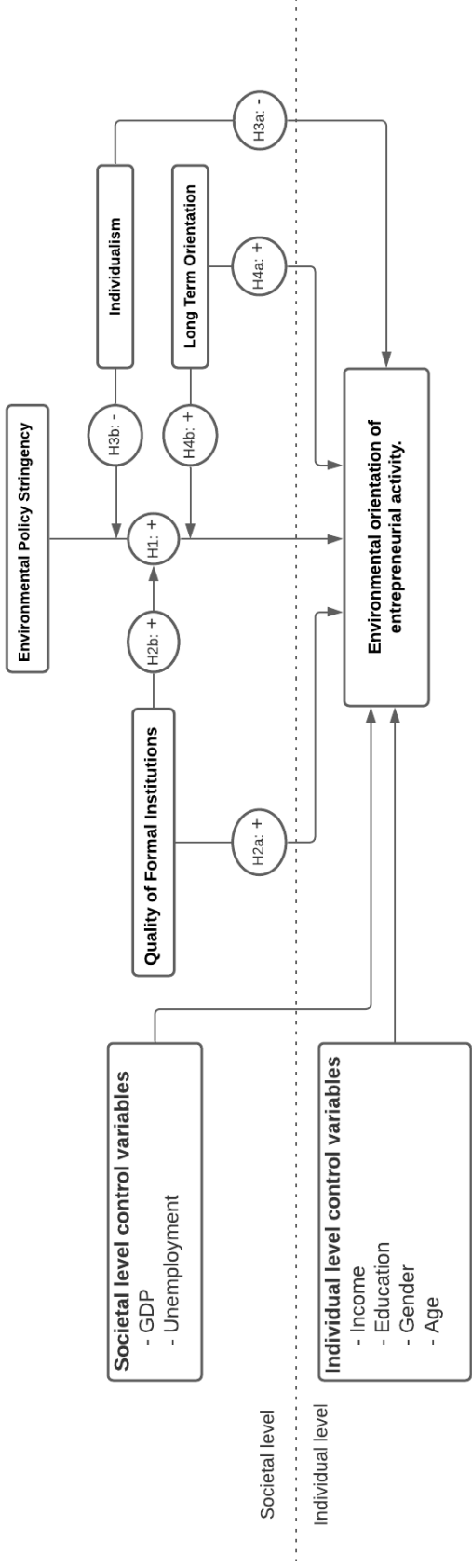
2.8 Conceptual framework

Figure 2.1: Conceptual framework

3 Data and methodology

In the following section the data and methodology of this study will be described. In section 3.1 the relevant data, including their sources will be introduced. Thereafter, the dependent and independent variables will be introduced, giving relevant descriptive statistics and insights into the way they are calculated. Section 3.2 will discuss the multilevel analysis deployed to empirically test the conceptual framework, why this model is chosen and how it is constructed.

3.1 Data

In order to test the presented conceptual framework and its affiliated hypotheses, data from the Global Entrepreneurship Monitor, World Bank Worldwide Governance Indicators project, OECD and Hofstede's cultural dimension are used. To study the effect of formal and informal institutions on environmental entrepreneurial orientation the Global Entrepreneurship Monitor Adult Population Survey (GEM-APS) of 2009 was used to measure the environmental orientation of early-stage entrepreneurs. Furthermore, this dataset contains individual-level control variables such as age, gender, education and income. The GEM-APS survey monitors entrepreneurial activity around the globe and was administered in 55 countries among 183.074 individuals. The 2009 topic concerning social entrepreneurship was used for this study because it contains additional questions regarding the environmental orientation of entrepreneurs. Moreover, the OECD-database was used to test the effect of regulatory institutions. The Organisation for Economic Cooperation and Development (OECD) provides indices to compare cross-country differences in the stringency of different environmental policy instruments. Cross-country cultural dimensions were retrieved from Hofstede's dataset Hofstede (2010). To test the effect of the quality of formal institutions the Worldwide Governance Indicators (WGI) project was used. This project of the World Bank reports aggregates over 30 different individual data sources from a variety of institutes, and is widely used in entrepreneurial research. Furthermore, country level controls were added which where retrieved from the GEM National Experts Survey (2009), the World Bank (2009) and the World Values Survey (2009). Because not all country-level variables are present for all 54 countries, the dataset is limited to 2163 entrepreneurs across 21 countries. Table 3.2 can be consulted for a complete overview of the operationalization and data sources of all variables, while Table Table A.1 in the Appendix, provides an overview of all countries and country-level indicators per country.

3.1.1 Dependent variable

In this study environmental orientation was chosen as the dependent variable, this because it gives room for different interpretations and degrees of environmental entrepreneurship, while still allowing a large-scale quantitative research (Hörisch et al., 2017). In the GEM 2009 Adult Population Survey, respondents were asked to divide 100 points across economic, social and environmental value creation of the firms the individuals were owning/operating, to rank its importance. The score they appointed to environmental value creation can be seen as a proxy of their environmental entrepreneurial orientation. Across the 2163 individuals scoring their entrepreneurial environmental orientation the mean *Environmental orientation* is 14.80 with a standard deviation of 14.81. Because this study focuses on the environmental orientation of early-stage entrepreneurs, only individuals owning/operating were selected who indicated that they owned and operated a business that was no older than 42 months, this means that the sample size consisted

of 2163 early-stage entrepreneurs. The logarithmic function is taken over the dependent variable to ensure a normal distribution, but first all values of 0 were replaced with 1 to ensure no data was lost.

3.1.2 Independent variables

In this section, the independent variables used in this study will be discussed. Consisting of a more detailed description regarding the *Environmental Policy Stringency* variable, institutional quality indicators and the cultural dimension variables will be given.

Environmental Policy Stringency (EPS), this index is intended to compare cross-country environmental policy stringency and denotes the Environmental Policy Stringency index constructed by the OECD. Comparing environmental policies across countries comes with a difficulty; environmental policies differ across countries in use of instruments, efficiency and stringency (Fischer & Newell, 2008). The *EPS* takes into account market and non-market incentives of governments regarding environmental policy, and is computed using stringency indicators of different environmental policy instruments including: environmental tax rates, tradable permit schemes, feed-in tariffs, standard and environmental research and development spending. Furthermore, the *EPS* has been used as a measure for environmental policy in a different array of research directions, regarding competitiveness (Rubashkina, Galeotti, & Verdolini, 2015) and ecological innovations (Ghisetti & Pontoni, 2015). Even though the *EPS* index does not take all environmental policy instruments into account, it does contain the primarily used ones and the ones best comparable in a cross-country setting (Botta & Koźluk, 2014). Figure A.1 located in the Appendix, contains the aggregation methods utilized for compositing the *EPS*. For further information regarding the composition of this index, Botta and Koźluk (2014) can be consulted. The index ranges from 0 (least stringent) to 6 (most stringent). With a minimum value of 0.42, a maximum value of 4.08, a mean of 2.54 and a standard deviation of 1.03. We can conclude that the countries present in the dataset employ a diverse stringency of environmental policy. This variable limits the sample with respect to countries, especially since this environmental policy indicator is only known for primarily developed countries. This limits the generalizability of the present study to developed countries, in the robustness analysis in section 4.2.2 and discussion in section 5 this limitation will be further expanded upon.

To measure the quality of formal institutions this study uses the six governance indicators provided by the WGI project of the WorldBank. Governance can be defined as: "the traditions and institutions by which authority in a country is exercised" (Kaufmann, Kraay, & Mastruzzi, 2011). These indicators reflect three main domains, namely; the quality of institutions regarding the process by which government is selected, monitored, and replaced; capacity to formulate effective policies; and respect of citizens for the institutions that dictate economic and social interaction between them (Kaufmann, Kraay, & Mastruzzi, 2009). In previous studies, these governance indicators have been used to determine social entrepreneurial activity (Fuentelsaz, Gonzalez, & Maícas, 2018), because they are accurate and cover a wide range of countries (Thomas, 2010). The six governance indicators are: Voice and accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. The index of each indicator ranges from -2.50 to +2.50, with a higher score relating to a higher quality of formal institution. Because the six indicators are highly correlated amongst each other, and to overcome potential multicollinearity problems, not all indicators could be used. Therefore, a composite indicator *Quality of*

Table 3.1: **Descriptive statistics**

Variable	Obs.	Mean	Std. Dev.	Min	Max
Environmental orientation	2163	14.80	14.81	0	100
Age	2163	39.47	11.10	18	79
Gender	2163	0.61	0.49	0	1
Education	2163	0.42	0.49	0	1
Income					
High income	2163	0.57	0.49	0	1
Middle income	2163	0.26	0.44	0	1
Low income	2163	0.17	0.38	0	1
Environmental policy stringency (EPS)	21	2.54	1.03	0.42	4.08
Quality of formal institutions (QFI)	21	0.95	0.75	-0.75	1.86
Individualism (IDV)	21	59.14	22.24	18	91
Long-term orientation (LTO)	21	59.47	21.54	25.69	100
Gross Domestic Product per capita (GDP)	21	35465.90	20858.42	3832.00	79977.70
Unemployment (UE)	21	8.18	4.73	3.10	23.54

All independent variables are not yet standardized, and environmental orientation is not logarithmized

formal institutions (QFI) was calculated as the average of the six aforementioned governance indicators.

To obtain comparable results and overcome any potential problems with different opperalizations all independent variables are grand-mean standardized.

3.1.3 Control variables

In this section the control variables utilized in this study will be discussed. Firstly, the individual-level controls, will be further introduced. Secondly, the country level controls will be further analysed.

Individual-level controls

Primarily based on the findings of Hörisch et al. (2017) this study controls for age, gender, education and income at the individual-level of the 2163 individuals belonging to the sample. *Age* reflects the individual respondents age in years. The effect of age on environmental or sustainable orientation is not totally clear. Research into general environmental orientation and sustainable behaviour resulted in mixed results, with Vecchione et al. (2015) finding that younger individuals are more concerned with environmental issues. However, a recent meta-analysis (Wiernik, Ones, & Dilchert, 2013) has shown that older individuals are more likely to engage with nature, and refrain themselves from environmental degradation behaviour. Furthermore, the evidence from the social entrepreneurship literature is also mixed; Stephan et al. (2015) hypothesised that younger individuals would be more inclined to engage in social entrepreneurship, but did not find significant results; while Lepoutre et al. (2013) actually found a positive effect of age on social entrepreneurship activity. Hörisch et al. (2017) did find a significant positive results researching environmental entrepreneurial orientation within the GEM-APS dataset, adding that this positive effect may potentially be because older individuals have children and therefore tend to be more environmentally oriented. Furthermore, Age^2 was added to control for a possible nonlinear relationship. Evidence from the social entrepreneurship literature suggests an inverted u effect of age on social entrepreneurial activity Estrin, Mickiewicz, and Stephan (2013). From Table 3.1 it can be observed that the average age of a respondent is 39.47 year with a standard deviation of 11.10, where the youngest respondent was 18 years old and the oldest was 79 years old.

The variable *Education* was recoded to reflect whether the individual completed at least post secondary education (=1) or not (=0). In general, a positive effect of education and commercial entrepreneurship is assumed. A similar effect is suggested in the social entrepreneurship literature (Estrin, Mickiewicz, & Stephan, 2013; Lepoutre et al., 2013). However, in the environmental entrepreneurship space, Hörisch et al. (2017) found a significant negative effect of education on environmental orientation of entrepreneurs. A possible explanation can be found in the fact that environmental orientation seems to decrease when business skills are acquired, which suggests that higher educated individuals seem to be educated to act upon regular commercial entrepreneurial opportunities. From Table 3.1 it can be observed that *Education* has a mean of around 0.42, with a standard deviation of 0.48, indicating that around 42% of individual at least completed post-secondary education.

Environmental entrepreneurship is in the literature often described as opportunity-driven type of entrepreneurship (Schaltegger & Wagner, 2011), suggesting that environmental entrepreneurship does not lead from financial hardship. Interestingly, Hörisch et al. (2017) found a negative effect of household income on environmental orientation, which suggests that low-income entrepreneurs tend to use environmental orientation is used as a self-transcendence value to overcome the perceived lack of material success. In the model two dummy variables will be included, namely, *High income* and *Middle income* with the lowest income tertile serving as the reference category. The descriptive statistics displayed in Table 3.1 indicate that 57% of the sample belongs to the highest tertile of household income, 26% to the middle tertile and 17% to the lowest tertile.

Gender indicates the gender of the individual (= 1 for males and = 0 for females). The mean of 0.61 indicates that 61% of respondents are male, this is in line with the assumption of the literature that males tend to be over represented in the entrepreneurial domain (Minniti, 2009). However, this effect is less present in the environmental entrepreneurship space (Hechavarria et al., 2012). Hörisch et al. (2017) showed that being male is negatively related with the environmental orientation of entrepreneurs.

Societal-level controls

At the societal level, this study controls for *GDP per capita*, and *Unemployment*. The variable *GDP per capita* reflects the gross domestic product per capita, measured in US $, in a country. This variable is controlled for because the literature suggests the economic development of a country influences both entrepreneurial activity and the type of activity (Stephan et al., 2015). Hörisch et al. (2017) found a positive effect of GDP on environmental orientation. Even though the results of Hörisch et al. (2017) regarding unemployment rates are mixed, *Unemployment* was still controlled for. The rationale behind it is that environmental entrepreneurs are often portrayed as innovative opportunity-driven entrepreneurs and higher unemployment is correlated with the entry of necessity-driven entrepreneurs (Audretsch & Thurik, 1998). *Unemployment* is defined as the percentage of the workforce without a job actively seeking employment.

Table 3.2: Overview of variables

Variable	Data source	Explanation	Operationalization
Dependent variable			
Environmental orientation	GEM-APS (2009)	Environmental orientation of entrepreneurial venture.	Log of points allocated (0-100)
Individual-level controls			
Age	GEM-APS (2009)	Age of individual	In years
Gender	GEM-APS (2009)	Gender of individual	Male = 1, female = 0
Education	GEM-APS (2009)	Education attainment of individual	At least post seconder education (1) or not (0).
Income	GEM-APS (2009)	Household income	Three dummy variables: *High income*, *Middle income* and the reference category *Low income*.
Societal-level independent variables			
Formal institution			
Environmental policy stringency (EPS)	OECD (2009)	Index regarding the stringency of environmental policy.	Index regarding from 0 (not stringent) to 6 (highest degree of stringency)
Quality of formal institutions			
Quality of formal institutions (QFI)	World Bank WGI (2009)	Average of the indicator value of: Voice and accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.	Index ranging from -2.5 to +2.5, with a higher values corresponding to better governance,
Hofstede's cultural dimensions			
Individualism (IDV)	Hofstede (2010)	Index regarding the degree to which members of society have strong ties with each other.	Index ranging from 0 to 100, with a higher score representing a more individualistic society
Long-term orientation (LTO)	Hofstede (2010)	Index regarding the degree to which a society bases its virtues on future rewards	Index ranging from 0 to 100, with a higher score representing a more long-term oriented society
Societal-level controls			
Gross Domestic Product per capita (GDP)	World Bank (2009)	Gross Domestic Product per capita	In US dollar.
Unemployment (UE)	World Bank (2009)	Individuals without work but seeking employment.	Percentage of total labor force

3.2 Methodology

This study focuses on the effect of country-level differences in formal institutions and culture on an individual-level variable environmental orientation of entrepreneurial activity, therefore, a multi-level research method was chosen. This research design also gives answer to the call for more large-scale statistical research in environmental entrepreneurship (Thompson et al., 2011) with a specific focus on environmental regulation Demirel et al. (2019), in relationship with the quality of formal institutions and informal institutions.

3.2.1 Multi-level model

A multilevel analysis research design was chosen because there was heterogeneity between countries, which can already be observed because of the differences in mean of environmental orientation in different countries, see Table A.1 in the Appendix. Normal OLS regression models yields biased standard error estimates if independence of the standard errors is violated (Bliese & Ployhart, 2002), applying a multilevel analysis relaxes the assumption of independence of

a normal regression. This is important because underestimation of standard errors increases the possibility of Type 1 errors (McNeish & Stapleton, 2016).

Null-model

To formally test if a multi-level model is appropriate, a null model was constructed. The null model is equal to a random intercept model which looks as follows (Snijders & Bosker, 2011);

$$Y_{ij} = \gamma_{00} + u_j + \epsilon_{ij} \tag{1}$$

here Y_{ij} denotes the dependent variable (logarithm of *Environmental Orientation (EO)*) for individual i and country j, γ_{00} denotes the intercept, u_j denotes the group-deviation corresponding to the country and ϵ_{ij} denotes the error term corresponding to the i-th individual and the j-th country. This model is able to predict the intercept of level 1 (individuals) as a random effect of level 2 (country) Garson (2013). The null-model is essential to test if there is an agency effect and to compare with the conditional model later on. Based on this null model, the intraclass correlation (ICC) coefficient can be calculated. The ICC score defines the proportion of variation of environmental orientation of entrepreneurs that occurs across countries and the variation of environmental orientation of entrepreneurs in the same country.

$$ICC = \frac{Between\ group\ variance}{Between\ group\ variance + Within\ group\ variance} = \frac{Var(u_j)}{Var(u_j) + Var(\epsilon_{ij})} \tag{2}$$

The ICC score of 0.180, indicates that around 18.0% of the variance can be explained by country level differences. A ICC score of around 0.20 is common in cross-sectional multi-level modeling applications in research studies (Muthén, 1991). Therefore it is concluded that a multilevel modeling approach is most applicable in the context of this study.

Random intercept model

A random intercept model is chosen because the focus lies on the effect of country-level indicators on an individual-level outcome. The differences of individual-level predictors across countries are not deemed relevant in this study. Therefore, this model relaxes the assumption that level-1 variables have the same effect across different groups, but does not go so far as a random slope model in allowing for different coefficients of effects across groups (Snijders & Bosker, 2011). Therefore, the proposed models follow the structure of Equation 3, which is as follows:

$$\mathbf{Y}_{ij} = \gamma_{00} + \gamma_{0n}\mathbf{W}_j + \gamma_{10}\mathbf{X}_{ij} + u_j + \epsilon_{ij} \tag{3}$$

where Y_{ij} once again denotes the dependent variable, γ_{00} denotes the overall intercept, γ_{0n} is the n-th country-level coefficient corresponding to independent variables $\mathbf{W}_j$, γ_{10} refers to the regression coefficient of individual-level independent variables $\mathbf{X}_{ij}$ for every individual i in each country j and u_j denotes the country-specific intercept for country j. Here, γ_{0n} corresponds to the regression coefficient of the country-level variable in country j and γ_{01} corresponds to the regression coefficient of individual-level variables for every individual i in each country j.

Full model

The final model models the dependent variable *Environmental orientation* of early-stage entrepreneurs with both the consideration of individual-level predictors and country-level predictors. Furthermore, to investigate the effect of

the quality of formal institutions and culture on the relationship between environmental policy and environmental orientation of entrepreneurs, three interaction terms were added. The full multilevel model with random intercepts follows from Equation 4.

$$\mathbf{Y}_{ij} = \gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}EPS_j + \gamma_{02}QFI_j + \gamma_{03}IND_j + \gamma_{04}LTO_j + \gamma_{05}(QFI_j * EPS_j) + \gamma_{06}(IND_j * EPS_j) + \gamma_{07}(LTO_j * EPS_j) + \gamma_{08}\Psi_j + u_j + \epsilon_{ij}$$
(4)

Where X_{ij} denotes all individual level controls (gender, age, high income, middle income and education), Ψ_j notes all country level controls (gdp per capita and unemployment) and γ_{08} refers to the regression coefficient of the specific country-level control variable. Furthermore, γ_{05}, γ_{06} and γ_{07} denote the regression coefficients of the interaction terms between *EPS* and respectively *QFI*, *IND* and *LTO* and u_j considers the residual term from the country-specific intercept, which is the mean of the dependent variable if all independent variables are equal to zero.

Because of the relative small level-2 sample size of 21 countries, statistical power is potentially an issues (Snijders & Bosker, 1993). This study deals with this possible problem in two manners. As suggested by Parboteeah et al. (2012), regarding cross-cultural research with a small country sample size, we start with modeling the contextual predictor one by one, to ensure the effects lost by a loss of power were detected when all predictors are modeled together. Small country sample sizes in multilevel modeling and the resulting lack of power are problematic because of the potential of Type II error Snijders and Bosker (2011). Each of the interaction terms is also modeled separately before the final model, following equation 4 is constructed. Furthermore, to provide a statistical measure to report the relative change of country-level variance, and to understand the effect size of country level predictors on the country level the relative change in the explained country-level variance is reported, as suggested by Hox, Maas, and Brinkhuis (2010), this change is labeled as the change in "Pseudo R^2".

Table 3.3 contains the correlation matrix of the country-level variables. It can be observed that *EPS*, *QFI* and *GDP* are relative strongly correlated with each other. This suggests that there is the potential for multicollinearity. To ensure no issues arose because of multicollinearity the variance inflation factor of all variables was calculated. The results of this analysis can be observed in Table A.2 located in the Appendix, the results suggest multicollinearity is no issue, since none of the VIF-values are above the threshold of 10, suggested by the literature (Hair, Anderson, Tatham, & William, 1998). The results of the correlation suggest that GDP per capita is positively associated with more stringent environmental policy and higher quality of formal institutions. Furthermore, these results underwrite the importance of controlling for GDP per capita.

Table 3.3: Correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Environmental policy stringency (EPS)	1.00					
Quality of formal institutions (QFI).	0.70	1.00				
Individualism (IDV)	0.30	0.64	1.00			
Long-term orientation (LTO)	-0.14	-0.17	-0.29	1.00		
Gross Domestic Product per capita (GDP)	0.68	0.85	0.54	-0.15	1.00	
Unemployment (UE)	0.08	-0.32	-0.27	-0.42	-0.36	1.00

4 Results

In the following section, the results of this study will be discussed. First, the main findings from the multilevel random intercept model will be presented. Second, the robustness of the results will be analysed through two different manners. Firstly, using a different measure of environmental policy stringency and secondly, looking at potential influential countries. Lastly, a further analysis will be provided looking at different elements of the Environmental Policy Stringency index and its effect on the environmental orientation of early-stage entrepreneurs.

4.1 Main analysis

A multilevel regression analysis using a random intercept model was used to analyse the data of the environmental orientation of early-stage entrepreneurs (level-1) who were nested within countries (level-2). Of interest is the relationship between institutional factors (level-2 predictors) on the environmental orientation of early-stage entrepreneurs (level-1 outcome). Table 4.1 contains the results of the direct effect of environmental policy, the quality of formal institutions, and the cultural dimensions of individualism and long-term orientation on the logarithmic function of the environmental orientation of entrepreneurs. Table 4.2 displays the results of the random-intercept multilevel model containing the interaction terms to research the interaction effect of environmental policy with the quality of formal institutions, long-term orientation and individualism on the environmental orientation of early-stage entrepreneurs. Because this study focuses on the contextual effects of institutional effects on individual level effects, the fixed effects parts of the multilevel analysis are of relevance for the hypothesis testing. However, looking at the random effects, the between-country variance can also indicate whether contextual effects have an influence on the explained between-country variance. The results in Table's 4.1 and 4.2 are based on the data of 2163 individuals (level 1) in 21 countries (level 2).

4.1.1 Results of direct effect using multilevel regression analysis

Firstly, the results of the multilevel analysis using the GEM-dataset do not support hypothesis one, regarding the hypothesised positive effect of environmental policy on the environmental orientation of early-stage entrepreneurs. Even though, the regression coefficient of *Environmental Policy Stringency*, displayed in Table 4.1, indicates a positive relationship in both models ($\beta_{EPS\text{-}M2} = 0.090$, $p > 0.10$ & $\beta_{EPS\text{-}M6} = 0.094$, $p > 0.10$), both indicators are not significant at the 10% significance level. Furthermore, looking at the difference of the Pseudo R^2 of model 2 (with *EPS*) compared with model 1 (baseline model) would suggest that adding *Environmental policy stringency* decreases the unexplained between-country variance with 0.7% $(((0.547 - 0.551)/0.551)*100\%)$. Suggesting *Environmental Policy Stringency* is responsible of 0.7% of the between-country variance.

Secondly, regarding the hypothesised positive effect of the quality of formal institutions on the environmental orientation of early-stage entrepreneurs. The results regarding the proxy *Quality of formal institutions*, resulting from the aggregate of the six governance indicators of the WGI project of the Worldbank, constitute a statistically significant positive effect on environmental orientation of early-stage entrepreneurs. In both model 3 and model 6, the regression coefficient is positive ($\beta_{QFI\text{-}M3} = 0.068$, $p < 0.0.5$ & $\beta_{QFI\text{-}M6} = 0.064$, $p < 0.01$), which does correspond with the hypothesised positive relationship between the quality of formal institutions and environmental orientation.

The regression coefficient of model 6 ($\beta_{QFI\text{-}M6} = 0.064, p < 0.01$) suggest that an increase of one σ_{QFI} increases the logarithmic function of the environmental orientation of early-stage entrepreneurs with 0.064, ceteris paribus. This effect is significant at the 1% significance level. Furthermore, looking at the difference of Pseudo R^2 comparing model 3 (with QFI) with model 1 (baseline model). The between country variation does decrease by 7% (((0.514 - 0.551)/0.551)*100%), comparing model 3 with model 1, suggesting that adding *Quality of formal institutions* to the model does decrease the unexplained variance of environmental orientation between countries. The previous provides evidence in support of hypothesis 2a in the presented model and dataset, suggesting that a higher quality of formal institutions is positively associated with a higher environmental orientation of early-stage entrepreneurs.

Thirdly, Hofstede's cultural dimension of individualism vs collectivism was hypothesised to negatively influence the environmental orientation of early-stage entrepreneurs. The regression coefficient of the variable *Individualism* indeed shows a negative association ($\beta_{IDV\text{-}M4} = -0.133, p > 0.10$ & $\beta_{IDV\text{-}M6} = -0.103, p > 0.10$). However, the results are insignificant at the 10% significance level. Suggesting that this model in combination with the present data shows no support for hypothesis 3A. Furthermore, looking at the variance component, adding *Individualism* increases the unexplained between country-variance with 1% ((0.543-0.551)/0.551)*100%).

Lastly, Hofstede's cultural dimension long-term vs short-term orientation, was hypothesised to positively influence the environmental orientation of early-stage entrepreneurs. The regression coefficient of the variable *Individualism*, indeed shows a positive association ($\beta_{LTO\text{-}M5} = 0.167, p > 0.10$ & $\beta_{LTO\text{-}M6} = 0.121, p > 0.10$). However, the results of the regression coefficient are insignificant at even the 10% significance level. Suggesting that this model in combination with the present data shows no support to accept hypothesis 4A. Furthermore, looking at the variance component, adding *Long-term orientation* increases the unexplained between country-variance with 3% ((0.535-0.551)/0.551)*100%).

Regarding the results of the control variables in the main analysis of the direct effects are the following: the regression coefficients of *Age*, *Gender*, and *Education* have no statistical significant effect on the environmental orientation of early-stage entrepreneurs in any of the models 1 till 6. $\beta_{Income\ high}$ does seem to have a significant negative effect (at the 5% significance level) in models 1 till 6 (with $\beta_{Income\ high\text{-}M6} = -0.078, p < 0.01$). Suggesting that belonging to the higher percentile of household income is significantly negatively associated with a lower environmental orientation. Interestingly, the regression coefficient for *Income middle* is not significant.

Furthermore, regarding the country-level control variables *GDP per capita* and *Unemployment*, no statistically significant effect could be concluded. Across all models the regression coefficient of *GDP per capita* did suggest a positive effect (for example, $\beta_{GDP\text{-}M6} = 0.199, p > 0.10$) of the Gross domestic product per capita on the logarithmic function of the environmental orientation of early-stage entrepreneurs. However, the results are statistically insignificant across models 1 till 6. The regression coefficient of the variable *Unemployment* also suggested a positive effect between the % of the workforce actively seeking for employment and the logarithmic function of the environmental orientation of early-stage entrepreneurs (for example, $\beta_{UE\text{-}M6} = 0.325, p > 0.10$). However, these results are not significant even at the 10% significance level.

To conclude, regarding the hypothesised direct effects, only evidence in support of hypothesis 2A was found, suggesting the quality of formal institutions is positively associated with a higher environmental orientation of early-stage entrepreneurs. Regarding the direct effect of environmental policy stringency and cultural determinants, no results in support of these hypotheses were found.

Table 4.1: Results multilevel random-intercept regression analysis

Dependent variable = logarithmic function of the environmental orientation of entrepreneurs	(0)	(1)	(2)	(3)	(4)	(5)	(6)
Fixed part							
Individual-level controls							
Age		-0.060	-0.062	-0.059	-0.062	-0.062	-0.064
		(0.192)	(0.189)	(0.192)	(0.191)	(0.191)	(0.188)
Age^2		0.081	0.083	0.080	0.083	0.083	0.085
		(0.205)	(0.203)	(0.206)	(0.205)	(0.205)	(0.202)
Gender		-0.023	-0.023	-0.022	-0.022	-0.023	-0.022
		(0.032)	(0.031)	(0.032)	(0.032)	(0.032)	(0.031)
Education		0.030	0.030	0.032	0.030	0.029	0.030
		(0.072)	(0.072)	(0.073)	(0.072)	(0.072)	(0.072)
Income high		-0.078**	-0.078**	-0.077**	-0.077**	-0.077***	-0.078**
		(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.026)
Income middle		-0.041	-0.040	-0.040	-0.041	-0.041	-0.041
		(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.035)
Country-level independent variables							
Environmental policy stringency			0.090				0.094
			(0.193)				(0.129)
Quality of formal institutions				0.068**			0.064***
				(0.031)			(0.025)
Individualism					-0.133		-0.103
					(0.196)		(0.204)
Long-term orientation						0.167	0.121
						(0.162)	(0.141)
Country-level control variables							
GDP per capita		0.074	0.004	0.146	0.170	0.149	0.199
		(0.156)	(0.183)	(0.157)	(0.222)	(0.194)	(0.243)
Unemployment		0.140	0.131	0.226	0.195	0.238	0.325
		(0.146)	(0.147)	(0.157)	(0.168)	(0.197)	(0.216)
Intercept							
Intercept	2.032***	2.062***	2.058***	1.957***	2.062***	2.064***	1.960***
	(0.140)	(0.130)	(0.131)	(0.157)	(0.129)	(0.126)	(0.141)
Random part							
Between country-variance	0.603***	0.551***	0.547***	0.514***	0.543***	0.535***	0.494***
	(0.096)	(0.084)	(0.083)	(0.071)	(0.078)	(0.076)	(0.071)
Within country-variance	1.288	1.250	1.250	1.250	1.250	1.250	1.250
	(0.108)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)	(0.109)
ICC	0.180	0.163	0.161	0.145	0.159	0.155	0.135
Model fit statistics							
Log pseudo-likelihood	-4573	-3579	-3579	-3578	-3579	-3579	-3577
Observations	2163	2163	2163	2163	2163	2163	2163
Countries	21	21	21	21	21	21	21
Degrees of freedom	3	10	11	11	11	11	14
AIC	9153	7179	7180	7178	7180	7179	7183
BIC	9171	7235	7242	7241	7242	7242	7262
Wald χ^2(df)		24.89***	25.76***	37.30***	25.93***	24.85***	46.62***
Δ Psuedo R^2 (compared to M0)		0.086					
Δ Psuedo R^2 (compared to M1)			0.007	0.067	0.015	0.029	0.103

Note: Standard error in parentheses.

Computations made using Stata 16 using ML estimation and robust standard errors clustered at the country-level.

Significant: ***p<0.01, **p<0.05, *p<0.10.

ICC = Intraclass correlation coefficient, AIC = Akaike information criterion, BIC = Bayesian information criterion,

Table 4.2: Results multilevel random-intercept regression analysis

Dependent variable = logmarithmic function of the environmental orientation of entrepreneurs	(7)	(8)	(9)	(10)
Fixed part				
Individual-level controls				
Age	-0.063	-0.064	-0.064	-0.065
	(0.188)	(0.189)	(0.187)	(0.188)
Age^2	0.085	0.086	0.085	0.086
	(0.202)	(0.203)	(0.201)	(0.202)
Gender	-0.023	-0.023	-0.022	-0.023
	(0.031)	(0.031)	(0.031)	(0.031)
Education	0.030	0.029	0.030	0.028
	(0.072)	(0.072)	(0.072)	(0.072)
Income high	-0.077***	-0.076**	-0.077***	-0.078***
	(0.026)	(0.038)	(0.026)	(0.026)
Income middle	-0.041	-0.040	-0.041	-0.041
	(0.035)	(0.038)	(0.035)	(0.035)
Country-level independent variables				
Environmental policy stringency	0.143	0.038	0.092	-0.031
	(0.192)	(0.199)	(0.154)	(0.308)
Quality of formal institutions	-0.027	0.091**	0.065***	0.076
	(0.177)	(0.037)	(0.025)	(0.235)
Individualism	-0.103	-0.056	-0.102	-0.059
	(0.206)	(0.217)	(0.206)	(0.219)
Long-term orientation	0.104	0.060	0.120	0.060
	(0.149)	(0.153)	(0.147)	(0.154)
Country-level interaction effect				
EPS * QFI	-0.061			-0.006
	(0.117)			(0.139)
EPS * IDV		-0.203		-0.219
		(0.187)		(0.225)
EPS * LTO			0.007	-0.041
			(0.144)	(0.118)
Country-level control variables				
GDP per capita	0.231	0.201	0.201	0.190
	(0.236)	(0.251)	(0.224)	(0.241)
Unemployment	0.307	0.252	0.324	0.246
	(0.231)	(0.213)	(0.216)	(0.221)
Intercept				
Intercept	2.062***	2.027***	1.958***	2.051***
	(0.269)	(0.149)	(0.133)	(0.299)
Random part				
Between country-variance	0.493	0.478***	0.243***	0.477***
	(0.069)	(0.068)	(0.135)	(0.069)
Within country-variance	1.250	1.250	1.562	1.250
	(0.109)	(0.109)	(0.019)	(0.019)
ICC	0.134	0.128	0.208	0.127
Model fit statistics				
Log psuedo-likelihood	-3577	-3577	-3577	-3577
Observations	2163	2163	2163	2163
Countries	21	21	21	21
Degrees of freedom	15	15	15	15
AIC	7184	7184	7185	7188
BIC	7270	7269	7270	7284
Wald $\chi^2(df)$	59.02***	48.29***	51.29***	107.89***
Δ Psuedo R^2 (compared to M6)	0.002	0.032	0.508	0.034

Note: Standard error in parentheses.

Computations made using Stata 16 using ML estimation and robust standard errors clustered at the country-level.

Significant: ***p<0.01, **p<0.05, *p<0.10.

ICC = Intraclass correlation coefficient, AIC = Akaike information criterion,

BIC = Bayesian information criterion,

4.1.2 Results of interaction effect using multilevel regression analysis

The results of the multilevel regression analysis containing the interaction terms on the country-level regarding the interaction effect of environmental policy stringency with the quality of formal institutions, individualism and long-term orientation can be observed in Table 4.2. The dependent variable is the logarithmic function of the environmental orientation of early-stage entrepreneurs. A similar approach as in the direct effect section was utilized, in the sense that each interaction was added one by one as suggested by Parboteeah et al. (2012). Model 7 extends upon model 6 by including an interaction term of the variables EPS and QFI. Model 8 extends upon model 6 by including an interaction term of EPS and IDV and model 9 extends upon model 6 by including an interaction term of EPS and LTO. To conclude, model 10 takes into account all three proposed interaction effects in one model.

Firstly, taking a closer look at the results of model 7 and 10, regarding the interaction effect of EPS and QFI, no significant interaction effect, at the 10% significance level, can be concluded from the data ($\beta_{EPS*QFI\text{-}M7} = -0.061, p > 0.10$ & $\beta_{EPS*QFI\text{-}M10} = -0.006, p > 0.10$). Not taking into account the insignificance of the regression coefficients, model 7 suggests that the insignificant, at the 10% significance level, positive effect of EPS is negative moderated by the interaction effect of EPS and QFI. Model 10 suggests, not taking into account the insignificance, that the insignificant negative effect of EPS on the logarithmic function of the environmental orientation is negatively moderated by the variable QFI. The hypothesised interaction effect hypothesised a positive moderation effect. Therefore, no evidence in support of hypothesis 2b was found in the dataset, resulting in the rejection of hypothesis 2b. Secondly, looking at model 8 and 10, no significant, at the 10% significance level, interaction effect between EPS and IDV was found ($\beta_{EPS*IDV\text{-}M8} = -0.203, p > 0.10$ & $\beta_{EPS*IDV\text{-}M10} = -0.291, p > 0.10$). Hypothesis 3B suggests that Hofstede's cultural dimension of individualism negatively moderates the hypothesised positive effect of environmental policy stringency on the environmental orientation of early-stage entrepreneurs. Seen the insignificance of the interaction term at the 10% significance level, no evidence in support of hypothesis 3B was found, resulting in the rejection of hypothesis 3B. Thirdly, the results of models 9 and 10 suggest no significant, at the 10% significance level, interaction effect between EPS and LTO was found ($\beta_{EPS*LTO\text{-}M9} = 0.007, p > 0.10$ & $\beta_{EPS*LTO\text{-}M10} = -0,041, p > 0.10$) in the present data. Hypothesis 4B suggests that Hofstede's cultural dimension long-term orientation positively moderates the effect of EPS on the environmental orientation of early-stage entrepreneurs. It is interesting to note that the Δ Pseudo R^2 increases with 0.508, suggesting that adding the interaction term $EPS * LTO$ decreases in the unexplained country-variance with 50.8% compared to model 6. This is a major reduction when comparing the reduction of the other interaction terms on the unexplained variance. A possible explanation could be that because EPS and LTO are negatively correlated, their interaction effect captures a part of the unexplained country variance, without resulting in a significant effect.

4.2 Robustness analysis

To analyse the robustness of the results presented in the previous section two main approaches were used. Firstly, a similar model containing an alternative measure for environmental policy was used. Secondly, regarding the main analysis, a robustness check was performed looking at the effect of influential countries.

4.2.1 Alternative measure

A similar multilevel model was constructed as portrayed in equation 4, but using a different measure to indicate the stringency of environmental policy in a country. This analysis used the variable *Environmental taxes (ET)* indicating the tax income as a % of GDP as a proxy to measure environmental policy stringency, the data of this measure originates from the OECD-database OECD (2009) the values of the year 2009 were used. The use of environmental tax income as a percentage of GDP is based on the social entrepreneurship literature, where governmental expenditure as a percentage of GDP is often used as a proxy to measure the governmental welfare function Mair and Marti Lanuza (2006); Stephan et al. (2015). Furthermore this measure has been utilized before by Hörisch et al. (2017), who describes it as a proxy for the ability of the government to regulate environmental polluting behaviour.

The results of the multilevel analysis displayed in Table A.3 yields interesting results. First of all, it is interesting to note that the results do not show any evidence of a significant direct effect of variable *Environmental tax income* ($\beta_{ET\text{-}M2b} = 0.172, p > 0.10$ & $\beta_{ET\text{-}M6b} = 0.232, p > 0.10$). In general the sign of the regression coefficient suggests a similar direction as the variable *EPS*, as both relationship suggest that more stringent environmental policy is related with a higher environmental orientation of early-stage entrepreneurs. However, both are insignificant. The regression coefficient does show a significant effect in models 7b and 8b ($\beta_{ET\text{-}M7b} = 0.370, p < 0.10$ & $\beta_{ET\text{-}M8b} = 0.273, p < 0.05$). However the interaction effects are not significant in these models, making the interpretation invalid. Especially since the results of the main analysis show a general positive significant effect of the quality of formal institutions on the environmental entrepreneurial orientation of early-stage entrepreneurs, the interaction effect between *ET* and *QFI* in the robustness analysis was of interest. Moreover, the results, do not show support of hypothesis H2b, suggesting a positively moderating effect of the quality of formal institutions on the relationship between environmental policy stringency and the environmental orientation of early-stage entrepreneurs.

4.2.2 Influential country analysis

In determining influential cases in multilevel modeling, Cooks distance can be calculated to serve as measures for the influence of level-2 units (countries) on the fixed effects parameters of the model (Van der Meer, Te Grotenhuis, & Pelzer, 2010). Where Cooks distance measures the influence of a level-2 unit on the complete model (model 10). Using a cut-off value suggested by the literature of $\frac{2}{n} = \frac{2}{21} = 0.095$. The measure of both Brazil and China were above this cut-off value, suggesting that these countries have a significant influence on the model and are potential outliers. Therefore, models 6 and 10 were recalculated excluding each one of these countries. Thereafter, because both countries are non-OECD countries, all non-OECD countries were excluded.

The results of this robustness analysis are displayed in table Table A.4 which can be found in the Appendix. Most interestingly, the results of this robustness analysis indicate that the statistically significant effect of *QFI* in the full sample is not replicated in any of the other samples. This suggest that the significant results obtained in the main analysis are potentially driven by the inclusion of lower developed countries. However, it is also possible that the sample without one of these countries knows too little variation in the quality of formal institutions for an effect to be detected. The results of the other institutional framework determinants did not suggest any other results than the results of the full sample.

4.3   Further analysis

Different environmental policy instruments can potentially effect environmental entrepreneurs in a different manner. For example, market-based regulations are aimed to mitigate the negative externalities of environmental degrading activities. A market-based regulation tries to discourage polluting behaviour and promote environmental friendly behaviour through market signals rather than explicit directives prohibiting certain behaviour by internalizing a share of the cost into the production function of the polluter. Through this process, the firm get incentives to act more in accordance with the social optimum, through optimising his own interests. This opportunity for reducing negative externalities, or even creating positive environmental externalities is a potential opportunity for green entrepreneurs (Cohen & Winn, 2007). On the contrary, command-and-control type regulations may hinder environmental entrepreneurship. Because command and control environmental regulations can act as an entry barriers for new comers (Dean et al., 2000). This possible constraint for green entrepreneurs is what (Pacheco, Dean, & Payne, 2010) defines as "the green prison", where green entrepreneurs are stifled in the possibility to perform entrepreneurial activities by existing conditions created by incumbent firms. The aforementioned potentially suggest that environmental entrepreneurs are effected differently by different types of environmental policy instruments.

The effect of the stringency of market- and non-market-based regulation and each separate environmental policy instrument on environmental orientation of early-stage entrepreneurs was tested. Russia was excluded from this analysis because the decomposed environmental index values were missing for Russia. Therefore, also model 2 was reestimated with the same restricted sample of 2148 entrepreneurs in 20 countries. Different variations on Model 2 were estimated, of which the results can be observed in Table A.5 in the Appendix. The results suggest that none of the instruments or category of instruments has a statistically significant effect on the environmental orientation of early-stage entrepreneurs. Furthermore, it can be observed that all regression coefficients, although insignificant, are positive. Which is a similar results as obtained in the main results of the composite *EPS* indicator.

5 Conclusion, limitations and future research

5.1 Conclusion

For the coming decades, the environmental challenges facing mankind will only increase. Environmental entrepreneurship has shown both the consumers and the academic world that environmental entrepreneurs have the possibility to contribute to solving these challenges. Commercial entrepreneurs, alike environmental entrepreneurs do not act upon entrepreneurial opportunities within a vacuum, their actions, perceptions, and desires are influenced through their societal institutional framework. Environmental entrepreneurs have the potential to alleviate society from environmental challenges, while still bringing economic value to the table. However, the literature concerning cross-country research into institutional drivers of environmental entrepreneurship is sparse. While researchers have made major contributions in the field of institutional drivers of social entrepreneurship (Estrin, Mickiewicz, & Stephan, 2013; Hoogendoorn, 2016; Stephan et al., 2015), the environmental entrepreneurship space has only seen sporadic academic attention. This study has made an attempt in closing this research gap, by providing an explorative account for the effect of environmental policy on environmental orientation of early-stage entrepreneurs, utilizing a complete institutional framework by taking into account the quality of formal institutions and cultural dimensions on the effect of environmental policy. Through applying a wide institutional context on the drivers of environmental value creation of entrepreneurs, a light is shed on the regulatory, institutional, and cultural determinants of environmental entrepreneurship. Using a multilevel model, with a random intercept, the direct effect and interaction effect of environmental policy, quality of formal institutions and cultural dimensions on the environmental orientation of early-stage entrepreneurs. Utilizing the GEM-dataset, OECD-dataset, WGI data from the World Bank and cultural dimension constructed by Hofstede 9 hypothesis were tested.

The main conclusion of this study is that the effect of environmental policy is more complex than supposed by the literature. The main analysis regarding the aggregate measure of environmental policy stringency developed by the OECD, did not yield a statistically significant result. Two potential explanations can be given for the insignificant findings of this effect. First of all there is the possibility that there is no effect. Secondly, there is the potential that due to the small country sample size, no significant effect was found. The robustness analysis assessing the effect of environmental taxes (as % of GDP) on environmental orientation gave similar, results, the sign of the regression effect was positive but insignificant. Therefore, no real conclusion can be drawn on whether environmental policy stringency follows the legitimacy, institutional support or institutional void theory (Stephan et al., 2015). These findings, therefore do not support the finding of Hörisch et al. (2017) regarding the negative effect of environmental taxes on environmental entrepreneurial orientation, especially in developed countries, because such relationship was not found in this study.

Furthermore, none of the individual policy instruments or categories of environmental policy instruments were found to be significant determinants of the environmental orientation of early-stage entrepreneurs. Again, the lack of significant results may be caused by the relatively small country sample or the lack of an actual effect. Therefore, no real conclusions on the institutional support theory, institutional void theory and legitimacy theory regarding

environmental policy can be drawn. Increasing the availability of comparable environmental policy stringency data is necessary to provide evidence for or reject these theoretical mechanisms. Moreover, no significant interaction effect regarding environmental policy was found. A major limitation of the findings of this study is the limited availability of comparable cross-country data on the stringency of environmental policy, especially for developing countries.

A positive statistically significant, at the 5% significance level, effect of the quality of formal institutions on the environmental orientation of early-stage entrepreneurs suggests that environmental entrepreneurship is positively associated with institutional quality. To our knowledge, this is the first study adopting a quality of formal institutions perspective in the environmental entrepreneurial context. This conclusion is in line with the finding of Hörisch et al. (2017), who suggests that environmental entrepreneurs are benefited by a business-friendly environment. The results of this study suggest that environmental entrepreneurs benefit from general good quality formal institutions and not from specific environmental policies. However, the robustness analysis has shown that the effect depends on the inclusion of influential developing countries. Because the sample of countries used in this study is mainly of developed countries, the generalizability of the findings towards developing countries is difficult. These findings break with the general environmental and social entrepreneurship literature in the fact that in this study only the general institutional quality is found to impact environmental entrepreneurship. With other researchers also finding specific institutions to effect environmental entrepreneurs (Hörisch et al., 2017; Meek et al., 2010) or social entrepreneurs (Hoogendoorn, 2016; Stephan et al., 2015). Furthermore, these results potentially suggest that the positive effect of formal institutional quality is especially of importance in developing countries. A potential explanation for this effect could be that, because environmental entrepreneurs have less formal business-experience (Kuckertz & Wagner, 2010) compared to commercial entrepreneurs, they benefit relatively more from a high-quality institutional environment compared to commercial entrepreneurs. Partially, this results support the institutional support theory regarding environmental entrepreneurship (Stephan et al., 2015), suggesting that like social entrepreneurs, environmental entrepreneurs benefit from a predictive business environment (Estrin, Mickiewicz, & Stephan, 2013). However, more research utilizing a dataset containing more developing countries is needed. Linking the quality of formal institutions with the environmental orientation of entrepreneurs will be a fruitful area for further research.

The institutional perspectives suggest that to understand individual behaviour, both formal and informal institutions need to be examined (North et al., 1990). This study has adhered to this perspective by assessing the effect of environmental policy in combination with assessing the effects of two of the cultural dimension developed by Hofstede, namely individualism and long-term orientation. Regarding the direct effect of both cultural dimensions, no statistically significant effect was found, this result can be either caused because there is no effect or because their is not enough statistical power to, statistically significantly, define the effect. The statistical insignificance indicates no clear-cut evidence in support of the theory promoted by Meek et al. (2010) to considering the cultural determinants in the environmental entrepreneurship context. Furthermore, the interaction terms assessing the relationship between the cultural dimensions and environmental policy were also insignificant. Partially, this questions the applicability of the institutional framework in assessing environmental entrepreneurship. However, far to less is known about cultural determinants of environmental entrepreneurship to dismiss this perspective. Moreover, more large-scale research is needed to focus on cultural determinants of environmental entrepreneurship using a bigger, more representative

country sample then used in this study.

5.2 Limitations and future research

In the following section the limitations of the present study will be discussed, possible solutions for future researchers will be provided, together with general area's of potential future research. Firstly, one of the major limitations all ready mentioned in the previous section, is the relatively small country sample size. There are researchers who argue that such a small level-two unit sample is insufficient when applying multilevel modeling and assessing country-level determinants on individual level outcomes (Bryan & Jenkins, 2016). For example, Maas and Hox (2005) recommend at least a country-level sample size of 30 units when contextual effects are of interest. However, applying a multilevel model in this study was still preferred as the ICC statistic showed dependence existed between individual observations within a country (Snijders & Bosker, 2011). An insignificant sample size reduces the statistical power, lowering the probability to detect a true effect and increasing the potential of Type I errors. Future research would benefit from utilizing a larger country-level sample size to sidestep any of the aforementioned problems and increase the precision of the results. Partially, the small sample size is induced by the availability of comparable environmental policy data, therefore, extending the calculation of the OECD-EPS measure to more countries would benefit academic research into the effects of environmental policy on environmental entrepreneurs. Furthermore, the used sample in this study mainly contains developed countries, limiting the generalizability of the results. Especially since environmental problems and therefore environmental entrepreneurship as a solution constitutes a global phenomenon an area of future research could be extending the research on institutional drivers of environmental entrepreneurship to less economically developed countries.

Secondly, a major limitation is the cross-sectional research design utilised in this study. Primarily, this research design was chosen because data limitations imposed by the GEM-APS survey, which only questioned entrepreneurs about their environmental orientation in the 2009 adult population survey. Ideally one would utilize a panel dataset to assess the effect of differences in environmental policy and the quality of formal institutions. For example, Tina Dacin, Goodstein, and Richard Scott (2002) underwrite the importance of understanding institutional change as an important driver of individual behaviour effected by the institutional context not merely the statically institutional context. For culture, this is less of an obstacle as cultural dimensions are less subject to change (Hofstede & Minkov, 2010). Thus, potentially environmental entrepreneurs are thus not triggered by environmental policy stringency but by change of environmental policy stringency. Furthermore, using a cross-sectional research design limits the ability to make claims about causality. Furthermore, the recent introduction of the concept of institutional entrepreneurs suggest that potentially environmental policy is influenced by environmental entrepreneurial activity (Hardy & Maguire, 2008). Potentially suggesting reversed causality is a problem. Looking over a longer period, changes in regulatory changes and environmental entrepreneurial action in a panel dataset would increase the understanding of this interaction between entrepreneurs and regulation and especially environmental entrepreneurs and environmental regulation.

Thirdly, a major limitation exists in how this study approached environmental entrepreneurship. Looking at the self-perceived environmental orientation of the firms of early-stage entrepreneurs comes with the problem that their is the potential of discrepancy between reported environmental orientation and true environmental orientation. Re-

spondents may overestimate their own environmental contribution or give social desirable answers. Both fallacies may be over or underrepresented in certain cultures. However, research has also shown that environmental orientation is an important determinant in environmental process and product innovation practices (Feng, Zhao, Li, & Song, 2018). Future researchers may potentially sidestep this problem by assessing environmental entrepreneurship through other measures, such as green entrepreneurial output measures. Furthermore, this research has focused on the extend of environmental orientation, defining environmental entrepreneurship as a continuum. Future research could potentially focus on factors influencing any environmental value creation attainment.

Taking into account the aforementioned limitations, this study does contribute to the academic literature in the following two manners. Firstly, contributions are made to the understanding of the institutional theory in the environmental entrepreneurial context, the positive effect of quality of formal institutions provides partial evidence that the three-pillar framework developed by Scott (1995) is fruitful in assessing contextual effects in the environmental entrepreneurship context. However, the insignificant results regarding environmental policy and cultural dimensions ask for more research contemplating on the applicability of the institutional framework for environmental entrepreneurial research. Therefore, this study supports the notion of Hörisch et al. (2017) to extend the use of this framework, widely used in the the social entrepreneurship context (Stephan et al., 2015) to the environmental entrepreneurship space. Secondly, this study has contributed to the growing body of literature concerning environmental entrepreneurship. Increasing understanding and empirical evidence supporting country-level determinants of environmental entrepreneurship. Regarding the environmental entrepreneurship literature, the most important conclusion of this study suggests that potentially environmental entrepreneurship follows the institutional support theorem with regard to the quality of formal institutions. However, it can be constituted that the main conclusion constitutes that more large-scale cross-country research is needed to understand the full extent of institutional determinants on environmental entrepreneurial activity.

References

Acs, Z. (2006). How is entrepreneurship good for economic growth? *Innovations: Technology, Governance, Globalization*, *1*(1), 97–107.

Ahlstrom, D., & Bruton, G. (2001). Learning from successful local private firms in china: Establishing legitimacy. *Academy of Management Executive*, *15*(4), 72-83.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Allen, J., & Malin, S. (2008). Green entrepreneurship: A method for managing natural resources? *Society and Natural Resources*, *21*(9), 828–844.

Anderson, A. R. (1998). Cultivating the garden of eden: environmental entrepreneuring. *Journal of Organizational Change Management*, *11*(2), 135–144.

Antolín-López, R., Martínez-del Río, J., & Cespedes-Lorente, J. (2019). Environmental entrepreneurship as a multi-component and dynamic construct: Duality of goals, environmental agency, and environmental value creation. *Business Ethics A European Review*, *28*(4), 407–422.

Arnocky, S., Milfont, T. L., & Nicol, J. R. (2014). Time perspective and sustainable behavior: Evidence for the distinction between consideration of immediate and future consequences. *Environment and Behavior*, *46*(5), 556–582.

Audretsch, D. B., Belitski, M., & Desai, S. (2015). Entrepreneurship and economic development in cities. *The Annals of Regional Science*, *55*(1), 33–60.

Audretsch, D. B., Grilo, I., & Thurik, A. R. (2007). *The handbook of research on entrepreneurship policy.* Northamption, MA: Edward Elgar.

Audretsch, D. B., & Thurik, A. R. (1998). *The Knowledge Society, Entrepreneurship and Unemployment* (Research Report 9801/E,). Zoetermeer, NL: EIM.

Autio, E., Pathak, S., & Wennberg, K. (2013). Consequences of cultural practices for entrepreneurial behaviors. *Journal of International Business Studies*, *44*(4), 334–362.

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, *43*(4), 717–736.

Barley, S., & Tolbert, P. (1997). Institutionalization and structuration: Studying the links between action and institution. *Organization Studies*, *18*(1), 93–117.

Baum, J. R., Olian, J., Erez, M., Schnell, E., Smith, K., Sims, H., . . . Smith, K. (1993). Nationality and work role interactions: A cultural contrast of israeli and u.s. entrepreneurs' versus managers' needs. *Journal of Business Venturing*, *8*(6), 499-512.

Baumol, V. J. (1990). Entrepreneurship: Productive, unproductive. *The Journal of Political Economy*, *98*(5), 893–921.

Beugelsdijk, S., & Noorderhaven, N. (2004). Entrepreneurial attitude and economic growth: A cross-section of 54 regions. *The Annals of Regional Science*, *38*(2), 199–218.

Bliese, P. D., & Ployhart, R. E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organizational Research Methods*, *5*(4), 362–387.

Botta, E., & Koźluk, T. (2014). Measuring environmental policy stringency in oecd countries: A composite index approach. *OECD Publishing*(1177).

Bozhikin, I., Macke, J., & da Costa, L. (2019). The role of government and key non-state actors in social entrepreneurship: A systematic literature review. *Journal of Cleaner Production*, *226*(1), 730-747.

Brieger, S., & De Clercq, D. (2019). Entrepreneurs' individual-level resources and social value creation goals: The moderating role of cultural context. *International Journal of Entrepreneurial Behaviour Research*, *25*(2), 193-216.

Bruton, G. D., & Ahlstrom, D. (2002). An institutional view of china's venture capital industry: Explaining the differences between china and the west. *Journal of Business Venturing*, *18*(2), 233–259.

Bruton, G. D., Ahlstrom, D., & Li, H.-L. (2010). Institutional theory and entrepreneurship: where are we now and where do we need to move in the future? *Entrepreneurship Theory and Practice*, *34*(3), 421–440.

Bryan, M. L., & Jenkins, S. P. (2016). Multilevel modelling of country effects: A cautionary tale. *European Sociological Review*, *32*(1), 3–22.

Canestrino, R., Ćwiklicki, M., Magliocca, P., & Pawełek, B. (2020). Understanding social entrepreneurship: A cultural perspective in business research. *Journal of Business Research*, *110*, 132-143.

Carree, M., Stel, A., Thurik, R., & Wennekers, S. (2002). Economic development and business ownership: An analysis using data of 23 oecd countries in the period 1976–1996. *Small Business Economics*, *19*(3), 271-290.

Choi, D., & Gray, E. (2008). Socially responsible entrepreneurs: What do they do to create and build their companies? *Business Horizons*, *51*(4), 341-352.

Choi, S., & Kim, Y. (2005). Antecedents of green purchase behavior: An examination of collectivism, environmental concern, and pce. *Advances in Consumer Research*, *32*(1), 592-599.

Chui, A., & Kwok, C. (2009). Cultural practices and life insurance consumption: An international analysis using globe scores. *Journal of Multinational Financial Management*, *19*(4), 273-290.

Cohen, B., & Winn, M. (2007). Market imperfections, opportunity and sustainable entrepreneurship. *Journal of Business Venturing*, *22*(1), 29-49.

Cojoianu, T., Clark, G., Hoepner, A., Veneri, P., & Wojcik, D. (2020). Entrepreneurs for a low carbon world: How environmental knowledge and policy shape the creation and financing of green start-ups. *Research Policy*, *49*(6), 1–19.

Connell, R. W., & Messerschmidt, J. W. (2005). Hegemonic Masculinity: Rethinking the Concept. *Gender & Society*, *19*(6), 829–859.

Damania, R., Sterner, T., & Whittington, D. (2020). Environmental policy instruments and corruption. *China Economic Journal*, *13*(2), 123–138.

Davidsson, P. (1995). Culture, structure and regional levels of entrepreneurship. *Entrepreneurship & Regional Development*, *7*(1), 41–62.

Dean, T., Brown, R., & Stango, V. (2000). Environmental regulation as a barrier to the formation of small manufacturing establishments: A longitudinal examination. *Journal of Environmental Economics and Management*, *40*(1), 56-75.

Dean, T., & McMullen, J. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing*, *22*(1), 50-76.

de Bruin, A., Brush, C., & Welter, F. (2008). Advancing a framework for coherent research on women's entrepreneurship. *Entrepreneurship Theory and Practice*, *31*(3), 323-339.

Dees, J., Elias, J., & Bowie, N. (1998). The challenges of combining social and commercial enterprise. university-business partnerships: An assessment norman e. bowie lanham, md: Rowman littlefield publishers, inc., 1994. *Business Ethics Quarterly*, *8*(1), 165–178.

Demirel, P., Li, Q., Rentocchini, F., & Tamvada, J. (2019). Born to be green: new insights into the economics and management of green entrepreneurship. *Small Business Economics*, *52*(4), 759–771.

DiMaggio, P. J. (1988). Interest and agency in institutional theory. In L. Zucker (Ed.), *Research on institutional patterns.* Cambridge: Ballinger Publishing Co.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160.

Djankov, S., La Porta, R., Lopez-de Silanes, F., & Shleifer, A. (2002). The regulation of entry. *The Quarterly Journal of Economics*, *117*(1), 1–37.

Doh, J., & Guay, T. (2006). Corporate social responsibility, public policy, and ngo activism in europe and the united states: An institutional-stakeholder perspective. *Journal of Management Studies*, *43*(1), 47-73.

Estrin, S., Korosteleva, J., & Mickiewicz, T. (2013). Which institutions encourage entrepreneurial growth aspirations? *Journal of Business Venturing*, *28*(4), 564–580.

Estrin, S., Mickiewicz, T., & Stephan, U. (2013). Entrepreneurship, social capital, and institutions: Social and commercial entrepreneurship across nations. *Entrepreneurship: Theory and Practice*, *37*(3), 479–504.

Etzioni, A. (1987). Entrepreneurship, adaptation and legitimation: a macro-behavioral perspective. *Journal of Economic*

Behavior & Organization, *8*(2), 175–189.

Feng, L., Zhao, W., Li, H., & Song, Y. (2018). The effect of environmental orientation on green innovation: Do political ties matter? *Sustainability*, *10*(12), 46–74.

Finkelstein, M. (2010). Individualism/collectivism: Implications for the volunteer process. *Social Behavior and Personality*, *38*(4), 445-452.

Fischer, C., & Newell, R. G. (2008). Environmental and technology policies for climate mitigation. *Journal of Environmental Economics and Management*, *55*(2), 142–162.

Fuentelsaz, L., Gonzalez, C., & Maícas, J. P. (2018). Formal institutions and opportunity entrepreneurship. the contingent role of informal institutions. *Business Research Quarterly*, *22*(1), 5–24.

Garson, G. D. (2013). *Hierarchical linear modeling: Guide and applications*. Los Angeles, CA: Sage Publications.

Ghisetti, C., & Pontoni, F. (2015). Investigating policy and r&d effects on environmental innovation: A meta-analysis. *Ecological Economics*, *118*, 57–66.

Glaeser, E. L., & Shleifer, A. (2003). The rise of the regulatory state. *Journal of Economic Literature*, *41*(2), 401–425.

Gliedt, T., & Parker, P. (2007). Green community entrepreneurship: creative destruction in the social economy. *International Journal of Social Economics*, *34*(8), 538–553.

Granato, J., Inglehart, R., & Leblang, D. (1996). The effect of cultural values on economic development: theory, hypotheses, and some empirical tests. *American Journal of Political Science*, *40*(3), 607–631.

Griffiths, M. D., Gundry, L. K., & Kickul, J. R. (2013). The socio-political, economic, and cultural determinants of social entrepreneurship activity: An empirical examination. *Journal of Small Business and Enterprise Development*, *20*(2), 341–357.

Gundry, L. K., Kickul, J. R., Griffiths, M. D., & Bacq, S. C. (2011). Creating Social Change Out of Nothing: The Role of Entrepreneurial Bricolage in Social Entrepreneurs' Catalytic Innovations. In G. T. Lumpkin & J. A. Katz (Eds.), *Social and sustainable entrepreneurship* (Vol. 13, pp. 1–24). Emerald Group Publishing Limited.

Hair, J. F., Anderson, R. E., Tatham, R. L., & William, C. (1998). *Black (1998), multivariate data analysis.* Upper Saddle River, NJ: Prentice Hall.

Hardy, C., & Maguire, S. (2008). Institutional entrepreneurship. *The Sage Handbook of Organizational Institutionalism*, *2*, 198–217.

Hechavarria, D. M., Ingram, A., Justo, R., & Terjesen, S. (2012). Are Women More Likely to Pursue Social and Environmental Entrepreneurship? In *Global women's entrepreneurship research* (p. 135–151). Cheltenham, UK: Edward Elgar Publishing.

Helland, E., & Matsuno, M. (2003). Pollution abatement as a barrier to entry. *Journal of Regulatory Economics*, *24*(2), 243–259.

Hemingway, C. A. (2005). Personal values as a catalyst for corporate social entrepreneurship. *Journal of Business Ethics*, *60*(3), 233–249.

Hockerts, K., & Wüstenhagen, R. (2010). Greening goliaths versus emerging davids—theorizing about the role of incumbents and new entrants in sustainable entrepreneurship. *Journal of Business Venturing*, *25*(5), 481-492.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Sage Publications Sage, CA: Los Angeles.

Hofstede, G., & Bond, M. H. (1988). The Confucius connection: From cultural roots to economic growth. *Organizational Dynamics*, *16*(4), 5–21.

Hofstede, G., & Minkov, M. (2010). Long-versus short-term orientation: new perspectives. *Asia Pacific business review*, *16*(4), 493–504.

Hofstede, Geert and Bond, Michel and Minkov, Michel. (2010). *Dimension data matrix.* Retrieved from `https://geerthofstede .com/landing-page/national-culture.html`

Holmes Jr, R. M., Miller, T., Hitt, M. A., & Salmador, M. P. (2013). The interrelationships among informal institutions, formal institutions, and inward foreign direct investment. *Journal of Management*, *39*(2), 531–566.

Hoogendoorn, B. (2016). The prevalence and determinants of social entrepreneurship at the macro level. *Journal of Small Business Management*, *54*(S1), 278-296.

Hoogendoorn, B., Guerra, D., & van der Zwan, P. (2015). What drives environmental practices of smes? *Small Business Economics*, *44*(4), 759–781.

Hoogendoorn, B., Van der Zwan, P., & Thurik, R. (2019). Sustainable entrepreneurship: The role of perceived barriers and risk. *Journal of Business Ethics*, *157*(4), 1133–1154.

Hörisch, J., Kollat, J., & Brieger, S. A. (2017). What influences environmental entrepreneurship? a multilevel analysis of the determinants of entrepreneurs' environmental orientation. *Small Business Economics*, *48*(1), 47–69.

Hox, J. J., Maas, C. J., & Brinkhuis, M. J. (2010). The effect of estimation method and sample size in multilevel structural equation modeling. *Statistica Neerlandica*, *64*(2), 157–170.

Hörisch, J. (2015). The role of sustainable entrepreneurship in sustainability transitions: A conceptual synthesis against the background of the multi-level perspective. *Administrative Sciences*, *5*(4), 286-300.

Ingram, P., & Silverman, B. S. (2000). Introduction: The new institutionalism in strategic management. In P. Ingram & B. S. Silverman (Eds.), *The new institutionalism in strategic management* (Vol. 19, pp. 1–30). Emerald Group Publishing Limited.

Jackson, G., & Deeg, R. (2008). Comparing capitalisms: understanding institutional diversity and its implications for international business. *Journal of International Business Studies*, *39*(4), 540-561.

Jaffe, A. B., Newell, R. G., & Stavins, R. N. (2005). A tale of two market failures: Technology and environmental policy. *Ecological Economics*, *54*(2), 164–174.

Kachlami, H. M. (2014). The Likely Determinants of Social Entrepreneurship and Policy Implications. In A. Lundström, C. Zhou, Y. von Friedrichs, & E. Sundin (Eds.), *Social entrepreneurship: Leveraging economic, political, and cultural dimensions* (pp. 293–307). Cham, CH: Springer International Publishing.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). Governance matters viii: aggregate and individual governance indicators, 1996-2008. *World Bank Policy Research Working Paper*, *21*(1).

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, *3*(2), 220–246.

Kautonen, T., Van Gelderen, M., & Tornikoski, E. T. (2013). Predicting entrepreneurial behaviour: a test of the theory of planned behaviour. *Applied Economics*, *45*(6), 697–707.

Kearins, K., & Collins, E. (2012). Making sense of ecopreneurs' decisions to sell up. *Business Strategy and the Environment*, *21*(2), 71 - 85.

Kedmenec, I., & Strašek, S. (2017). Are some cultures more favourable for social entrepreneurship than others? *Economic Research*, *30*(1), 1461–1476.

Khanna, T., & Palepu, K. (2000). The future of business groups in emerging markets: Long-run evidence from chile. *Academy of Management Journal*, *43*(3), 268–285.

Kirkwood, J., & Walton, S. (2010). What motivates ecopreneurs to start businesses? *International Journal of Entrepreneurial Behavior & Research*, *16*(3), 204-228.

Kitzmueller, M., & Shimshack, J. (2012). Economic perspectives on corporate social responsibility. *Journal of Economic Literature*, *50*, 51-84.

Koe, W.-L., & Majid, I. A. (2014). Socio-cultural factors and intention towards sustainable entrepreneurship. *Eurasian Journal of Business and Economics*, *7*(13), 145–156.

Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions—investigating the role of business experience. *Journal of Business Venturing*, *25*(5), 524-539.

Lee, C. K., Simmons, S. A., Amezcua, A., Lee, J. Y., & Lumpkin, G. T. (2020). Moderating effects of informal institutions on social entrepreneurship activity. *Journal of Social Entrepreneurship*, *1*(1), 1–26.

Lenox, M., & York, J. (2012). Environmental entrepreneurship. In *The oxford handbook of business and the natural environment* (pp. 70–82). New York, NY: Oxford University Press.

Lepoutre, J., Justo, R., Terjesen, S., & Bosma, N. (2013). Designing a global standardized methodology for measuring social entrepreneurship activity: the global entrepreneurship monitor social entrepreneurship study. *Small Business Economics*, *40*(3), 693–714.

Levie, J., & Autio, E. (2011). Regulatory burden, rule of law, and entry of strategic entrepreneurs: An international panel study. *Journal of Management Studies*, *48*(6), 1392–1419.

Light, P. C. (2006). Reshaping social entrepreneurship. *Stanford Social Innovation Review*, *4*(3), 47–51.

Linnanen, L. (2002). An insider's experiences with environmental entrepreneurship. *The Journal of Corporate Environmental Strategy and Practice*, *38*, 71–80.

Lortie, J., Barreto, T., & Cox, K. (2019). The implications of national and regional long-term orientation on entrepreneurial activity. *International Journal of Entrepreneurial Behaviour Research*, *25*(6), 1236–1258.

Lumpkin, G. T., Brigham, K. H., & Moss, T. W. (2010). Long-term orientation: Implications for the entrepreneurial orientation and performance of family businesses. *Entrepreneurship & Regional Development*, *22*(3-4), 241–264.

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*, *1*(3), 85-91.

Mair, J., & Marti Lanuza, I. (2006). Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of World Business*, *41*(1), 36-44.

Mair, J., & Marti Lanuza, I. (2009). Entrepreneurship in and around institutional voids: A case study from bangladesh. *Journal of Business Venturing*, *24*(5), 419–435.

McNeish, D. M., & Stapleton, L. M. (2016). The effect of small sample size on two-level model estimates: A review and illustration. *Educational Psychology Review*, *28*(2), 295–314.

Meek, W., Pacheco, D., & York, J. (2010). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. *Journal of Business Venturing*, *25*(5), 493-509.

Minkov, M. (2007). *What makes us different and similar: A new interpretation of the world values survey and other cross-cultural data*.

Minkov, M., & Hofstede, G. (2012). Hofstede's fifth dimension: New evidence from the world values survey. *Journal of Cross-cultural Psychology*, *43*(1), 3–14.

Minniti, M. (2009). Gender issues in entrepreneurship. *Foundations and Trends in Entrepreneurship*.

Mueller, S. L., & Thomas, A. S. (2001). Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness. *Journal of Business Venturing*, *16*(1), 51–75.

Muthén, B. O. (1991). Multilevel factor analysis of class and student achievement components. *Journal of Educational Measurement*, *28*(4), 338–354.

Nguyen, C., Kim, S., & Su Dinh, T. (2020). Entrepreneurship and natural resource rent-seeking: The roles of institutional quality. *Economics Bulletin*, *40*(2), 1159-1177.

Noorderhaven, N., Thurik, R., Wennekers, S., & Van Stel, A. (2004). The role of dissatisfaction and per capita income in explaining self–employment across 15 european countries. *Entrepreneurship Theory and Practice*, *28*(5), 447–466.

North, D. C., et al. (1990). *Institutions, institutional change and economic performance*. Cambridge university press.

OECD. (2009). *Environmental policy stringency database*. Retrieved from `https://stats.oecd.org/Index.aspx?DataSetCode=EPS`

Pacheco, D. F., Dean, T. J., & Payne, D. S. (2010). Escaping the green prison: Entrepreneurship and the creation of opportunities for sustainable development. *Journal of Business Venturing*, *25*(5), 464-480.

Parboteeah, K. P., Addae, H. M., & Cullen, J. B. (2012). Propensity to support sustainability initiatives: A cross-national model. *Journal of Business Ethics*, *105*(3), 403–413.

Pathak, S., & Muralidharan, E. (2016). Informal institutions and their comparative influences on social and commercial entrepreneurship: The role of in-group collectivism and inter-personal trust. *Journal of Small Business Management*, *54*, 168–188.

Patzelt, H., & Shepherd, D. (2011). Recognizing opportunities for sustainable development. *Entrepreneurship Theory and*

Practice, *35*(4), 631 - 652.

Pellegrini, L., & Gerlagh, R. (2006). Corruption, democracy, and environmental policy: an empirical contribution to the debate. *The Journal of Environment & Development*, *15*(3), 332–354.

Pigou, A., & Aslanbeigui, N. (1938). *The economics of welfare*.

Pinillos, M.-J., & Reyes, L. (2011). Relationship between individualist–collectivist culture and entrepreneurial activity: evidence from global entrepreneurship monitor data. *Small Business Economics*, *37*(1), 23–37.

Pinkse, J., & Groot, K. (2015). Sustainable entrepreneurship and corporate political strategy: Overcoming market barriers in the clean energy sector. *Entrepreneurship Theory and Practice*, *39*(3), 633-654.

Porter, M. E., & Van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, *9*(4), 97–118.

Puumalainen, K., Sjögrén, H., Syrjä, P., & Barraket, J. (2015). Comparing social entrepreneurship across nations: An exploratory study of institutional effects. *Canadian Journal of Administrative Sciences*, *32*(4), 276–287.

Ronald, I. (1995). Public support for environmental protection: The impact of objective problems and subjective values in 43 societies. *Political Science Politics*, *28*(1), 57–72.

Rubashkina, Y., Galeotti, M., & Verdolini, E. (2015). Environmental regulation and competitiveness: Empirical evidence on the porter hypothesis from european manufacturing sectors. *Energy Policy*, *83*, 288–300.

Sahasranamam, S., & Nandakumar, M. (2018). Individual capital and social entrepreneurship: Role of formal institutions. *Journal of Business Research*, 104–117.

Samarasinghe, R. (2012). The influence of cultural values and environmental attitudes on green consumer behaviour. *International Journal of Behavioral Science*, *7*, 83-98.

Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: Categories and interactions. *Business Strategy and the Environment*, *20*(4), 222 - 237.

Schumpeter, J., & Backhaus, U. (1947). The Theory of Economic Development. In J. Backhaus (Ed.), *Joseph alois schumpeter: Entrepreneurship, style and vision* (pp. 61–116). Boston, MA: Springer US.

Schwartz, S. (2006). A theory of cultural value orientations: Explication and applications. *Comparative sociology*, *5*(2-3), 137–182.

Scott, W. R. (1995). *Institutions and organizations: Ideas, interests, and identities*.

Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. *Business Horizons*, *48*(3), 241–246.

Shane, S. (1993). Cultural influences on national rates of innovation. *Journal of Business Venturing*, *8*(1), 59–73.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, *25*(1), 217-226.

Simmons, S. A., Wiklund, J., & Levie, J. (2014). Stigma and business failure: implications for entrepreneurs' career choices. *Small Business Economics*, *42*(3), 485–505.

Simmons, W., & Emanuele, R. (2007). Male-female giving differentials: Are women more altruistic? *Journal of Economic Studies*, *34*, 534-550.

Simón-Moya, V., Revuelto-Taboada, L., & Guerrero, R. F. (2014). Institutional and economic drivers of entrepreneurship: An international perspective. *Journal of Business Research*, *67*(5), 715–721.

Snijders, T. A., & Bosker, R. J. (1993). Standard errors and sample sizes for two-level research. *Journal of Educational Statistics*, *18*(3), 237–259.

Snijders, T. A., & Bosker, R. J. (2011). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Sage Publications Sage, CA: Los Angeles.

Sonin, K. (2003). Why the rich may favor poor protection of property rights. *Journal of Comparative Economics*, *31*(4), 715–731.

Steensma, H. K., Marino, L., Weaver, K. M., & Dickson, P. H. (2000). The influence of national culture on the formation of technology alliances by entrepreneurial firms. *Academy of Management Journal*, *43*(5), 951–973.

Stel, A., Storey, D., & Thurik, R. (2007). The effect of business regulations on nascent and young business entrepreneurship. *Small Business Economics*, *28*(2-3), 171-186.

Stephan, U., Uhlaner, L., & Stride, C. (2015). Institutions and social entrepreneurship: The role of institutional voids, institutional support and institutional configurations. *Journal of International Business Studies*, *46*(3), 308-331.

Stevenson, H., & Jarillo, C. (1990). A paradigm of entrepreneurship as a field of research. *Academy of Management Review*, *3*, 45–57.

Suchman, M. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, *20*(3), 571-610.

Swidler, A. (2000). Cultural power and social movements. In *Culture and politics* (pp. 269–283). Springer.

Thelken, H., & Jong, G. (2020). The impact of values and future orientation on intention formation within sustainable entrepreneurship. *Journal of Cleaner Production*, *266*, 122052.

Thomas, M. A. (2010). What do the worldwide governance indicators measure? *The European Journal of Development Research*, *22*(1), 31–54.

Thompson, N., Kiefer, K., & York, J. G. (2011). Distinctions not Dichotomies: Exploring Social, Sustainable, and Environmental Entrepreneurship. In G. T. Lumpkin & J. A. Katz (Eds.), *Social and sustainable entrepreneurship* (Vol. 13, pp. 201–229). Emerald Group Publishing Limited.

Tina Dacin, M., Goodstein, J., & Richard Scott, W. (2002). Institutional theory and institutional change: Introduction to the special research forum. *Academy of Management Journal*, *45*(1), 45–56.

Tracey, P., & Phillips, N. (2007). The distinctive challenge of educating social entrepreneurs: A postscript and rejoinder to the special issue on entrepreneurship education. *Academy of Management Learning Education*, *6*(2), 264-271.

Triandis, H. (1988). Collectivism v. individualism: A reconceptualisation of a basic concept in cross-cultural social psychology. In *Cross-cultural studies of personality, attitudes and cognition* (pp. 60–95). Springer.

Urban, B., & Kujinga, L. (2017). The institutional environment and social entrepreneurship intentions. *International Journal of Entrepreneurial Behavior & Research*, *23*(4).

Van der Meer, T., Te Grotenhuis, M., & Pelzer, B. (2010). Influential cases in multilevel modeling: A methodological comment. *American Sociological Review*, *75*(1), 173–178.

Van Stel, A., Carree, M., & Thurik, R. (2005). The effect of entrepreneurial activity on national economic growth. *Small Business Economics*, *24*(3), 311–321.

Vecchione, M., Schwartz, S. H., Caprara, G. V., Schoen, H., Cieciuch, J., Silvester, J., . . . others (2015). Personal values and political activism: A cross-national study. *British Journal of Psychology*, *106*(1), 84–106.

Veciana, J., & Urbano, D. (2008). The institutional approach to entrepreneurship research. introduction. *International Entrepreneurship and Management Journal*, *4*, 365-379.

Verheul, I., Wennekers, S., Audretsch, D., & Thurik, R. (2002). An Eclectic Theory of Entrepreneurship: Policies, Institutions and Culture. In D. Audretsch, R. Thurik, I. Verheul, & S. Wennekers (Eds.), *Entrepreneurship: Determinants and policy in a european-us comparison* (pp. 11–81). Boston, MA: Springer US.

Vuorio, A., Puumalainen, K., & Fellnhofer, K. (2017). Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behavior Research*, *24*, 359–381.

Wiernik, B., Ones, D., & Dilchert, S. (2013). Age and environmental sustainability: A meta-analysis. *Journal of Managerial Psychology*, *28*(7/8), 826–856.

The World Bank. (2009). *Gross dommestic product per capita.* Retrieved from `https://data.worldbank.org/indicator/NY.GDP.PCAP.CD`

The World Bank. (2009). *World governance indicators.* Retrieved from `https://info.worldbank.org/governance/wgi/Home/Documents`

York, J., O'Neil, I., & Sarasvathy, S. (2016). Exploring environmental entrepreneurship: Identity coupling, venture goals, and stakeholder incentives. *Journal of Management Studies*, *53*(5), 695–737.

York, J., & Venkataraman, S. (2013). The entrepreneur-environment nexus: Uncertainty, innovation, and allocation. *Journal*

of Business Venturing, *25* (5), 449-463.

Zucker, L. G. (1977). The role of institutionalization in cultural persistence. *American Sociological Review*, *42* (5), 726–743.

Appendix

Table A.1: Overview of variables per country

Country	Average *EO*	EPS	VA	PSAV	GE	RQ	RL	CC	QOFI	IDV	LTO	GDP	UE
Belgium	20.13	2.58	1.35	0.82	1.57	1.31	1.38	1.46	1.17	75.00	81.86	44583.54	7.91
Brazil	6.14	0.42	0.52	0.17	-0.09	0.10	-0.16	-0.07	-0.58	38.00	43.83	8597.92	8.52
China	14.15	0.98	-1.70	-0.45	0.09	-0.22	-0.41	-0.51	-0.38	20.00	87.41	3832.00	4.70
Denmark	16.05	4.08	1.54	1.00	2.23	1.88	1.92	2.45	1.87	74.00	34.76	58163.28	6.01
Finland	14.44	3.25	1.47	1.46	2.23	1.81	1.97	2.25	1.87	63.00	38.29	47293.99	8.25
France	17.36	3.69	1.24	0.51	1.48	1.22	1.45	1.44	1.08	71.00	63.48	41575.42	8.74
Germany	10.24	3.06	1.33	0.86	1.58	1.52	1.66	1.76	1.18	67.00	82.87	41485.90	7.74
Greece	18.24	2.08	0.89	-0.21	0.62	0.84	0.65	0.07	0.17	35.00	45.34	29710.97	9.62
Hungary	5.97	2.66	0.91	0.54	0.67	1.08	0.80	0.43	0.23	80.00	58.19	13046.48	10.03
Italy	17.77	2.73	1.03	0.35	0.42	0.97	0.40	0.20	-0.04	76.00	61.46	37079.76	7.75
Japan	23.68	1.73	1.02	0.98	1.45	1.10	1.29	1.38	1.05	46.00	87.91	40855.18	5.10
Korea	16.22	3.52	0.71	0.41	1.09	0.84	0.99	0.54	0.67	18.00	100.00	19143.85	3.60
Netherlands	14.37	3.69	1.46	0.94	1.74	1.70	1.81	2.13	1.35	80.00	67.00	52514.03	4.35
Norway	14.23	3.19	1.55	1.28	1.84	1.47	1.88	1.99	1.46	69.00	34.51	79977.70	3.10
Russia	7.57	0.60	-0.90	-0.97	-0.41	-0.34	-0.78	-1.13	-0.92	39.00	81.36	8562.81	8.30
Slovenia	22.27	1.85	1.06	0.93	1.15	0.92	1.08	1.06	0.73	27.00	48.61	24694.23	5.86
South Africa	26.78	1.52	0.57	-0.11	0.48	0.41	0.12	0.18	0.02	65.00	34.00	5862.80	23.54
Spain	15.57	3.00	1.18	-0.47	0.95	1.19	1.16	1.06	0.51	51.00	47.61	32042.47	17.86
Switzerland	12.02	3.19	1.55	1.31	1.95	1.55	1.75	2.07	1.57	68.00	73.55	69927.47	4.12
United Kingdom	19.61	2.58	1.30	0.12	1.51	1.58	1.74	1.63	1.11	89.00	51.13	38713.14	7.54
United States	13.44	2.93	1.10	0.45	1.51	1.40	1.60	1.29	1.11	91.00	25.69	47099.98	9.25
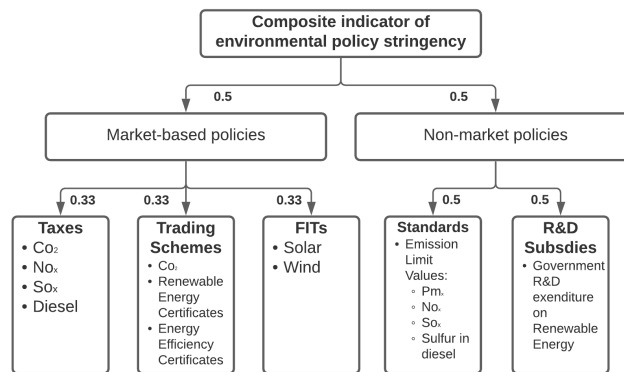
Figure A.1: Composition of environmental policy stringency index
Source: Botta and Koźluk (2014).

Table A.2: VIF Analysis

Variable	VIF	1/VIF
Age	41.87	0.024
Age^2	41.79	0.024
Gender	1.04	0.966
Education	1.12	0.890
Income	1.04	0.962
Environmental policy stringency (EPS)	4.78	0.209
Quality of formal institutions (QFI).	2.48	0.404
Individualism (IDV)	2.68	0.373
Long-term orientation (LTO)	3.16	0.316
Gross Domestic Product per capita (GDP)	5.82	0.172
Unemployment (UE)	2.37	0.422

VIF = Variance inflation factor

Table A.3: Robustness analysis multilevel random-intercept regression analysis using alternative measure for environmental policy

Dependent variable = logmarithmic function of the environmental orientation of entrepreneurs	(1)	(2b)	(6b)	(7b)	(8b)	(9b)	(10b)
Fixed part							
Individual level controls							
Age	-0.060	-0.067	-0.075	-0.073	-0.068	-0.075	-0.071
	(0.192)	(0.189)	(0.187)	(0.188)	(0.176)	(0.188)	(0.188)
Age2	0.081	0.088	0.096	0.095	0.090	0.097	0.091
	(0.205)	(0.203)	(0.201)	(0.202)	(0.176)	(0.202)	(0.202)
Gender	-0.023	-0.023	-0.023	-0.023	-0.024	-0.023	-0.023
	(0.032)	(0.032)	(0.031)	(0.031)	(0.028)	(0.031)	(0.031)
Education	0.030	0.031	0.033	0.031	0.029	0.033	0.023
	(0.072)	(0.074)	(0.073)	(0.072)	(0.061)	(0.073)	(0.073)
Income high	-0.078***	-0.078***	-0.078***	-0.079***	-0.077**	-0.079***	-0.078***
	(0.038)	(0.035)	(0.026)	(0.026)	(0.038)	(0.026)	(0.026)
Income middle	-0.041	-0.042	-0.042	-0.042	-0.041	-0.042	-0.042
	(0.038)	(0.034)	(0.035)	(0.035)	(0.038)	(0.035)	(0.035)
Country-level independent variables							
Environmental tax income		0.172	0.232	0.370*	0.273**	0.206	0.142
		(0.139)	(0.101)	(0.192)	(0.137)	(0.143)	(0.209)
Quality of formal institutions			0.073***	-0.028	0.089*	0.069***	0.090
			(0.018)	(0.101)	(0.046)	(0.024)	(0.164)
Individualism			-0.112	-0.101	-0.089	-0.096	-0.005
			(0.200)	(0.630)	(0.172)	(0.235)	(0.198)
Long-term orientation			0.161	0.121	0.210	0.152	0.177
			(0.116)	(0.120)	(0.160)	(0.126)	(0.147)
Country-level interaction effect							
ET * QFI				-0.128			0.019
				(0.117)			(0.183)
ET * IDV					-0.205		0.090***
					(0.129)		(0.164)
ET * LTO						-0.038	-0.181
						(0.139)	(0.141)
Country-level control variables							
GDP per capita	0.074	0.042	0.263	0.304	0.228	0.249	0.139
	(0.156)	(0.154)	(0.224)	(0.216)	(0.196)	(0.251)	(0.191)
Unemployment	0.140	0.169	0.412**	0.401**	0.418**	0.405**	0.375**
	(0.146)	(0.145)	(0.185)	(0.185)	(0.186)	(0.196)	(0.168)
Intercept							
Intercept	2.062***	2.066***	1.954***	2.061***	2.027***	1.958***	2.051***
	(0.130)	(0.124)	(0.123)	(0.184)	(0.149)	(0.127)	(0.299)
Random part							
Between country-variance	0.551***	0.526***	0.451***	0.443***	0.535***	0.203***	0.392***
	(0.084)	(0.086)	(0.072)	(0.081)	(0.116)	(0.064)	(0.079)
Within country-variance	1.250	1.250	1.250	1.250	1.252	1.563	1.250
	(0.109)	(0.109)	(0.109)	(0.109)	(0.019)	(0.273)	(0.109)
ICC	0.163	0.151	0.115	0.112	0.128	0.115	0.090
Model fit statistics							
Log likelihood	-3579	-3578	-3578	-3575	-3594	-3576	-3573
Observations	2163	2163	2163	2163	2163	2163	2163
Countries	21	21	21	21	21	21	21
Degrees of freedom	11	12	12	16	16	16	18
AIC	7179	7181	7181	7182	7227	7183	7182
BIC	7235	7249	7266	7273	7318	7274	7285
Wald $\chi^2(df)$	31.26***	33.84***	88.17***	176.47***	174.96***	91.96***	680.40***
Delta	1	2	3	4	5	6	7

Note: Standard error in parentheses. Computations made using Stata 16 using ML estimation and robust standard errors clustered at the country-level.

ICC = Intraclas and s correlation coefficient, AIC = Akaike information criterion, BIC = Bayesian information criterion,

Table A.4: Results robustness analysis multilevel random-intercept regression analysis influential countries

Dependent variable = logmarithmic function of the	Full sample		China excluded		Brazil excluded		Only OECD	
environmental orientation of entrepreneurs	(6)	(10)	(6)	(10)	(6)	(10)	(6)	(10)
Fixed part								
Individual level controls								
Age	-0.064	-0.065	-0.004	-0.005	-0.193	-0.190	-0.154	-0.147
	(0.188)	(0.188)	(0.216)	(0.215)	(0.153)	(0.154)	(0.193)	(0.191))
Age2	0.085	0.086	0.035	0.036	0.205	0.202	0.179	0.173
	(0.202)	(0.202)	(0.230)	(0.230)	(0.173)	(0.173)	(0.206)	(0.206)
Gender	-0.022	-0.023	-0.017	-0.018	-0.039	-0.038	-0.032	-0.032
	(0.031)	(0.031)	(0.039)	(0.039)	(0.031)	(0.031)	(0.041)	(0.041)
Education	0.030	0.028	0.004	0.004	-0.002	-0.001	-0.027	-0.026
	(0.072)	(0.072)	(0.085)	(0.085)	(0.076)	(0.076)	(0.092)	(0.092)
Income high	-0.078***	-0.078***	-0.072***	-0.072***	-0.074***	-0.071**	-0.073*	-0.074
	(0.026)	(0.026)	(0.034)	(0.034)	(0.028)	(0.029)	(0.040)	(0.042)
Income middle	-0.041	-0.041	-0.020	-0.021	-0.044	-0.043	-0.023	-0.024
	(0.035)	(0.035)	(0.035)	(0.036)	(0.039)	(0.039)	(0.043)	(0.044)
Country-level independent variables								
Environmental policy stringency	0.094	-0.031	-0.072	-0.013	-0.061	-0.338	-0.191	0.386
	(0.129)	(0.308)	(0.201)	(0.312)	(0.146)	(0.290)	(0.172)	(0.697)
Quality of formal institutions	0.064***	0.076	0.053	0.047	0.031	0.029	0.031	0.415
	(0.025)	(0.235)	(0.040)	(0.289)	(0.026)	(0.235)	(0.056)	(0.453)
Individualism	-0.103	-0.059	-0.108	-0.112	-0.112	-0.059	0.118	-0.189
	(0.204)	(0.219)	(0.182)	(0.196)	(0.191)	(0.219)	(0.170)	(0.216)
Long-term orientation	0.121	0.060	0.133	0.083	0.013	0.060	0.027	0.007
	(0.141)	(0.154)	(0.127)	(0.135)	(0.131)	(0.154)	(0.108)	(0.149)
Country-level interaction effect								
EPS * QFI		-0.006		-0.062		0.155		-0.453
		(0.139)		(0.119)		(0.139)		(0.469)
EPS * IDV		-0.219		-0.203		-0.004		0.229
		(0.225)		(0.187)		(0.204)		(0.193)
EPS * LTO		-0.041		-0.062		0.289**		-0.019
		(0.118)		(0.119)		(0.143)		(0.193)
Country-level control variables								
GDP per capita	0.199	0.190	0.007	-0.006	0.124	0.190	-0.017	-0.060
	(0.243)	(0.241)	(0.260)	(0.270)	(0.265)	(0.241)	(0.247)	(0.229)
Unemployment	0.325	0.246	0.327	0.264	0.193	0.246	0.001	-0.032
	(0.216)	(0.221)	(0.184)	(0.209)	(0.193)	(0.221)	(0.127)	(0.150)
Intercept								
Intercept	1.960***	2.051***	1.625***	1.800***	2.089***	1.848***	1.877***	1.756***
	(0.216)	(0.299)	(0.325)	(0.354)	(0.144)	(0.300)	(0.341)	(0.423)
Random part								
Between country-variance	0.494***	0.477***	0.474***	0.452***	0.443***	0.394***	0.402***	0.396***
	(0.071)	(0.069)	(0.071)	(0.069)	(0.071)	(0.071)	(0.090)	(0.089)
Within country-variance	1.250	1.250	1.326	1.326	1.237	1.237	1.336	1.336
	(0.109)	(0.019)	(0.104)	(0.104)	(0.120)	(0.120)	(0.123)	(0.123)
ICC	0.135	0.127	0.113	0.104	0.114	0.092	0.083	0.081
Model fit statistics								
Log likelihood	-3577	-3577	-3004	-3003	-3213	-3211	-2535	-2534
Observations	2163	2163	1753	1753	1956	1956	1474	1474
Countries	21	21	20	20	20	20	17	17
Degrees of freedom	15	18	15	18	15	18	15	18
AIC	7183	7188	6037	6042	6456	6458	5100	5105
BIC	7262	7284	6119	6140	6539	6559	5179	5200
Wald $\chi^2(df)$	46.62***	107.89***	25.70***	195.42***	33.39***	76.76***	17.78***	45.67***

Note: Standard error in parentheses. Computations made using Stata 16 using ML estimation and robust standard errors clustered at the country-level.

ICC = Intraclass correlation coefficient, AIC = Akaike information criterion, BIC = Bayesian information criterion,

Table A.5: Results further analysis multilevel random-intercept regression analysis decomposition of EPS

Dependent variable = logmarithmic function of the environmental orientation of entrepreneurs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fixed part									
Individual level controls									
Age	-0.035	-0.036	-0.036	-0.036	-0.036	-0.036	-0.036	-0.036	-0.036
	(0.194)	(0.191)	(0.191)	(0.191)	(0.191)	(0.191)	(0.191)	(0.191)	(0.191)
Age2	0.060	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061
	(0.208)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)
Gender	-0.018	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Education	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)
Income high	-0.080***	-0.080***	-0.080***	-0.080***	-0.080***	-0.080***	-0.080***	-0.080***	-0.080***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Income middle	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Country-level independent variables									
EPS		0.059							
		(0.214)							
Market EPS			0.055						
			(0.198)						
Non-market EPS				0.087					
				(0.316)					
Environmental tax rate					0.060				
					(0.217)				
Trading schemes						0.075			
						(0.271)			
Feed-in-tarifs							0.142		
							(0.516)		
Standards								0.094	
								(0.340)	
Research and development									0.107
									(0.309)
Country-level control variables									
GDP per capita	0.045	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	(0.169)	(0.179)	(0.179)	(0.179)	(0.179)	(0.179)	(0.179)	(0.179)	(0.179)
Unemployment	0.133	0.128	0.128	0.128	0.128	0.128	0.128	0.128	0.128
	(0.148)	(0.148)	(0.148)	(0.148)	(0.148)	(0.148)	(0.148)	(0.148)	(0.148)
Intercept									
Intercept	2.081***	2.081***	2.035***	2.125***	2.028***	2.064***	2.061***	2.092***	2.092***
	(0.133)	(0.133)	(0.238)	(0.180)	(0.261)	(0.139)	(0.169)	(0.129)	(0.129)
Random part									
Between country-variance	0.558***	0.556***	0.556***	0.556***	0.556***	0.556***	0.556***	0.556***	0.556***
	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)
Within country-variance	1.247	1.247	1.247	1.247	1.247	1.247	1.247	1.247	1.247
	(0.110)	(0.110)	(0.110)	(0.110)	(0.110)	(0.110)	(0.110)	(0.110)	(0.110)
ICC	0.167	0.166	0.166	0.166	0.166	0.166	0.166	0.166	0.166
Model fit statistics									
Log likelihood	-3550	-3550	-3550	-3550	-3550	-3550	-3550	-3550	-3550
Observations	2148	2148	2148	2148	2148	2148	2148	2148	2148
Countries	20	20	20	20	20	20	20	20	20
Degrees of freedom	12	12	12	12	12	12	12	12	12
AIC	7121	7123	7123	7123	7123	7123	7123	7123	7123
BIC	7184	7191	7191	7191	7191	7191	7191	7191	7191
Wald $\chi^2(df)$	28.20***	32.55***	32.55***	32.55***	32.55***	32.55***	32.55***	32.55***	32.55***
Δ Psuedo R^2 (compared to M1)		0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004

Note: Standard error in parentheses. Computations made using Stata 16 using ML estimation and robust standard errors clustered at the country-level.

ICC = Intraclass correlation coefficient, AIC = Akaike information criterion, BIC = Bayesian information criterion,