August 2017

TOWARDS UNDERSTANDING ENTREPRENEURSHIP'S ROLE IN OUR COMMON FUTURE: ESSAYS FROM THE SUSTAINABILITY-ENTREPRENEURSHIP NEXUS

Kiven Pierre
Syracuse University

ABSTRACT

The purpose of this dissertation is to facilitate a better understanding of the relationship between entrepreneurship and attainment of sustainable development. Drawing on prior work, I present three related essays that together provide both an evaluation and extension of research at the intersection of the entrepreneurship and sustainable development concepts – herein referred to as *the Sustainability-Entrepreneurship Nexus*. In addition, the findings from these essays provide some interesting research opportunities for management and entrepreneurship scholars alike.

Essay 1 provides a literature review of extant research within the S-E Nexus. Focusing on the composition of conceptual and empirical articles, and the outcomes of sustainability-oriented entrepreneurial activity researched by scholars, this review proved more comprehensive in comparison to prior related reviews. The findings from this essay speak mainly to the underdeveloped state of empirical research within the S-E Nexus – especially regarding institutional- and multi-level entrepreneurship research. Armed with these findings, I conclude this essay with some potential research areas based on societal 'grand challenges' for management scholars.

Essay 2 is an empirical study that looks into the antecedent factors posited to affect institutional entrepreneurship for sustainable development. Specifically, it examines whether and to what extent different dimensions of the institutional context, in addition to a long-term oriented culture, affect the emergence of institutional entrepreneurship for sustainable development in the form of adoption of a global environmental initiative. The results of this study highlight the importance of strong regulatory frameworks and a long-

term orientation in encouraging sustainability-oriented entrepreneurial action amongst influential institutional actors such as politicians and other country representatives.

Essay 3 uses extant literature to reframe climate change adaptation as representative of acts of institutional entrepreneurship. This reframing facilitated subsequent examination of how two forms of climate change adaptation – planned and autonomous – affected individual new venture creation. The study also accounts for the role of corruption as a moderator to the posited climate change adaptation-new venture creation relationship. Results based on multi-level analyses suggest that both planned and autonomous climate change adaptation positively influence individual new venture creation – the latter having a stronger effect. The results also suggest that corruption moderates the positive relationship between both planned and autonomous climate change adaptation and individual new venture creation.

All told, this dissertation provides scholars with updated insights to the Sustainability-Entrepreneurship Nexus. This is especially as it relates to avenues for research within the nexus; the role played by institutions and temporality in sustainability-oriented action amongst actors; and, the positive benefits to entrepreneurship to be had from greater instances of climate change adaptation.

TOWARDS UNDERSTANDING ENTREPRENEURSHIP'S ROLE IN OUR COMMON FUTURE: ESSAYS FROM THE SUSTAINABILITY-ENTREPRENEURSHIP NEXUS

By:

Kiven E.B. Pierre
B.S., Morgan State University, 2011
M.B.A, Syracuse University, 2013

Dissertation proposal submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy (Ph.D.) in Business Administration.

Syracuse University

August 2017

ACKNOWLEDGEMENTS

To my parents, Donald and Babsie Pierre: Your continuous support and encouragement from my days preparing for Common Entrance and CSEC examinations have instilled in me the belief that I can accomplish anything. Thank you!

To my brother and sister, Andre and Keisa: While I may not have always been the easiest to deal with, you both put up with my tirades as the youngest sibling and help me to navigate both the easiest and toughest of times throughout my life thus far. Thank you!

To the many teachers, lecturers, and professors I have had whilst attending Starters Nursery, St. Margaret's Primary, Queen's College, Morgan State University, and ultimately Syracuse University: I am forever grateful for the bits of wisdom you have imparted upon me, and the continuous motivation you have provided during my academic career thus far. Thank you!

To my dissertation committee, Tom Lumpkin, Todd Moss, Maria Minniti, Alex McKelvie, and Jeffery York; and my oral chair Lynne Vincent: For your patience, support, and invaluable feedback and encouragement throughout the dissertation process. Thank you!

To my many relatives, friends, and colleagues: For all your words of encouragement throughout this phase of my career and in my many pursuits. Thank you!

Table of Contents

List of Illustrations

TABLES:

FIGURES:

CHAPTER 1: DISSERTATION OVERVIEW

Introduction

This dissertation is composed of three essays that build upon established literature to illuminate further the role of entrepreneurship in the attainment of sustainable development. Though both entrepreneurship and sustainable development have received much scholarly attention, research at their intersection – herein referred to as the Sustainability-Entrepreneurship Nexus – remains ripe with opportunities for impactful theoretical and practical contributions. This introductory chapter expands on the latter point while providing some background on the main concepts of sustainable development and entrepreneurship. It then outlines the related gaps in the current literature on entrepreneurship for sustainable development, and the resultant research questions that form the basis for each study in this research. The chapter concludes with an overview of each study.

Sustainability and Sustainable Development

Sustainability in the traditional sense refers to an ability to continue a defined behavior indefinitely. In the past two decades the term has become synonymous with sustainable development – a staple concept in debates on the environment, development and governance (Sneddon, Howarth, & Norgaard, 2006; Zaccai, 2012). *Sustainable development*, as commonly understood, refers to development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development [WCED], 1987). Sustainable development is generally posited to comprise of three representative and

overlapping pillars – namely *economic sustainability*, *ecological sustainability,* and *social sustainability* (Atkinson, Dietz, Neumayer, & Agarwala, 2014).

The concept of *economic sustainability* is most associated with development as a process focused growth and/or change, and for objectives such as the provision of individual basic needs (Lele, 1991). It prioritizes political rights, basic human needs, and economic opportunities and equity over aggregate economic output (Sneddon et al., 2006). This pillar of sustainable development emphasizes promotion of a reasonable quality of life through the productive capacity of various actors (Bansal, 2005). For economic sustainability, it is the creation and distribution of goods and services that will help to raise the standard of living around the world that must be sustained in order to ensure the wellbeing of future generations.

The concept *ecological/environmental sustainability* has its origins in the context of renewable resources (e.g. forests and fisheries). Here, ecological and environmental resource economics researchers focus on the ecological conditions necessary for supporting human life at some specified level of well-being through future generations (Lele, 1991). In general, environmental economists are concerned with the existence of negative externalities such as pollution and wastes – e.g. atmospheric/climate change; air/marine/inland waterway/land pollution. Natural resource economists, on the other hand, are concerned with externalities related to the depletion and degradation of common property, common pool, or open-access resources (Fullerton & Stavins, 1998). These include for example land/water/mineral/energy resources, forests/timber, fisheries, and biological/genetic diversity. For ecological sustainability, the ability of the natural environment to provide important resources and services for life that must be sustained.

Regarding the concept of *social sustainability*, researchers are mainly concerned with society and the human condition. It emphasizes meeting the needs of both present and future generation in light of factors such as population growth and rapid urbanization; food and energy security; health and disease; poverty; and education and empowerment. Social sustainability also requires that all actors, both present and future, in society have an equal access to resources and opportunities (Bansal, 2005). For social sustainability, the social basis for human life and welfare must be sustained.

Sustainability and sustainable development have been defined, interpreted, and analyzed in various ways. As a result extant literature on the concepts has evolved into opposing views between the concepts of *weak* and *strong sustainability* (Atkinson et al., 2014). The notion of *weak sustainability* assumes that human welfare is not normally dependent on natural capital and can be maintained by substituting other manufactured capitals such as technology (Ekins, 2014). Weak sustainability is defined as maintaining total capital – i.e. the sum of natural capital (e.g. environmental resources) and economic capital (e.g. knowledge and labor). Sustainable development, according to the weak sustainability criteria, essentially requires that there be no decrease in total economic welfare (van den Bergh, 2014).

Strong sustainability, in contrast, assumes that human welfare is critically dependent on natural capital. It also assumes that substitutability of economic or manufactured capital for natural capital is limited by the uncertainties associated with components of natural capital that make a unique contribution to welfare (Ekins, 2014). Thus, the strong sustainability approach can be defined simply as maintaining natural and economic capital in a separate but balanced manner. Sustainable development, according

to the strong sustainability camp, is most associated with safeguarding the life support functions of nature and the environment (van den Bergh, 2014).

The distinction between weak and strong sustainability comes down to the following. First, the degree of substitutability between products and services of the market economy (i.e. economic capital) and the environment (i.e. natural capital). Second, the degree of difference between different forms of capital and the welfare that they generate. Third, the degree to which theoretical arguments are based primarily on perspectives from environmental or ecological economics. Stated simply, weak sustainability analyses assume that there can be substitution between the three pillars of sustainable development outlined above. Conversely, strong sustainability recognizes that there are some 'critical' forms of natural capital required for ecological sustainability that cannot be substituted for by economic or social sustainability (Ekins, 2014). One can thus expect the theoretical and practical implications of sustainable development to differ significantly depending on whether a weak or strong sustainability approach is applied.

Within this dissertation, I conceptualize sustainability and sustainable development in line with the strong sustainability paradigm and its focus on preservation of critical natural capital and environmental functions. As such, I define sustainability as *the ability of a human, natural, or mixed system to withstand or adapt to endogenous or exogenous change indefinitely*. Sustainable development, thus, is *a pathway of deliberate change and improvement that maintains or enhances this attribute of the system, while answering the needs of the present population* (Dovers & Handmer, 1992; Handmer & Dovers, 1996). In essence, I conceptualize sustainability as the desired/preferred characteristic of an overall

system; and sustainable development as the objectives/processes that facilitate sustainability in that particular system.

The strong sustainability paradigm is preferred as I share the view that basic life support systems are impossible to substitute with manufactured goods/services (Barbier, Burgess, & Folk, 1994). These basic life support systems (or functions of critical natural capital) include: 1) the regulation of essential ecological processes; 2) provision of natural resources and habitats for refuge, reproduction, conservation, and evolutionary processes; and 3) provision of possibilities for education and scientific research, recreation, and aesthetic enjoyment (Ekins, 2011; 2014; Ekins et al., 2003). Moreover, as literature suggests, the strong sustainability approach is more preferable given the considerable risk, uncertainty, and ignorance attached to the way in which natural capital (e.g. the global carbon cycle), affects actors' ability to predict effectively the effect(s) of its degradation. Explicit consideration of strong sustainability is also important since some natural capital may be irreversible once lost; and non-substitutable – i.e. increased future consumption is not an appropriate substitute for natural capital losses (Dietz & Neumayer, 2007).

Individuals are more averse to losses in utility than they are keen to gains in it (Kahneman and Tversky, 1979). This suggests that scholars and practitioners alike are highly, or should at the very least be somewhat, averse to losses in natural capital functions that directly provide us with utility. However, this aversion is not reflected in entrepreneurship literature, which tends to favor alignment with the weak sustainability paradigm and underplays the importance of natural capital (cf. Schaefer, Corner, & Kearins, 2015). Accordingly, I contend that focusing on the strong sustainability paradigm (and its

emphasis natural capital) allows for a more balanced understanding of the relation between entrepreneurship and sustainable development.

Entrepreneurship

Entrepreneurship, in the simplest sense, refers to *the identification, evaluation, and exploitation of opportunities* (Shane, 2012; Shane & Venkataraman, 2000; Venkataraman, 1997). For the purposes of this chapter, I broadly define entrepreneurship as acts of organizational creation, renewal or innovation that occur within, or outside, an existing organization by *actors* acting independently or as part of a corporate system (Sharma & Chrismann, 1999; *emphasis added*). This broad definition acknowledges that entrepreneurship can be evidenced in different forms and at various levels of analysis (Davidsson & Wiklund, 2001). Entrepreneurship activity has long been recognized as playing an important role in economic growth and development (Baumol, 1990; Sobel, 2008). As Schumpeter (1942) suggests, the important role of entrepreneurship can be linked to the creative destructive processes fueled by enterprising entities who recognize and subsequently exploit opportunities for generating economic rents (cf. Hart, 2005).

Given that entrepreneurship is related to economic growth (cf. Baumol, 1990), one can argue that it will similarly be important for sustainable development. This is especially the case since entrepreneurship can be a means by which pervasive market failures and imperfections (e.g. poverty or environmental and social disruptions) – sources of entrepreneurial opportunities – are ameliorated (Alvarez & Barney, 2014; Cohen & Winn, 2007; Dean & McMullen, 2007). *Entrepreneurial opportunities* being defined as situations for the formation of new means, ends, or means-ends relationships through which new products, services, and organizing methods can be introduced (Eckhardt & Shane, 2003).

Entrepreneurial opportunities represent a central theme within entrepreneurship research. They are also linked to a number of phenomena within the realm of entrepreneurship research (Venkataraman, 1997). These include for example entrepreneurial learning and information asymmetries (Corbett, 2005; 2007; Politis, 2005; Shane, 2000); organizational learning (Easterby-Smith & Araujo, 1999; Lumpkin & Lichtenstein, 2005); alertness (Gregoire, Shepherd, & Lambert, 2010; Tang, Kacmar, & Busenitz, 2012); and informal activity (Robinson, 2006; Webb, Tihanyi, Ireland, & Sirmon, 2009).

In general, there has been a wealth of entrepreneurship research incorporating the concept of sustainable development (see: Hall, Daneke, & Lenox, 2010; Munoz & Dimov, 2015; Rajasekaran, 2013; Thompson, Kiefer, & York, 2011). This proliferation of research at the intersection of the sustainable development and entrepreneurship literatures is, in part, due to the opportunities that sustainable development present for individuals, businesses, and organizations (Patzelt & Shepherd, 2011). The sizeable nature of the body of research at this nexus can also be attributed to the various modes through which entrepreneurial activity has been posited to foster sustainable development. For instance, various types of entrepreneurship – from social, to eco or environmental, to institutional – have been linked to sustainable development (Dorado & Ventresca, 2013; McMullen, 2011; Pacheco Dean, & Payne, 2010; Short, Moss, & Lumpkin, 2009; York & Venkataraman, 2010). I briefly highlight each of these in the following sections.

Social Entrepreneurship

Social entrepreneurship refers to innovative activity with a social objective in the profit or non-profit sectors (Dees, 1998; Dees & Anderson, 2003; Emerson & Twersky, 1996). In a narrow sense, it refers to the phenomenon of applying business logic and market-based approaches to in the non-profit or third sector (Reis, 1999; Thompson, 2002). For this research, I define social entrepreneurship as innovative, social value creating activity that can occur within or across the nonprofit, business, or government sectors. This broad conceptualization allows for better comparison with related forms of entrepreneurship (Austin Stevenson, & Skillern, 2006).

Social entrepreneurship research is primarily concerned with understanding how: 1) opportunities for creating positive social benefits are exploited; 2) altruistic motivations drive entrepreneurship; and 3) the implications of actors having dual objectives – i.e. social and financial (Mair & Marti, 2006; Short et al., 2009; Thompson et al., 2011). Given the significant and diverse contributions social entrepreneurs make to their communities and societies by adopting business models to offer creative solutions to complex and persistent social problems, social entrepreneurship is also of great interest and relevance to scholars. This can be seen, for instance, in the various studies referring to important social change agents such as Muhammed Yunus or Bill Drayton (Zahra et al., 2009). Social entrepreneurship is tied to sustainable development primarily through its impact on social value creation. *Social value creation* or the generation of utility from addressing opportunities inherent in social issues (Amit & Zott, 2001; Tsai & Goshal, 1998), in particular, is also central to elements of sustainable development such as equity or community resilience.

Environmental Entrepreneurship

Environmental entrepreneurship refers to the exploitation of opportunities for resolving environmental issues while creating economic and ecological value (Dean & McMullen, 2007; Cohen & Winn, 2007; Meek, Pacheco, & York, 2010; York & Venkataraman, 2010). Environmental entrepreneurship can best be evidenced in the numerous innovative responses to climate change by entrepreneurial entities. Scholars have also documented various instances where these 'ecopreneurs' address environmental issues through, for example, renewable energy or supply chain innovations, and other environmentally responsible action (Meek et al., 2010).

Environmental entrepreneurship research has disciplinary roots in environmental economics, entrepreneurship, and institutional theory. Scholars within this field are mainly concerned with understanding 1) how opportunities which stem from environmentally relevant market failures are exploited; 2) how entrepreneurship processes both influence and are affected by environmentally relevant institutions and government agencies; and 3) the implications of incorporating business and environmental specific logics in entrepreneurship processes (Thompson et al., 2011).

Sustainable development requires that growth of a society/economy be balanced with conservation of natural ecosystems that provide for said growth (Van den Bergh & Nijkamp, 1991). Extant literature is ripe with instances where both unchecked economic development and social issues have contributed to troubling environmental conditions for natural ecosystems worldwide. Environmental entrepreneurship is therefore tied to sustainable development as the process incorporates both the opportunities presented by, and outcomes directed towards environmental conservation.

Institutional Entrepreneurship

Institutional entrepreneurship refers to the process whereby actors gain support and acceptance for institutional change projects that contribute to transforming existing, or creating new, institutions (Battilana, Leca, & Boxenbaum, 2009; DiMaggio, 1988; Dorado, 2005; Pacheco, York, Dean, & Sarasvathy, 2010). *Institutions* are humanly devised schemas, norms, and regulations that enable and/or constrain the behavior of social actors, making life predictable and meaningful (North, 1990; Scott, 1995; 2008). In addition, *institutional change* and *institutional innovation* processes jointly, and in a general sense, refer to a difference in form, quality, or state over time in an institution (Hargrave & Van de Ven, 2006).

Despite being studied from two related approaches – i.e. institutional economics and institutional theory – some common traits about institutional entrepreneurship have emerged from the literature (Pacheco et al., 2010). These include a focus on actors as innovators and agents of institutional change; and the formation of governance institutions in organizing for coordination problems. In addition, scholars generally agree on other aspects of institutional entrepreneurship such as its determinants (e.g. self-interest, functional pressures, or ideology and culture), and the mechanisms of institutional change (e.g. political processes or collective action) (p. 980).

Institutional entrepreneurship can be linked to sustainable development as they both involve institutional change of some kind. Sustainable development, for instance, is sometimes described as requiring changes in inefficient institutions that allow societal issues to persist (Bansal, 2005; Gladwin, Kenneley, & Krause, 1995). Further, given their relative breadth, sustainable development issues are often addressed via complex political

processes (Giddens, 2009). Institutional entrepreneurs do not only have the agency for navigating these political processes and recognizing opportunities they present, but also mobilize resources integral for institutional change (Dorado, 2005).

Sustainable Entrepreneurship

Sustainable entrepreneurship refers to the process whereby actors discover, evaluate, and exploit economic opportunities present in market failures that detract from environmental sustainability (Dean & McMullen, 2007). Recent definitions also position sustainable entrepreneurship as focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain. Here, gain is broadly construed to include economic and non-economic benefits to individuals, organizations, society, and the economy (Shepherd & Patzelt, 2011; 2017). Literature on sustainable entrepreneurship emphasizes examination of how the opportunities to bring into existence 'future' goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences (Cohen & Winn, 2007).

Sustainable entrepreneurship shares similarities with the other types of entrepreneurship mentioned above as it relates to socially or environmentally motivated actors that capitalize on economic opportunities to reduce uncertainty, provide innovation, and allocate scarce resources in response to market failures (Dean & McMullen, 2007; Short et al., 2009; York & Venkataraman, 2010). For instance, other accepted definitions of sustainable entrepreneurship point to market imperfections and failures as the origin of such activity (Cohen & Winn, 2007; Dean & McMullen, 2007). Also, while not always explicit in definitions, the motivations for social, environmental, institutional, *and*

sustainable entrepreneurship are posited as being inherently more normative (Thompson et al., 2011). Where actors with a utilitarian identity are said to be governed by economic rationality, revenue maximization, and cost minimization, those with normative identities are governed by a higher commitment to self and purpose – which often centers on creating social and environmental value for the public good (Moss, Short, Payne, & Lumpkin, 2011; pg.: 3-4). Various studies document how the existence of these 'dual identities' affects venture performance (Moss, Neubaum, & Meyskens, 2015); management of social business tensions and conflict (Smith, Gonin, & Besharov, 2013); and the existence of hybrid organizational forms (Battliana & Dorado, 2010).

Similar to social, environmental, and institutional entrepreneurship, sustainable entrepreneurship is also posited as an important phenomenon in the quest to achieve sustainable development (Shepherd & Patzelt, 2011; Spence et al., 2011). For instance, outcomes integral to environmental sustainability such as the establishment of low-carbon cities, environmentally friendly institutions, and sustainability innovations have all been associated with sustainable entrepreneurship (Parrish & Foxon, 2006; Schalteger & Wagner, 2011; Shepherd & Patzelt, 2011; Spence, Gherib, & Biwole, 2011; Whiteman et al., 2011). A key distinction to note, however, is that sustainable entrepreneurship concentrates on the simultaneous achievement of three objectives (economic, social, and environmental), whereas social, environmental entrepreneurship tends to focus on two objectives (see: Thompson et al., 2011). Sustainable entrepreneurship research represents not only a valid and exciting new area of study with thought-provoking theoretical implications, but also an informative field with serious practical implications. The

challenge, however, lies in further advancement of the field beyond its current nascent state of development (Shepherd & Patzelt, 2011).

Problem Statement and Research Questions

The concepts of environmental sustainability and sustainable development have received a considerable amount of attention from scholarly management research in general (see: Anderson, Potocnik, & Zhou, 2014; Bebbington, 2001; Etzion, 2007; Lulfs & Hahn, 2014; Montiel, 2008; Montiel & Delgado-Ceballos, 2014). Conversely, the same cannot be said for entrepreneurship literature, where scholarly engagement with these concepts is described as being in a developmental stage (Munoz & Dimov, 2015). This developmental nature of entrepreneurship for sustainable development research is primarily due to the lack of quantitative empirical research within the field. In addition, there remains a paucity of empirical research examining the actual/practical outcomes of entrepreneurship activity meant to address issues of sustainable development.

Given the still emergent nature of research at the intersection of entrepreneurship and sustainable development literature, there exist few quantitative empirical studies aimed at testing established and/or proposed theories. This is, of course, with the exception of increased empirical efforts regarding social entrepreneurship (Gras, Moss, & Lumpkin, 2014), and to a lesser degree environmental entrepreneurship (King & Lenox, 2001; Koo, Ching, & Ryoo, 2014; Meek et al., 2010; York & Lenox, 2014). As Short, Payne, & Ketchen (2008) suggest, an absence of empirical studies hampers the development of any new field as a distinct area of study. Thus, the absence of quantitative empirical studies regarding entrepreneurship for sustainable development, I maintain, similarly hampers development of the entrepreneurship research field as a whole.

Extant research regarding entrepreneurship for sustainable development has also been mainly conceptual in nature (e.g. Dean & McMullen, 2007) – relying more on qualitative empirical studies. The literature shows few quantitatively driven empirical studies of entrepreneurship, and these have been focused on one of two stages – namely the opportunity recognition/exploitation or venture development stages (e.g. Munoz & Dimov, 2015). Notably, this comes at the expense of research devoted to examining the actual outcomes and impacts of entrepreneurship for sustainable development. Here, *outcomes* and *impacts* refers to tangible and intangible results that foster one or more of social, economic, or environmental value creation. Focusing on the actual outcomes/impacts entrepreneurship for sustainable development is important as scholars can build new theory, and extend existing ones – with more weight given to the natural environment and developing economy contexts (McMullen, 2011; Spence, et al., 2011; Waring, 2010). Such theorizing enhances scholars understanding of the means through which entrepreneurship sustains nature, utilitarian sources of life support for humans, and communities (Shepherd & Patzelt, 2011). Furthermore, empirically validated outcomes associated with entrepreneurship for sustainable development can spawn effective policy and practical responses to sustainability issues.

From a practical perspective, the past of two decades have seen many advancements regarding sustainable development. These advancements are especially evident in the various policies, organizational responses, and achievements made with respect to the United Nation's Millennium Development Goals. The UN's Millennium Development Goals are the world's prior time-bound and quantified targets for addressing extreme poverty and its many dimensions, while promoting gender equality, education,

and environmental sustainability. They also include basic human rights, the rights of each person on the planet to health, education, shelter, and security (United Nations [UN], 2015). Notably however, while there has been some progress, many pervasive societal issues persist – with worsening consequences (UN, 2015). The persistence of these societal issues, I contend, suggests that, entrepreneurship for sustainable development research has not been effective at examining the root causes for societal issues as opposed to their symptoms. It also suggests the presence of a widening gap between scholarly entrepreneurship for sustainable development research and the actual *practice* of entrepreneurship meant to effect environmental sustainability.

Such a gap is troubling since it represents a potential knowledge transfer problem where academics and practitioners alike encounter problems translating and diffusing research knowledge into practice (Van de Ven & Johnson, 2006). Moreover, in light of worsening environmental conditions and climate change an absence of empirically validated outcomes associated with entrepreneurship for sustainable development limits effective policy and practice responses to sustainability issues. Such limitations can be especially troublesome for developing economy contexts that are already constrained for resources (Bruton, Ahlstron, & Li, 2010). Notably also the outcomes of entrepreneurship for sustainable development are of importance to human survivability (Ferraro et al., 2015).Overall, one can make the claim that extant literature still lacks a clear understanding of the determinants and resultant outcomes associated with entrepreneurship for sustainable development.

This dissertation addresses the research gap stated above with the following research questions. First, *what is the state of development of entrepreneurship for*

sustainable development scholarship, and what have been the outcomes of interest researched? Second, h*ow does countries' national and cultural contexts affect entrepreneurial activity for sustainable development amongst institutional actors?* Finally, h*ow does planned and autonomous climate change adaptation, and the interaction of the two, affect entrepreneurship in the form of individual new venture creation; and, what is the role of countries' level of corruption in the climate change adaptation-new venture creation relationship?* The following sections provide an overview of the respective chapters that address these questions.

Overview of Chapter 2 – Literature Review

The purpose of Chapter 2 is to both examine the development of the body of work centered at the intersection of entrepreneurship and sustainable development concepts, and to identify the outcomes/impacts of sustainability-oriented entrepreneurial activity that have been of interest to scholars. Examination of this body of work is warranted given that despite the sizeable nature it remains difficult to distinguish between types of entrepreneurship that have been posited to affect attainment of sustainable development (Thompson et al., 2011). In addition, in spite of greater attention to environmental sustainability among individuals, organizations, and governments there remains a paucity of evidence of and/or empirical support for sustainable development (Ferraro et al., 2015, Shepherd & Patzelt, 2017).

For the review, I employed tailored search criteria across Business Source Premier, ProQuest, JSTOR, and Science Direct, and Wiley Online databases to obtain a sample of articles strongly representative of work at the intersection of entrepreneurship and sustainable development – i.e. the *Sustainability-Entrepreneurship Nexus*. I then coded the

sampled articles for the overall research methodology and design, use of propositions/hypotheses, geographic focus, level of analysis, incorporation of the time concept, and the outcomes of interest. Subsequently, I code for the sustainable development outcome(s) of interest in each article in order to generate several categories of outcomes. The review concludes with discussions of the main findings, their implications, and a presentation of future research opportunities that builds on emergent themes in management research.

Table 1.1: Prior Reviews of Sustainable-Entrepreneurship Nexus Scholarship

Related Reviews	**Journal***	**Focus of Related Review Articles**			**Interdisciplinary**	**Focus on Outcomes**
		What is the state of the field?	How is extant literature related?	What are future research opportunities?	What are the views of other academic disciplines?	What have been the outcomes researched?
Cohen, Smith, & Mitchell, 2008	BSE			X		X
Hall, Daneke, & Lenox, 2010	JBV	X		X		
Thompson, Keifer, & York, 2011	n/a		X	X		
Rajasekaran, 2013	JOEM	X		X		
Munoz & Dimov, 2015	JBV		X	X		
Schaefer, Corner, & Kearins, 2008	OE		X	X		
My Review	**n/a**	**X**	**X**	**X**	**X**	**X**

*Note: BSE- Business Strategy and the Environment; JBV-Journal of Business Venturing; JOEM-Journal of Entrepreneurship and Management; OE-Organization and Environment

The literature review provides scholars with a better understanding of the development of the Sustainability-Entrepreneurship Nexus (S-E Nexus) as a field of study. As demonstrated in Table 1.1, this review is more comprehensive in nature when compared to previous reviews of entrepreneurship for sustainable development research

(Hall et al., 2010; Munoz & Dimov, 2015; Rajasekaran, 2013; Thompson et al., 2011). The importance of a more comprehensive review of S-E Nexus scholarship being that it provides a more informed picture regarding what is known, unknown, and still to be clarified about the field. A comprehensive review also recognizes the breadth of entrepreneurship for sustainable development scholarship, and allows for better comparison of studies and their respective contributions. This review can thus help scholars to direct more effectively their research efforts. Additionally, by focusing on the outcomes previously examined within the S-E Nexus this review allows better scholarly assessment of the theoretical and practical contributions to be garnered from entrepreneurship for sustainable development research.

Overview of Chapter 3 – Empirical Study 1

The purpose of chapter 3 is to provide quantitative evidence regarding the effect of countries' national and cultural contexts on the emergence of entrepreneurship for sustainable development amongst actors such as politicians and other influential country representatives. As such, the empirical study within this chapter develops and subsequently tests a model relating three dimensions of countries' national context and one aspect of their cultural context to instances of institutional entrepreneurship. This empirical study emerged in direct response to gaps identified by the literature review, and calls for more impactful entrepreneurship research – especially at the institutional level and with respect to climate change (Howard-Grenville, Buckle, Hoskins, & George, 2014; Shepherd, 2015).

The arguments within this study utilize institutional theory (Scott, 1995) to delineate three dimensions of the national context (i.e. contexts) which are posited to relate

significantly to acts of institutional entrepreneurship. In addition, by incorporating insights from research on the social construction of time (Huy, 2001; Lawrence, Winn, & Jenkins, 2001; Navis & Glynn, 2010) the long-term orientation of countries' cultural context is also posited to have a direct and indirect effect on instances of institutional entrepreneurship. Hypotheses developed are tested within the context of the global carbon-offset market. Specifically, I analyze data obtained from United Nation's Reducing Emissions from Deforestation and Forest Degradation (REDD) Program – a globally recognizable and accepted approach to address climate change. Event history analysis was used to examine the likelihood of engagement in the UN's REDD+ Program for 38 countries given their prevailing regulatory, normative, cognitive, and cultural contextual factors over the period 2006-2015.

The findings of this study mainly suggest that regulatory contexts favoring entrepreneurship and a long-term oriented culture can influence institutional entrepreneurship for sustainable development – both directly and indirectly for the latter. By looking at the interaction between regulatory, normative, cognitive, and cultural contexts this study responds to calls for greater examination of the interaction between formal and informal institutions (Pacheco et al., 2010). In addition, it provides one of the first quantitative empirical tests of the relation between institutions and the emergence of institutional entrepreneurship for sustainable development. Furthermore, it highlights the importance of accounting for temporality when theorizing/researching sustainability-oriented entrepreneurship activity.

Overview of Chapter 4 – Empirical Study 2

The purpose of Chapter 4, and the second empirical study within this dissertation, is to address further the need for more quantitative empirical research regarding entrepreneurship for sustainable development. Building on the findings of Chapter 3, this study examines the effect of two types of climate change adaptation on individual entrepreneurship. Specifically it examines 1) how countries' autonomous and planned climate change adaptations affect the likelihood of individual new venture creation; and 2) the role of countries' level of corruption in the climate change adaptation-new venture creation relationship. Autonomous and planned climate change adaptation generally refers to 'top-down' and 'bottom-up' approaches to addressing climate change.

For this study, I drew on prior institutional entrepreneurship literature (Battilana, Leca, & Boxenbaum, 2009; DiMaggio, 1988; Dorado, 2005; Pacheco et al., 2010) – essentially working on the assumption that instances of climate change adaptation may also be considered acts of institutional entrepreneurship. I complement the initial institutional theory perspective with an institutional economic perspective since scholars suggest this enables for theorizing about the actual outcomes of institutional entrepreneurship (Pacheco et al., 2010). Based on the extant literature, both types of climate change adaptation and corruption are posited to have a positive and negative effect on individual new venture creation respectively. The hypotheses developed in this study were also tested within the context of the global voluntary carbon-offset market.

The findings of this study contribute to extant entrepreneurship literature in several ways. First, integration of institutional theory and institutional economic perspectives provides for a quantitative test regarding the impact of climate change adaptation on

entrepreneurship. Second, it addresses calls for greater examination of the relation between entrepreneurial action and climate change (Howard-Grenville et al., 2014; George, Schillebeeckx, & Liak, 2015). Third, it addresses calls for more multi-level entrepreneurship research in general, and for quantitative empirical research regarding sustainability-oriented entrepreneurship in particular.

CHAPTER 2: THE SUSTAINABILITY-ENTREPRENEURSHIP NEXUS: A REVIEW AND RESEARCH AGENDA

INTRODUCTION

Since introduction of the term sustainable development by the World Commission on Environment and Development (WCED), scholars have generated a large body of literature exploring entrepreneurship's role in achieving the goal of environmental sustainability. Environmental sustainability, in this sense, refers to the commonly understood triple bottom line concept of balancing economic, environmental, and social goals. For almost two decades research at the confluence of the environmental sustainability and entrepreneurship literatures – i.e. the sustainability-entrepreneurship nexus – has shed light onto how such entrepreneurial activity emerges, and on the resultant outcomes (e.g. Belz & Binder, 2015; Parrish & Foxon, 2006; Schalteger & Wagner, 2011; Shepherd & Patzelt, 2011; Spence, Gherib, & Biwole, 2011). In general, research within the sustainability-entrepreneurship nexus (S-E Nexus) suggests that entrepreneurship in pursuit of sustainable development is usually value-based – i.e. more focused on generating social and environmental as opposed to economic value (Shepherd & Patzelt, 2011; 2017). In addition, entrepreneurship for sustainable development is premised on actors' recognition of opportunities inherent in sustainable development issues (Pacheco, Dean, & Patne, 2010; Patzelt & Shepherd, 2011) – the result of both prior knowledge and a greater normative identity.

Despite the sizeable body of literature on entrepreneurship for sustainable development, issues persist. For instance, it remains difficult to distinguish between effects of the different types of entrepreneurship on sustainable development (Thompson, Keifer,

& York, 2011). Previous research has shown that traditional business, institutional, social, and environmental categories of entrepreneurship matter for attainment of sustainable development (Baumol, 1990; McMullen, 2011; Pacheco et al., 2010; Short, Moss, & Lumpkin, 2009; York & Venkataraman, 2010). Yet, theoretical and empirical puzzles remain regarding exactly 'how' each category of entrepreneurship impacts sustainable development. Solving such puzzles is an important challenge as distinguishing between categories of entrepreneurial activity and their effects on sustainable development builds legitimacy for the field (Short, Payne, & Ketchen, 2008).

Thus, the goal of this review is to survey the body of research at the intersection of sustainable development and entrepreneurship literatures to address the following two questions. What is the state of development of extant scholarship on entrepreneurship for sustainable development? What outcomes have been examined in entrepreneurship for sustainable development research? Notably, there have been attempts to integrate the body of research within the S-E Nexus (e.g. Hall, Daneke, & Lenox, 2010; Munoz & Dimov, 2015; Rajasekaran, 2013; Thompson et al., 2011). The review by Hall et al. (2010) focuses more on providing an overview of both the conceptual roots for, and emergent research on, entrepreneurship for sustainable development. Conversely, Thompson et al. (2011), focus more on distinguishing between the three *types* of entrepreneurship most associated with sustainable development – namely *social*, *environmental*, and *sustainable*. Rajasekaran (2013) provides a brief review of the field with some areas for future research. Finally, Munoz & Dimov (2015) simply summarize a handful of articles in their examination of the sustainable venture development process. Overall, these reviews have been more geared towards organizing scholarly arguments regarding the definition, determinants, and

implications (for both research and practice) of entrepreneurship for sustainable development. Consequently, these prior reviews both fail in spanning the breadth of the S-E Nexus and in directing attention towards to actual outcomes of entrepreneurship for sustainable development.

Through this extensive review, scholars are provided with a better understanding of the development of the sustainability-entrepreneurship nexus as a field of study, and of the outcomes that have been examined by scholars within the field. The latter, in particular, being important as it enables an assessment of the theoretical and practical contributions to be garnered from S-E Nexus research – especially given the static or worsening state of many issues inherent to attaining sustainable development.

METHODS

The objective of the methodology for this part of the literature review was to obtain a sample of articles centered on the nexus of sustainability and entrepreneurship. I define the sustainability-entrepreneurship nexus (hereafter: S-E Nexus) as the body of research centered on explicating the relationships between concepts of environmental sustainability and entrepreneurship. Articles of this nature add both to understandings of how entrepreneurs contribute to environmental sustainability, and how principles of environmental sustainability (e.g. intergenerational equity) affect entrepreneurship. For this study, I use the terms *sustainability* and *sustainable development* interchangeably to mean *environmental sustainability*—the process of sustaining economic wealth, while also maintaining and enhancing the natural and social forms of capital (Atkinson et al., 2014; Hamilton & Naikal, 2014). *Entrepreneurship,* I define broadly as acts of organizational creation, renewal or innovation that occur within or outside an existing organization by

individuals or groups of individuals, acting independently or as part of a corporate system (Sharma & Chrismann, 1999).

I follow a process similar to that used in notable entrepreneurship review articles (Ireland & Webb, 2007; Jones, Coviello, & Tang, 2011; Short et al., 2009; Terjesen, Hessels, & Li, 2013). Before sourcing articles I established criteria for defining sustainable entrepreneurship as a field of study and identifying articles to review, and for excluding articles. Next, I searched for peer reviewed journal articles that directly and explicitly integrated concepts associated with sustainability and entrepreneurship as defined above. I primarily sought to identify articles that addressed entrepreneurial behavior – i.e. opportunistic, value-driven, value-adding, creative activity (Bird, 1989) – resulting from, or directed towards, environmental sustainability.

With the scope of articles for this study identified, I then set several exclusion criteria. Articles were excluded if they had no theoretical relevance to the concepts of sustainable development *and* entrepreneurship. Specifically this refers to: 1) studies that do not focus on sustainable development – e.g. studies examining 'sustainable' competitive advantage; 2) research published in edited books and conference proceedings – mainly due to different review processes as opposed to peer-reviewed journals; 3) case studies for teaching purposes. Thus, articles of interest were those published in peer-reviewed journals with specific relevance to this reviews' topic of entrepreneurship for sustainable development – i.e. aspects of sustainability and entrepreneurship should be central of their arguments.

Narrow Search

I began by first conducting a keyword search of the EBSCO host, ProQuest, JSTOR, and Science Direct databases. Each database was searched for articles that contained the following root keywords: *sustainab* and entrepreneur**. I restricted the keyword search to article abstracts, and refined each search for full text articles from scholarly reviewed academic journals. The rationale for searching within article abstracts was that I wanted to identify articles that have the concepts sustainability and entrepreneurship at the core of their arguments as opposed to those that make casual references to the concepts. It should be noted that the JSTOR database cautions that some of the articles available do not have abstracts. I do not envision this to be a problem, based on the assumption that such articles may be outside the parameters of this study's defined search criteria. Also, the journals selected to refine search results were based both on 1) their relevance to this study's focus – i.e. they discussed a sustainability antecedent or outcome related to entrepreneurial activity; and 2) their inclusion on the social science citation index journal list.

This search resulted in 193 articles – all of which were exported into the citation manager RefWorks. I then removed close and exact duplicates of articles. As a next step, I removed irrelevant articles based on reading the abstracts, and in some cases the introductions, for each article. Removal of duplicates and non-fitting articles reduced the sample to 87 articles.

To complement this sample of articles, I performed several additional steps. First, I searched the Wiley Online database using the same criteria as above for any articles that might have been missed/overlooked. Second, I searched the reference section of recent S-pE Nexus related review articles (Hall et al., 2010; Munoz & Dimov, 2015) to identify any

articles that were initially missed. Fifty-seven (57) additional articles were obtained from the references of the previously mentioned journals; and were assessed for any duplicates, and fit with the research topic. Together, the narrow search yielded 126 articles.

Broad Search

Having identified a core set of articles, I then performed a refined, yet broad search for additional articles. Essentially, I sought to obtain a cross disciplinary sample of articles to get a better understanding of the body of sustainable entrepreneurship literature (see: Ireland & Webb, 2007; Short et al., 2009). Specifically, I searched each of the above-mentioned databases, but with minor adaptations given limitations within the individual search engines. In particular, variations in the search criteria for the JSTOR and Science Direct databases were the result of restrictions within the individual databases regarding the allowed length of the search term(s) and the searchable fields of the articles. Table 2.1 provides a summary of the search terms used.

This broad search resulted in 518 articles. Again, all articles obtained were exported to RefWorks where exact and close duplicates were removed. Similar to the narrow search procedure, the abstract and introduction of the remaining 346 articles were reviewed to assess their relevance to this review's topic based on the criteria outlined above. Following this process, 127 articles remained.

Thus, the final sample of 253 articles obtained from both searches and screenings served as the basis for the review. I recognize that this sample of articles may not be representative of the entire population of articles mentioning the sustainable development and entrepreneurship. Despite potential omissions, which I acknowledge as a limitation, I

expect that the tailored search criteria yielded a strongly representative sample of articles on sustainable entrepreneurship.

Articles in the sample suggest a consistent increase in S-E Nexus research over the period 1987-2015 (see: Figure 1). Notably, less than 1% of the sampled articles were from the 7-year period 1987-1994. Publications were found to increase with each subsequent period as follows 1995-1999 (5%), 2000-2004 (10%), and 2005-2009 (20%). The majority of sampled articles were from 2010-2015 (65%) – influenced, perhaps, by the *Journal of Business Venturing* Special Issue on sustainable entrepreneurship in 2010. Overall, the average rate of increase in publications over the five 4-year periods 1990-2015 was 1620%. Thus, there is preliminary support for a claim that the topic of sustainable entrepreneurship has amassed a sizeable body of literature. Moreover, one can also argue that the field has gained credibility as an area of inquiry.

Figure 2.1: Sustainability-Entrepreneurship Nexus Publications 1987-2015

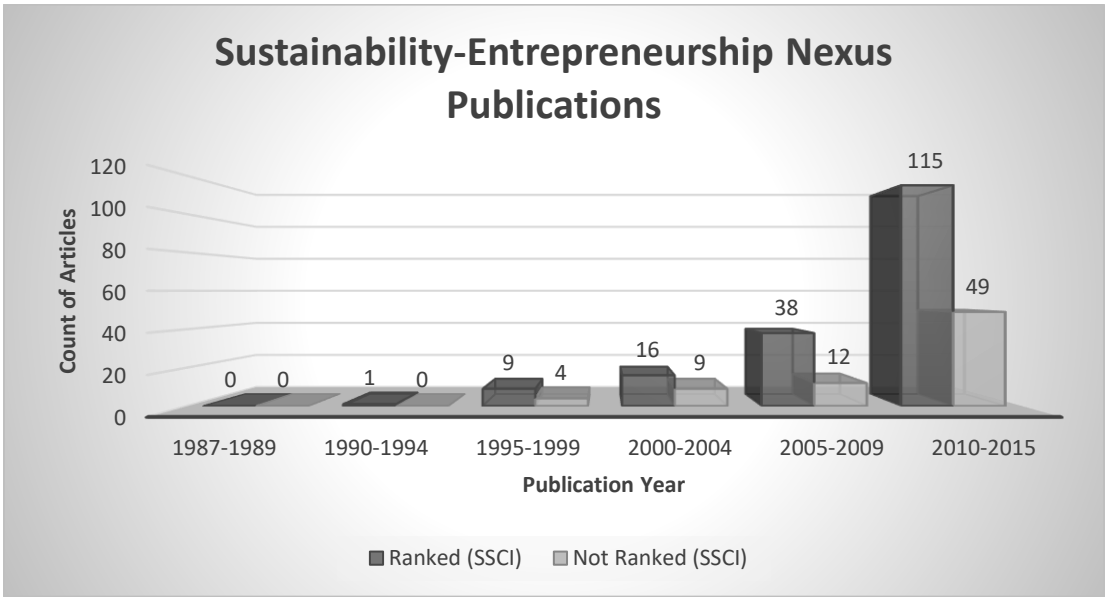


Table 2.1: Broad Search Summary

Database(s)	Boolean Search Terms/Criteria
-Business Source Premier (EBSCOhost) **-ProQuest** **-Wiley Online Library**	1) green OR social OR sustainab* OR ecol* OR environment* OR entrepreneur* OR enterprise OR innovat* in the **Title**; AND 2) green OR social OR sustainab* OR ecol* OR environment* OR entrepreneur* OR enterprise OR innovat* in the **Abstract**; AND 3) sustainab* AND entrepreneur* OR sustainab* AND innovat* OR sustainab* AND enterprise in the **Subject/Keywords**.
-JSTOR	1) green OR social OR sustainab* OR environment* OR innovat* in the **Title**; OR 2) sustainab* AND entrepreneur* OR enterprise in the **Abstract**.
-Science Direct	1) green OR social OR sustainab* OR ecol* OR environment* OR entrepreneur* OR enterprise OR innovat* in the **Title**; AND 2) sustainab* AND entrepreneur* OR sustainab* AND innovat* OR sustainab* AND enterprise in the **Title/Abstract/Keywords**.

STATUS OF SUSTAINABILITY-ENTREPRENEURHSIP NEXUS SCHOLARSHIP

Many scholars would agree that given the broad nature and applicability of the concept, sustainability is a truly interdisciplinary phenomenon. This was made evident from the sampled articles as publications stemmed from a variety of academic disciplines. In order to highlight the sources of sustainable entrepreneurship research I follow extant frameworks used in identifying links between entrepreneurship and other disciplines (e.g. Ireland & Webb, 2007; Short et al., 2009). Specifically, I identify the academic domain from which a publication emanates, and whether or not said publication is featured on the Thomson Reuters Social Citation Index. These results are presented in Table 2.2 below. Also, see *Appendix A* for a list of the articles used in the review.

As the sampled articles show, sustainable entrepreneurship publications appear most frequently in journals related to the management discipline (39%). Following that are the entrepreneurship (17%), and management-related (17%) categories – the latter being mostly comprised of journals related to corporate social responsibility. In addition, a

number of articles in the sample were published in the operations management discipline (9%). Notably, there was a negligible number of articles in the sample from related business fields such as accounting, marketing, economics, finance, law, and marketing – each of which comprised 2% or less in the sample. The same can also be said for the anthropology (0%), education (0.4%), political science (2%), psychology (1%), and sociology disciplines (2%).

Of the sampled articles, 179 (71%) were from journals ranked on the Social Sciences Citation Index (SSCI). For the management discipline, 73% of the articles were from SSCI ranked journals. The same trend in terms of number of SSCI publications was observed for the entrepreneurship (69%); operations management (95%); and other business (81%) categories. Over the 4-year periods from 2000-2015, sustainable entrepreneurship publications from SSCI ranked journals increased by an average of 139%, compared to an average of 156% for unranked journal publications for the same period. This difference can be associated more with variations in publishing criteria for SSCI ranked journals as opposed to unranked journals. Altogether, the findings above suggest that the S-E Nexus is indeed growing – with much of the growth driven by the management and entrepreneurship fields.

Table 2.2: Academic Discipline and Journals of Articles in Sample

Academic Domains/ Journals	Total in Sample	%	SSCI Ranked	%
Accounting *Accounting Auditing & Accountability Journal (1); Accounting Review (1); European Accounting Review (1); International Journal of Accounting & Information Management (1); Journal of Accounting & Organizational Change (1)*	5	2%	3	60%
Anthropology	-	0%	-	-
Economics *International Journal of Economics & Finance (2); Journal of Economic Issues (1)*	3	1%	1	33%
Education *Education & Information Technologies (1)*	1	0.4%	1	100%
Entrepreneurship *Academy of Entrepreneurship Journal (1); Entrepreneurship Theory & Practice (6); Entrepreneurship & Regional Development (5); International Entrepreneurship & Management Journal (1); International Journal of Entrepreneurship (2); International Small Business Journal (1); Journal of Business Venturing (10); Journal of Development Entrepreneurship (5); Journal of Entrepreneurship & Management (1); Journal of Small Business & Entrepreneurship (6); Journal of Small Business & Enterprise Development (3); Journal of Small Business Management (1)*	42	17%	29	69%
Finance	0	0%	-	-
Geography *Journal of Place Management & Development (1); Journal of Urban Affairs (1); People & Environment (1); The Geographical Journal (1)*	4	2%	2	50%
Law	0	0%	-	-
Management *Academy of Management Executive (1); Academy of Management Journal (2); Academy of Management Perspectives (1); Academy of Management Review (4); Asian Business & Management (1); Business Strategy & the Environment (32); California Management Review (3); European Business Review (1); European Journal of Innovation Management (1); Family Business Review (1); Greener Management International (11); Innovation: The European Journal of Social Science Research (1); International Business Research (4); International Journal of Business & Management (2); International Journal of Business & Society (1); International Journal of Organizational Analysis (1); Journal of Applied Business Research (1); Journal of Business Research (2); Journal of General Management (1); Journal of International Business Research (1); Journal of Management (1); Journal of Management Studies (3); Journal of Organizational Change Management (4); Management Decision (1); Management International (1); Management Research Review (1); MIT Sloan Management Review (3); Organization Science (2); R&D Management (1); Research Policy (3); Strategic Management Journal (6)*	98	39%	72	73%

Academic Domains/ Journals	Total in Sample	%	SSCI Ranked	%
Marketing *Journal of Marketing Management (2); Journal of the Academy of Marketing Science (2)*	4	2%	2	50%
Operations Management *Journal of Cleaner Production (19); Production & Operations Management (1); Total Quality Management (2)*	22	9%	21	95%
Political Science *Governance: An International Journal of Policy, Administration, and Institutions (1); Journal of Public Affairs (1); Journal of Public Policy & Marketing (1); Public Administration Quarterly (1); Public Administration Review (1)*	5	2%	3	60%
Psychology *Journal of Economic Psychology (1); The Journal of Applied Behavioral Science (1)*	2	1%	2	100%
Sociology *International Journal of Social Economics (4); International Journal of Sociology & Social Policy (1)*	5	2%	-	
Other Business *Business Ethics: A European Review (2); Corporate Governance (5); Corporate Social Responsibility & Environmental Management (2); Journal of Business Ethics (31); Journal of Corporate Citizenship (2); Social Responsibility Journal (1)*	43	17%	35	81%
Other *American Journal of Agricultural Economics (1); Ecological Applications (1); Energy Policy (1); International Journal of Agricultural Sustainability (1); International Journal of Innovation Management (3); Journal of Environmental Protection (1); Journal of Health Organization & Management (1); Journal of Management & Sustainability (2); Journal of Strategic Innovation & Sustainability (1); Management Research News (1); Studies in Comparative International Development (1); Sustainable Development (5)*	19	8%	8	42%
TOTAL	253	100%	179	71%

Conceptual Articles

For the 83 (33%) conceptual articles in the sample, I coded for the primary theoretical contribution – whether descriptive, explanatory, or predictive in nature (Snow & Thomas, 1994). Following Short et al. (2009), I coded articles as *descriptive* if definitions were provided for key terms or concepts in line with entrepreneurship for sustainable development. Articles were coded as *explanatory* if they provided explanations regarding

the relationships between key constructs entrepreneurship and sustainable development. Finally, *predictive* articles refers to those where explicit propositions are made regarding the antecedents or outcomes of entrepreneurship for sustainable development.

For the sampled conceptual articles, roughly half (49%) were classified as descriptive based on coding. On the one hand, descriptive articles sought to clarify 'what' the concept of sustainability meant to their respective fields of study; and, how it informed current thinking. This was especially the case with management journal articles (e.g. Gladwin, Kennelly, & Krause, 1995; Hart & Milstein 1999). On the other, descriptive articles also sought to outline the qualities of entrepreneurs who recognize and subsequently exploit sustainable development opportunities. Linnanen (2002), for example, concluded that one of the key distinguishing features between environmentally driven entrepreneurs and traditional entrepreneurs was the inherent value-based ideology of the former.

Explanatory articles (30%) sought to expand on how various factors affect, and are affected by sustainability related entrepreneurship activity. Studies, for instance, were keen on explaining how entrepreneurs come to realize and exploit sustainability-driven opportunities (Hockertz & Wustenhagen, 2010; Keogh & Polonsky, 1998; Pacheco, Dean & Payne, 2010). Explanatory articles in the sample also introduced frameworks for the advancement of S-E Nexus scholarship by outlining means of integrating sustainable development principles into broader theoretical perspectives (e.g. Gibb & Ahikary, 2000; Gibson, 2012; Schalteger & Wagner, 2012). Schaltegger & Wagner (2011), for example, build on sustainable development and entrepreneurship literature to elaborate on how

sustainable entrepreneurship differs from other 'sustainability-oriented' entrepreneurial activities.

Predictive articles that featured explicit propositions regarding sustainable entrepreneurship comprised 22% of the sample. All but one of the predictive conceptual articles sampled was from an SSCI ranked journal. These articles essentially help to advance contemporary understandings of the entrepreneurs who pursue sustainable development outcomes. Predictive articles emphasize that entrepreneurs that address climate change are adept at recognizing and subsequently exploiting opportunities that result from market failures (Azmat & Samaratunge, 2009; Cohen & Winn, 2007; Dean& McMullen, 2007). The awareness of actors to sustainability-driven opportunities is posited to be the result of their prior knowledge, entrepreneurial experience, and pro-social motivations (Patzelt & Shepherd, 2011; Santos, 2012). Incidentally, these same human capital factors also play a role in the subsequent evaluation and exploitation of these opportunities (c.f. Davidsson & Honig, 2003). Altogether, the predictive articles sampled provide fertile ground for empirical testing that can help advance research in the S-E Nexus.

Overall, the sampled conceptual articles suggest that scholarship at the S-E Nexus is still within its early or developmental stages. Evidently, research has been primarily preoccupied with accurately identifying traits of entrepreneurs who recognize and exploit sustainable development opportunities at the expense of tracking or predicting what he/she does. Thus, the pillars required for building predictive models such as boundary conditions, clearly defined concepts, or antecedent factors are lacking. This is similar to findings concerning social entrepreneurship literature (Short et al., 2009), and is

suggestive that more attention be paid to building predictive conceptual models within the S-E Nexus.

Table 2.3: Characteristics of Sampled Articles

Article Characteristics	**Number of Articles**	**%**
Conceptual Articles	**83**	**33%**
Purpose		
Descriptive	40	48%
Explanatory	25	30%
Predictive	18	22%
Formal Propositions	15	18%
Empirical Articles	**162**	**64%**
Formal Propositions/Hypotheses	62	38%
Qualitative Methods		
Case study	66	41%
Grounded theory	7	4%
Discourse analysis	22	14%
Other	11	7%
Quantitative Methods		
Ranking	1	1%
Descriptive statistics	10	6%
Regression	46	28%
SEM	4	2%
Factor analysis	13	8%
Correlations	3	2%
T-tests	4	2%
Other	4	2%
Data Collection		
Observations	12	7%
Interviews	75	46%
Surveys	42	26%
Secondary data	98	60%
Not specified	12	7%
Review Articles	**8**	**3%**

Empirical Articles

For coding empirical articles in the sample, I was primarily concerned with identifying how empirical research on sustainable entrepreneurship has developed over the years. Thus, I coded articles for the overall research methodology and design, use of hypotheses, geographic focus, level of analysis, and incorporation of the time concept. Articles were also coded to identify the outcome researched, however, given that I discuss outcomes in terms of both conceptual and empirical articles I elaborate further on the coding for outcomes later.

Research Design/Method. One hundred and sixty-two articles (64%) of the sampled articles were empirical in nature. Of these, 106 articles (65%) featured a qualitative methodological approach. It was observed that the qualitative empirical studies sampled relied heavily on case study analysis as sixty-six articles used this approach. Grounded theory (7 articles) and discourse analysis (22 articles) were also used to facilitate qualitative research. The remaining eleven qualitative articles sampled used a mix of ethnography and action research.

Roughly eighty-five (52%) of the sampled empirical articles featured a quantitative method. The most favored analytical method was regression analysis – featured in forty-six articles. This was followed by factor analysis (13 articles), and descriptive statistics (10 articles). Four articles featured structural equation modelling and t-tests, while three used correlations. Only one article reported use of rankings, while the remaining four articles used other analytical methods such as event analysis, quasi-experiments, or fuzzy set comparative analysis.

Use of Hypotheses. The use of formal hypotheses are important as they 1) are the basic tools of theory; 2) can be used to validate relationships between key variables; and 3) can be distinguished from the opinion or value of the author (Kerlinger, 1986). Formal hypotheses were used for 38% of the sampled empirical articles. Again, it was noticed that SSCI ranked publications were leading in terms of formal hypothesis use. Thus, it is evident that scholarship on sustainable entrepreneurship is building around validated hypotheses.

Research Context. Entrepreneurship, like sustainable development, is of concern for many nations around the world given the pervasiveness of many environmental and social problems. As such, it can be expected that the research settings used to examine sustainable entrepreneurship will vary. This was evident in the sampled articles as research settings spanned several countries. Based on the coding employed, it was observed that the United States was the most used research setting – being used in thirty articles (19%) within the sample. With the addition of Canada (eight articles) and Mexico (one article), North America was featured as a research setting for 25% of sampled empirical articles. The second most cited setting was Germany (twelve articles), followed by The Netherlands (eleven articles). Canada, Sweden, and England/Great Britain/UK (eight articles each), and Finland (seven articles). Each of Brazil, Denmark, Italy, and Spain were featured in four articles. Bangladesh, Mexico, Norway, New Zealand, and South Africa were each used in two articles. Other countries observed include Bosnia & Herzegovina, Cameroon, Costa Rica, Ghana, Israel, Indonesia, Jamaica, South Korea, Nigeria, Philippines, Russia, Rwanda, Samoa, and Tunisia, Taiwan, and Thailand (one article each). Regarding multi-country studies, seventeen articles (10%) used data from across various countries, while four articles (2%) focused on the EU/European countries, and one article (<1%)

focused on Asian countries. It can be concluded that scholarship on entrepreneurship for sustainable development is becoming increasingly contextualized. This is beneficial since more local and contextualized understandings with respect to sustainable development across the globe are required for a full understanding of sustainable development.

Levels of Analysis. Multilevel theorizing and empirical analysis represent important, but under researched areas for management scholars in general, and entrepreneurship scholarship in particular (Hitt et al., 2007; Shepherd, 2011). It acknowledges the influence that context can have on individual phenomena, such as entrepreneurship, and vice versa (Klein, Tosi, Canella. Jr., 1999). Moreover, as scholarship on entrepreneurship spans many disciplines and contexts, it presents many opportunities for multilevel research (Shepherd, 2011). I thus coded the empirical articles sampled for the level of analysis emphasized and whether they employed some degree of multi-level theorizing in their analysis. Regarding the former, I coded the focal level for each article as stated by the author into one of six possible levels – namely environmental, interorganizational networks, organizations, subunits, groups, and individuals (Hitt et al., 2007). Regarding the latter, I coded for whether contextual concepts and factors were central to the theoretical framework being developed or tested.

As shown in Table 2.4, empirical studies in the sample were predominantly focused at the organizational level – used in 107 articles (63%) out of the total count of 169. This is followed by studies at the interorganizational network level (14%) – inclusive of studies incorporating, for example, industry level considerations. Individual and environmental (e.g. institutions) were the focal levels in 19 articles (11%) each. Notably, although the organizational level was most prominent, only 7% of these articles could be said as having

multilevel considerations in their theoretical model. The empirical studies at the environment (42%), inter-organizational network (26%), and individual (21%) levels were also identified as having multilevel considerations.

As an extension, I also compared the multilevel considerations between conceptual and empirical articles. This was to elucidate further the development of sustainable entrepreneurship scholarship concerning multilevel theorizing. In total 250 articles were coded as indicating their level of analysis. Although the majority of sampled articles were empirical in nature, only twenty-six (15%) were coded as having multi-level considerations. This is in comparison to the twenty-two conceptual articles (27%) found as having multi-level considerations. This is similar to what was found by Hitt et al. (2007), who in their review of multilevel research in management, concluded that multilevel theorizing was more likely to be found in conceptual articles.

Table 2.4: Levels of Interest in S-E Nexus Articles

Paper Type		**Conceptual**				**Empirical**			
Levels of Analysis*	**Total**	**Count**		**ML****		**Count**		**ML**	
Environment	35	15	43%	6	40%	20	57%	9	45%
Inter-organizational Networks	34	10	29%	5	50%	24	71%	7	29%
Organizations	150	42	28%	8	19%	108	72%	8	7%
Sub-unit	1	0	0%	0	-	1	100%	1	100%
Group	0	0	-	0	-	0	-	0	-
Individual	35	16	46%	5	31%	19	54%	4	21%
TOTAL	255	83	33%	24	29%	172	67%	29	17%

**Note: Articles were coded into more than one category if applicable, thus total is greater than 253.*
***ML – Multi-level*

Time. As proposed by Whetten (1989) and reiterated by George & Jones (2000), *time* represents an important part of theorizing within management studies – being a boundary condition that specifies *when* a particular construct may be relevant. It is therefore worth considering the concept of time in relation to studies of entrepreneurship

(Das & Teng, 1997; Slevin & Covin, 1997). In addition, time has also been indicated as integral concept to S-E Nexus research (Bansal & DesJardine, 2014; Bansal & Knox-Hayes, 2013; Slawinski & Bansal, 2012; 2015). In particular, because sustainable outcomes often endeavor to account for 'future' generations, actors who seek to exploit sustainable development opportunities must acknowledge the time component in some form (Slawinski & Bansal, 2012; 2015). For example, actors can have different conceptions of time, map activities to time, or relate with time (Ancona et al., 2001) differently in response to the long-term requirements of environmental sustainability.

As such, I applied a simple coding procedure to identify whether the concept of time was incorporated in an article in any form. Specifically, I distinguished between articles that were cross-sectional or dynamic in nature as described by the author in their methodology. As an example, I coded articles as being dynamic if data was collected over time (qualitative studies) or if a longitudinal dataset was used (quantitative studies).

In the subset of empirical articles only seventeen (10%) acknowledged time as a central concept in their arguments/analysis. Notably, however, each categorization of time as proposed by Ancona et al. (2001) were seen used within this small subset of articles. The concept of time was for instance incorporated latently as many of these studies were concerned with documenting of assessing the effects of innovation diffusion through longitudinal studies. This was evident in the case of Etzion & Ferraro (2010) and their analysis of the institutionalization of the Global Reporting Initiative (GRI). Empirical studies within the S-E Nexus also showed some consideration of how actors map activities to time with respect to achieving sustainable development (Feola & Butt, 2015). Within this

subset of articles, how actors relate to time (e.g. temporal orientation) within a sustainability-oriented context was also considered (Wang & Bansal, 2012).

DOMAIN ORIGINS AND OUTCOMES OF INTEREST AT THE SUSTAINABILITY-ENTREPRENEURHSIP NEXUS

To review further S-E Nexus scholarship I also coded articles (both conceptual and empirical) based on 1) the domain of origin to which it could be assigned and 2) the outcomes examined. More specifically, domain of origin refers to the main *type* of entrepreneurship referenced within the article – i.e. whether *business/economic*, *environmental*, *social*, *institutional*, or *sustainable*. I focus on these types of entrepreneurship since research suggests that entrepreneurial activity occurring at the intersection of these domains is likely to be geared towards the realization of sustainable development (McMullen, 2011). Moreover, identifying and delineating the relevant domains for S-E Nexus literature helps scholars to better understand the boundary and exchange conditions of the field (Short et al., 2009). Thus, consideration of the domain of origin, I maintain, can help illuminate the foundations and theoretical bases upon which the literature rests.

To code the domain of origin, I use a triple bottom line framework. This framework has been utilized by various scholars to better identify domains of scholarship on social entrepreneurship – Short et al. (2009) in the case of social entrepreneurship, and McMullen (2011) in delineating the field of development entrepreneurship. As an example of the coding process, Linnanen (2002) who focuses exclusively on the ecopreneur was coded as originating from the *environmental entrepreneurship*, whereas Rapp & Eklund (2002) who focus on quality improvement within corporations was coded as *business entrepreneurship*.

I also contrast the domain of origin with the main outcomes of interest, made explicit or implicit, in the arguments for each article. Coupling the outcomes of interest with the domain of origin in this way, I maintain, helps to both highlight further boundary differences and gaps in the literature. Further, observation of the outcomes of dependent variables of interest in scholarly articles helps in understanding the scope and distinctiveness of a field (Yu et al., 2011).

With respect to coding of the outcomes of interest. I first noted the outcome or dependent construct used by the author explicitly or implicitly. For example, while Alvarez & Barney (2014) do not provide a visible theoretical framework, it is evident that they are focused on poverty alleviation as an outcome of entrepreneurial action. I use the typology for entrepreneurship value creation advanced by Cohen, Smith, & Mitchell (2008). This typology builds on the triple bottom line perspective and thus suits this review's purposes well – especially given that I organize the domain of origin in a similar framework. According to the Cohen et al. (2008) framework, entrepreneurial value creation can be classified as one of either seven categories. The first three – *performance*, *promise*, and *perpetuity* – are representative of outcomes that are primarily economic, social, and environmental in nature respectively. The fourth is *socio-efficiency* where outcomes reflect a focus on social and economic objectives; fifth is *stewardship* category where outcomes serve a primarily social and environmental objective. The sixth is *eco-efficiency* where, like the previous two, outcomes serve dual objectives – i.e. environmental and economic. Finally, there is the *sustainability* category where outcomes are simultaneously economic, environmental, and social in nature encompassing the holistic view of sustainable development (Cohen et al., 2008; pg. 111). Note that the *sustainability* category serves as a

catchall for articles that broadly reference outcomes such as 'sustainable development' or 'sustainability innovation' but do not provide specific examples or measures.

Business Entrepreneurship and S-E Nexus Outcomes

I coded articles as belonging to this domain when they focused on inherently profit seeking ventures (McMullen, 2011). Of the sampled articles, one hundred and eight (43%) were coded as being from this domain. Articles within the business entrepreneurship domain were focused mainly on factors related to incorporating social and environmental concerns into new and existing firms. Articles within this domain also appeared reliant on strategy based theories such as the resource-based view (Chakrabarty & Wang, 2012; Chang, 2014; Kappor & Furr, 2015), or stakeholder management and stewardship theory (Craig & Dibrell, 2006; Husser; & Evraert-Bardinet, 2014).

Within the business entrepreneurship domain, outcomes related to economic performance (31%) and sustainable development (33%) were most prominent. Economic performance outcomes researched include for example sales growth, profit margin, and return on assets (Ameer & Othman, 2012; Gray et al., 2006; Hart & Milstein, 1999; Wang & Bansal, 2012); or competitive advantage (Marchi, Mari, Micelli, 2013). In terms of sustainable development outcomes, business entrepreneurship studies have examined dependent variables that can be described as broad and multi-dimensional. These include, for example, *sustainability co-creation*—the generation and ongoing realization of shared value between firms and customers (Arnold, 2015). Relatedly, Hart & Milstein (2003) fuse sustainable development principles with a stakeholder value framework in their conceptualization of the multi-dimensional outcome sustainable value creation. Economic performance and sustainable development outcomes in this domain were followed by

outcomes focused on socio- (17%) and eco-efficiency (13%). Notably, dependent variables specific to promise (6%), perpetuity (5%), or stewardship (6%) – i.e. those with less emphasis on economic objectives – were least researched from the economic domain.

S-E Nexus research from the business entrepreneurship domain can help provide valuable insight regarding research on corporate sustainability or sustainable intrapreneurship (see: Salzmann et al., 2005). This is mainly due to the domain's preoccupation with determining the financial implications of pursuing environmental goals (Aargaon-Correa, Marcus, & Hurtado-Torres, 2016). In essence, S-E Nexus research emanating from this domain can prove instrumental in resolving the issue of whether the exploitation of sustainability-driven opportunities bodes well for organizational performance.

Environmental Entrepreneurship and S-E Nexus Outcomes

Articles were coded to this domain when focal entities under investigation were depicted as mainly responding to environmental market failures or engaged in environmental-specific ethics (Thompson, Kiefer, & York, 2011). Like the business entrepreneurship domain, strategy based perspectives appear to be the primary theorizing vehicles. Notably, studies within the environmental entrepreneurship domain used theories that were more applicable to consideration of context. Various authors for instance use institutional theory (Linder, Bjorkdahl, Ljungberg, 2014; Meek, Pacheco, & York, 2010; Pacheco; York, & Hargrave, 2014) as a means of explicating the role of institutions in entrepreneurship for sustainable development. Possibly the result of sustainable development's traditional emphasis on the natural environment, articles from within the environmental entrepreneurship domain were second most within the articles

sampled. Seventy-nine (31%) articles focused on outcomes related to entrepreneurs with a primarily environmental focus.

Within this subset of articles, holistic conceptions of sustainability were again the dominant outcome of interest (30%). However, compared to the economic domain, performance outcomes ranked third (23%) behind socio-efficiency (25%) and was only slightly higher than eco-efficiency (22%). Again, outcomes related to promise (1%), perpetuity (8%), or stewardship (6%) appeared to be understudied within sustainable entrepreneurship literature.

Social Entrepreneurship and S-E Nexus Outcomes

Articles in the sample were coded as belonging to this domain when sustainable entrepreneurship stemmed from actors with a predominantly social focus. Similar to the findings of Thompson et al. (2011), the coding suggests that S-E Nexus research within the social domain hails from primarily disciplinary roots grounded in non-profit and the public sector, political science and economics, and management entrepreneurship. In comparison, I observe a similar trend within S-E Nexus research from the social domain. Hall et al. (2012) for instance use an Austrian economics perspective to examine how economic and socially driven policies differentially affect productive entrepreneurial outcomes. Other scholars take a more ethics approach to examine the individual and organizational implications influences for sustainability action (e.g. Clausen & Gyimothy, 2015; Hahn, 2009; Kim, Brodhag, & Mebratu, 2014; Santos, 2012; Simola, 2007). Notably, however, is an absence of any dynamic theories.

S-E Nexus scholarship from the social domain was identified in 20% (fifty articles) of the coded sample. Similar to articles from the economic and environmental domains,

sustainability (46%) and performance related outcomes (34%) were most evident within the sample. With the exception of stewardship (4%), socially oriented outcomes were also well represented within this subset of articles – socio-efficiency (16%) and promise (12%). The point of few dynamic theories noted above is also underscored by only two studies out of the thirty-one empirical articles in this subset being identified as acknowledging time.

Institutional Entrepreneurship and S-E Nexus Outcomes

Articles were coded as belonging to this domain if they reflected arguments involving agents or entities focused on creating new, or changing existing, institutional frameworks to ones that integrate principles of environmental sustainability (Pacheco, York, & Dean, 2010). Along with the expected use of institutional theory, institutional economics and neo-institutional theory are also observed as being utilized in this domain of S-E Nexus research. I draw attention to Woolthius et al (2013) who synthesize institutional theory and institutional economics to examine how institutional entrepreneurs create favorable contexts for sustainable development by influencing formal and informal institutions.

There were nineteen articles (8%) from this domain within the sample. While sustainability outcomes were predominantly researched – used in nine articles (47%) – there was a more balanced distribution for the remaining outcomes researched in this subset of articles. This is due to the remaining six outcome categories being equally ranked in some cases. Socio-efficiency and performance ranked second with three articles each (16%), while stewardship and eco-efficiency were both featured in two articles apiece (11%). Promise and perpetuity, both with one article each (5%) round out the outcomes researched in this domain.

Sustainable Entrepreneurship and S-E Nexus Outcomes

Sixty-seven articles (26%) within the sample were coded as being from the sustainable entrepreneurship domain. Articles coded to this domain were explicit in stating that the individuals/entities upon which they focused sought to maximize *simultaneously* economic, environmental, and social goals. There was a variety of disciplinary roots observed within this subset of articles – inclusive of, for example, market theory or neo-classical and ecological economics (Dean & McMullen, 2007; Cohen & Will, 2007; Rees, 2002). Game theory also emerged as a perspective used for examining how individuals create (Pacheco, Dean & Payne, 2010), or managers exploit (Lampioski et al., 2014), opportunities for sustainable development.

Similar to the other domains, holistic sustainability outcomes (48%) were observed as the dominant outcomes researched. The outcomes variables ranged from the antecedents affecting individuals' sustainability orientation (Kuckertz & Wagner, 2010; Lans, Blok, & Wesselink, 2014; Munoz & Dimov, 2015), to sustainability innovation (both incremental and radical) and its diffusion (Heiskanen, Lovio, & Jalas, 2011; Hansen & Schaltegger, 2013; Pastakia, 1998). Socio-efficiency (22%) and performance (18%) outcome variables were observed as the next most prevalent categories of outcomes examined. The least researched outcome variable categories within this domain observed were eco-efficiency (10%), perpetuity and stewardship (6% each), and promise (4%).

Figure 2.2: Domain Origins and Outcomes of Interest in S-E Nexus Scholarship

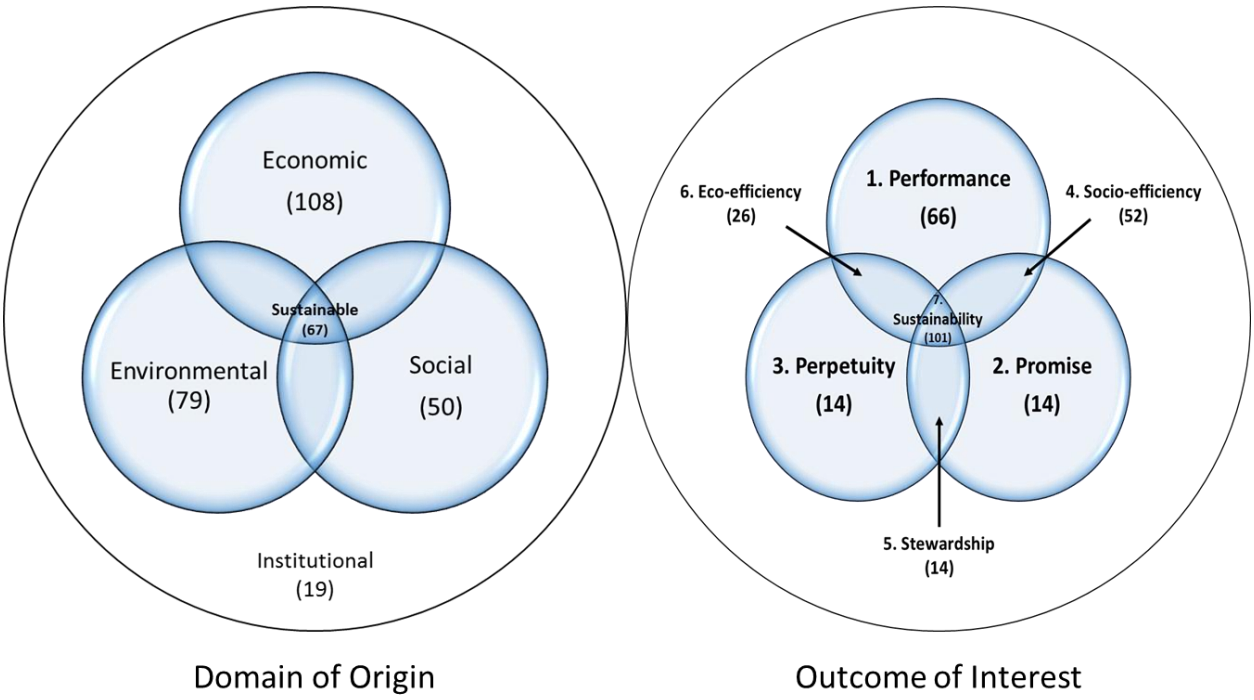
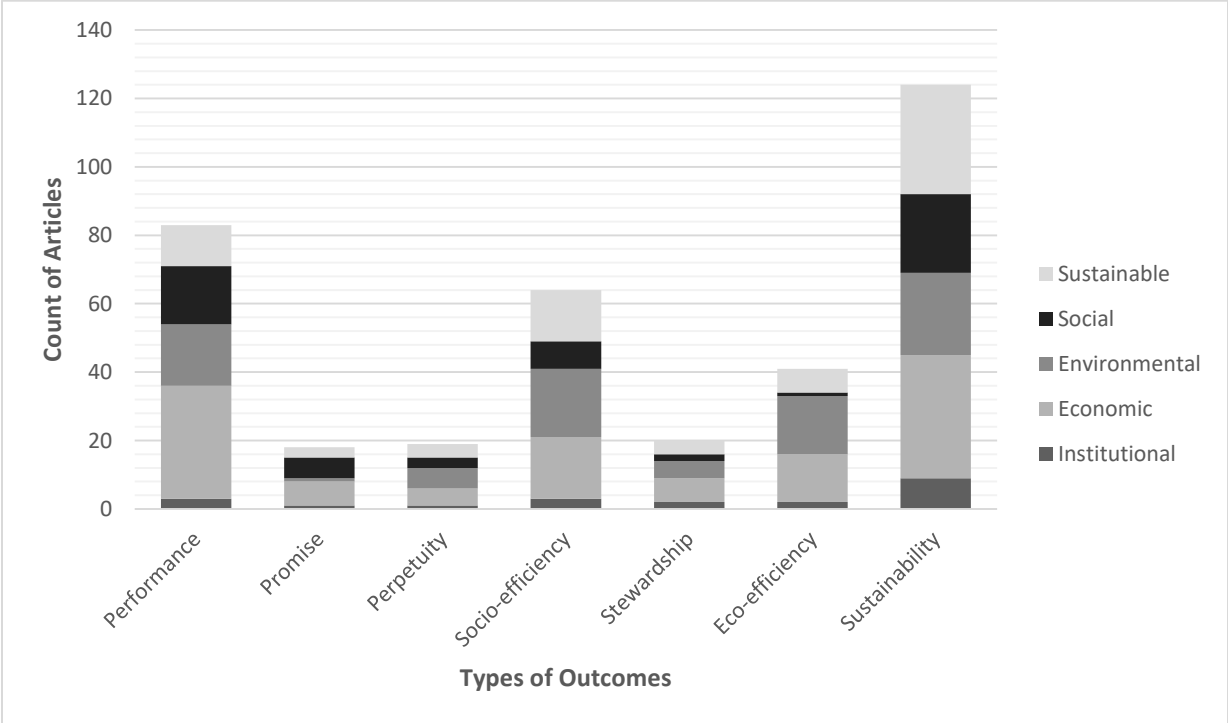


Figure 2.3: Outcomes of Interest in S-E Nexus Research by Domain of Origin



DISCUSSION AND CONCLUSION

Conceptual and Empirical S-E Nexus Research: Implications

Based on the review of S-E Nexus research above, I outline some observations regarding the development of the field. First, the development of S-E Nexus scholarship over the past two decades can be described as being focused almost exclusively on two areas. These are: 1) determining the antecedents of sustainability-oriented entrepreneurial action, and 2) understanding the role of sustainability principles in relation to the entrepreneurial pursuits of various entities. Key factors include the existence of pervasive market imperfections and the opportunities they induce (Alvarez & Barney, 2014; Cohen & Winn, 2007; Dean & McMullen, 2007). However, it should also be noted that individual motivation plays a role in awareness to and subsequent exploitation of these opportunities (Munoz & Dimov, 2015).

The review of S-E Nexus research also suggests that more clarity is needed regarding what, other than the simultaneous pursuit of triple-bottom line objectives, distinguishes entrepreneurship for sustainable development. In light of this, I maintain that for S-E Nexus scholarship to progress, attention should be paid to the other boundary conditions of theory – namely *where* and *when* (Whetten, 1989). Perhaps, it is the case that distinguishing entrepreneurship for sustainable development depends on some aspect of the contexts within which actors emerge and/or operate; or rather, how they conceive of and use time in their decision making.

Second, the relatively low number of articles featuring formal propositions suggests that there exist few theoretical models to guide the empirical testing necessary to develop S-E Nexus scholarship. A point not highlighted above is that only four of the articles

featuring formal propositions are multi-level in nature. This is a worrying trend as the sustainable development concept is one that necessitates a multilevel and dynamic approach (Geels 2010; 2011). Although few articles provide formal propositions to guide empirical tests, it is good to note the considerable empirical efforts within the field. Together this is suggestive of the influence that external fields have on providing theoretical guidance to empiricists within the sustainable entrepreneurship literature.

Third, despite the considerable empirical efforts outlined above, sustainable entrepreneurship scholarship is still dependent on case based research. This is similar to the related field of social entrepreneurship (Short et al., 2009) where case based research was found to be most prevalent. On the one hand, it can be argued that the reliance on case based research is linked to difficulty in collecting the data required for quantitative empirical research. On the other, it is also suggestive of the need for more empirical efforts based on quantitative analyses (Gras, Moss & Lumpkin, 2014).

Additionally, this review's findings regarding sustainable entrepreneurship scholarship shows an orientation towards organizational level research. This may, no doubt, be tied to the prevalence of research on corporate sustainability (see: Montiel, 2008; Salzmann, Ionescu-Somers, & Steger, 2005). Although such research may be instrumental in advancing knowledge on how entrepreneurship for sustainable development takes place within an established organization. However, as recent empirical evidence points to the influence of individuals and new entrants on subsequent incumbent action (York & Lennox, 2014), future research may find benefit in exploring alternative or multiple levels of analysis.

Further, empirical efforts should take care to incorporate context and time, as these can help further distinguish the phenomenon from related forms of entrepreneurship. For instance, consider microfinance studies that have shown how the provision of basic infrastructural resources in the form of financial capital can facilitate the emergence of low-cost and innovative business models (Ault & Spicer, 2014). Future empirical efforts could use this as motivation to explore alternative research contexts beyond the US and UK. Or rather, studies within developed economy contexts may also seek to focus on more impoverished geographic areas or industry settings where sustainability is a primary organizing objective.

Concerning time, I draw attention to the study by Perego & Kolk (2012), which though qualitative still acknowledged the importance of time to organizations' responses to sustainable isomorphic pressures in the form of sustainability assurance use. Studies such as Wesseling et al (2015) also show how time can be incorporated from a quantitative methodological approach. As their analysis of the evolution of the electric vehicle industry revealed, the opportunity and incentive for sustainability innovation was dependent on incumbents' financial performance. In other words, what may be preventing the radical innovations required for sustainable development is the inability of sustainability-oriented firms to acquire the necessary resources for action.

Domains and Outcomes of S-E Nexus Research: Implications

Based on the stated origins and outcomes researched in sustainable entrepreneurship scholarship, as outlined above, I provide some additional observations. First, findings suggest that S-E Nexus scholarship remains highly fragmented. The main reason being that many types of entrepreneurial activity – as identified by actors' main

goals/objectives and their degree of substitutability – have been shown to foster outcomes in line with sustainable development. Second, although sustainability outcomes are extensively researched within the identified domains, much of this research is static or cross-sectional in nature with little attention given to dynamic research methods. Further, it could also be observed that authors tend to use the term sustainable development as an outcome with little specification as to how the term is conceptualized or what type of 'sustainable development' outcome is being pursued. Szekely & Strebel (2013) for example, by distinguishing between innovation types were able to show that the type of sustainability innovation pursued by an entity - whether incremental, radical, or systemic – should be tailored to the particular context.

Additionally, the preceding review suggests that much of S-E Nexus research to date aligns with proponents of *weak*- as opposed to *strong* sustainability arguments. This current alignment of the literature is mainly due to the limited number of articles focused on examining environmentally relevant outcomes. If maintaining and increasing human welfare is the defining characteristic of sustainable development, and human welfare in turn is derived from the combination of different forms of capital, then sustainable development requires that these capital stocks, which produce human welfare, be maintained or increased over time (Ekins, 2014; pg. 59)[1]. As weak sustainability proponents argue, welfare is not dependent on a specific form of capital and as such can be maintained with substitution – e.g. by replacing natural environmental functions with

[1] 'Forms of Capital' refers to—physical or manufactured capital (e.g. infrastructure); social capital (networks); human capital (knowledge); and natural capital (e.g. ecosystem services)—(Scoones, 1998)

technological fixes. Strong sustainability proponents, in contrast, argue that such substitution of manufactured or physical capital for natural capital elements is limited by critical natural capital factors that make unique contributions to human welfare (Ekins, 2014). The weak vs. strong sustainability debate is relevant to S-E Nexus research as it creates for distinctiveness within the field. Moreover, as strong sustainability arguments emphasize the measurement of critical elements of natural capital, they can aid in the development of measurement and empirical models needed in S-E Nexus scholarship (Ekins, 2014).

Areas for Future S-E Nexus Research

As this review of the literature suggests, S-E Nexus scholarship, over the past two decades, remains in a nascent stage of development. Extant research has focused more on distinguishing the sustainable entrepreneur from related forms of entrepreneurial activity and explaining the emergence of sustainable ventures. In addition, reliance on case based research methods has contributed to an absence of more generalizable quantitative studies. Moreover, both conceptual and empirical studies of sustainable entrepreneurship show an emphasis on static as opposed to dynamic analysis. Notably, the difficulty in measuring sustainability and sustainable outcomes can be one reason to blame for these issues (Schalteger & Wagner, 2006). Another is the paucity of research seeking to exploit emergent research methods and novel datasets to tackle pressing issues in the entrepreneurship, and greater management domain.

In order to help address the issues stated above and spur future research within the S-E Nexus, I offer several possible research questions based on the Academy of Management Journal editorial team's 'grand challenges' (George, Howard-Grenville, Joshi, &

Tihanyi, 2016). These grand challenges specifically refer to issues surrounding big data, climate change, aging populations, purposeful organizations, digital money, risk and resilience, and natural resources (George et al., 2016). Each grand challenge holds implications for management research in general and entrepreneurship research in particular. Table 2.6 (*Appendix A*) outlines the seven grand challenges on which I focus along with some potential research questions.

Big Data

Big data typically refers to content generated from a plurality of sources – such as internet clicks or mobile transactions. This data is typically high volume and requires powerful computational techniques in order for trends and patterns to emerge (George, Haas, & Pentland, 2014). In addition to the rich information that the granularity of this data provides organizations, it can also illuminate the richness of individual behavior that is yet to be tapped by management scholars. Big data thus offers immense opportunities for management research in general, and for entrepreneurship research in particular to focus on, for instance, the micro-foundations of organizational strategies or behaviors (p. 325).

Concerning entrepreneurship for sustainable, development I see big data as being influential for research in several ways. First, as George et al. (2014) suggest these 'information goods' will impact how entrepreneurs and innovators create new products/services and transform industries. However, it is still unclear as to how sustainable economic models emerge from the use of such data. Further, I ask, what differences are there, if any, in the way sustainable entrepreneurs perceive and use information goods in comparison to less sustainability-oriented entrepreneurs? A second potential area of inquiry as indicated by George et al (2014) is the balance between value

creation and value capture. Given the number of stakeholders involved in the generation, amalgamation, storage, and use of big data, how is the value created by its usage apportioned? Further, emergent techniques in textual and content analysis can also help generate insight into important aspects of sustainable entrepreneurship. For example, while detailed data on new ventures are generally unavailable in large datasets, the data held within unstructured formats such as daily tweets or social media posts can provide rich textual data for qualitative and quantitative studies.

Climate Change

It is understood that climate change represents one of the greatest challenges faced by the human species in the 21st century. In the general sense, climate change refers to changes in the earth's energy balance because of both natural processes and human activity, which can have profound geographical and environmental implications (Howard-Grenville et al., 2014). Interestingly, climate change can also be seen as one the main reasons for the emergence of entrepreneurship for sustainable development – i.e. as individuals and organizations work either to safeguard the environment from further harm, or to reverse damage that has already been done. Further, the proliferation of regulations at both national and regional levels serves only to create more opportunities, and risks, for sustainability-oriented individuals and organizations to exploit.

As various scientists and scholars agree, the effects of climate change are already being felt. From low lying developing coastlines at risk from increased flooding, to developed nations such as those in Europe forced to deal with increased migration from social and environmental disturbances, climate change will require many adaptations by individuals and organizations. Howard-Grenville et al. (2014) outline four key areas where

climate change implications are sure to be evidenced – value chains, organizational resilience, and in work-life and societal shifts. Shifting the focus from organizations to sustainable entrepreneurship in particular, I outline some other research questions for future research in Table 2.6.

Aging Populations

Driven by positive trends in life expectancy and fertility rates the human population is aging at rate without comparison in recent history. This presents a number of new challenges and opportunities to management, and entrepreneurship, research and practice (Kulik et al., 2014). This is especially as it relates to *whom* organizations manage; *what* needs managing; and *how* people are managed (p. 929). Entrepreneurship scholarship even points toward a relation between aging and entrepreneurial behavior (see: Levesque & Minniti, 2006). Given that the implications of an aging population can be evidenced at a societal, organizational, or individual level, there are also opportunities for multi-level theorizing.

Notable implications at the societal level include longer retirement ages, increased life expectancy, and immigration. Researchers can thus examine, for instance, how such factors affect individual or employee orientations towards sustainability principles. At the organizational level policy changes may necessitate adaptations to work and job design in light of more elderly employees. Will such changes encourage organizations to take a more proactive as opposed to reactive stance on sustainability issues? At the individual level, societal and organizational policies are likely to influence individuals to change their views regarding work, careers, and retirement (Kulik et al., 2014). Especially regarding later-in-life careers and career changes, entrepreneurship becomes a factor given the extensive

network and resources of older individuals. This begs questions such as whether individuals that start ventures later in their careers are more open to sustainability principles as opposed to individuals who start ventures earlier in life. Additionally, are younger or older individuals more likely to invest in sustainable ventures?

Purposeful Organizations

Another area that can spawn fruitful research on sustainable entrepreneurship involves focusing on the purpose of organizations. Purpose, in this sense, refers to both whether an organization's actions are profitable or legal, and questions the underlying logic of the action (Hollensbe et al., 2014). A focus on purpose is especially integral to the development of sustainable entrepreneurship research given that purpose acknowledges the interdependence of business, society, *and the environment* (pp. 1228, *emphasis added*). Notably, extant research related to the founding principles of organizations can provide a good foundation for such research.

Digital Money

Digital money essentially refers to a medium of exchange, or a measure and store of value in electronic form (Dodgson et al., 2015). Influenced by increased globalization and technological advancement, digital money has emerged as a potent new means of facilitating commercial transactions. As Dodgson et al. (2015) note, digital money has two particular effects. One, it dematerializes – by moving economic transactions from the physical to digital world. Two, it disintermediates – connecting people and money more closely and removing the need for intermediaries such as banks (p. 325). Additionally, digital money affords disenfranchised individuals easier access to finance – with implications for both the formal and informal economies. Digital money thus presents

another fruitful grand challenge for groundbreaking research on sustainable entrepreneurship. As Dodgson et al. ask, what opportunities does digital money offer entrepreneurship and new models of innovation? I extend this line of questioning by offering several questions directed to sustainable entrepreneurship.

Risk and Resilience

How, and why, do some individuals and organizations adapt and thrive amid adversity while others fail to do so? This question presents management, and entrepreneurship, scholars with the challenge of studying the role and functioning of organizations during adverse natural and social events (Van der Vegt et al., 2015). This challenge becomes greater when considering that the likelihood and impact of such adverse events is predicted to increase given greater density in global networks of people, organizations, and countries (p. 971). Risks and adverse events, in this case, referring to disasters or organizational crises. *Disasters* refers to potentially traumatic events that are collectively experienced, have an acute onset, and are time delimited to either natural, technological, or human causes (McFarlane & Norris, 2006). *Crises* refers to low-probability, high-impact events which threatens the viability of a system, and is characterized by ambiguity as to cause, effect, and means of resolution (Pearson & Clair, 1998). Sustainable entrepreneurship presents novel opportunities to contribute in this area given that resilience has emerged as a fruitful concept linked to sustainability and sustainable development (Dovers & Handmer, 1992; Handmer & Dovers, 1996).

Natural Resources

Natural resources underpin the foundations of human and economic activity. As such, their increased exploitation has led to discussions of sustainability in policy and

executive decision-making (George et al., 2015). Natural resource considerations span both countries and industries as food, energy, and water concerns present many sustainability issues. Sustainability issues surrounding natural resources essentially challenge management and entrepreneurship researchers to provide greater strategic and managerial insight into conversations traditionally held within policy, scientific, and engineering circles (p. 1596). As such, I provide several examples of questions on how natural resource scarcity can be used to advance sustainable entrepreneurship research.

Conclusion

If the main goal of individual and organizational actors the world over is sustainable development, then it is entrepreneurship for sustainable development that should be emphasized in extant entrepreneurship research. With this in mind, I surveyed the extant body of literature found at the nexus of sustainability and entrepreneurship to help guide the further development of this important research stream. As the review findings suggest, the previous two decades of research within the S-E Nexus have been limited by studies that failed to embrace the inherent multilevel and dynamic nature of sustainability-entrepreneurship relationship. Thus, in an effort to spawn more research within the S-E Nexus literature I outline several areas for future research. Each of these areas, once incorporated into S-E Nexus scholarship, can help to advance scholars' understanding of exactly what interactions at the nexus of sustainability and entrepreneurship mean for a collective future where human life flourishes – both in theory and in practice (Schaefer et al., 2015).

CHAPTER 3: STARTING THE FIGHT AGAINST CLIMATE CHANGE: HOW CONTEXT AND CULTURE AFFECT INSTITUTIONAL ENTREPRENEURSHIP FOR SUSTAINABLE DEVELOPMENT

INTRODUCTION

The issues that must be addressed to enhance the environmental sustainability of human socio-economic systems also present opportunities for entrepreneurship (Hall, Danele, & Lenox, 2010). Some individual and organizational actors who recognize and act on these opportunities to effect environmental sustainability will create products and services aimed at alleviating environmental or social issues (Thompson, Kiefer, & York, 2011). Other actors, particularly those involved in governance of socio-technical systems (Manning & Reinecke, 2016), enact the opportunities presented by environmental sustainability issues to either create new- or alter existing institutional frameworks (Dacin, Goodstein, Scott, 2002; Pacheco, York, Dean, & Sarasvathy, 2010). These *institutional entrepreneurs* utilize acquired resources to initiate, and actively participate in the implementation of divergent changes to established institutionalized templates for organizing within a given context (Aldrich, 2011; Battilana, Leca, & Boxenbaum, 2009; Dorado, 2005; Greenwood & Suddaby, 2006). In addition to their individual agency and motivation, institutional entrepreneurs can be influenced to act by the characteristics of the national context – i.e. widespread social understandings that define rational behavior – within which they are embedded (Greenwood, Oliver, Sahlin, & Suddaby, 2008; Hardy & Maguire, 2008).

While scholars have acknowledged the role of different institutional contexts in driving entrepreneurship in general (for reviews see: Bruton, Ahlstron, & Li, 2010;

Suddaby, 2010; Tolbert, David, & Sine, 2011; Welter, 2011), avenues remain to improve our understanding of context's influence on institutional entrepreneurship. Extant studies, for instance, have been mainly preoccupied with explaining the role of context on micro- and meso-level entrepreneurial behaviors (e.g. Acs, Desai, & Hessels, 2008). While adding to our knowledge of how actors come to establish new ventures, or how organizations expand products/services to new countries, these studies overlook the fact that governance actors – i.e. those who actively work to manage institutional frameworks (Manning & Reinecke, 2015) – are also influenced by the contexts they work in and create (Giddens, 1984). This is an important shortcoming as entrepreneurship for sustainable development – particularly at the national level – is integral in the transformation of institutions towards those that support sustainable development (e.g. Brown et al., 2009; Child, Lu, & Tsai, 2007). Moreover, institutional entrepreneurs, because of their position and influence, can significantly affect countries' pursuit of sustainable development (Brown, DeJong & Lessidrenska, 2009).

To address the stated gap in research, this study utilizes institutional theory to examine whether and how countries' national and cultural contexts influence entrepreneurial activity for sustainable development amongst institutional actors. First, drawing on institutional theory (Scott, 1995) I argue that regulatory, normative, and cognitive contexts, when favoring entrepreneurship, can influence national actors to engage in institutional entrepreneurship for sustainable development. Second, incorporating insights from work on the social construction of time (Huy, 2001; Lawrence, Winn, & Jenkins, 2001; Navis & Glynn, 2010) I argue that countries' cultural context, when more long-term oriented, positively influences actors' motivation to address the temporal

and spatial distortion between natural/physical systems and socio-economic systems (Bansal & Knox-Haynes, 2013). In other words, I contend that degree of long-term orientation held culturally will significantly moderate the effect of regulatory, normative, and cognitive contexts favoring entrepreneurship on institutional entrepreneurship for sustainable development.

As the findings suggest, regulatory contexts favoring entrepreneurship and a long-term oriented culture can influence institutional entrepreneurship for sustainable development. In addition, the degree to which actors within a country hold a long-term orientation positively moderates the effect of regulatory and cognitive institutional contexts favoring entrepreneurship in influencing institutional entrepreneurship for sustainable development. Based on these findings, this study contributes to extant literature in several ways. First, by looking at the interaction between regulatory, normative, cognitive, and cultural contexts this study responds to calls for greater examination of the interaction between formal and informal institutions (Pacheco et al., 2010). Second, it compliments studies which have suggested an integral role played by time as it relates to institutional change (Huy, 2001; Lawrence, Winn, & Jenkins, 2001) by looking at how culturally held beliefs regarding time affect institutional entrepreneurship. Third, it contributes to the entrepreneurship literature by improving our understanding of the antecedent factors to institutional entrepreneurship for sustainable development (Dorado & Ventresca, 2013). Finally, this study also responds to calls for more quantitative studies of entrepreneurship for sustainable development (Thompson et al., 2011).

THEORY AND HYPOTHESES

Institutional Theory and Entrepreneurship

According to institutional theory, entrepreneurship is contextually embedded within social, cultural, and political contexts that influence individual and organizational values, norms, motives, and behaviors (Bruton et al., 2010). This is effectively encapsulated by North (1990) who defined institutions as the formal or informal rules of the game that serve to constrain the choices of individuals and organizations. As extant research suggests, institutions can influence both the rate and type of entrepreneurial activity within a country (Bruton et al., 2010; Stenholm, Acs, & Wuebker, 2013). Thus, institutional theory serves as a suitable lens for explaining how national level contexts influence institutional entrepreneurship for sustainable development.

For this study, I draw on Scott's (1995) conceptualization of the institutional context as being comprised of regulatory, normative, and cognitive institutions that provide the stability and incentives that can promote or inhibit social behavior in an economy. The institutional pillars introduced by Scott (1995) have been well utilized in entrepreneurship and management literature. For instance, studies have adapted Scott's (1995) conceptualization of distinct institutions, both validating their distinct nature and demonstrating their influences on levels of entrepreneurship across countries (Alvarez, Amoros, & Urbano, 2014; Busenitz, Gomez, & Spencer, 2000; Manolova, Eunni, & Gyoshev, 2008). This approach has also been used to examine the influence of institutions on the engagement of women in entrepreneurship (Baughn, Chua, & Neupert, 2006; Yousafzai, Saeed, & Muffatto, 2015). Other studies have incorporated these institutional pillars to examine their direct effects on international entrepreneurial activities (Xu, Pan, & Beamish,

2004); and their moderated effects of the emergence of new businesses (De Clerq, Danis, & Dakhli, 2010).

In contrast, this research is concerned with how these individual pillars influence institutional entrepreneurship activity amongst national actors that work and operate at an 'institutional' level – i.e. those that establish the rules and norms regarding economic activity within a country. Essentially, it is assumed that once present and in support of entrepreneurship, each institutional pillar provides national actors with symbolic systems – i.e. rules/laws, values, and categories – which serve to reduce uncertainty regarding institutional entrepreneurial activity (Scott, 1995, pg. 77-78). Before turning to the theoretical arguments, I next conceptualize institutional entrepreneurship for sustainable development.

Institutional Entrepreneurship for Sustainable Development (SD)

Entrepreneurship for sustainable development is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society (Shepherd & Patzelt, 2011; Shepherd & Patzelt, 2017). It is made possible due to the presence of entrepreneurial opportunities inherent to sustainable development issues, which threaten the functioning of human socio-economic systems (Cohen & Winn, 2007; Dean & McMullen, 2007). In addition to the presence of these opportunities, entrepreneurship for sustainable development is made possible due to the existence of enterprising actors who are able to recognize and subsequently exploit these entrepreneurial opportunities for sustainable development (Patzelt & Shepherd, 2011).

Parrish (2010) suggests that entrepreneurship favoring sustainable development is based on a 'perpetual' as opposed to 'exploitative' reasoning. In other words, when exploiting opportunities, actors employ an interpretive scheme whereby humans and the natural environment are not viewed purely as means, but as means and ends in their own right (p. 516).

As prior literature suggests, entrepreneurship for sustainable development can be evidenced at the individual, organizational, or national levels of analysis (McMullen, 2011; Spence, Gherib, & Biwole, 2011). Here, I focus on the national level, where entrepreneurial activity for sustainable development will resemble institutional entrepreneurship. Institutional entrepreneurship refers to the process whereby actors leverage resources to create or transform institutions (Battliana, Leca, & Boxenbaum, 2009; Garud, Hardy, & Maguire, 2007; Lawrence & Phillips, 2004). Actors can be influential individuals, organizations, or a collective of individuals and organizations (Wijen & Ansari, 2007). Actors who engage in institutional entrepreneurship are embedded within a prevailing institutional environment and are subjected to an institutionalized logic. They also possess the agency necessary to exercise their divergent views (Dorado, 2005). To be considered institutional entrepreneurship, actors must initiate and participate in the implementation of divergent changes to institutions (Battliana et al., 2009). These changes can be either within the confines of an organizations or the wider institutional context. Taken together, current literature suggests that the emergence of institutional entrepreneurship is a factor of both governing field characteristics, and the social position of actors' influences its emergence (Battliana et al., 2009; Dorado, 2005).

Scholars have offered various accounts of institutional entrepreneurship in relation to sustainable development issues (e.g. Ansari, Wijen, Gray, 2013; Child, Lu, Tsai, 2007; Dorado & Ventresca, 2013; Schussler, Ruling, Wittneben, 2014; Wijen, 2014; Wijen & Ansari, 2007). Dorado & Ventresca (2013), for instance, argue that actors often lack the motivation to engage and decision making capacity for entrepreneurial engagement in relation to complex social problems. Entrepreneurial engagement – i.e. institutional entrepreneurship – is possible however given conditions such as increased public awareness, dissonant loyalty to collective interests, establishment of arbitrary time setters, and a 'hiding hand' effect where actors underestimate their own creativity and the difficulty of resolving complex social problems (p. 76). Child, Lu, & Tsai (2007), also, in their description of the evolution of China's Environmental Protection System suggest that interactions between the country's prevailing institutional context and enterprising actors affected how that evolution took place. Further, Wijen (2014), in his study of sustainability standard adoption within institutional fields, also shows how the institutional context can affect both if a sustainability standard is adopted by actors, and the degree to which that adoption leads to the institutional actor's desired outcome. Institutional entrepreneurship thus provides a valid conceptualization of entrepreneurial action at the national level that favors sustainable development.

Building on the above, I conceptualize institutional entrepreneurship for sustainable development as a process whereby actors mobilize resources to either create new sustainability-driven institutions or transform existing institutions so that they align more with the principles of environmental sustainability. Extant scholarship suggests that three conditions must be satisfied in order for the institutional context to influence

entrepreneurship for sustainable development at the national level. First, the proposed institutional change must be perceived as legitimate – i.e. desirable or appropriate – according to institutional actors (Lenox, 2006; Suchman, 1995). Second, institutional actors must have agency and a social position that enables them to act entrepreneurially if necessary (Battliana, Leca, & Boxenbaum, 2009; Lawrence & Phillips, 2004). Third, the institutional context enables entrepreneurial action by providing opportunities and incentives that influence actors' motivation to engage with, or decision making capacity regarding, complex socioeconomic issues (Battliana et al., 2009; Dorado, 2005; Dorado & Ventresca, 2013). In the arguments that follow, the former two conditions remain implicit, leaving the latter condition as the primary focus.

Regulatory Context and Institutional Entrepreneurship for SD

The regulatory context are representative of rational actor models of behavior – i.e. the formal imposition, enforcement, and acceptance of policies, rules, laws, and sanctions that affect actors' behavior (Manolova, Eunni, & Gyoshev, 2008; Yousafzai et al., 2015). The regulatory component of countries institutional context involves factors such as the efficiency and predictability of taxes; government policies in support of new business activity; and ease of new business licensing and certification (Busenitz et al., 2000; Reynolds et al., 2005). In general, the regulatory institutional context influences the legitimacy and acceptance of entrepreneurship through legally sanctioned rules (Scott, 1995). The regulatory context is coercive in its influence on actors. Further, actors subject to a strong regulatory context will value expedience concerning the governed actions (Scott, 1995).

A strong regulatory context with respect to entrepreneurship gives actors the capacity to better establish rules, inspect conformity to those rules, and manipulate sanctions in order to regulate behavior with respect to starting and governing businesses. Conversely, a weak regulatory context will increase the opportunity cost of actions regarding entrepreneurship for individuals due to the uncertainty of the regulatory framework (Aidis, Estrin, & Mickiewicz, 2012). Further, the regulatory context can facilitate the acquisition of resources that can be leveraged by entrepreneurs (Busenitz et al., 2000).

Given the complexity of sustainability issues, having a stronger regulatory context gives institutional entrepreneurs a better foundation to build upon in the pursuit of institutional change for sustainable development (cf. Dorado & Ventresca, 2013; Ferraro et al., 2015). In other words, when the regulatory context favors entrepreneurship, national actors advocating regulatory change in support of sustainable development benefit from less uncertainty regarding transaction costs involved in acting entrepreneurially. National actors, as I suggest, can avoid costly transactional and adaptation costs associated with enacting institutional change in the presence of a strong regulatory context for entrepreneurship. As one study by Wijen (2014) further suggests regulatory contexts favoring entrepreneurship also increase the performance of adoption of sustainability driven policies. Altogether, I hypothesize that:

H1a – The more countries' regulatory context favors entrepreneurship, the greater the likelihood of institutional entrepreneurship for sustainable development amongst national actors.

Normative Context and Institutional Entrepreneurship for SD

The regulatory context places emphasis on rules that introduce prescriptive, evaluative, and obligatory dimensions to social life (Scott, 1995). Normative institutions emphasize social obligation as the basis for encouraging or constraining human interaction (Scott, 1995; 2008). In addition, while regulatory institutions are driven by conformity to laws, the logic underlying the normative institutional context is that of appropriateness (Scott, 1995). Scholars have also regarded normative institutions as reflective of actors' orientation towards ensuring an ongoing relationship with a common set of standards and value patterns (see: Baughn et al., 2006). Though varied depending on the level of analysis, the presence and strength of the normative context can be identified by the certifications, accreditations, and trade associations that govern socially acceptable behavior (Scott, 1995; pg. 56).

Regarding entrepreneurship, normative institutions refer to the degree to which enterprising activity, and creative or innovative thinking are considered legitimate means of pursuing valued ends (Busenitz et al., 2000; De Clerq et al., 2010; Scott, 2008). For instance the normative context can be identified as a factor in why entrepreneurship activity is encouraged and supported in some countries, whereas within others it is discouraged and made difficult to pursue (see: Baumol, Litan, & Schramm, 2009). A normative context encouraging of entrepreneurship, in addition to encouraging entrepreneurial action amongst actors, facilitates the breakdown of barriers to such action (Stenholm et al., 2013).

The greater the normative context for entrepreneurship, the more national actors' prescriptive, evaluative, and obligatory frames of reference will condone entrepreneurial

action. This is likely given that strong normative contexts towards entrepreneurship will encourage the application of perpetual reasoning to value systems and norms, by influencing the prescriptive, evaluative, and obligatory dimensions of social life (Scott, 1995). Perpetual reasoning refers to the logic of using human and natural resources in a way that enhances and maintains the quality of their functioning for the longest time possible (Parrish, 2010). As Dorado & Ventresca (2013) suggest, a strong normative context makes institutional entrepreneurs more aware of any disconnect between how things should be and how they presently are with respect to sustainable development issues. Further, in order to reduce the unpleasantness of this 'dissonance' they are more likely to engage in sustainability-oriented enterprising activity such as voluntary carbon-offset adoption practices. In essence, the pursuit of institutional entrepreneurship for sustainable development is the result of actors' quests to attain the moral legitimacy that accompanies a strong normative institutional context. Altogether, I hypothesize that:

H1b – The more countries' normative context favors entrepreneurship, the greater the likelihood of institutional entrepreneurship for sustainable development amongst national actors.

Cognitive Context and Institutional Entrepreneurship for SD

Cognitive institutions constitute the nature of reality and the frameworks through which actors interpret information (Stenholm et al., 2013). The cognitive context therefore refers to the widely shared knowledge and schemas that actors use to interpret phenomena (Kostova & Roth, 2002). According to scholars the cognitive context act as a

medium between the external world of stimuli and the response of the individual organism (Scott, 1995). Given strong cognitive contexts, actions occur because the routines governing them are 'taken-for-granted' (pg. 57).

For entrepreneurial activity, the cognitive context reflects issues such as prior experience with start-up activity; identification and exploitation of profitable opportunities; perceived resource orchestration abilities; and confidence in management and growth of new businesses (Busenitz et al., 2000; De Clerq et al., 2010). These skills and knowledge are likely to vary in terms of their dispersion within and across countries thus impacting actors' abilities to act entrepreneurially (Manolova et al., 2008; Stenholm et al., 2013). A stronger cognitive context towards entrepreneurship places less burden on actors regarding enterprising activity (De Clerq et al., 2010). As such, one can expect countries with strong cognitive contexts toward entrepreneurship to exhibit a vibrant entrepreneurial culture *at all levels of analysis* (Stenholm et al., 2013, *emphasis added*).

When favoring entrepreneurship, the cognitive context influences institutional entrepreneurship for sustainable development by providing actors with the knowledge and capabilities to recognize and exploit sustainable development opportunities. Actors embedded within a cognitive institutional contexts favoring entrepreneurship will be more aware of entrepreneurial opportunities as they benefit from the shared experiences and knowledge of others (Manolova et al., 2008). They are also more likely to recognize shortfalls in that knowledge – again, given the complexities surrounding sustainable development issues. As Dorado & Ventresca (2013) suggest, the cognitive dissonance that this recognition creates necessitates initial engagement, where actors use outcomes as reference points to redefine and improve upon the initial plan. Institutional entrepreneurs

will engage in sustainability-oriented institutional change both to reduce this cognitive dissonance, and to generate common frames of reference for addressing sustainable development issues (p. 76). This engagement by actors is similar to what Ferraro et al. (2015) refer to as distributed experimentation, or iterative action that generates small wins, promotes evolutionary learning, and increases engagement. Altogether, I hypothesize that:

H1c – The more countries' cognitive context favors entrepreneurship, the greater the likelihood of institutional entrepreneurship for sustainable development amongst national actors.

Temporality of Cultural Contexts

Time represents an important element in theorizing and is central to many studies in management and entrepreneurship (e.g., Ancona, et al., 2001; George & Jones, 2000; McMullen & Dimov, 2013; Selden & Fletcher, 2015). A temporal perspective, as such, can be deemed as integral to institutional change and institutional entrepreneurship. Giddens (1984), for instance, defines institutions as the more enduring features of social life that give solidity to social systems across 'time' and space (p. 24). Accordingly, I employ this perspective on the role of socially constructed views of time (Gidden, 1984) to elucidate how culturally held views about time can affect actors' decision-making.

Culture, can be defined as socially established structures of meaning that guide behavior (Hofstede, 2001; Scott, 1995). It can be transferred from one generation to another via teaching and imitation of values, knowledge and related factors (North, 1990).

Research shows that countries' cultural context can be classified along several dimensions including, for example, uncertainty avoidance, gender egalitarianism, power distance, and future orientation (House, et al., 2004). In addition, previous research has already generated evidence regarding how the different dimensions of culture matter in relation to entrepreneurship activity (Hayton et al., 2002). Within this paper, the focus is on a future or long-term oriented culture since actors' consideration of time is inherent to the concept of sustainable development (Slawinski & Bansal, 2015).

The cultural context can produce a socially constructed view of time, which can be evidenced in differences between cultures with respect to the dominant constructions of time (Ancona et al., 2001). This is evidenced by Hofstede (1983) who demonstrates that cultures can exhibit differences with respect to actors' temporal orientations. The socially constructed view of time within countries' cultural contexts influences actor behaviors – as evidenced, for example, by their temporal orientation or style (Ancona et al., 2001, p. 522).

Actor's relation to time is not dichotomous. Scholars generally agree that, with respect to time, actors' vary in terms of their prioritization of activities, which support a past as opposed to a future orientation. Family business research, for instance, has readily acknowledged how goals, outcomes, and activities of actors' within family firms can differ with respect to time (see: Brigham, Lumpkin, Payne, & Zachary, 2014). In other words, actors' within a given environment typically fall along a spectrum ranging from a short- to long-term orientation (Huy, 2001). In addition, actors' prevailing temporal orientations, capabilities, and interactions are embedded within, and constitute, the wider institutional environment which can also be either short- or long-term oriented. Essentially, whereas a short-term orientation gives more relevance to the past and present, a long-term

orientation signals individuals' attention to the future (Lumpkin & Brigham, 2011; Lumpkin, Brigham, & Moss, 2010).

Within cultural contexts that favor short-term actions, actors have weak uncertainty avoidance towards the future. They are socialized into accepting this more short-term orientation, and are more likely to take actions, which preserves their present state of security (Hofstede, 1983; 1993). As Parrish (2010) suggests short-term thinking encourages the exploitation of natural resources in order to obtain profits as 'quickly' as possible and thus runs counter to sustainability-driven principles. For a cultural context that favors a greater long-term orientation, on the other hand, actors value an extended time horizon and place greater emphasis on the future (Lumpkin & Brigham, 2011). As literature would suggest, a cultural context that favors a long-term orientation not only values the future, but is also concerned with bridging concerns from the past and present with the future (p. 1152). As the study by Hofstede (1983) suggests, a cultural context that emphasizes an orientation to the future will seek to use institutions such as technology or formal rules to reduce the uncertainty of future events. Such contexts, for example, would have a greater presence of research and development activities.

The cultural context, like regulatory, cognitive, or normative, contexts, will be present within a given environment due to the interactions of various actors' schemas. It also engenders behavioral responses by actors given their perception of what is legitimate or socially acceptable according to the dominant, though informal, paradigm. Actors embedded within a given cultural context will have a temporal orientation and undertake actions that align more with either a short- or long-term orientation. I therefore expect

countries' cultural contexts regarding how actors relate to time, to be significantly related to the emergence of institutional entrepreneurship for sustainable development.

Long-term Orientation and Institutional Entrepreneurship for SD

Cultural contexts, as the arguments above suggest, refer to shared meanings between actors that guide behavior (cf. Hofstede, 2001). Within respect to enterprising activity, cultural contexts can encourage actions that facilitate either short-term goal attainment (e.g. efficiency gains) or long-term goal attainment (e.g. research and development). Countries with a cultural context emphasizing short-term oriented actions are more likely to be appreciative of heritage and traditions; whereas more long-term oriented societies encourage actions in preparation for the future. I here assume that countries' cultural institutional context will vary in terms of the degree to which actors favor a short- as opposed to long-term orientation.

Ancona et al. (2001) suggest that how actors perceive time is likely to affect how they map out different activities across time. For example, the extent to which actions such as allocation of time, synchronization, or the duration of activities favors long as opposed to short-term outcomes will depend on the dominant social conceptions of time. Entrepreneurship for sustainable development values the maintenance or enhancement of human and natural resources—for *the longest time possible* (Parrish, 2010; *emphasis added*). Moreover, the qualitative management and outcomes required for sustainability in human socio-economic systems requires actions and outcomes that are more open to change and adaptable (Ferraro, Etzion, & Gehman, 2015; Schaefer, Corner, & Kearins, 2015) – which again favors actors with greater long-term orientation. Along-term oriented cultural context thus, again, matters as actors may require inducements or prompting from

their environment in order to engage in entrepreneurial action for sustainable development. As the study by Dorado & Ventresca (2013) suggests, the cultural context serves as an 'arbitrary time setter' that likely influences entrepreneurial action by defining temporal processes and markers.

Countries' degree of long-term orientation, I argue, will both directly affect engagement in institutional entrepreneurship for sustainable development amongst national actors, and moderate the effect of regulatory, normative, and cognitive contexts favoring entrepreneurship on such engagement. Concerning the direct effect, cultural contexts that are more long-term oriented allow for the alignment of actors' views of time with sustainable development's view of time. This is because actors embedded within such a context will be more willing to address the uncertainty surrounding complex sustainable development issues (cf. Strickland, Lewicki, & Katz, 1966). They will also possess temporal capabilities, which enable them to address said issues (Huy, 2001). Within a more long-term oriented cultural context, actors' are also better able to establish a connection between their individual actions and the collective outcome for sustainable development (Dorado & Ventresca, 2013). As literature suggests, entrepreneurial action for sustainable development is more likely to emerge when actors favor long-term oriented actions and outcomes (Parrish, 2010; Wang & Bansal, 2012). Based on the preceding, I hypothesize that:

H2 – The more countries' cultural context favors a long-term orientation, the greater the likelihood of institutional entrepreneurship for sustainable development amongst national actors.

As depictions of the three institutional pillars suggest, regulatory, normative, and cognitive institutional contexts for entrepreneurship are likely to encourage more short-term oriented actions. Conformity to each institutional context essentially provides actors with resources and legitimacy which they seek to acquire in the near to short-term in order to maintain any power/influence they may possess (Scott, 1995). Regulatory institutions, for instance, emphasize expedience, which does not encourage long-term actions. Even the fulfilment of social obligations, the basis of compliance, for normative institutions has been associated with short-termism (Hofstede, 1993: p.90). The cultural context thus matters, as actors may be more likely to avoid long-term oriented action, such as those inherent to entrepreneurship for sustainable development, if they are embedded within an environment that emphasizes short-term actions.

Regarding the indirect effect, I consider how a greater long-term orientation of the cultural context moderates the relationship between the three institutional dimensions (regulatory, normative, cognitive) and institutional entrepreneurship for sustainable development. First, for regulatory institutions a cultural context that favors long-term oriented actions encourages the formation of formal regulations that aid in reducing uncertainty regarding the future. As Fischer et al. (1997) find, actors within an organizational context tend to enact with time in a manner that best aligns with their current and future objectives regarding growth. Their enactment of time, I suggest, is tied to the socially constructed temporal perspective within the organization – i.e. the cultural – regarding the objective of growth. National actors, however, are also subject to the influences of the prevailing socially constructed views of time. Moreover, given a long-term oriented cultural context they can be expected to enact also with time in a manner that best

allows for attainment of sustainable development outcomes. This is because both the complexity of sustainable development issues, and the time required for their resolution necessitates the establishment of structures that aid in reducing uncertainty and costs associated with sustainability-oriented entrepreneurial action. A long-term oriented cultural context will have actors who are more capable of leveraging current regulatory structures to create ones more 'temporally' consistent with sustainable development outcomes.

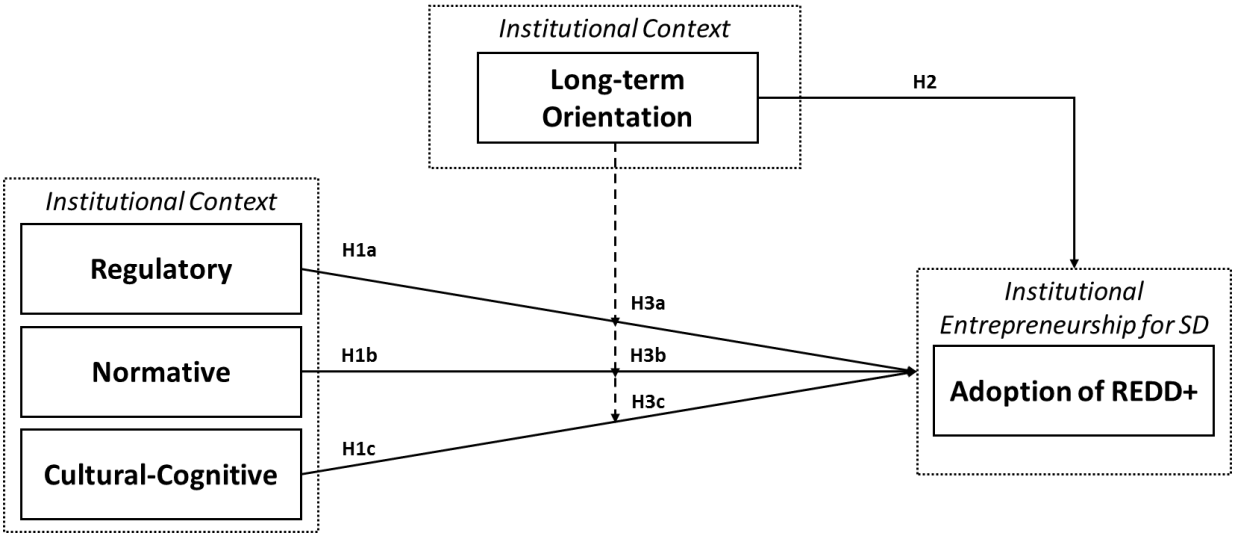
Second, for normative institutions a greater long-term orientation of the cultural context encourages greater moral and pro-social norms regarding enterprising activity. This is because the distancing of the decision to act and the reward increases honest and moral behavior (Ruffle & Tobol, 2014). As prior studies suggest, actors' emotional responses tend to be more severe for future events than for past events; and because such emotional reactions often guide moral intuitions, judgments of moral behavior may be more severe in prospect than in retrospect (Caruso, 2010). As such actors within a long-term oriented cultural context can be expected to assess future bad deeds more negatively, and future good deeds more positively, than equivalent behavior in the equidistant past. This is likely to translate over into enterprising behavior regarding sustainable development opportunities as actors strive to attain moral legitimacy.

Third, for cognitive institutions a greater long-term orientation of the cultural context encourages experimentation and risk-taking for sustainable development. A cultural context that is more long-term oriented encourages actions by actors which favor delayed as opposed to immediate results (Hofstede, 2001). In essence, actors embedded within a long-term oriented cultural context can be expected to undertake more actions

aimed at reducing the uncertainty around sustainable development issues. This is primarily because they may be more risk averse regarding the uncertainty of distant future events (Das & Teng, 1997). Actors embedded within a long-term oriented cultural context value information that aids in reducing the uncertainty of the future. As argued above, a strong cognitive institutional context influences institutional entrepreneurship for sustainable development by national actors because they more readily recognize and subsequently seek to fill deficits in knowledge regarding future events about the natural environment. A long-term oriented cultural context, because it encourages future oriented actions, will therefore heighten actors' ability and willingness to recognize and address knowledge gaps regarding resolving sustainable development issues. Altogether, I hypothesize that:

H3 – The more countries' cultural context favors a long-term orientation, the greater the effect of a) regulatory, b) normative, and c) cognitive contexts favoring entrepreneurship on institutional entrepreneurship for sustainable development amongst national actors.

Figure 3.1: Empirical Model 1



METHODS

Research Context

To test the above hypotheses this study utilizes the context of the global REDD+ Partnership (REDD+), an emerging field for voluntary carbon-offset markets. The REDD+ Partnership involves policies, projects, and interventions meant to combat climate change by reducing emissions from deforestation and forest degradation (Agrawal, Nepstad, & Chhatre, 2011; REDD+ Partnership, 2013; Sukhdev et al., 2008). The Partnership, formally launched in 2008, combines the technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Program (UNDP) and the United Nations Environment Program (UNEP). At its core, REDD+ is a voluntary incentives-based strategy that compensates national governments and subnational actors in return for demonstrable reductions in carbon emissions (Agarwal et al., 2011). In other words, the main idea underlying REDD+ is to pay forest owners and users to reduce carbon emissions and increase carbon removals. Such payments for environmental (or ecosystem) services (PES) provides strong incentives directly to forest owners and users to manage forests better and clear less forestland (Angelsen, 2009; Wunder, 2005). REDD+ is representative of the most advanced approach to climate change under the United Nations Framework Convention on Climate Change and, according to recent reports has seen contributions of over 6 billion US dollars in cash and in-kind contributions (Agarwal et al., 2011; REDD+ Partnership, 2013).

The REDD+ framework supports nationally led processes and promotes the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in national and international implementation of

carbon abatement projects and initiatives (UN-REDD, 2008). By providing incentive payments for countries' sustainable land use and forest management practices, REDD+ seeks to reduce, and in some instances reverse, the degradation of forests – in the process providing both economic and non-economic benefits to individuals. REDD+ projects have, for example, encouraged forest policy reforms with local stakeholder involvement, and promoted reforestation in several rural areas throughout countries such as Brazil, Costa Rica, Mexico, Indonesia, Uganda, and Vietnam (Peskett, Schreckenberg, & Brown, 2011; Sunderlin et al., 2013).

For this study, I am concerned exclusively with REDD+ arrangements – an agreement to undertake REDD+ related actions, involving a funder, a recipient, and one or more beneficiaries (REDD+ Partnership, 2013). 'Funders' provide financing for REDD+ projects associated with a particular arrangement, and tend to favor developed countries bent on using REDD+ as a cost containing measure for achieving emissions reductions targets (Agrawal et al., 2011). 'Recipients' refers to the country or Non-Governmental Organizations (NGOs) that receive and manage REDD+ funds. Recipient countries tend to favor developing countries that see REDD+ as both a viable means of participating in international climate negotiations, and a source of revenue (Agrawal et al., 2011). 'Beneficiaries' to a REDD+ arrangement are the countries to which funds are dispersed pending evidenced achievement of goals specified in the arrangement. It should be noted that countries cannot merely self-select into REDD+ arrangements. Rather, engagement in REDD+ is based both on developed (developing) countries 1) having the financial (natural) resources pertinent to a particular arrangement; and 2) committing those resources to

specific performance criteria for that arrangement (Agrawal et al., 2011; REDD+ Partnership, 2013).

The emerging field surrounding the REDD+ Partnership provides a unique context within which to examine the drivers of institutional entrepreneurship for sustainable development for several reasons. First, the data provides the opportunity to both quantitatively examine the emergence of institutional entrepreneurship, and build the scholarly field of entrepreneurship through the generation of empirical findings. This is because the compilation of REDD+ financing data represents one of the few existent cross-country datasets on activity that matches institutional entrepreneurship favoring sustainable development, as all REDD+ activities have an explicit goal of simultaneously addressing economic, environmental, and social concerns. Moreover, national and sub-national actors agreeing to a particular REDD+ arrangement make an explicit commitment to development in favor of a green economy. In other words, parties to REDD+ arrangements explicitly acknowledge that there are limits to the use of the natural environment, and actively seek to transform the importance of evaluating the true social and environmental costs of economic development (Sukhdev et al., 2011).

Second, because REDD+ arrangements have an explicit timeframe within which the activities of each are confined, institutional actors can be said to have enacted with time as evidenced by the mapping of activities across time (Ancona et al., 2001). The REDD+ Partnership therefore provides for a research context where the effect of long-term orientation should be relatively salient on the emergence of institutional entrepreneurship for sustainable development from amongst institutional actors. Previous studies have also cited similar reasons in support of novel research contexts (cf. Madsen & Desai, 2010: 459).

Further, while scholars have researched temporality with respect to institutions and institutional change, and institutional entrepreneurship (cf. Lawrence et al., 2001), regarding entrepreneurship for sustainable development these studies have been mainly conceptual or qualitative in nature. Quantitative studies on the temporality of institutions offers both opportunities for validation of theoretical postulations, and greater generalizability. Additionally, the salience of long-term orientation within the REDD+ context aside, actors' simultaneous embeddedness in local geographic communities as well as broader global environments influences the likelihood that they will act as institutional entrepreneurs.

Data & Sample

The sample used in this study consists of cross-country data obtained from several sources. To obtain the dependent variable(s), I used the Voluntary REDD+ Database (VRD) which provides information on REDD+ financing, actions and results that have been reported to the REDD+ Partnership. The VRD aims to improve effectiveness, efficiency, transparency and coordination of REDD+ initiatives; and to support efforts to identify and analyze gaps and overlaps in REDD+ financing (REDD+ Partnership, 2013). For the independent variables, I used the Global Entrepreneurship Monitor (GEM) dataset, which provides comparable national entrepreneurship indicators and measures (Reynolds et al., 2005). To obtain country and control variables, I used the World Bank's World Development Indicators (WDI), which provides cross-country measures of relevant economic indicators; and the Heritage Foundation's Index of Economic Freedom, which provides country level data on institutions.

Data from both the GEM and World Bank databases have been extensively used in studies examining entrepreneurship (e.g. Anokhin & Schulze, 2009; De Clercq, Lim, & Oh, 2013; Estrin, Mickiewicz, & Stephan, 2013). The Heritage Foundation's Index of Economic Freedom has also been used in entrepreneurship studies to provide valid measures of the institutional environment (e.g. Aidis et al., 2012; Estrin, Korosteleva, & Mickiewicz, 2013). The VRD dataset utilized has yet to be applied in entrepreneurship studies, and, thus provides a unique opportunity to understand institutional entrepreneurship that promotes sustainable development. To build the dataset I followed several steps as outlined below.

First, I collected REDD+ Partnership data from the VRD, which is based on reports from funders and recipients of REDD+ finance. All data submitted to the database on behalf of a country or institution is always submitted and formally approved by a designated VRD country or institution focal point, before it is publicly viewable on the database (REDD+ Partnership, 2013). In its entirety, the dataset is comprised of a total of 1685 REDD+ arrangement reports based on reports from 73% of the REDD+ Partnership countries.

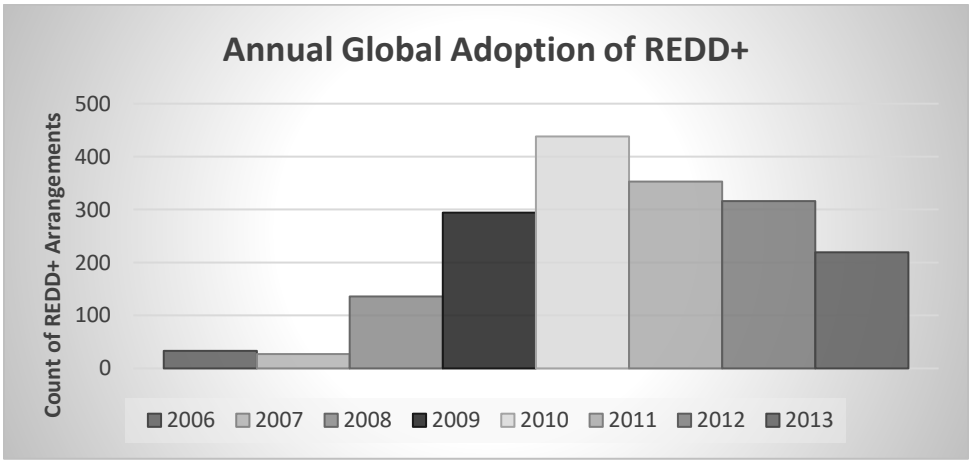
Second, I collected data from the GEM National Expert Survey. The GEM National Expert Survey (NES) is a standard yet important aspect of the GEM framework. The NES essentially captures Entrepreneurial Framework Conditions – i.e. conditions which enhance (or hinder) new business creation (Kelley, Singer, & Herrington, 2012). The NES is based on an annual survey of 36 experts in each participating country, which is subsequently harmonized to ensure comparability across countries. Each framework condition is constructed using a block of six five-point Likert scale items meant to assess different aspects of each condition. Importantly, entrepreneurial framework conditions measured by the NES suit the purposes of this study as they are described as accounting for

the different rules of the game that directly affect entrepreneurial activity's inputs and outputs (GEM).

Third, I collected data from the Global Leadership & Organizational Behavior Effectiveness project (GLOBE) (House et al., 2004). The GLOBE study facilitates a deeper understanding of how culture and leadership vary by national culture. It provides different measures of societal culture that been employed in a number of management studies (see: Smith, 2006).

Finally, I collected data from the World Bank Group's Development and Governance Indicators, Heritage Foundation, and Yale's Environmental Performance Index for all countries for the period 2000-2015. I then merged these datasets once the dependent variable was constructed from the original VRD data for 134 countries listed on the REDD+ website. I assume that each country in being exposed to the REDD+ framework has an opportunity to become an explicit funder or recipient should an enterprising entity within the national government pursue this opportunity. I use the beginning year for each arrangement as the frame of reference, which meant that construction of the dependent variable restricted the period of analysis to 2006-2015.

Figure 3.2: Global REDD+ Adoptions



Dependent Variable

REDD+ Adoption. The dependent variable tracks whether or not a country enacted REDD+ arrangements in a given year. This variable was constructed by coding for the annual count of REDD+ arrangements adopted by nations. Countries reporting REDD+ arrangements can do so in a capacity of either a funder or recipient (but not both for the same arrangement), or a beneficiary (REDD+, 2015). In coding the data, I considered countries identified as either a funder, recipient, or beneficiary to a particular REDD+ arrangement countries as having enacted REDD+. Enactment of REDD+ means that countries have undertaken some activities, or have demonstrable institutional changes and evidenced impacts supportive of promoting low-carbon development (Sukhdev et al., 2011). As an example, consider the REDD+ arrangement *Norway's Contribution to the Forest Investment Program*. This arrangement, beginning in 2010, is reported by Norway (who is also the funder), and is with the Forest Investment Program (the recipient). There are also eight beneficiary countries to this arrangement - Brazil, Burkina Faso, Democratic Republic of the Congo, Ghana, Indonesia, Lao People's Democratic Republic, Mexico, and Peru. In coding this particular arrangement, Norway was marked as adopting REDD+ as a funder, while the remaining countries were each marked as having adopted REDD+ as beneficiaries. For this particular arrangement, the recipient, Forest Investment Program, is not coded since it is an organization and not a country. I coded each arrangement in this way and used the sum of each category – i.e. funder, recipient, and beneficiary – for each year as the measure for countries' REDD+ adoption. Thus, if a country were marked once as a funder, recipient, and beneficiary in a given year the dependent variable would show that country as having enacted REDD+ three times for that year.

Independent Variables

Regulatory Context. I measure countries regulatory context using the Government Policy Framework Condition provided by the GEM NES. This measure provides an assessment of the extent to which public policies support entrepreneurship. I use the sum of the Government Policy Framework Condition's two main components (summarized in table 1). A larger number indicates a stronger and more developed regulatory context towards entrepreneurship.

Normative Context. I measure countries normative context using the Cultural and Social Norms framework condition from the GEM NES. This measure captures the extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income. A larger number indicates a stronger normative context towards entrepreneurship.

Cognitive Context. I measure countries cognitive context using the Government Entrepreneurship Programs framework condition provided by the GEM NES. This composite measure captures the presence and quality of programs directly assisting entrepreneurship at all levels of government. A larger number is a proxy for a stronger cognitive context towards entrepreneurship.

Measures of the institutional context based on the GEM NES measures have been found to be positively related to other measures of countries' regulatory, normative, and cognitive institutional context (see: Stenholm et al., 2013). In addition, the GEM NES measures, in being based on expert judgments of national conditions, captures variations in the actions of institutional actors. This is because the experts interviewed as part of the survey may in and of themselves be institutional actors – e.g. a local policy maker or

member of a development agency. Altogether, use of the GEM-NES (cf. Yousafzai, Saeed, & Muffatto, 2015) and GLOBE (cf. Gupta, Hanges, & Dorfman, 2002) data to obtain relevant measures of countries' institutional and cultural environments is suitable for the purpose of this research.

Long-term Orientation. I measure countries' long-term orientation using the *Future Orientation* measure provided by the GLOBE Culture and Leadership Study 2004 (GLOBE, 2016, House et al., 2004). This measure captures the extent to which individuals engage in future oriented actions such as planning, investing in the future, and delaying gratification. I factor analyze the two future orientation measures – values and practices – provided by GLOBE and use the predicted value for the analyses.

Control Variables

I also include controls variables for additional factors likely to influence institutional entrepreneurship for sustainable development at the national level – i.e. whether a country adopts REDD+. The first, *gross domestic product per capita (GDP per capita),* accounts for the economic context of and the level of economic development for countries (Van Stel & Carree, 2010). Developed countries can be expected to have more financial, and other, resources readily available and at their disposal to engage in REDD+ financing arrangements as opposed to less developed nations. Thus, I include a *developed country* dummy variable that identifies developed countries based on World Bank classifications – i.e. countries classified as high-income based on gross national income per capita. I also include the Index of *Economic Freedom* to account for any stable aspect of the institutional environment not captured by the regulatory, normative, and cognitive institutional context variables used.

Countries with higher rates of depletion for critical resources such as rainforest and minerals can be expected to have a greater interest in adopting REDD+ as opposed to countries with lower resource depletion. Hence, I include a control for *natural resource depletion*. Energy efficiency and conservation serve as integral aspects of REDD+. Thus, countries that face large or looming energy demands can be expected to seek out solutions in REDD+ projects. Similarly, I controlled for *electricity production* as energy may also represent a significant factor in the adoption of REDD+.

Population effects are also expected to influence countries' adoption of REDD+ as a growing population can place a burden on natural resources (George, Schillebeeckx, & Liak, 2015). Accordingly, I include three controls to account for possible effects of countries' populations. Specifically, I control for both *urban* and *rural population growth.* These measures account for the year over year rate of growth for countries' urban and rural populations respectively. Essentially, national actors presiding over urban and rural constituencies will be more aware of the resource requirement needs of their growing populations. As such, the adoption of REDD+ becomes a favorable option as it provides a means of safeguarding resources for the growing populations.

To account for geographic effects I include two additional controls. The first, *land area under cereal production*, measures the total harvested land area (in hectares) for each country because countries with a larger area of arable land face a larger risk from climate change. REDD+ adoption would thus serve as a means to reduce that risk. The second, *landlocked*, is a dummy variable for if a country is almost or entirely surrounded by land. The landlocked dummy variable is included since countries confined in this manner face greater challenges to acquire resources for their development. The representatives of such

countries may thus be more opened to REDD+ adoption given the resources that can be obtained.

Another control variable included is *environmental performance* – measured using Yale's Environmental Performance Index. Countries with a low score regarding environmental performance run the risk of chastisement from the global community. This is primarily due to the increased transparency and accountability imposed by supranational actors (Wijen, Zoeteman, Pieters, & Van Seters, 2012: p. 17) regarding sustainable development. Accordingly, I expect that low performing countries are more likely to favor adoption of REDD+ since it would serve as a positive signal to the global community of their commitment to the natural environment. To account for any experience a country has in REDD+ adoption I also include the control *REDD growth*. This variable is measured using the year over year rate of growth in global REDD+ adoptions for each country. In addition to these controls, I also include dummy variables to account for the *region* to which each country belongs.

Variable definitions and data sources are summarized in Table 3.0 in Appendix B.

Analysis

To test the hypotheses I estimate several event history models - using Cox proportional hazard regressions (see: Allison, 1984). Cox proportional hazard regressions are used to estimate the probability of an event occurring given the values of the independent variables (Allison, 1984; Blosfeld, Golsch, & Rohwer, 2012). It is therefore an appropriate approach for describing how the likelihood of enacting REDD+ (the event in this case) varies in response to the other covariates of interest. The use of Cox proportional hazards model was also deemed appropriate since it better controls for any bias from

right-censoring of the data as opposed to ordinary least squares regressions (Moss, Neubaum, & Meyskens, 2015). Right censoring is a possibility since countries could have enacted REDD+ after the final year of the data used in this study (2015). Event history models such as the Cox regressions have been utilized in numerous instances in the entrepreneurship and management literature (see: Bird & Wennberg, 2016; Gimeno, Hoskisson, Beal, & Wan, 2005; Iyer & Miller, 2008).

Table 3.1: Multicollinearity Tests

	REDD+ Adoption
VARIABLES	**VIF**
Regulatory Context	3.27
Normative Context	2.04
Cognitive Context	3.64
Long-term Orientation	2.41
GDP per capita (log)	7.36
Natural Resource Use	2.49
Electricity Production (log)	1.57
Population Growth	1.84
Index of Economic Freedom	3.97
Environmental Performance Index	6.91
Land Area for Cereal (log)	1.61
Landlocked	1.87
Previous REDD+ Adoptions	1.14
Developed Country	2.48
Mean VIF for model	*3.04*
Condition index statistic for model	*8.27*

Note: VIF = Variance inflation factors.

The data are set up such that every year in which a country enacts REDD+ is a spell. The 134 country-year event histories yielded 1206 spells. Note that successful enactment of REDD+ within a given year does not lead to exclusion of that country for subsequent years in the regression. This is because the enactment of REDD+ by a country in one year should not preclude them from enacting it in a subsequent year. In general, for survival

analysis the subject (i.e. country) would be removed after the event occurs. However, to account for the repeated nature of the events in the analysis I follow the suggestions of Allison (1984) and Blosfeld, Golsch, & Rohwer (2007), and specify exit time as the final year of the analysis so that countries are still included in the analysis risk pool after an event.

Before testing the hypotheses, the following steps were taken. First, given that the variables REDD+ adoption, GDP per capita, natural resource depletion, electricity production, and land area under cereal production were skewed, I used the natural log for each. Second, I standardized independent and control variables to reduce the potential for multicollinearity between the main and interaction effects (Stephan et al., 2015); and better illustrate the interaction effects graphically (cf. Dawson, 2014; Hox, 2010) Third, I checked the variance inflation factors (VIF) of the full model (i.e. main and interaction effects) for the presence of multicollinearity (Wooldridge, 2012). As shown in Table 3.1 the VIFs for the specified variables were all less than 10. Additionally, I also checked the condition index statistic for each of the models. The condition index statistic serves as another means to assess models for the presence of multicollinearity (cf. Stephan et al., 2015). Also shown in Table 3.1, the condition index statistic was well below the limit of 30 (7.98). Together these results suggest that multicollinearity may not pose a threat to the analyses (Hair, Anderson, Tatham, & Black, 1998). Fourth, following Mossholder, Settoon, & Henagan (2005), I verify that the proportional-hazards assumption is not violated by checking the Schoenfeld residuals after fitting separate models of each independent variable. The results based on Stata's 'estat phtest' estimation command suggest that this assumption may be violated for the control variables GDP per capita, environmental

performance, and total previous adoptions. As suggested by Allison (1984) such violations can be expected in discrete samples such the cross-country dataset used in this study. I do account, however, for any violation of the proportionality assumption stratifying the data by the Region of country. Additionally, to account for any tied events within a given year, I specify that the Efron method (see: Kapoor & Lee, 2013) be used to handle ties. According to Cleves, Gould, and Gutierrez (2008) the Efron method is computationally more intensive than the Breslow method but performs a more accurate approximation.

Table 3.2: Variable Comparison by Countries' Level of Development

Variables	Developing N=167	Developed N=159	Difference
REDD+ Adoption	0.51	0.49	0.02
Regulatory Context	4.92	5.69	-0.77***
Normative Context	3.09	2.99	0.1
Cognitive Context	2.56	3.09	-0.53***
Long-term Orientation	-0.26	0.32	-0.58***
GDP per capita	7253.81	43923.04	-36669.23***
Natural Resource Use	7.25	0.51	6.74***
Electricity Production	8.84	2.87	5.97***
Population Growth	1.28	0.49	0.79***
Index of Economic Freedom	57.14	71.6	-14.46***
Environmental Performance Index	50.25	73.9	-23.65***
Land Area for Cereal (million hectares)	17.72	6.12	11.60***
Landlocked	0.14	0.14	-0.01
Previous REDD+ Adoptions	3.75	5.99	-2.24*

Note: Developing Countries-Argentina (8); Bolivia (8); Brazil (9); China (9); Colombia (8); Costa Rica (6); Ecuador (8); El Salvador (4); Georgia (2); Guatemala (7); India (9); Indonesia (3); Iran (8); Kazakhstan (9); Malaysia (7); Mexico (8); Morocco (1); Namibia (4); Philippines (3); Russian (9); South Africa (8); Thailand (5); Turkey (9); Venezuela (9); Zambia (6). **Developed Countries-** Australia (5); Austria(9); Canada(3); Czech Republic (5); Denmark (9); Finland (9); France (6); Germany (8); Greece (9); Ireland (9); Italy (9); Japan (6); Korea (8); Netherlands (7); Portugal (6); Slovenia (9); Spain (9); Sweden (6); Switzerland (9); United Kingdom (9); United States (9)

Following the preliminary tests above, I test for the main effects (hypotheses 1 and 2) in separate models that include the control variables, long-term orientation, and one of

the institutional context variables. Note that as an additional precaution, I test the hypotheses with models excluding the developed country dummy variable. This is due to it being highly correlated with and captured by the variable GDP per capita. To test for the interaction effects (Hypotheses 3a-c) I add an interaction term to each of the respective models. To establish the goodness of fit for each model I report the log-likelihood and Akaike information criterion (AIC) – where a higher number for the former and a lower for the latter indicates a better-fitted model.

RESULTS

Table 3.2 provides a comparison of several variables between the developed and developing countries in the sample. I also perform a simple t-test of the means for each sample in order to allow for better comparison between the groups. As the figures show, REDD+ adoption, on average, is higher amongst the developing countries in the sample – though the difference is not significant. Table 3.2 also shows that developed countries, on average, have better institutional contexts, long-term orientation, GDP per capita, and environmental performance, and previous REDD+ adoptions in comparison to the developing countries in the sample. Developing countries in the sample do exhibit significantly higher levels of resource depletion, electricity production from oil sources, population growth, and land area under cereal production.

Table 3.3 outlines the summary statistics and correlation matrix for the main variables. The highest correlations of concern were between GDP per capita, environmental performance, and the developed country dummy variable – which ranged from |0.65| – |0.88|. Concerning the hypotheses, Table 3.4 summarizes the results of the regression analyses. Specifically, Model 1 contains the control variables only and serves as

the baseline against which I compare subsequent models. Models 2-5 are the main effect models and are used to assess hypotheses 1 and 2. Models 6-8 represent the full (i.e. interaction) models and include an interaction term between the institutional context variables and future orientation. Tables 3.5-3.8 (Appendix B) contain the results from the robustness tests to the main results.

Hypothesis 1a states that there exists a positive relationship between a regulatory context favoring entrepreneurship and institutional entrepreneurship for sustainable development. Based on the results in Table 3.4 I find support for this hypothesis. The direct effect for regulatory institutional context, as shown in Model 2, is positive and significant ($\beta = 0.56$, $p < 0.01$).

Hypothesis 1b states that there will be a positive relationship between a normative context favoring entrepreneurship and institutional entrepreneurship for sustainable development. The results in Table 3.4, do not provide support for this hypothesis as the coefficient for countries normative institutional context is negative and not significant ($\beta = -0.19$, *n.s.*) as shown in Model 3.

Hypothesis 1c states that a cognitive institutional context favoring entrepreneurship will be positively related to institutional entrepreneurship for sustainable development. Again, the results of Table 3.4 (Model 4) do not provide support for the hypothesis. As shown, the coefficient for cognitive context is positive but not significant ($\beta = 0.19$, *n.s.*).

Hypothesis 2 states that countries' degree of long-term orientation will be positively related to institutional entrepreneurship for sustainable development, and was supported. As Table 3.4 (Model 5) demonstrates, long-term orientation is significantly positive in relation to REDD+ adoption ($\beta = 0.33$, $p < 0.01$).

Table 3.3: Variable & Correlation Matrix

Variables	Mean	S.D.	1	2	3	4	5	6	7
1.REDD+ Adoption	4.84	11.88							
2.Regulatory Context	5.30	1.47	-0.07						
3.Normative Context	3.04	0.80	-0.05	0.74					
4.Cognitive Context	2.82	0.76	-0.02	0.88	0.71				
5.Long-term Orientation	0.02	0.52	0.02	0.38	0.08	0.38			
6.GDP per capita (log)	9.64	1.10	0.10	0.27	0.01	0.39	0.54		
7.Natural Resource Use	-0.10	2.20	-0.08	-0.25	0.02	-0.30	-0.37	-0.52	
8.Electricity Production (log)	5.93	8.73	0.02	-0.28	-0.02	-0.19	-0.49	-0.21	0.19
9.Population Growth	0.89	0.72	-0.08	-0.12	0.13	-0.19	-0.26	-0.51	0.42
10.Index of Economic Freedom	64.19	10.61	0.14	0.43	0.18	0.49	0.65	0.67	-0.58
11.Environmental Performance Index	61.78	13.67	0.07	0.22	-0.11	0.34	0.52	0.88	-0.52
12.Land Area for Cereal (log)	14.80	1.84	0.17	-0.07	0.17	-0.11	-0.15	-0.25	0.25
13.Landlocked	0.14	0.35	-0.11	0.02	-0.07	0.06	0.27	-0.05	0.29
14.Previous REDD+ Adoptions	4.84	11.88	1.00	-0.07	-0.05	-0.02	0.02	0.10	-0.08
15.Developed Country	0.49	0.50	0.09	0.26	-0.06	0.35	0.56	0.87	-0.64

Variables	8	9	10	11	12	13	14	15
9.Population Growth	0.10							
10.Index of Economic Freedom	-0.38	-0.23						
11.Environmental Performance Index	-0.20	-0.45	0.64					
12.Land Area for Cereal (log)	0.08	0.03	-0.26	-0.44				
13.Landlocked	-0.32	0.22	0.07	0.08	-0.17			
14.Previous REDD+ Adoptions	0.02	-0.08	0.14	0.07	0.17	-0.11		
15.Developed Country	-0.25	-0.55	0.68	0.87	-0.30	0.01	0.09	

*Note: N=326. Correlations above |0.14|significant at p=0.05.

Table 3.4: Results for Cox Model of REDD+ Adoption

	Hazard of REDD+ Adoption							
VARIABLES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
GDP per capita	-0.69*	-0.75*	-0.61*	-0.77**	-0.87**	-1.11**	-0.83**	-0.98***
	(0.30)	(0.33)	(0.29)	(0.29)	(0.32)	(0.35)	(0.30)	(0.28)
Natural Resource Use	0.02	-0.03	0.11	-0.00	0.02	0.03	0.14	-0.03
	(0.25)	(0.23)	(0.29)	(0.25)	(0.22)	(0.19)	(0.24)	(0.19)
Electricity Production	-0.17	-0.09	-0.19	-0.16	-0.11	-0.09	-0.12	-0.16
	(0.16)	(0.14)	(0.17)	(0.16)	(0.14)	(0.12)	(0.15)	(0.13)
Population Growth	0.15	0.14	0.19	0.15	0.20	0.17	0.16	0.21
	(0.16)	(0.15)	(0.16)	(0.15)	(0.15)	(0.14)	(0.17)	(0.15)
Index of Economic Freedom	0.36**	0.20	0.40**	0.30+	0.25*	0.24*	0.32**	0.26*
	(0.14)	(0.13)	(0.13)	(0.15)	(0.11)	(0.12)	(0.11)	(0.12)
Environmental Protection Index	0.72*	0.81*	0.64*	0.77*	0.68*	0.84*	0.58*	0.72*
	(0.32)	(0.32)	(0.29)	(0.31)	(0.32)	(0.33)	(0.29)	(0.32)
Land Area for Cereal	0.35+	0.43*	0.36+	0.36+	0.34+	0.46*	0.36+	0.39*
	(0.20)	(0.19)	(0.20)	(0.19)	(0.18)	(0.19)	(0.19)	(0.19)
Landlocked	-0.47	-0.52	-0.50	-0.51	-0.76*	-0.84*	-0.78*	-0.86*
	(0.37)	(0.40)	(0.38)	(0.40)	(0.38)	(0.36)	(0.31)	(0.35)
Previous REDD+ Adoptions	0.13*	0.11*	0.12*	0.12*	0.16**	0.15**	0.15*	0.16**
	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)
Regulatory Context		0.56**				0.37+		
		(0.19)				(0.20)		
Normative Context			-0.19				-0.26	
			(0.24)				(0.23)	
Cognitive Context				0.19				0.11
				(0.16)				(0.16)
Long-term Orientation					0.33**	0.31**	0.48***	0.34**
					(0.13)	(0.10)	(0.13)	(0.11)
Regulatory Context X Long-term Orientation						0.30*		
						(0.13)		
Normative Context X Long-term Orientation							0.33	
							(0.21)	
Cognitive Context X Long-term Orientation								0.27**
								(0.10)
Observations	280	280	280	280	280	280	280	280
Region	YES	YES	YES	YES	YES	YES	YES	YES
Log-likelihood	-225.89	-222.57	-225.68	-225.47	-223.59	-219.65	-222.33	-221.94
Chi-square	64.66	83.47	76.67	81.25	84.77	130.69	78.06	149.73
AIC	469.78	465.15	471.36	470.93	467.18	463.95	468.67	467.87

Note: Robust standard errors in parentheses. Significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Hypothesis 3 states that countries' long-term orientation will positively moderate the effect of a) regulatory, b) normative, and c) cognitive contexts favoring entrepreneurship on institutional entrepreneurship for sustainable development. Table 3.4 provides support for two of the three hypotheses. Specifically, the coefficients for the interactions between long-term orientation and regulatory ($\beta = 0.30$, $p < 0.05$), and cognitive ($\beta = 0.27$, $p < 0.01$) contexts are each positive and significant – supporting hypotheses 3a, and 3c respectively. The results do not provide support for hypothesis 3b regarding the interaction of long-term orientation and normative contexts ($\beta = 0.33$, *n.s.*). Figure 3.3 provides a graphical representation of interaction effects obtained from the analyses – with 95% confidence intervals.

Log-likelihood and AIC statistics are used to assess each model's fit to the data. A higher number for the former and a lower number for the latter statistics is indicative of a better-fitted model. According to the fit statistics in Table 3.4, the main effect models (2 and 5) provide a better fit over the control only model (1). In addition, the interaction models (6 and 8) provide a better fit over both the controls only, and main effect models.

Robustness Checks

In addition to the main analysis reported above, I also conduct several supplemental analyses to assess the robustness of the results. First, I factor analyze the regulatory, normative, and cognitive context variables to construct a single measure of countries' institutional context for entrepreneurship. The principal-factor solution with orthogonal varimax rotation showed that all of the variables used loaded onto a single factor. Factor 1 had an eigenvalue of 2.89 and explained roughly 99% of the variance observed. Each of the institutional context variables had high factor loadings - regulatory (.99), normative (.96),

and cognitive (.99). Models 9 and 10 in Table 3.5 presents the results from this analysis. As shown, the coefficient for institutional context is positive and significant in the main effect model ($\beta = 0.45$, $p < 0.05$). As shown in Model 10 the coefficient of the interaction term between institutional context and long-term orientation is also positive and significant ($\beta = 0.34$, $p < 0.01$).

Second, I test the direct and moderation effect of research and development (R&D) expenses. Countries with a long-term oriented cultural context are likely to be engaged in more research and development activities compared to more short-term oriented nations. As prior studies suggest, greater investment in research and development is an indication of a greater long-term orientation since these investments do not typically yield payoffs immediately (Chrisman, Fang, Kotlar, & DeMassis, 2015; Chrisman & Patel, 2012; Chrisman, Sharma, Steier, & Chua, 2013). Consequently, greater spending on research and development is indicative a greater long-term orientation amongst national actors. Preliminary analysis served to confirm this assumption as the Research and Development measure correlated positively with Hofstede's country measure for long-term orientation ($\rho = .449$, $p < .01$). As shown in models 11-14 in Table 3.5 the hypothesized effects for hypotheses 2 ($\beta = 0.52$, $p < 0.05$); 3a ($\beta = 0.42$, $p < 0.05$); 3b ($\beta = 0.37$, $p < 0.05$); 3c ($\beta = 0.36$, $p < 0.01$) remain robust to these specifications. The results of model 15, which features the interaction of R&D and the factor-analyzed institutional context variable, also provide support for the moderation effect of long-term orientation ($\beta = 0.46$, $p < 0.01$).

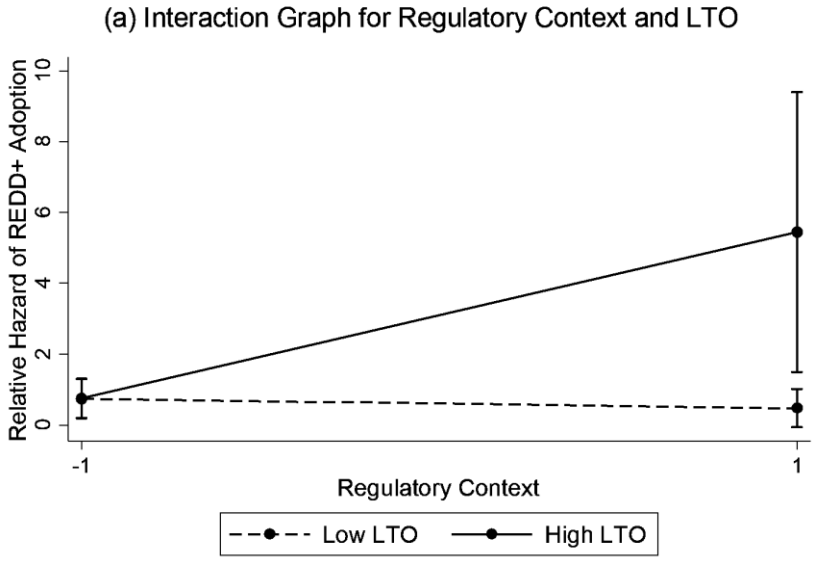
Third, I re-run models from the main analyses and previous robustness tests where the dependent variable is based on countries adopting REDD+ arrangements that are expected to provide '*Social and Environmental Benefits'* specifically. Tables 3.6 and 3.7,

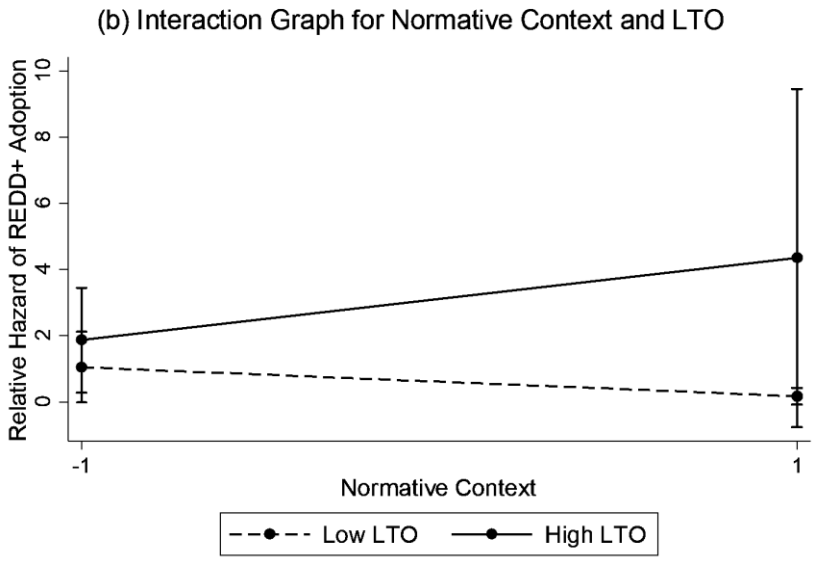
respectively, present the results from these regressions, which favor significantly the direct and indirect influence of long-term orientation on institutional entrepreneurship for sustainable development.

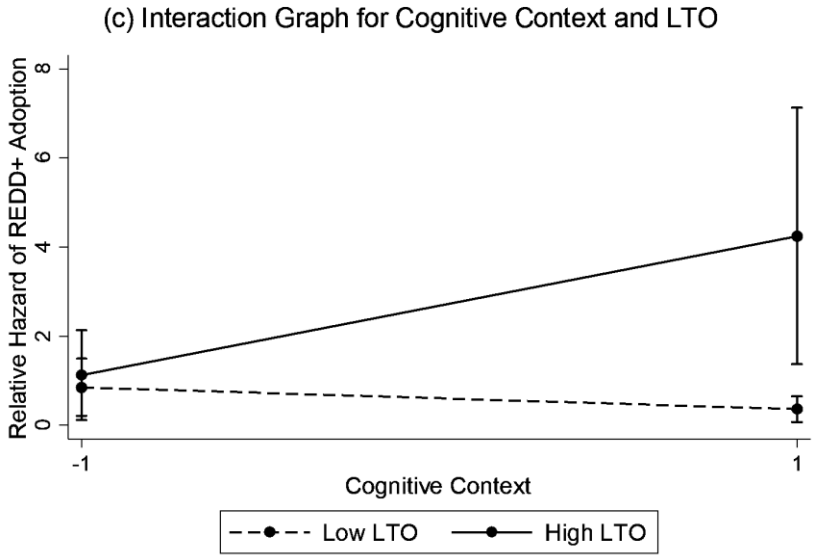
Fourth, I split the samples between developed and developing economies using current classifications provided by the World Bank. Table 3.8 presents the results from these regressions, where although not as strong as previous models, there is still evidenced support in favor of the moderating effect of long-term oriented culture on institutional entrepreneurship for sustainable development.

The results from these additional models also provide support for the direct and moderating effect of long-term orientation on institutional entrepreneurship for sustainable development (hypotheses 2, and 3a-3c) identified in the main analyses.

Figure 3.3: Interaction Graphs of Countries' Institutional Context for Entrepreneurship and Long-term orientation on REDD+ adoption.







DISCUSSION AND CONCLUSION

This study investigates the interrelationships among regulatory, normative, cognitive contexts favoring entrepreneurship, long-term oriented national culture, and institutional entrepreneurship for sustainable development. The findings show that regulatory contexts when favoring entrepreneurship can influence national actors to engage in institutional entrepreneurship for sustainable development in the form of

adoption of REDD+. The results also show that countries' national culture when favoring a long-term orientation both encourages institutional entrepreneurship for sustainable development, and moderates the effect of regulatory, normative, and cognitive contexts on the same.

The absence of significant effects for normative and cognitive contexts favoring entrepreneurship suggests that countries seeking to encourage institutional change in favor of sustainable development would be well served in placing emphasis on development of the regulatory institutions that encourage innovation and risk-taking. This, it appears, fosters a regulatory context favorable to entrepreneurship, and thereby institutional entrepreneurship for sustainable development. Countries should also seek to cultivate national cultures that maintain an orientation towards the future as these both directly and indirectly encourages institutional entrepreneurship for sustainable development. This is particularly the case for developed countries, where as demonstrated through a post-hoc analysis, long-term oriented culture appears to have a more pronounced effect (see Table 3.9).

The findings of this study compliment previous research highlighting the relationship between institutions and entrepreneurship. Herein, however, I deepen and extend understandings of this relationship by demonstrating that actors at the national level themselves can be influenced to create or change institutions given regulatory, normative, and cognitive contexts favoring entrepreneurship. I confirm the conjecture of scholars such as (Dorado & Ventresca, 2013) who posit that institutional factors themselves can influence actors in their decisions regarding engagement in institutional entrepreneurship. In addition, this study compliments research on institutional work

(Zietsma & Lawrence, 2010). In particular I confirm that context-specific norms regarding time do play a role in the establishment of new- or the changing of existing institutions (e.g. Granqvist & Gustafsson, 2016). In contrast to previous studies (e.g. Estrin et al., 2013; Stenholm et al., 2013; Youfsazi, Saeed, & Muffatto, 2015), the result of this study suggest that entrepreneurial activity, at least at the national level, may not be influenced directly by normative and regulatory contexts favoring entrepreneurship. In other words, it does not matter for institutional entrepreneurship that national contexts view entrepreneurship as acceptable, or that cognitive scripts exist regarding entrepreneurial behavior.

Contributions

The findings of this study contribute to extant literature in the following ways. First, similar to Stephan et al. (2015), this study provides support for the configurations perspective of institutional theory. Specifically, the findings regarding the moderation effect of countries' degree of long-term orientation on regulatory and cognitive contexts favoring entrepreneurship adds to the limited number of entrepreneurship studies that address the interaction of formal and informal institutions (Bruton et al., 2010; Jones, Coviello, & Tang, 2011). Second, the support found for the direct effect of regulatory contexts favoring entrepreneurship on national actors' adoption of REDD+ supports the position that variance in institutional environments can affect entrepreneurial activity within a country. Third, the findings regarding the effect of countries' degree of long-term orientation indicate that actors' relation to time does matter for institutional entrepreneurship. The results thus provide some empirical support for prior studies that have emphasized the importance of temporal perspective with respect to institutional entrepreneurship (e.g. Buhr, 2012; Granqvist & Gustafsson, 2016).

This study also adds to the limited number of quantitative studies of national level institutional entrepreneurship – especially as it relates to sustainable development. Prior studies on institutional entrepreneurship for sustainable development have been mainly qualitative in nature (e.g. Child, Lu, & Tsai, 2007; Henfridsson & Yoo, 2014; Lawrence & Phillips, 2004; Prasad, Prasad, & Baker, 2016; Wright & Zammuto, 2013). While these studies do provide noteworthy contributions, they are less generalizable when compared to quantitative studies. The results herein are more generalizable, but also provide a basis of comparison for future empirical analyses of institutional entrepreneurship for sustainable development.

In addition, this study contributes to entrepreneurship literature by responding to calls for greater examination of entrepreneurship in relation to climate change (Howard-Grenville, et al., 2014). As the results suggest institutional actors are more likely to mobilize efforts to combat climate change when subjected to institutional regulatory, normative, and cognitive institutional contexts that favor entrepreneurship. This, I maintain, underscores the importance of the national context for entrepreneurial activity addressing climate change. In particular, institutional actors by participating in the creation of regulatory, normative, and cognitive institutions for entrepreneurship are themselves better able to address the complexity inherent to sustainable development opportunities (Dorado & Ventresca, 2013).

Implications

One of the hurdles to the adoption of sustainability-oriented innovations lies in the wicked and complex nature of sustainable development issues (Dorado & Ventresca, 2013). As the findings of this study suggest, an important factor in explaining the emergence of

institutional entrepreneurship amongst national actors could be the presence of regulations favoring entrepreneurship. Stenholm et al. (2013) suggest, through their findings, that policy-makers keen on increasing rates of entrepreneurial activity focus on establishing supportive regulative institutional arrangements. I find that such environments may have the dual effect of influencing both individual- and national level actors. In essence, national actors, who themselves create regulatory contexts that encourage entrepreneurship amongst their constituents may themselves be influenced to act entrepreneurially as they have more regulatory frameworks to help reduce uncertainty regarding sustainable development issues.

Sustainability and sustainable development contain an inherent temporal element, and within organizational studies, these concepts bring to the foreground the tension of balancing short-term and long-term needs (Bansal & Desjardine, 2014; Bansal & Knox-Haynes, 2013; Slawinski & Bansal, 2015). Thus, another implication of this research is its illustration of the impact of a long-term oriented culture on institutional entrepreneurship. As extant research suggests, actors' inclination for entrepreneurship can vary depending on the characteristics of national culture (Mueller & Thomas, 2000). National level actors seeking to encourage institutional change in favor of sustainable development should therefore focus on fostering cultures that are more open to addressing the issues regarding the future. This, for example, could be pursued with workshops centered on future-oriented actions such as planning or saving.

Directions for Future Work and Conclusion

While this research did provide insight into institutional entrepreneurship, it is also subject to some limitations. I outline these along with some avenues for future research

below. First, although unique, the use of REDD+ data may limit the generalizability of our results to sustainability-oriented organizational fields. As the characteristics, and therefore influence, of organizational fields can vary, one possible area for future research is an examination of how regulatory, normative, and cognitive contexts favoring entrepreneurship impact institutional entrepreneurship in other fields. Further insight may be gleaned in comparing the results of such research to this study.

Second, given limitations in the completeness of data submitted to the United Nations regarding REDD+ project implementation, I was unable to examine the effectiveness of specific REDD+ policies or projects within and across countries. Although engagement with REDD+ is already a step in the right direction for most countries, the effectiveness of REDD+ policies implemented is likely to vary given local factors and conditions. Another area for future research could thus be an examination of specific REDD+ policies and projects. Future research could also examine whether and to what extent countries engage in decoupling of REDD+ - i.e. adopt REDD+ in 'word' and not 'deed'.

In addition to the areas mentioned above, future research can examine other cross-country factors that may affect institutional entrepreneurship for sustainable development. These factors include, for example, individual regulatory, normative, and cognitive institutions such as specific laws/regulations or attitudes towards entrepreneurship. The institutional or geographic distance between funder and recipient countries may also be another factor that influences the decision to engage in institutional entrepreneurship. Moreover, other national factors such as individualist vs. collectivistic cultures represent another promising area for future research.

In totality, this study demonstrates that regulatory contexts favorable to entrepreneurship drive institutional entrepreneurship for sustainable development amongst national actors. It also shows the effect of regulatory contexts, in addition to normative and cognitive contexts, favoring entrepreneurship will be contingent on countries' degree of long-term orientation. Collectively, the study's findings suggest the need to explore, further, factors associated with institutional entrepreneurship at the national level – particularly as it pertains to sustainable development – and to determine the outcomes of the associated institutional changes.

CHAPTER 4: ENTREPRENEURSHIP IN THE ANTHROPOCENE: HOW NATIONAL RESPONSES TO CLIMATE CHANGE AND CORRUPTION AFFECT NEW VENTURE CREATION

INTRODUCTION

Following Hurricane Katrina in 2005, individual, organizational, and political actors in Louisiana were required to make adjustments in their behaviors regarding both current vulnerabilities to disasters like Katrina, and future disasters, tied to climate change (Feldman, 2005). Similarly, following Superstorm Sandy in 2010 actors at all levels were again required to make adjustments in their behaviors regarding their vulnerability to and readiness to face climate change risks (Force, 2013). In another case, this time in Haiti, actors also adjusted to a climate change related disaster both in an attempt to reduce their current vulnerabilities and reduce future risks they faced (Williams & Shepherd, 2016). The adjustments made by actors in each of the cases above all represent some form of *climate change adaptation* (Nelson, Adger, & Brown, 2007). Climate change adaptation, as described by scholars and practitioners, represents one the most important challenges faced by society today (George et al., 2016; Howard-Grenville, et al, 2014). This is because climate change adaptation has the potential to guarantee a sustained, flourishing life for human beings on this planet (Ferraro, Etzion, & Gehman, 2015).

With the increasing relevance of climate change, the concept of climate change adaptation has received notable attention from management and entrepreneurship scholars alike (for a review see: Linnenluecke, Griffiths, & Winn, 2013). Climate change adaptation broadly refers to decision-making process and the set of actions undertaken to maintain capacity to deal with current or future predicted change in climatic stimuli

(Linnenluecke et al., 2013; McLaughlin, 2011). Through climate change adaptation research management scholars, for instance, have garnered a better understanding of how firms and organizations increase both their and the surrounding communities' resilience (McKnight & Linnenluecke, 2016); or how new organizational forms emerge in response to climate related stimuli (e.g. Wittneben, Okereke, Banerjee, & Levy, 2012). Entrepreneurship scholars, on the other hand, have also advanced knowledge regarding climate change adaptation. This is especially as it relates to how and why individual and institutional actors or social movements choose to exploit identified opportunities for sustainable development – such as addressing climate change (Dorado & Ventresca, 2013; Thompson, Kiefer, & York, 2010). In sum, literature on climate change adaptation within the management and entrepreneurship fields has fostered better understandings of two basic forms of climate change adaptation – namely *planned* and *autonomous* adaptation. A problem, however, is that extant adaptation literature within the management and entrepreneurship literature has seldom examined the interaction between these two types of climate change adaptation. In addition, extant management and entrepreneurship studies of climate change adaptation are mainly preoccupied with the question: "does it pay to be green?" (Ferraro et al., 2015; Shepherd & Patzelt, 2017; Wittneben et al., 2012). As a result, current literature paints an incomplete picture regarding climate change adaptation and its resultant outcomes – especially those outcomes that are not finance or performance related (c.f. Shepherd, 2015; Shepherd & Patzelt, 2017).

Addressing the above research gap is important as the absence of empirical evidence regarding climate change adaptation both hinders the development of management and organizational theory, and prevents the identification of appropriate

policy responses regarding climate change (Howard-Grenville et al., 2014). Thus, the purpose of the present study is to fill this gap by examining two related questions. First, to what extent, if any, does planned and autonomous climate change adaptation, and the interaction of the two, affect entrepreneurship in the form of individual new venture creation? Second, what is the role of countries' level of corruption in the climate change adaptation-new venture creation relationship? In essence, I attempt to determine whether planned and autonomous climate change adaptation, through their effects on environmental uncertainty, significantly affect new venture creation – both individually and jointly. Also, because of inherent ties between climate change and influential stakeholders in the political economy (Giddens, 2009), I seek to determine whether corruption, which also affects environmental uncertainty, is relevant to the climate change adaptation-entrepreneurship debate.

I answer the above questions through an integration of institutional theory and institutional economics perspectives of institutional entrepreneurship. Integrating these perspectives was favored since the former, mainly concerned with the process of institutional entrepreneurship, offers little insight regarding the actual outcomes – as in the case of the latter (Pacheco, York, Dean, & Sarasvathy, 2010). Subsequent to the theoretical development, I generate empirical evidence based on multi-level and cross-country analysis of a sustainability-oriented organizational field. The findings of this analysis confirm that 1) both planned and autonomous adaptation and their interaction relate positively to individual new venture creation; and 2) that countries' level of corruption does play a significant role in these relationships.

Through the findings, this study contributes to extant entrepreneurship literature in several ways. First, it makes strides towards an integration of institutional theory and institutional economics perspectives regarding institutional entrepreneurship. Specifically, we provide a better understanding of the individual benefits associated with institutional entrepreneurship that favor sustainable development (Pacheco et al., 2010); and how informal institutions (i.e. corruption) can affect the outcomes of institutional entrepreneurship (Misangyi, Weaver, & Elms, 2008). Second, it complements previous institutional entrepreneurship studies by providing additional quantitative evidence regarding the ability of political and public policy action to influence individual engagement in entrepreneurship (e.g. Sine & David, 2003). Where qualitative research has been the default methodology for institutional entrepreneurship research (cf. Pacheco et al., 2010), this study provides generalizable empirical findings across many countries. Additionally, this study addresses concerns for greater multilevel theorizing in entrepreneurship research in general (Davidsson & Wiklund, 2001; Zahra, Wright, & Abdelgawad, 2014), and for the advancement of sustainable entrepreneurship research through quantitative methods in particular (Schaefer, Corner, & Kearins, 2015; Thompson et al., 2011). Third, and more broadly, this study answers recent calls for greater examinations of the relationship between entrepreneurship and climate change (Howard-Grenville et al., 2014; George, Schillebeeckx, & Liak, 2015).

THEORY AND HYPOTHESES

An Institutional Entrepreneurship Perspective of Climate Change Adaptation

Climate change refers to variations brought about in the Earth's atmosphere due to the presence and concentration of greenhouse gases such as carbon dioxide and methane

(Howard-Grenville et al., 2014). *Climate change adaptation* can thus be defined as adjustments in ecological, social or economic systems in response to observed or expected changes in climatic stimuli and their effects and impacts in order to alleviate adverse impacts of change or take advantage of new opportunities (Adger, Arnell, & Tompkins, 2005; cf. (IPCC 2001: 982). Climate change adaptation must occur in something (i.e. who or what adapts? – countries in this case) and is meant to stabilize greenhouse gas concentrations at levels that reduce the adverse effects on societal health and well-being (Smit et al., 2000).

Climate change adaptation can take many forms. According to literature, different *types* (i.e. how adaptation occurs) can be identified depending on the overall attributes of interest. Common distinctions used include, for instance, purposefulness, timing, and temporal or spatial scope (Smit & Pilifisova, 2003). Within this paper, I specifically look at climate change adaptation in terms of purposefulness. With respect to this differentiating attribute, climate change adaptation can be either *planned* or *autonomous* in nature (Smit & Pilifisova, 2003). Planned adaptations to climate change are purposeful or intentional means of addressing climatic stimuli (e.g. new pollution abatement or carbon tax policies). In comparison, autonomous adaptation to climate change represents more spontaneous and reactive responses to climate change – usually occurring after initial impacts are manifest (Smit & Pilifisova, 2003). Autonomous adaptation, notably, takes place without the intervention of a public or government agency (e.g. changes in energy practices or insurance premiums).

Climate change adaptation – whether planned or autonomous - results in new means for improving the adaptive capacity of actors or systems with respect to adverse

environmental events. *Adaptive capacity* refers to the potential or ability of an actor or system to adjust to the effects of climate change (Nelson et al., 2007). Individuals, organizations, and nations can have specific adaptive capacities for well-understood challenges, or generic adaptive capacities for dealing with a wide range of uncertainty. An actor or system's adaptive capacity, for the purposes of this study, includes resources such as time, money, technology, knowledge and skills, information, social and institutional support (Grothmann & Patt, 2005; Haddad, 2005).

If beneficial to an actor or systems' adaptive capacity, new means of addressing climate change can spread from one actor or system to another (cf. Etzion, Gehman, Ferraro, & Avidan, 2015). For instance, an effective environmental policy in response to climate change from one region/country may be subsequently adopted throughout various other regions/countries. In addition, one firms' successful response(s) to adverse weather events and stimuli, may be copied (or institutionalized) by their competitors and partners. In this sense, climate change adaptation can be likened to *institutional entrepreneurship*. Defined, institutional entrepreneurship refers to the process whereby actors leverage resources to create or transform institutions (Battliana, Leca, & Boxenbaum, 2009; Garud, Hardy, & Maguire, 2007; Lawrence & Phillips, 2004). In the case of climate change adaptation, it is institutionalized processes and practices regarding how actors and systems respond to adverse climate events (e.g. type of warning system used) that are created or transformed.

Conceptualizing climate change adaptation as institutional entrepreneurship allows for application of two commonly used perspectives in theorizing. The first, institutional theory has mainly been used by scholars to examine determinants and processes of

institutional entrepreneurship (see: Bruton, Ahlstrom, & Li, 2010). As the institutional theory perspective suggests, change agents within a country can recognize the obsolescence of beliefs and practices regarding environmental sustainability. Subsequent to this recognition, the change agents can design new processes and practices for responding to changing climate conditions, and engage in strategies to foster greater adoption of these practices and beliefs. Though appropriate for theorizing about determinants and processes of institutional entrepreneurship, the institutional theory perspective does not suffice for hypothesizing about the actual outcomes. Hence, in line with suggestions by Pacheco et al. (2010), I complement the institutional theory arguments with the institutional economics perspective of institutional entrepreneurship.

The institutional economics perspective of institutional entrepreneurship focuses attention on the intended and/or unintended consequences of institutionalization (e.g. Mair & Marti, 2006; Wright & Zamuto, 2013). Essentially, using the institutional economics perspective, enables elaboration on how climate change adaptation (both planned and autonomous), and corruption affect countries' adaptive capacity. The crux of the argument being that new processes and practices for handling climatic stimuli – i.e. climate change adaptation – serve to increase actors' adaptive capacity; whereas, *corruption* – the use of public office for private benefit – reduces said capacity. Improvement in actors' adaptive capacity enables adjustments to environmental changes and implementation adaptation decisions given an increased willingness to transform capacity into action (Nelson et al., 2007). In other words, it is assumed that increased (reduced) adaptive capacity regarding climate change translates to less (greater) perceived environmental uncertainty as actors consider themselves better (worse) able to handle future events. As perceived uncertainty

regarding future events and the availability of resources influences entrepreneurial activity (Minniti & Levesque, 2008, York & Venkataraman, 2010), both climate change adaptation and corruption should therefore relate significantly to individual new venture creation.

In the following sections, I build on current institutional entrepreneurship, corruption, and new venture creation literatures to theorize about how planned and autonomous climate change adaptation, and corruption, affect actors' adaptive capacity, thereby influencing the willingness to engage in new venture creation.

Planned Climate Change Adaptation and New Venture Creation

Planned adaptation to climate change refers to deliberate actions or policy decisions on behalf of a public agency meant to reduce the impacts of adverse environmental events. Planned adaptation is based on institutional actors' awareness of: 1) current or impending changes; and 2) that action is required to minimize losses or benefit that result from climate change (Smit & Pilifosova, 2003). Planned climate change is pursued insofar as countries perceive that net positive benefits will stem from such actions (Stavins, 1997). Prior research suggests that planned climate change adaptation can increase actors' adaptive capacity by facilitating collaborations, which encourage realization of projects to address climate change (Woolthius et al., 2013). Collaboration essentially enhances adaptive capacity through the forging of new relations around climate change, which allow for the pooling of scarce resources, task specialization, and the development of trust between actors (Thompson, Herrmann, & Hekkert, 2015).

Planned climate change adaptation also increases actors' adaptive capacity by providing basic frames of reference, which can be used to identify and remove maladaptive policies and practices regarding the natural environment (Burton, 1996; Pielke, 1998). For

instance, consider farmers who possess no previous knowledge regarding risks they face from flooding because of climate change. The adaptive capacity of these same farmers is likely to benefit positively from climate change related training programs by the state aimed at sensitizing citizens to the flooding risks and possible solutions. In support of this point, Dhanda & Hartman (2011) found that some voluntary carbon policies provided individual stakeholders with access to consulting services as well as other resources related to addressing climate change. Further, planned adaptations can serve to benefit adaptive capacity by mitigating the effects of uncooperative behavior in the face of collective action problems such as climate change (Pacheco, Dean, & Payne, 2010).

The complexity of climate change is such that it presents individuals and firms with severe uncertainty in terms of how to best cope with its effects (Dorado & Ventresca, 2013; York & Venkataraman, 2010). Successful responses to climate change effects made through planned adaptation, by improving adaptive capacity, contribute to reducing this uncertainty (Ferraro et al., 2015). Given that reduced environmental uncertainty provides individuals with more confidence in starting a new venture since they are more willing to forego the safety of working within an established firm (Baumol, 1990). Planned adaptation, I contend, thus serves to encourage individual new venture creation by improving actors' adaptive capacity, and providing a context within which individuals feel more confident in starting a new business despite experienced and potential effects of climate change. Altogether, I hypothesize that:

H1a: Planned climate change adaptation is positively related to the likelihood of individual new venture creation.

Autonomous Climate Change Adaptation and New Venture Creation

Autonomous adaptation to climate change refers to reactive responses by individual actors and organizations that occur after initial climate change effects, and without the intervention of public or governance agencies (Smit & Pilifosova, 2003). Autonomous climate change adaptation represents initiatives by private actors, rather than governments, which can be catalyzed by market or welfare changes that are in response to actual or anticipated climate change (Leary, 1999). Within the macro or national-level context, autonomous adaptation to climate change is the net result of individuals, organizations, and collectives adopting pro-environmental normative prescriptions – especially under conditions of uncertainty (DiMaggio & Powell, 1983).

Research suggests that individuals and organizations adapt to climate change by promoting pro-environmental behavior (Linnenluecke et al., 2013). For individuals, such behavior includes patronizing environmentally friendly products and services (Hockerts & Wustenhagen, 2010). Organizations and industries, on the other hand, adapt to climate change by altering their competences and processes in order to, 1) achieve better performance and efficiency from their use of natural resources; and, 2) reduce their negative impact on the environment (Wittneben et al., 2012). The collective effects of individual, firm, and industry adaptations to climate change helps to improve actors' adaptive capacity by establishing norms of pro-environmental behavior (Meek, Pacheco, & York, 2010; Pacheco et al., 2010). Scholars have, for example, highlighted the importance of self-regulatory norms regarding environmental performance and management in improving industry responsiveness to natural environment concerns (see: Barnett & King, 2008; King & Lenox, 2000).

Autonomous adaptations to climate change also improves actors' adaptive capacity through their cognitive abilities. Previous studies, for example, have shown that autonomous adaptations such as implementation and use of climate forecasts provide farmers with enough information to improve their harvests (cf. Grothmann & Patt, 2005). Similar to planned adaptation, enhancement of actors' adaptive capacity because of autonomous adaptation is expected to reduce their perceived environmental uncertainty. Moreover, because of this reduced uncertainty actors should be more willing to engage in actions such as new venture creation. Altogether, I hypothesize that:

H1b: Autonomous climate change adaptation is positively related to the likelihood of individual new venture creation.

The Effect of Autonomous and Planned Adaptation on New Venture Creation

Given the predicted positive effects of planned and autonomous adaptations to climate change on actors' adaptive capacity and therefore likelihood to engage in new venture creation, I further argue for the presence of a positive interactive effect. This is the case as planned and autonomous adaptations to climate change can be mutually reinforcing with respect to their effect on actors' adaptive capacity. When in sync, planned and autonomous adaptations can increase adaptive capacity by fostering greater cooperation between public and private actors with regards to addressing climate change (Ansari, Wijen, & Gray, 2013; Wijen & Ansari, 2007). In New York, public planners working to identify and implement effective climate change policies helped private stakeholders develop adaptation strategies in the process. As outlined by Yohe (2014), an important

outcome of these partnerships was the risk-management information regarding climate change that fed directly into subsequent iterations of the same process. This example demonstrates how the interaction of planned and autonomous adaptations can serve to generate information that actors' subsequently use to improve their adaptive capacity.

In addition to allowing for more cooperation between public and private entities, research suggests that the interaction of planned and autonomous climate change adaptation fosters societal acceptance of pro-environmental actions (Giddens, 2009). Such acceptance of pro-environmental actions ensures that resources for addressing climate change are equitably distributed throughout the community, nation, or region (Meek et al., 2010). Actors' adaptive capacity may also be improved in the presence of planned and autonomous adaptations as performance is enhanced within the respective organizational field as a whole. Research shows that in China the degree to which newly introduced environmental laws by government agencies were effective depended on the embeddedness of individual institutional actors (Child, Lu, & Tsai, 2007). Consider also, that autonomous adaptations, by individual and organizational actors, often serve as a baseline for the development and evaluation of planned adaptations (Stavins, 1997; Smit & Pilifosova, 2003). In this way, autonomous adaptations serves to enhance actors' adaptive capacity both at an individual and institutional level. Altogether, I hypothesize that:

H1c: The interaction between autonomous and planned climate change adaptation is positively related to the likelihood of individual new venture creation.

Corruption, Adaptation, and New Venture Creation

Corruption refers to the abuse of public power or authority for private benefit (Rodriguez, Siegel, Hillman, & Eden, 2006). Corruption, as an informal institution, is evidenced in traditions, customs, societal norms, shared mental models, unwritten codes of conduct, ideologies, and templates that have never been consciously designed but are still in everyone's interest to keep (Baumol, 1990; North, 1990). Corruption reflects a poor institutional environment within a country. As such, it can influence both how actors evaluate entrepreneurial opportunities and actors' ability to appropriate the returns accruing from enterprising activity (Acs, Autio, & Szerb, 2014).

Regarding entrepreneurship, corruption can reduce the availability of valuable resources required by individuals to engage in new venture creation (Anokhin & Schulze, 2008; Cuervo-Cazurra, 2006; Habib & Zurawicki, 2002). In addition, high levels of corruption can turn existing regulations into de facto unofficial taxes (Wunder, 2005, p.6). Such taxes place an undue burden on existing entrepreneurs, and can dissuade potential ones from committing to new venture creation. Consider also that countries with higher levels of corruption are likely to exhibit higher entry costs for potential entrepreneurs (Djankov et al., 2002; Klapper, Laeven, & Rajan, 2006).

Corruption can also increase ambiguousness and uncertainty surrounding climate change adaptation (Wijen, 2014). As stated by Soreide (2009), the extent of corruption indicates the probability of public officials actually engaging in fair and ethical actions. Considering, that actors engaged in climate change adaptation on behalf of a country are usually from the public sphere (Manning & Reineke, 2016). The presence of corruption would therefore represent a significant obstacle to their effective functioning. Moreover,

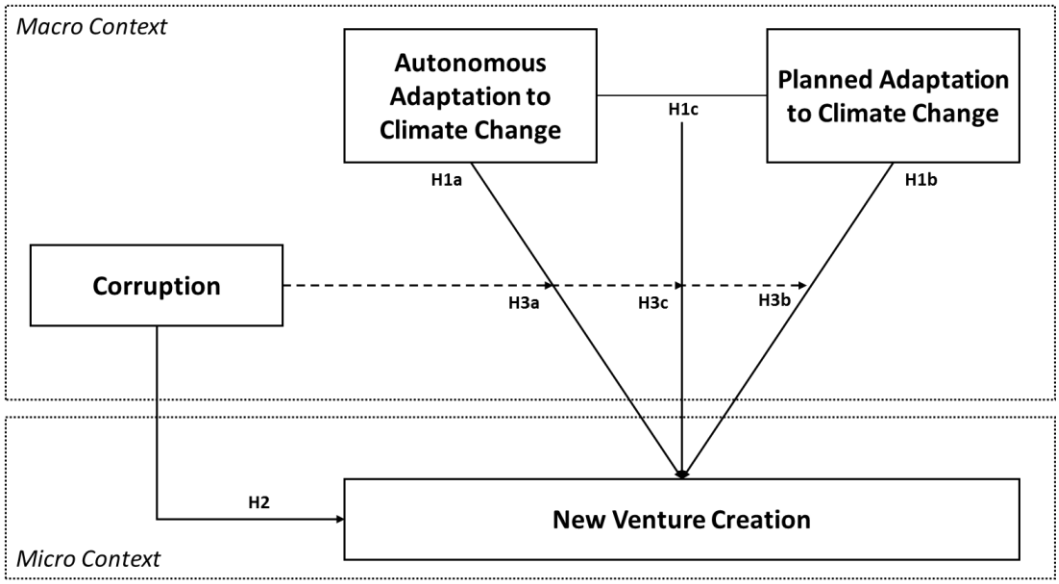
with a high level of corruption there is likely to be less credibility in the actions of public officials. This suggests that given high degrees of corruption, adaptations such as adoption of particular climate change policies may be merely symbolic in nature. This can be evidenced in some voluntary markets where actors misappropriate resources allocated for carbon-offset initiatives (Wijen & van Tulder, 2011).

Corruption can also affect actors' adaptive capacity negatively by encouraging unethical behavior amongst actors seeking to avoid environmental compliance. As costs associated with environmental management increase, actors are more likely to shirk in their responsibility to the environment (Sharfman & Fernando, 2008). Such avoidance of adaptation by actors, I contend, serves to perpetuate further environmental degradation, thereby reducing countries' overall ability to address climate change. Altogether, I hypothesize that:

H2: Corruption is negatively related to the likelihood of individual new venture creation.

H3: Corruption negatively moderates the effect of a) planned adaptation; b) autonomous adaptation; and c) their interaction, on the likelihood of individual new venture creation.

Figure 4.1: Empirical Model 2



METHODS

Research Context

I test the above hypotheses in the context of the global voluntary carbon-offset market – an emerging and sustainability-oriented field. Voluntary carbon-offset markets represent a type of Payment for Ecosystem Services (PES) mechanism where a service buyer buys a well-defined environmental service from a service provider (Benessaiah, 2012; Farley & Costanza, 2010; Wunder, 2005). Voluntary carbon mitigation approaches are regarded as a potent means of addressing global climate change as they incentivize the reduction of emissions associated with forest use; conservation and enhancement of forest carbon stocks; and the sustainable management of forests (REDD+ Partnership, 2013; 2015). Since 2008, there has been more than US $7.2 billion pledged for the support of emissions reductions programs related to forest use (Williams, 2013).

The global sector for climate change mitigation is suitable for the purposes of this research since it is associated with both planned and autonomous forms of climate change adaptation. In general, most of the actions regarding climate change, such as adoption of a voluntary policy, happen at the national or institutional level (Giddens, 2009). In addition, global climate change policy often builds upon and informs the actions of individual and organizational actors (Smit & Pilifosova, 2003). Additionally, global climate change policies and initiatives explicitly consider economic, environmental, and social concerns of livelihood attainment by individuals (Agrawal, Nepstad, & Chhatre, 2011). The context is therefore one in which the effects of climate change adaptation and corruption in relation to new venture creation should be salient.

Data and Sample

The data used in this study come from several sources. To obtain the independent variable for planned adaptation, I used data from the United Nation's Voluntary REDD+ Database (VRD). The VRD contains data regarding countries engagement in the Reducing Emissions from Deforestation and Degradation Program (REDD+). The database essentially provides information on REDD+ financing, actions, and results that have been reported to the REDD+ Partnership. It also aims to improve transparency around REDD+, support efforts to identify and analyze gaps and overlaps in REDD+ financing, and help share experiences on REDD+ (REDD+ Partnership, 2013).

For the independent variable measure of autonomous adaptation, I used data provided by the Notre Dame Global Adaptation Index (ND-GAIN). The ND-GAIN is a free, open-source index, which assess countries exposure to climate change along two dimensions – vulnerability and readiness. Vulnerability assesses countries' exposure,

sensitivity, and adaptive capacity to impacts of climate change, while readiness accounts for countries' ability to apply economic investments to economic, governance, and social components (Chen et al., 2015). The ND-GAIN data spans 192 countries from 1995 to present. Corporations, NGOs, governments, and development decision-makers use the ND-GAIN to make informed strategic operational and reputational decisions regarding supply chains, capital projects, policy changes and community engagements (Chen et al., 2015). The corruption variable was measured using data from the Heritage Foundation's Index of Economic Freedom. Additionally, for the individual-level dependent variable and several controls I used the Global Entrepreneurship Monitor Adult Population Survey (GEM APS) dataset. This dataset provides comparable national entrepreneurship indicators (Reynolds et al., 2005). Finally, to obtain country control variables, I used the World Bank's Development Indicators (WDI), which provides cross-country measures of relevant economic indicators.

Regarding these above sources, data from both the GEM APS and World Bank databases have been extensively used in studies examining entrepreneurship (e.g. Anokhin & Schulze, 2009; De Clercq, Lim, & Oh, 2013; Estrin, Mickiewicz, & Stephan, 2013). The Heritage Foundation's Index of Economic Freedom is used in entrepreneurship research to provide valid measures of the institutional environment (e.g. Aidis, Estrin & Mickiewicz, 2012; Estrin, Korosteleva, & Mickiewicz, 2013). The VRD dataset which I utilize has not yet, to my knowledge been used in entrepreneurship studies, and thus provides a unique opportunity to better understand sustainable-oriented entrepreneurship activity.

Dependent Variables

New Venture Creation. The dependent variable used in this study is *new venture creation*. New venture creation is defined as those individuals between ages 18-64 years who have taken action towards creating a business in the past year, and expect to own a share of said business, which must not have paid any wages or salaries for more than three months (Reynolds et al., 2005; Kelley et al., 2016). I measure new venture creation using individual-level data provided by the GEM APS. The APS is based on a comprehensive questionnaire, administered to a minimum of 2000 adults in each GEM country, and designed to collect detailed information on the entrepreneurial activity, attitudes and aspirations of respondents (Kelley et al., 2016). The data captures both entrepreneurs and non-entrepreneurs as it draws from the entire working-age population in each participating country (Aidis et al., 2012).

Independent Variables

REDD+ Adoption. I measure planned adaptation using the annual count of REDD+ arrangements enacted by nations – whether as funder, recipient, or beneficiary. Each arrangement in the VRD dataset indicates the funder, recipient, and beneficiary countries that are party to that agreement; and the beginning and end years of the arrangement. A country may be listed as either a funder (i.e. provides funding for REDD+ objectives as part of the arrangement), recipient (i.e. receives and manages distribution of funds), or beneficiary (i.e. receives access to funds to complete stated objectives) to a REDD+ arrangement. However, a country cannot be listed as more than one for the *same* arrangement – i.e. for example, the United States cannot be the funder of 'arrangement A', and still directly 'benefit' or 'receive' funds from 'arrangement A'. I coded a country as

having adopted REDD+ if it was indicated as one of either a funder, recipient, or beneficiary to an arrangement for a particular year.

Climate Change Adaptability. I measure autonomous adaptation using the *climate change adaptability* measure provided by the Notre Dame Global Adaptation Index (ND-GAIN). This ND-GAIN measure quantifies countries' vulnerability to sustainable development challenges in relation to their readiness to address said challenges (Chen et al., 2015). The ND-GAIN measure was deemed suitable for this study since it is captures the sum of individual and organizational responses to climate change effects at a national level. This represents one of the first time, to my knowledge, that the ND-GAIN index has been applied in an entrepreneurship study.

Corruption. The third independent variable, *corruption*, is measured using a sub-index from the Index of Economic Freedom. Specifically, I use Freedom from Corruption which captures the extent of countries perceived level of corruption (i.e. misuse of public power for private benefit) based on expert opinions and surveys. The original Freedom from Corruption measure gives a lower score to countries with higher levels of corruption. Thus for this study I reverse code the measure such that higher scores are indicative of more corruption.

Control Variables.

Following prior studies (Estrin et al., 2013; Horisch, Kollat, & Brieger, 2016; Stephan et al., 2013), I include several control variables – both at the individual and country-levels – to account for factors other than institutional entrepreneurship for sustainable development that can impact individuals' likelihood of new venture creation. Regarding individual-level direct effects, I control for *tertiary education*. Prior research shows that

persons with higher educational attainment are more likely to direct their efforts towards new venture creation (Koellinger, Minniti, & Schade, 2007). In addition, I control for *age* and *age squared* – both of which has also been shown to influence the likelihood of individuals' entrepreneurial activities (Levesque & Minniti, 2006; Stephan et al., 2013). Gender has also been shown to influence new venture creation (Langowitz & Minniti, 2007). Thus, I include a dummy variable for *gender*. Following Estrin et al. (2013), I also include controls for potential entrepreneurial experience of individuals. Specifically, I control for individual experience being a *business angel*, or experience owning another *established business*; and if they personally *know other entrepreneurs*.

Regarding country-level effects, entrepreneurship is shown to be systematically and consistently related to Gross Domestic Product (GDP) per capita, unemployment, income tax, and annual inflation (Arin et al., 2014). Thus, I include controls for each. G*ross domestic product per capita (GDP per capita)* accounts for the economic context of and the level of economic development for countries (Van Stel & Carree, 2010). U*nemployment*, accounts for country labor effects and has been found to influence entrepreneurial activity (Evans & Leighton, 1990; Thurik et al., 2008). *Income tax* is used to account for overall regulatory environment regarding entrepreneurship; and i*nflation* accounts for the riskiness of countries' business environment (c.f.: Parker, 2009). Prior empirical studies have shown inflation rates, and their volatility, to influence small business employment negatively (e.g. Robbins, Pantuosco, Parker, & Fuller, 2000). In addition, I follow Estrin et al. (2013) and include controls for 1) countries' prevalence *rate of new venture creation*; and 2) the country means for the individual-level control variables. Finally, I also control for each *year*. The variable definitions and data sources are summarized in Table 4.1 (Appendix C).

Analysis

I test the hypotheses of this study using a series of multilevel logistic regression models. This approach is suitable given that the binary nature of the dependent variable (Wooldridge, 2015). All models are estimated using the Stata's 'xtmelogit' command, and utilize the laplacian approximation. As suggested by Stephan et al. (2013), the multilevel approach used is advantageous for the following reasons. First, it reduces the potential for Type 1 errors that can occur if the hierarchical nature of the data is ignored. Second, it presents a more favorable option to aggregating the data to the country level since this carries the risk for aggregation bias – the generalization of individual-level constructs to the country-level. Third, multilevel analysis allows for the clustering, or the non-independence of individual level observations within the same country. To provide evidence of such clustering, I follow Stephan et al. (2013) and determine the Type 1 intra-class correlations (ICC) (c.f.: Hox, Mooerbeek, & van de Schoot, 2010). Specifically, I obtain the ICC for each of model used in hypothesis testing. The ICCs obtained were all within the range of 0.100 – 0.109 – indicating that roughly 10% of the total variance for individuals' likelihood of new venture creation resided at the country level.

Before testing the hypotheses, I standardized all independent variables. Similar to the Stephan et al. (2013) study, country level variables were standardized according to their country-level mean and standard deviation; while individual level variables were standardized according to their individual-level mean and standard deviation across the sample. Additionally, I check the variance inflation factor (VIF) and condition index statistic (CIS) for variables in order to test for multicollinearity. As shown in the left column of Table 4.2 the VIF for variables are well below 10 – with the exception of the *age* and *age*

squared, and the CIS is below 30 at 25.01. Given that the VIF for age and age-squared are greater than 10, I take a conservative approach and obtain VIFs and CISs for a models excluding the country prevalence rate for tertiary education, age, age squared, and gender in the effort to reduce any biased results due to multicollinearity. As shown in the right column of Table 4.2, although the VIF for age and age squared remain relatively similar, the mean VIF (4.11) and CIS (12.13) are both reduced by more than 50%. Thus, the main models used to test the hypotheses exclude the country prevalence rate for tertiary education, age, age squared, and gender.

I test for direct effects (Hypotheses 1a, 1b, and 2) in three separate models and simultaneously in one model – where all models also include the control variables. To test for the interaction effects (Hypotheses 1c, 3a, 3b, and 3c) each interaction term was assessed in a separate model. Note that all country level variables are lagged such that they are observed in time (t) while the dependent variable is observed in time (t+1). To establish goodness of fit, I report the log-likelihood and Akaike information criterion (AIC) for each model.

RESULTS

Table 4.3 provides a comparison of the main variables used in this study between developed and developing countries in the final sample. A simple t-test between the variable means across the samples are used to determine if the difference is significant. Both REDD+ adoption and climate change adaptability are higher for developed countries in the sample. Developed countries in the sample also have older and more tertiary-level educated entrepreneurs, in addition to higher GDP per capita, unemployment rate, and inflation. Conversely, the developing countries in the sample have, on average, higher rates

of corruption, new venture creation, and income tax. Additionally developing countries in the sample have higher rates of individuals: 1) with prior business experience; 2) that know an entrepreneur; and, 3) that were informal investors to another venture. Note that both developed and developing countries in the sample show a balance between male and female individuals engaged in entrepreneurial activity.

Table 4.3: Variable Comparison by Countries' Level of Development

Variables	Developing (N=131,323)	Developed (N=352,261)	Mean Difference
REDD+ Adoption	10.14	15.13	-4.99***
Climate Change Adaptability	53.35	71.96	-18.61***
Corruption Freedom	58.54	25.16	33.39***
New Venture Creation	0.19	0.05	0.14***
Tertiary Education	0.25	0.43	-0.19***
Age	37.63	44.36	-6.74***
Age squared	1597.66	2176.18	-578.52***
Gender	0.51	0.52	-0.00**
Business Angel	0.08	0.03	0.04***
Established Business Owner	0.25	0.14	0.11***
Knows an Entrepreneur	0.43	0.31	0.12***
Tertiary Education (country rate)	0.24	0.43	-0.19***
Age (country rate)	37.66	44.52	-6.86***
Age squared (country rate)	1601.22	2192.93	-591.70***
Gender (country rate)	0.51	0.52	-0.01***
Knows an Entrepreneur Rate	43.81	32.29	11.52***
Early-stage Entrepreneurial Activity Rate	18.04	6.2	11.84***
Established Business Ownership Rate	10.53	6.97	3.56***
Business Angel Investor Rate	7.86	3.27	4.59***
Gross Domestic Product per capita	8.66	10.56	-1.90***
Unemployment	7.78	11.08	-3.30***
Income Tax	4.96	2.01	2.94***
Inflation	38.02	54.12	-16.10***

***Note: Developing Countries –** Brazil; Chile; China; Colombia; Costa Rica; Dominican Republic; Guatemala; India; Iran; Jamaica; Malaysia; Pakistan; Peru; Thailand; Tunisia; Turkey; Uganda; Zambia. **Developed Countries –** Australia; Belgium; Chile; Denmark; Finland; France; Germany; Greece; Ireland; Italy; Japan; Netherlands; Norway; Portugal; Slovenia; south Korea; Spain; Sweden; Switzerland; United Kingdom; United States.

Table 4.4: Variable & Correlation Matrix (Individual Level)

Variables	Mean	S.D.	1	2	3	4	5	6	7
1.New Venture Creation	0.09	0.28							
2.Tertiary Education	0.38	0.49	0.00						
3.Age	42.53	14.50	-0.09	-0.01					
4.Age Squared	2019.08	1308.71	-0.10	-0.03	0.98				
5.Gender	0.52	0.50	-0.06	-0.02	0.03	0.03			
6.Business Angel	0.05	0.21	0.12	0.03	-0.02	-0.02	-0.05		
7.Established Business Owner	0.17	0.37	0.22	0.00	0.02	0.00	-0.11	0.10	
8.Knows an Entrepreneur	0.35	0.48	0.16	0.05	-0.15	-0.16	-0.10	0.15	0.16

***Note:** N=483,584. All correlations above |0.00| significant at p=0.05.

Table 4.5: Variable & Correlation Matrix (Country Level)

Variables	Mean	S.D.	1	2	3	4	5	6	7
1.REDD+ Adoption	13.78	21.05							
2.Climate Change Adaptability	66.90	10.19	0.08						
3. Corruption Freedom	34.22	19.15	0.00	-0.93					
4.Tertiary Education	0.38	0.14	0.29	0.59	-0.48				
5.Age	42.66	4.71	0.16	0.76	-0.74	0.40			
6.Age Squared	2032.24	454.22	0.15	0.71	-0.70	0.35	0.99		
7.Gender	0.52	0.04	-0.17	0.21	-0.26	-0.10	0.31	0.33	
8.Knows an Entrepreneur Rate	35.42	9.97	-0.23	-0.51	0.40	-0.46	-0.40	-0.35	-0.15
9.Early-stage Entrepreneurial Activity Rate	9.42	6.64	-0.01	-0.69	0.63	-0.44	-0.50	-0.42	0.10
10.Established Business Ownership Rate	7.94	4.26	-0.02	-0.43	0.44	-0.15	-0.31	-0.29	0.01
11.Business Angel Investor Rate	4.52	4.12	-0.04	-0.43	0.33	-0.22	-0.28	-0.22	-0.04
12.Gross Domestic Product per capita (log)	10.05	0.98	0.12	0.93	-0.87	0.58	0.73	0.67	0.14
13.Unemployment	10.18	6.15	0.26	-0.07	0.11	0.34	-0.06	-0.11	-0.24
14.Inflation	2.81	2.40	-0.26	-0.59	0.56	-0.45	-0.51	-0.45	-0.05
15.Income Tax	49.75	16.09	0.40	0.30	-0.24	0.43	0.37	0.34	-0.17
16.Developed Country	0.73	0.44	0.11	0.81	-0.78	0.58	0.65	0.58	0.09

Variables	8	9	10	11	12	13	14	15
9.Early-stage Entrepreneurial Activity Rate	0.52							
10.Established Business Ownership Rate	0.26	0.54						
11.Business Angel Investor Rate	0.59	0.69	0.33					
12.Gross Domestic Product per capita (log)	-0.59	-0.76	-0.45	-0.53				
13.Unemployment	-0.22	-0.26	-0.05	-0.11	0.09			
14.Inflation	0.39	0.46	0.32	0.31	-0.64	-0.15		
15.Income Tax	-0.38	-0.35	-0.13	-0.28	0.40	0.26	-0.22	
16.Developed Country	-0.51	-0.79	-0.37	-0.50	0.87	0.24	-0.55	0.45

***Note:** N=483,584. All correlations above |0.00| significant at p=0.05.

Tables 4.4 and 4.5 provides the summary statistics and correlations for the individual- and country-level variables respectively. For the individual-level variables the highest correlation was between age and age squared (0.99). For the country-level variables correlations greater than 0.70 were observed between GDP per capita and the developed country dummy, and several other variables. However, based on the VIF and condition index statistics calculated, and removal of highly correlated variables, I do not believe multicollinearity poses a major threat to the analyses.

With respect to the hypotheses, Table 4.6 (Models 1-5) provides the results for the main effects. Model 1 includes the controls only, while Models 2-4 test the effects of REDD+ adoption, climate change adaptability, and corruption respectively, and Model 5 test the effects on the individual variables simultaneously. In addition, Table 4.7 (Models 6-9) provides the results for the interaction effects. Models 6, 7, and 8 are used to assess the effect of the two-way interactions; and Model 9, the effect of three-way interaction between REDD+ adoption, climate change adaptability, and corruption.

Hypothesis 1a states that planned adaptation is positively related to individuals' likelihood of new venture creation. Model 2 of Table 4.6 shows a positive effect for REDD+ adoption ($\beta = 0.03$, $p < 0.001$), thus supporting hypothesis 1a.

Hypothesis 1b states that autonomous adaptation is positively related to individuals' likelihood of new venture creation. Model 3 of Table 4.6 provides support for this hypothesis as it shows a positive effect for climate change adaptability ($\beta = 0.10$, $p < 0.001$).

Table 4.6: Climate Change Adaptation & New Venture Creation

DV	New Venture Creation				
VARIABLES	**1**	**2**	**3**	**4**	**5**
Tertiary Education	0.06***	0.06***	0.06***	0.06***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.77***	0.77***	0.77***	0.77***	0.77***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Age Squared	-1.10***	-1.10***	-1.10***	-1.10***	-1.10***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Gender	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel	0.10***	0.10***	0.10***	0.10***	0.10***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Established Business Owner	0.44***	0.44***	0.44***	0.44***	0.44***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Knows an Entrepreneur	0.37***	0.37***	0.37***	0.37***	0.37***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur (Country)	0.01	0.01	0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Early-stage Entrepreneurship (Country)	0.04***	0.04***	0.03**	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Established Business Ownership (Country)	-0.03***	-0.02**	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel (Country)	0.04***	0.04***	0.03***	0.03***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gross Domestic Product per capita	-0.10***	-0.11***	-0.13***	-0.09***	-0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment	-0.17***	-0.16***	-0.17***	-0.18***	-0.16***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Inflation	0.03**	0.03***	0.03***	0.02*	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income Tax	-0.00**	-0.00**	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
REDD+ Adoption		0.03***			0.03***
		(0.01)			(0.01)
Climate Change Adaptability			0.09***		0.09***
			(0.01)		(0.01)
Corruption Freedom				0.04***	0.03***
				(0.01)	(0.01)
Constant (Individual)	-2.74***	-2.68***	-2.68***	-2.70***	-2.60***
	(0.11)	(0.12)	(0.12)	(0.11)	(0.12)
Constant (Country)	-0.38**	-0.37**	-0.37**	-0.38**	-0.36**
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,584	483,584	483,584	483,584
Number of Countries	38	38	38	38	38
Year Effects	YES	YES	YES	YES	YES
Log-likelihood	-117,728	-117,720	-117,687	-117,710	-117,666
AIC	235,499	235,485	235,420	235,466	235,382

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.7: Climate Change Adaptation & New Venture Creation

	DV	New Venture Creation		
VARIABLES	**6**	**7**	**8**	**9**
	ALL CONTROLS INCLUDED			
REDD+ Adoption	0.03***	0.02**	0.03***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)
Climate Change Adaptability	0.09***	0.09***	0.09***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)
Corruption Freedom	0.03***	0.03***	0.04***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)
REDD+ Adoption X Climate Change Adaptability	0.02+			0.00
	(0.01)			(0.01)
REDD+ Adoption X Corruption Freedom		0.03***		0.07***
		(0.01)		(0.01)
Climate Change Adaptability X Corruption Freedom			-0.00	-0.02*
			(0.01)	(0.01)
REDD+ Adoption X Climate Change Adaptability X Corruption Freedom				-0.06***
				(0.01)
Constant (Individual)	-2.62***	-2.62***	-2.60***	-2.66***
	(0.12)	(0.12)	(0.12)	(0.12)
Constant (Country)	-0.37**	-0.37**	-0.36**	-0.37**
	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,584	483,584	483,584
Number of Countries	38	38	38	38
Year Effects	YES	YES	YES	YES
Log-likelihood	-117,664	-117,660	-117,666	-117,629
AIC	235,381	235,373	235,384	235,315

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Hypothesis 1c states that the effect of planned adaptation on individuals' likelihood of new venture creation is stronger in the presence of autonomous adaptation. I find mild support for this hypothesis. As shown in Model 8 of Table 4.7, the interaction term between REDD+ adoption and climate change adaptability is positive, but weakly significant (β= 0.02, $p < 0.10$).

Hypothesis 2 states that corruption is negatively related to individuals' likelihood of new venture creation. Model 4 of Table 4.6 does not provide support for this hypothesis as the effect of corruption appears to be significantly positive ($\beta = 0.04$, $p < 0.001$).

Hypothesis 3a states that corruption will negatively moderate the effect of institutional entrepreneurship for sustainable development on individuals' likelihood of new venture creation. Model 7 of Table 4.7 shows that the interaction term for REDD+ adoption and corruption is significantly positive ($\beta = 0.03$, $p < 0.001$) and thus does not support the hypothesized effect.

Hypothesis 3b states that corruption will negatively moderate the effect of climate change adaptability on individuals' likelihood of new venture creation. Model 7 of Table 4.7 shows that the interaction term for climate change adaptability and corruption is negative ($\beta = 0.03$), but not significant. Note however, that the effect is negative in the Model 9 ($\beta = 0.02$, $p < 0.05$). Thus, I conclude that partial support was found for this hypothesized effect.

Finally, hypothesis 3c states that corruption will negatively moderate the effect of the interaction between planned and autonomous climate change adaptation on individuals' likelihood of new venture creation. As shown in Model 9 of Table 4.7, the three-way interaction between REDD+ adoption, climate change adaptability, and corruption is significantly negative ($\beta = -0.06$, $p < 0.001$). I therefore find support for this hypothesized effect.

With respect to the goodness of fit for the models, a higher log-likelihood and lower AIC is indicative of a better-fitted model. As the results show, each subsequent model provides a better fit of the data in comparison to the control only model (Model 1). This is

especially evident for Models 5 and 9 of Tables 4.6 and 4.7 respectively. Further, the Wald Chi2 statistics (not reported) are significant for all models at $p < 0.001$.

Additional Analyses

In addition to the main analyses reported in Tables 4.6 and 4.7, I also conduct several supplemental analyses to determine the robustness of the results. First, I test the hypothesized effects on models featuring alternative dependent variables, which capture necessity- and opportunity-based individual new venture creation. The former refers to individuals who engage in new venture creation for lack of better employment options; the latter captures individuals who are driven by an opportunity or want to increase (and not maintain) their income. Both measures were obtained from GEM APS data. Tables 4.8 through 4.11 present the results from these analyses. As shown, the results are qualitatively similar to the main findings. This was with the exception of the model featuring necessity-based new venture creation as the dependent variable where the sign is reversed for REDD+ adoption (see: Table 4.8).

Second, I assess models featuring an alternative measure of each individual variable. I use, 1) the total financial resources pledged by countries as part of REDD+ arrangements – i.e. REDD+ Resources in lieu of REDD+ adoption; 2) the ND-GAIN sub-index measure for countries' climate change readiness in lieu of climate change adaptability; and, 3) control of corruption from the World Bank's World Governance Indicators in lieu of Freedom from Corruption (reverse coded). Tables 4.12 and 4.13 present the results from these analyses, which also provide qualitative support to the main findings.

DISCUSSION AND CONCLUSION

The relationship between entrepreneurship and sustainable development issues such as climate change remains an emergent topic in entrepreneurship research. While scholars have advanced knowledge regarding the management and business implications of addressing climate change, limited generalizable evidence exists as it relates to entrepreneurship. This is especially the case for the creation of new ventures by individuals – which, in the context of sustainable development, represents an important mechanism for addressing climate change (Hoffman & Jennings, 2015). This study is thus one of the first to test empirically the effect of climate change adaptation on new venture creation.

The Impact of Climate Change Adaptation on Entrepreneurship

The findings of this study indicate that both planned and autonomous climate change adaptation do have an impact on individual engagement in new venture creation. In the case of the former, findings support existing theory regarding how acts of institutional entrepreneurship can positively affect the identification and exploitation of entrepreneurial opportunities by individuals (Sine & David, 2003). Similar to previous studies (Stephan et al., 2013), I include additional individual and country-level factors used to explain individual engagement in entrepreneurship. Thus, forms of planned climate change adaptation may be considered complementary to other factors in partially explaining acts of entrepreneurship.

Regarding autonomous adaptation, this research supports extant theory that environments characterized by more individual or organizational instances of pro-environmental behavior stimulates individual new venture creation (Meek et al., 2010).

The positive effect of climate change adaptability suggests that actors can gain confidence to pursue entrepreneurial ends from the reduced environmental uncertainty generated by autonomous adaptations amongst their individual and organizational peers. Consider, for example, social movement organizations and similar individual and organizational responses that emerge in response to climate change issues. These and related forms of autonomous adaptations can influence industry emergence and growth by engendering greater confidence in addressing uncertainty amongst actors (Pacheco, York, & Hargrave, 2014; c.f. York, Hargrave, & Pacheco, 2016). Thus, in line with such research, the findings of this study could be indicative of a micro-foundational effect regarding industry emergence and growth – especially within a sustainability-oriented context.

In addition, the findings of this study suggest that prioritization in terms of climate change action should be towards fostering greater autonomous adaptation strategies. According to the results in Table 4.6, there appears to be a larger effect from climate change adaptability in comparison to REDD+ adoption on individual new venture creation. Computed odds ratios of 1.09 and 1.03 respectively, and the results from the additional analyses (see: Table 4.12) also serving to confirm this suspicion. This is not to say that planned or 'top-down' approaches to climate change are not of relevance. Rather, there may indeed be a structured or timed approach to climate change adaptation (Bhur, 2012). In other words, planned climate change adaptation may foster greater individual benefits when they both inform current autonomous adaptations, as well as encourage future ones.

Accounting for Corruption

With respect to corruption, findings indicate that within the context of global climate policy, self-interested actions by institutional actors significantly influences

entrepreneurship outcomes associated with climate change adaptation. First, I found that there was a direct positive effect of countries level of corruption on the likelihood of individual new venture creation. Although not hypothesized, this finding was still in line with the 'greasing-the-wheel' hypothesis (Dreher & Gassebner, 2013). Given that some levels of corruption are required in order for new ventures to be created, it is understandable that the same might be required in order for planned or autonomous adaptations to take place.

Second, I also found evidence of a significant indirect effect of corruption. Specifically, countries' level of corruption was found to reduce the positive relationship between planned and autonomous climate change adaptation and new venture creation. This finding suggests that informal policies and practices (e.g. bribery for non-compliance) can limit the beneficial effects of planned and autonomous climate change adaptations. From a theoretical perspective, the negative moderation of countries' level of corruption supports calls for greater examination of the sociological outcomes associated with institutional entrepreneurial actions (Pacheco et al., 2010). In addition, it adds weight to contemporary claims by scholars and practitioners alike regarding the susceptibility of actors engaged in global climate action to corruption (Williams, 2013).

Limitations and Future Research

This research is subject to some limitations. Based on these limitations and the implications above, I also outline some potential areas for future research.

The main limitations of this study are with respect to the adaptation measures used, the outcome examined, and the research context. In the first case, despite being relevant for examining the effects of planned and autonomous climate change adaptation (on a national

scale) in relation to entrepreneurship, the measures did not provide for more nuanced analyses within adaptation distinctions. This is especially the case as it relates to the measure for autonomous adaptation which had it been more frim or industry specific could have provided added insight. There is thus potential for future research examining the effects of different types of planned and autonomous climate change adaptation respectively on entrepreneurship outcomes. Moreover, considering the greater positive influence of autonomous climate change adaptation found in this study, scholars may find promising research in identifying the underlying action(s) or process(es) driving this effect.

In the second case, the data did not allow for an examination of the actual financial or environmental performance of planned and autonomous adaptation to climate change. In addition, in comparison to studies that specifically examined the formation of environmental ventures (e.g. Meek et al, 2010) this study was confined to new venture creation in general. Thus, related to the opportunities above, future research within the entrepreneurship and wider management fields could take up the task of explicating the specific environmental and financial outcomes associated with climate change adaptation. The challenge however, lies in tying these sustainability-related phenomenon and contexts to relevant debates within academic circles.

Finally, although generalizable across countries and level, this study address only one approach toward understanding the complex relationship between climate change and entrepreneurship (Howard-Grenville et al., 2014). For instance, mitigation approaches like the REDD+ Partnership represent just one of several steps toward addressing climate change. Others include, for example, fossil fuel divestment or increased energy efficiency

targets, in addition to more social and economic approaches such as population and production targets (Edenhofer et al., 2014, pg. 477). The potential for future research therefore exists in examining how these individual carbon mitigation approaches are likely to affect, and be affected by, entrepreneurship.

Practical Implications

For entrepreneurs and managers the findings of this study provide some guidance as it relates to location decisions surrounding new ventures. Essentially, it may be in the best interest of aspiring entrepreneurs to locate in contexts known for pro-environmental activity, especially as it relates to the future availability of critical natural resources such as oceans or forests. For policy makers, the practical implication of this study lies in understanding the role that planned adaptations to climate change play in the effective functioning of autonomous adaptations.

Conclusion

While debates continue in global policy circles surrounding the reality of climate change, the costs of inaction continue to increase. Moreover, given the increased societal and business risks, it is important that we understand better how climate change, and the means used to address it, affect relevant management phenomena such as new venture creation. This study contributes to contribute to such an understanding by providing evidence of not only the significant influence of climate change adaptation, but also of corruption's role as a deterrent. It is hoped that through the empirical findings, this study will motivate others to join in the explaining what climate change means for management and entrepreneurship as a whole.

CHAPTER 5: DISSERTATION CONCLUSION

Closing Remarks

In this dissertation, I sought to enhance scholarly understanding of the relationship between entrepreneurship and the attainment of sustainable development. The essays that form the main body of work provide several holistic takeaways for Sustainability-Entrepreneurship Nexus scholarship. The first being that S-E Nexus scholarship stands to benefit immensely from advanced quantitative research efforts. Though intuitive to some, this notion has escaped other scholars operating within this research space as evidenced by the number of conceptual articles included in the literature review in comparison to empirical articles. In addition, evidence suggest that extant empirical entrepreneurship research efforts, though commendable, have thus far failed to address the complex research challenges (e.g. multi-level analyses) that understanding entrepreneurship for sustainable development requires.

The second holistic takeaway from this dissertation is that temporality is an integral part of sustainability-oriented entrepreneurship activity. This takeaway stems mainly from the results of the study featured in Chapter 3, where it was found that a long-term oriented culture was significantly related to engagement in institutional entrepreneurship for sustainable development. To date, few studies within the Sustainability-Entrepreneurship Nexus have explicitly addressed the enactment of time by actors. Thus, the evidence presented within this dissertation provides suitable justification for further inquiries into how temporality affects entrepreneurship for sustainable development. Consider, for instance, the following questions. How do sustainability-oriented entrepreneurship processes differ between actors with a predominantly short- vs. long-

term orientation? Also, given the inter-temporal tensions addressed engaging in entrepreneurship for sustainable development (Slawinski & Bansal, 2015), are sustainability-oriented actors more adept at addressing other paradoxes that shape management theory (e.g. exploration vs. exploitation)? Answers to these and other temporality driven questions, no doubt, hold implications for S-E Nexus research – especially when considering the time required to effectively address complex sustainable development issues.

The third holistic takeaway speaks to the positive benefits of climate change adaptation for entrepreneurship in general. As the findings discussed in Chapter 4 suggest, climate change adaptation amongst both institutional, and individual or organizational actors relate positively to entrepreneurship in the form of individual new venture creation. This was especially the case for autonomous climate change adaptation, which increased the likelihood of new venture creation greater in comparison to planned climate change adaptation. In addition, the effect of autonomous climate change adaptation on new venture creation did not appear contingent upon corruption – an arguable deterrent to climate change efforts. Accordingly, one can reason that 'bottom-up' climate change adaptation amongst individual and organizational actors should be encouraged over 'top-down' efforts by institutional actors. Such reasoning, however, hinges upon the provision of more evidence through scholarly and practical work regarding climate change adaptation.

Although these takeaways, discussed in a general manner, contribute to extant literature, it is important to note that the empirical analyses within this dissertation are confined to the global voluntary carbon-offset market, and a single sustainable development issue – i.e. climate change. This begs the question: For which other industries

and sustainable development issues might the findings and takeaways of this dissertation hold? Though many possibilities exist to explore the question posed above, consider the following examples. First, the study of entrepreneurship for sustainable development can extend to the management of other global ecosystems besides forests – e.g. coastal/freshwater resources, air quality, or agricultural land. Maintenance and/or enhancement of these ecosystem resources, like forests, requires complex and timely interactions amongst several actors (cf. Cohen & Winn, 2007). As such, similar findings regarding engagement in entrepreneurship for sustainable development and climate change adaptation can possibly be found from studies of the other ecosystem services. Second, this dissertation relates mostly to the thirteenth United Nations' Sustainable Development Goal of 'Climate Action.' Therefore, the other 16 Sustainable Development Goals should provide researchers with sufficient grounds to corroborate or update the findings presented within this dissertation.

Altogether, this dissertation justifies the Sustainability-Entrepreneurship Nexus as a valid field for research, demonstrates the relevance of accounting for temporality in S-E Nexus research, and suggest that autonomous climate change efforts may be more beneficial for entrepreneurship in comparison to planned efforts. I do hope that these contributions spur further research streams within the Sustainability-Entrepreneurship Nexus.

APPENDIX A: Additional Illustrations for Chapter 2

Table 2.5: Articles in Literature Review

Adendorff & Halkias 2014
Adeoti 2000
Agterbosch, Vermeulen & Glasbergen 2004
Al-Saleh & Mahroum 2014
Alvarez & Barney 2014
Alvord, Brown, & David 2004
Ameer & Othman 2012
Andersson, Shivarajan, & Blau 2005
Annibal, Liddle, & McElwee 2013
Archer & Jones-Christensesn 2011
Arena & Azzone 2012
Arnold 2015
Arnold & Hockerts 2011
Arroyo 2012
Ashby et al. 2009
Ault & Spicer 2014
Awang, Asghar, & Subari 2010
Aworemi, Abdul-Azeez, & Opoola 2010
Azmat & Samaratunge 2009
Ba et al. 2013
Barrios & Barrios 2004
Belkhir 2015
Belz & Binder 2015
Blundel, Monaghan, & Thomas 2013
Bocken 2015
Bohnsack, Pinkse, & Kolk 2014
Borland & Lindgreen 2013
Bos-Brouwers 2010
Brillo et al. 2015
Broto & Dewberry 2015
Cahn 2008
Cambra-Fierro & Ruiz-Benitez 2011

Campbell 2015
Campbell & Rogers 2012
Caron & Turcotte 2009
Castiaux 2012
Chakrabarty & Wang 2012
Chang 2014
Choi & Gray 2008
Ciasullo & Triosi 2013
Clarke, Holt, & Blundel 2014
Clarke-Sather et al. 2011
Clausen & Gyimothy 2015
Clemens 2006
Closs, Speier, & Meacham 2011
Cohen 2006
Cohen & Winn 2007
Cohen, Smith, & Mitchell 2008
Cox & Belland 2013
Craig & Dibrell 2006
Curry, Donker, & Krehbiel 2009
Daily & Ehrlich 1996
Dangelico 2015
Darby &Jenkins 2006
Dean & McMullen 2007
DeBurgos-Jimenez et al. 2011
DeClerq & Voronov 2011
Dendler 2014
DesJardins 1998
DiNorcia 1996
Dixon & Clifford 2007
Dixon-Fowler et al. 2013
Edgeman & Eskildsen 2014
Elkington 1994
Elzen et al. 2011
Epstein & Roy 2003

Escobar & Vredenburg 2011
Etzion & Ferraro 2010
Exton 2010
Feola & Butt 2015
Fergus & Rowney 2005
Fisk 1998
Forsman 2013
Funk 2003
Gagnon 2012
Gardetti & Torres 2013
Gauthier & Wooldridge 2012
Gerstlberger, Knusden, Stampe 2014
Gherib & Berger-Douce 2012
Gibb & Adhikary 2000
Gibbs 2006
Gibson 2012
Gladwin, Kennelly, & Krause 1995
Gliedt & Parker 2007
Gliedt & Parker 2014
Gomes et al. 2013
Gray et al. 2006
Gray et al. 2014
Griffiths et al. 2009
Hahn 2009
Hall et al. 2012
Hall, Daneke, & Lenox 2010
Halme & Korpela 2014
Handy et al. 2011
Hansen & Klewitz 2012
Hansen & Schaltegger 2013
Hart & Milstein 1999
Hart & Milstein 2003
Hashmi, Damanhouri, & Rana 2015

Heiskanen, Lovio, & Jalas 2011
Hellstrom 2007
Hind, Smit, & Page 2013
Hockerts & Wustenhagen 2010
Hoffmann 2007
Holt 2011
Horisch 2015
Hostager et al. 1998
Hunt 2011
Husser & Evraert-Bardinet 2014
Iakovleva et al. 2012
Isaak 2012
Jabbour et al. 2013
Jansson et al. 2015
Jepsen, Era, & Verganti 2014
Johnson 2015
Jolnik & Niesten 2015
Jorgensen & Knusden 2006
Kabir et al. 2012
Kantabutra & Thimas 2011
Kapoor & Furr 2015
Keijzers 2002
Keogh & Polonsky 1998
Keskin, Diehl, & Molenaar 2013
Ketola 2007
Khavul & Bruton 2013
Kim 2005
Kim, Brodhag, & Mebratu 2014
Kirchgeorg & Winn 2006
Klettner, Clarke, & Boersma 2014
Klewitz & Hansen 2014
Klewitz, Zeyen, & Hansen 2012
Knife, Haughton, & Dixon 2014
Kukertz & Wagner 2010
Kumar 2013
Kwon, Jang, Feiock 2014
Laine 2010
Lampikoski et al. 2014
Lans, Blok, & Wesselink 2014
Larson 2000
Laukkanen & Patala 2014
Lee 2009
Lee & Jay 2015
Lertzman & Vredenburg 2005
LeVeness & Primeaux 2004
Li, Rubin, & Onyina 2013
Linder, Bjorkdahl, & Ljungberg 2014
Linnanen 2002
Lopez-Gamero et al. 2008
Lordkipanidze, Brezet, & Backman 2005
Loussaief & Bourcier-Bequaert 2012
Manetti & Toccafondi 2012
Marchi, Mari, & Micelli 2013
Martinsons, Leung, & Loh 1996
Masurel 2007
McDonagh 1998
Meek, Pacheco, & York 2010
Mieg 2012
Miles, Munilla, & Darroch 2009
Moore & Wustenhagen 2004
Munoz & Dimov 2015
Najib, Dewi, & Widyastuti 2014
Ndubisi & Monash 2009
Nga & Shamuganathan 2010
Nicolopoulou 2014
Nowduri & Al-Dossary 2012
Nwanko, Phillips, & Tracey 2007
Ojo, Antisal, & Antisal 2015
Oneil, Hershauer, & Golden 2006
Orihuela 2014
Ortiz de Mandojana & Bansal 2015
Ozaki 2011
Pacheco et al. 2010
Pacheco, Dean, & Payne 2010
Pacheco, York, & Hargrave 2014
Parboteeah, Addae, & Cullen 2012
Parrish 2010
Parrish & Foxon 2006
Pastakia 2002
Pastakia 1998
Patzelt & Shepherd 2011
Pavlovich & Akoorie 2010
Payne & Raiborn 2001
Perego & Kolk 2012
Pfeffer 2010
Pinkse & Groot 2015
Rahman & Mazlan 2014
Rajasekaran 2013
Ramakrishnan, Haron, & Goh 2015
Randelin et al. 2013
Randjelovic, O'Rourke, & Orsato 2003
Randoy, Strom, & Mersland 2015
Rapp & Eklund 2002
Ras & Vermeulen 2009
Rees 2002
Reinstaller 2005
Rizzi et al. 2013
Robinson & Stubberud 2013
Rothenberg 2007
Roxas & Chadee 2012
Russo 2003
Samujh 2011
Santos 2012
Schaltegger & Wagner 2011

Scherer, Palazzo, & Seidl 2013
Schick, Marxen, & Freimann 2002
Schlange 2006
Shepherd & Patzelt 2011
Shepherd, Kuskova, & Patzelt 2009
Shepherd, Patzelt, & Baron 2013
Shrivastava 1995
Silajdzic, kurtagic, & Vucijak 2015
Simnett, Vanstraelen, & Wai 2009
Simola 2007
Spence, Gherib, & Biwole 2011
Spitzeck, Boechat, & Leao 2013
Stal, 2015
Starik & Rands 1995
Stead & Stead 2000
Surie & Ashley 2008
Szekely & Strebel 2013
Jasma et al. 2011
Terjesen, Bosma, & Stam 2015
Theyel & Hofmann 2012
Thompson, Hermann, & Hekkert 2015
Tilleman 2012
Tilley & Young 2009
Uhlaner et al. 2012
Broek et al. 2012
van den Hoed 2007
Van Marrewijk 2003
Vargas 2000
Volery 2002
Wagner 2012
Wagner & Blom 2011
Wagner & Schaltegger 2010
Wakkee, Burua, & vanBeukering 2014
Walley & Taylor 2002

Wang & Bansal 2012
Warnecke 2014
Webersik & Wilson 2009
Wesseling et al. 2015
Wheeler et al. 2005
Wijen 2014
Willemsen, Van der Veen 2014
Wolfgramm, Flynn-Coleman, & Conroy 2015
Wong 2013
Wood 2012
Woolthuis et al. 2013
York & Lenox 2014
York & Venkataraman 2010
York, Hargrave, & Pacheco 2015
Young & Tilley 2006
Zahra, Newey, & Li 2014

Table 2.6: Future Research Opportunities for S-E Nexus Scholarship

AMJ 'Grand Challenges' Themes	Potential Research Questions
Big Data	• How does the usage of big data affect the start-up process for sustainable entrepreneurs? • How does big data usage relate to mechanisms of value creation and capture within sustainable ventures? • How do information goods affect the diffusion of sustainability principles in society, communities, or organizations?
Climate Change	• How do sustainable entrepreneurs structure their value chains in response to emergent climate change constraints? • How do climate change policies at the national, sub-national, or regional level affect sustainable venture emergence? • How does the mismatch between temporality of natural and social systems affect individual/ organizational responses to climate change?
Aging Populations	• How does an organization's sustainability orientation evolve over time with its employee workforce? • How do major governance events – e.g. succession or board changes – affect organizations sustainability orientation? • How do demographic shifts at the national level relate to the emergence of sustainable ventures? • Are individuals more prone to recognize sustainable opportunities the older they become?
Purposeful Organizations	• What role does stewardship play in sustainable entrepreneurship? • How do values such as dignity, solidarity, plurality, subsidiarity, reciprocity, and sustainability influence individuals and organizations to engage in sustainable entrepreneurship? • How does sustainable entrepreneurship deliver value to society, and how does this differ from value delivered to society by other form of entrepreneurship?
Digital Money	• How do countries' digital readiness relate to the diffusion of sustainability practices at a national/regional level? • How does digital money and/or digital money platforms affect the venture creation/development process of sustainable ventures? • How do the dematerialization and disintermediation encouraged by digital money transactions affect individuals' orientation towards sustainability principles?
Risk & Resilience	• How does sustainable entrepreneurship help/hinder individual and organizational resilience and adaptation to sustainability issues? • How does sustainable entrepreneurship facilitate cooperation and coordination within and across organizations and countries? • How does engagement in sustainable entrepreneurship affect the entrepreneur's individual resilience capability?
Natural Resources	• What role do natural resources play in the different stages of the sustainable entrepreneurship process – i.e. from opportunity recognition to venture growth? • How do differences in individual and organizational attitudes regarding natural resource related to their orientation towards sustainability principles? • How do natural resource endowments and their exploitation within and across countries relate to national rates of sustainable entrepreneurial activity?

APPENDIX B: Additional Illustrations for Chapter 3

Table 3.0: Variable Descriptions

	Variable	Description	Data Source
DV	REDD+ Adoption	Measured as whether or not a country enters into REDD+ arrangements within a given year.	VRD
IV	Regulatory Context	The extent to which public policies support entrepreneurship. This EFC has two components: a) Entrepreneurship as a relevant economic issue and b) Taxes or regulations are either size-neutral or encourage new and SMEs.	GEM
IV	Normative Context	The extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income.	GEM
IV	Cognitive Context	The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal).	GEM
IV	Long-term Orientation	The extent to which individuals engage in future-oriented behaviors such as planning, investing in the future, and delaying gratification.	GLOBE
C	GDP per capita	Annual gross domestic product divided by mid-year population.	WDI
C	Developed Country	Dummy variable used to indicate a country as developed based on the World Bank classifications. (1=developed; 0=otherwise)	n/a
C	Economic Freedom	Overall measure of a country's institutional environment (values range from 1-100 and higher number denotes more economic freedom)	Heritage Foundation
C	Natural Resource Depletion	Measured as the sum of forest, energy, and mineral resources depletion within a country in a given year (% of GNI)	WDI
C	Total Electricity Production	Measured as the total amount of electricity generated from oil and petroleum products (% of total).	WDI
C	Population Growth	Rate of growth of midyear population from year t-1 to t, expressed as a percentage	WDI
	Land Area Under Cereal Production	Measured as the total area (hectares) of sown, cultivated, or harvested land within a country.	WDI
C	Landlocked	Dummy variable used to indicate if a country is landlocked. (1=landlocked; 0=otherwise)	EPI
C	Environmental Performance	Assesses countries' performance on high-priority environmental issues in two areas: protection of human health and protection of ecosystems.	EPI
C	Previous REDD+ Adoption	Count of total prior REDD+ adoptions made by a country.	VRD
C	Region	Dummy variables identifying countries as belonging to one of 7 regions - East Asia & Pacific; Europe & Central Asia; Latin America & Caribbean; Middle East & North Africa; North America; South Asia; Sub-Saharan Africa.	WDI

Table 3.5: Results for Cox Model of REDD+ Adoption

	Hazard of REDD+ Adoption						
VARIABLES	**9**	**10**	**11**	**12**	**13**	**14**	**15**
GDP per capita	-0.82*	-1.10***	-1.54***	-1.44**	-1.35**	-1.38**	-1.40**
	(0.32)	(0.31)	(0.46)	(0.51)	(0.45)	(0.47)	(0.48)
Natural Resource Use	-0.05	-0.01	0.19	0.30	0.29	0.34	0.34
	(0.24)	(0.19)	(0.28)	(0.27)	(0.31)	(0.25)	(0.26)
Electricity Production	-0.11	-0.12	-0.02	-0.07	-0.04	-0.08	-0.08
	(0.15)	(0.13)	(0.16)	(0.15)	(0.16)	(0.16)	(0.15)
Population Growth	0.13	0.16	0.19	0.22	0.13	0.23	0.21
	(0.15)	(0.14)	(0.16)	(0.15)	(0.16)	(0.15)	(0.15)
Index of Economic Freedom	0.22	0.25*	0.58**	0.42*	0.59**	0.51*	0.45*
	(0.14)	(0.12)	(0.20)	(0.20)	(0.19)	(0.21)	(0.20)
Environmental Protection Index	0.83**	0.80*	0.74*	0.90**	0.62*	0.64*	0.78*
	(0.32)	(0.32)	(0.32)	(0.33)	(0.29)	(0.32)	(0.32)
Land Area for Cereal	0.39*	0.42*	0.31	0.46*	0.31	0.36+	0.41*
	(0.19)	(0.18)	(0.19)	(0.21)	(0.20)	(0.20)	(0.20)
Landlocked	-0.52	-0.86*	-0.55	-0.82*	-0.58+	-0.78*	-0.83*
	(0.41)	(0.35)	(0.38)	(0.35)	(0.32)	(0.35)	(0.34)
Total Previous Adoptions	0.11*	0.16**	0.13*	0.13*	0.14*	0.12*	0.13*
	(0.05)	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)
Institutional Context	0.45*	0.25					0.11
	(0.19)	(0.19)					(0.18)
Long-term Orientation		0.35***					
		(0.11)					
Institutional Context X Long-term Orientation		0.34**					
		(0.12)					
R&D Expenses			0.52*	0.57*	0.55*	0.62**	0.62**
			(0.23)	(0.24)	(0.22)	(0.23)	(0.23)
Regulatory Context				0.15			
				(0.21)			
Regulatory Context X R&D Expenses				0.42*			
				(0.16)			
Normative Context					-0.18		
					(0.22)		
Normative Context X R&D Expenses					0.37*		
					(0.18)		
Cognitive Context						0.04	
						(0.16)	
Cognitive Context X R&D Expenses						0.36**	
						(0.11)	
Institutional Context X R&D Expenses							0.46**
							(0.15)
Observations	280	280	270	270	270	270	270
Region Effects	YES	YES	YES	YES	YES	YES	YES
Log-likelihood	-224.16	-220.89	-209.74	-205.95	-208.56	-207.21	-206.17
Chi-square	79.49	131.48	63.29	80.09	71.62	114.13	94.08
AIC	468.33	465.78	439.48	435.90	441.13	438.41	436.34

Note: Robust standard errors in parentheses. Significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 3.6: Results for Cox Model of REDD+ Adoption-Social & Environmental Benefits

	Hazard of REDD+ Adoption for Social & Environmental Benefits							
VARIABLES	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
GDP per capita	-1.09*	-1.12*	-1.12*	-1.11*	-1.40**	-1.86***	-1.47**	-1.45***
	(0.43)	(0.45)	(0.47)	(0.44)	(0.46)	(0.47)	(0.50)	(0.41)
Natural Resource Use	-0.03	-0.10	-0.07	-0.03	-0.07	-0.03	-0.05	-0.18
	(0.46)	(0.48)	(0.48)	(0.45)	(0.42)	(0.39)	(0.41)	(0.39)
Electricity Production	-0.23	-0.20	-0.22	-0.22	-0.19	-0.27	-0.18	-0.29
	(0.25)	(0.25)	(0.25)	(0.26)	(0.23)	(0.23)	(0.24)	(0.23)
Population Growth	0.05	0.04	0.03	0.05	0.11	0.04	-0.03	0.13
	(0.27)	(0.27)	(0.30)	(0.27)	(0.25)	(0.23)	(0.30)	(0.24)
Index of Economic Freedom	0.14	0.04	0.12	0.12	-0.02	0.09	0.02	0.04
	(0.20)	(0.21)	(0.22)	(0.23)	(0.19)	(0.18)	(0.22)	(0.18)
Environmental Protection Index	1.42***	1.46***	1.44***	1.43***	1.38***	1.62***	1.39**	1.37***
	(0.39)	(0.37)	(0.42)	(0.37)	(0.41)	(0.43)	(0.43)	(0.41)
Land Area for Cereal	0.26	0.30	0.26	0.26	0.25	0.33	0.26	0.29
	(0.33)	(0.31)	(0.33)	(0.33)	(0.29)	(0.30)	(0.30)	(0.31)
Landlocked	-0.40	-0.41	-0.38	-0.40	-0.84+	-1.14*	-0.89+	-1.00*
	(0.48)	(0.47)	(0.51)	(0.48)	(0.49)	(0.49)	(0.48)	(0.47)
Total Previous Adoptions	0.25***	0.24***	0.26***	0.25***	0.29***	0.32***	0.29***	0.32***
	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.08)	(0.08)	(0.07)
Regulatory Context		0.32				-0.07		
		(0.31)				(0.31)		
Normative Context			0.08				-0.05	
			(0.40)				(0.35)	
Cognitive Context				0.05				-0.12
				(0.29)				(0.26)
Long-term Orientation					0.48*	0.58**	0.65**	0.52*
					(0.21)	(0.21)	(0.20)	(0.21)
Regulatory Context X Long-term Orientation						0.59**		
						(0.21)		
Normative Context X Long-term Orientation							0.44	
							(0.32)	
Cognitive Context X Long-term Orientation								0.39*
								(0.17)
Observations	280	280	280	280	280	280	280	280
Region	YES	YES	YES	YES	YES	YES	YES	YES
Log-likelihood	-136.58	-135.97	-136.55	-136.56	-133.79	-130.99	-132.98	-132.15
Chi-square	46.77	56.86	49.21	47.83	72.59	81.28	80.77	81.85
AIC	291.15	291.94	293.11	293.11	287.59	285.97	289.96	288.31

Note: Robust standard errors in parentheses. Significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 3.7: Results for Cox Model of REDD+ Adoption-Social & Environmental Benefits

	Hazard of REDD+ Adoption for Social & Environmental Benefits						
VARIABLES	**24**	**25**	**26**	**27**	**28**	**29**	**30**
GDP per capita	-1.15**	-1.66***	-2.67**	-2.75**	-2.57**	-2.54**	-2.59**
	(0.44)	(0.42)	(0.85)	(0.87)	(0.88)	(0.87)	(0.86)
Natural Resource Use	-0.08	-0.09	0.03	0.29	-0.00	0.16	0.22
	(0.46)	(0.38)	(0.57)	(0.50)	(0.57)	(0.49)	(0.49)
Electricity Production	-0.20	-0.28	-0.06	-0.18	-0.09	-0.15	-0.17
	(0.25)	(0.23)	(0.26)	(0.27)	(0.26)	(0.27)	(0.27)
Population Growth	0.04	0.06	0.07	0.14	-0.03	0.14	0.12
	(0.27)	(0.23)	(0.27)	(0.27)	(0.29)	(0.27)	(0.26)
Index of Economic Freedom	0.06	0.08	0.61+	0.61+	0.58+	0.65+	0.61+
	(0.22)	(0.18)	(0.32)	(0.32)	(0.32)	(0.34)	(0.32)
Environmental Protection Index	1.46***	1.49***	1.49***	1.65***	1.49***	1.37***	1.50***
	(0.37)	(0.41)	(0.39)	(0.41)	(0.43)	(0.39)	(0.39)
Land Area for Cereal	0.27	0.31	0.30	0.39	0.29	0.32	0.36
	(0.32)	(0.30)	(0.30)	(0.32)	(0.31)	(0.32)	(0.31)
Landlocked	-0.40	-1.10*	-0.65	-1.08*	-0.80	-0.94+	-1.04*
	(0.48)	(0.48)	(0.50)	(0.54)	(0.54)	(0.50)	(0.52)
Total Previous Adoptions	0.25***	0.32***	0.26***	0.28***	0.28***	0.26***	0.27***
	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)
Institutional Context	0.23	-0.13					-0.20
	(0.31)	(0.28)					(0.26)
Long-term Orientation		0.58**					
		(0.21)					
Institutional Context X Long-term Orientation		0.56**					
		(0.21)					
R&D Expenses			0.75	1.02*	0.81+	0.96*	0.98*
			(0.48)	(0.41)	(0.42)	(0.43)	(0.41)
Regulatory Context				-0.27			
				(0.27)			
Regulatory Context X R&D Expenses				0.58*			
				(0.26)			
Normative Context					-0.03		
					(0.39)		
Normative Context X R&D Expenses					0.43		
					(0.36)		
Cognitive Context						-0.17	
						(0.25)	
Cognitive Context X R&D Expenses						0.39**	
						(0.15)	
Institutional Context X R&D Expenses							0.53*
							(0.23)
Observations	280	280	270	270	270	270	270
Region	YES	YES	YES	YES	YES	YES	YES
Log-likelihood	-136.30	-131.34	-120.87	-118.84	-120.12	-119.26	-118.91
Chi-square	53.25	83.89	64.63	73.67	72.78	73.02	73.97
AIC	292.59	286.68	261.73	261.68	264.25	262.52	261.83

Note: Robust standard errors in parentheses. Significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 3.8: Results for Cox Model of REDD+ Adoption by Level of Development

	Results for the Hazard of REDD+ Adoption							
	Developed				Developing			
VARIABLES	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**
GDP per capita	-0.20	0.76	0.67	0.08	-0.63	-0.37	-1.06*	-0.92+
	(3.99)	(1.04)	(1.08)	(1.17)	(0.53)	(0.32)	(0.46)	(0.50)
Natural Resource Use	-5.55**	-6.25**	-5.98**	-6.02**	-0.56	-0.27	-0.73*	-0.66+
	(1.93)	(2.15)	(2.18)	(2.05)	(0.37)	(0.38)	(0.34)	(0.36)
Electricity Production	-0.48+	-0.47*	-0.59*	-0.56*	-0.12	-0.17	-0.25	-0.19
	(0.26)	(0.19)	(0.27)	(0.25)	(0.19)	(0.19)	(0.20)	(0.20)
Population Growth	0.20	0.07	0.11	0.19	0.26	0.23	0.14	0.18
	(0.17)	(0.19)	(0.18)	(0.18)	(0.38)	(0.37)	(0.35)	(0.37)
Index of Economic Freedom	0.33	0.45	0.45	0.38	0.08	0.19	-0.05	0.06
	(0.39)	(0.37)	(0.46)	(0.40)	(0.15)	(0.16)	(0.20)	(0.15)
Environmental Protection Index	0.18	-0.08	0.05	0.05	0.62	0.46	0.85	0.89
	(0.46)	(0.42)	(0.49)	(0.44)	(0.66)	(0.48)	(0.56)	(0.70)
Land Area for Cereal	1.72***	1.76***	1.67***	1.74***	0.07	0.04	0.11	0.14
	(0.49)	(0.45)	(0.44)	(0.47)	(0.27)	(0.26)	(0.26)	(0.28)
Landlocked	-1.40**	-1.16*	-1.27*	-1.37**	0.35	0.08	0.18	0.31
	(0.48)	(0.51)	(0.52)	(0.50)	(0.43)	(0.34)	(0.31)	(0.36)
Total Previous Adoptions	-0.02	-0.07	-0.02	-0.03	0.25*	0.23*	0.28**	0.27**
	(0.04)	(0.06)	(0.06)	(0.04)	(0.10)	(0.11)	(0.11)	(0.10)
Long-term Orientation	0.52*	0.75*	0.40+	0.54*	0.12	0.12	0.38*	0.31
	(0.24)	(0.36)	(0.21)	(0.23)	(0.21)	(0.15)	(0.17)	(0.22)
Regulatory Context	0.06				0.41			
	(0.26)				(0.30)			
Regulatory Context X Long-term Orientation	0.49+				0.31			
	(0.30)				(0.44)			
Normative Context		-0.52				-0.01		
		(0.45)				(0.25)		
Normative Context X Long-term Orientation		0.62				0.65		
		(0.42)				(0.83)		
Cognitive Context			-0.29				0.75*	
			(0.34)				(0.36)	
Cognitive Context X Long-term Orientation			0.36				0.82*	
			(0.30)				(0.41)	
Institutional Context				-0.10				0.63
				(0.28)				(0.41)
Institutional Context X Long-term Orientation				0.50+				0.72
				(0.31)				(0.57)
Observations	138	138	138	139	142	142	142	143
Region	YES	YES	YES	YES	YES	YES	YES	YES
Log-likelihood	-103.61	-104.40	-104.85	-104.18	-81.22	-80.97	-80.81	-81.04
Chi-square	218.46	227.25	167.46	218.12	125.25	528.33	369.75	159.24
AIC	233.21	232.81	233.69	232.36	186.45	185.94	185.63	186.08

Note: Robust standard errors in parentheses. Significance: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

APPENDIX C: Additional Illustrations for Chapter 4

Table 4.1: Variable Descriptions

Variable		Description	Data Source
New Venture Creation	DV	1=individual has taken some action towards venture creation; 0 otherwise	GEM
REDD+ Adoption	IV	Count of REDD+ arrangements agreed to by a country within a given year.	VRD
Climate Change Adaptation	IV	Measured as the difference between country's readiness for, and vulnerability to sustainable development issues (Range is 0-100; higher number denotes greater adaptability)	ND-GAIN
Corruption	IV	The perceived level of corruption within a country as per the Heritage Foundation's freedom from corruption measure ranging from 0-100; reversed scored so higher value denotes more corruption.	Heritage Foundation
GDP per capita	C	Annual gross domestic product divided by mid-year population.	WDI
Unemployment	C	National unemployment rate (% of total labor force)	WDI
Income Tax	C	Taxes on income, profits and capital gains (% of total taxes)	WDI
Annual Inflation	C	Standard deviation of a country's annual inflation, consumer prices (annual %).	WDI
Developed Country	C	1=developed country; 0=otherwise	n/a
Early-stage Entrepreneurial Activity Rate	C	Percentage of a country's population engaged in early-stage new venture creation.	GEM
Business Angel Investor Rate	C	Percentage of countries' population who, in the past three years, personally provided funds for a new business started by someone else.	GEM
Established Business Ownership Rate	C	Percentage of countries' population involved in an established firm as owner/manager.	GEM
Knows an Entrepreneur Rate	C	Percentage of countries' population who know someone that started a business in the past 2 years.	GEM
Tertiary Education	C	1=individual has post-secondary education; 0=otherwise	GEM
Age	C	The age of the respondent between 14 and 99 at time of interview.	GEM
Gender	C	1=female; 0=male/otherwise	GEM
Business Angel	C	1=business angel in the past three years; 0=otherwise	GEM
Established Business	C	1=current owner/manager of business; 0=otherwise	GEM
Knows other entrepreneurs	C	1=personally knows other entrepreneurs in the past two years; 0=otherwise	GEM

Table 4.2: Multicollinearity Test Results for Full Interaction Model

DV	New Venture Creation	
VARIABLES	**VIF**	**VIF**
REDD+ Adoption	1.31	1.28
Climate Change Adaptability	2.14	2.02
Corruption Freedom	1.66	1.51
Tertiary Education	1.06	1.05
Age	28.75	28.67
Age squared	28.71	28.6
Gender	1.02	1.02
Business Angel	1.05	1.05
Established Business Owner	1.11	1.11
Knows an Entrepreneur	1.11	1.11
Tertiary Education (country rate)	1.78	-
Age (country rate)	89.86	-
Age squared (country rate)	88.63	-
Gender (country rate)	1.41	-
Knows an Entrepreneur Rate	1.23	1.14
Early-stage Entrepreneurial Activity Rate	1.52	1.47
Established Business Ownership Rate	1.72	1.57
Business Angel Investor Rate	1.71	1.46
Gross Domestic Product per capita	2.16	2.15
Unemployment	1.83	1.82
Income Tax	1.12	1.07
Inflation	1.86	1.8
Developed Country (dummy)	1.22	1.2
Mean VIF	11.05	4.11
Condition index statistic for model	*25.01*	*12.13*

***Note:** VIF = Variance inflation factors.

Table 4.8: Climate Change Adaptation and Necessity New Venture Creation

DV	Necessity-based New Venture Creation				
VARIABLES	**10**	**11**	**12**	**13**	**14**
Tertiary Education	-0.12***	-0.12***	-0.12***	-0.12***	-0.12***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.57***	0.57***	0.57***	0.57***	0.57***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Age Squared	-0.84***	-0.84***	-0.84***	-0.84***	-0.84***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Gender	0.05***	0.05***	0.05***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Established Business Owner	0.85***	0.85***	0.85***	0.85***	0.85***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur	0.13***	0.13***	0.13***	0.13***	0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur (Country)	0.04*	0.03*	0.03*	0.03*	0.03+
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Early-stage Entrepreneurship (Country)	0.11***	0.12***	0.11***	0.12***	0.11***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Established Business Ownership (Country)	-0.03*	-0.04**	-0.03*	-0.03*	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel (Country)	-0.07***	-0.07***	-0.07***	-0.07***	-0.08***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Gross Domestic Product per capita	-0.13***	-0.12***	-0.15***	-0.13***	-0.14***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Unemployment	0.05**	0.05**	0.06**	0.05**	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Inflation	-0.04*	-0.05**	-0.03+	-0.03*	-0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Income Tax	-0.00+	-0.00+	-0.00+	-0.00	-0.00+
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
REDD+ Adoption		-0.04*			-0.03*
		(0.02)			(0.02)
Climate Change Adaptability			0.05**		0.05**
			(0.02)		(0.02)
Corruption Freedom				0.03+	0.02
				(0.01)	(0.01)
Constant (Individual)	-4.71***	-4.77***	-4.68***	-4.69***	-4.72***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Constant (Country)	-0.31**	-0.31**	-0.30*	-0.30*	-0.30*
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,584	483,584	483,584	483,584
Number of Countries	38	38	38	38	38
Year Effects	YES	YES	YES	YES	YES
Log-likelihood	-41,284	-41,281	-41,280	-41,282	-41,276
AIC	82,612	82,608	82,606	82,610	82,602

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.9: Climate Change Adaptation and Necessity New Venture Creation

	DV	Necessity-based New Venture Creation			
VARIABLES		**15**	**16**	**17**	**18**
		ALL CONTROLS INCLUDED			
REDD+ Adoption		-0.04**	-0.02	-0.03*	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)
Climate Change Adaptability		0.04*	0.05**	0.05**	0.03
		(0.02)	(0.02)	(0.02)	(0.02)
Corruption Freedom		0.02	0.03*	0.03+	0.05**
		(0.01)	(0.01)	(0.02)	(0.02)
REDD+ Adoption X Climate Change Adaptability		0.03+			0.06***
		(0.02)			(0.02)
REDD+ Adoption X Corruption Freedom			-0.04**		-0.05*
			(0.02)		(0.02)
Climate Change Adaptability X Corruption Freedom				-0.01	0.02
				(0.01)	(0.02)
REDD+ Adoption X Climate Change Adaptability X Corruption Freedom					-0.06***
					(0.02)
Constant (Individual)		-4.75***	-4.68***	-4.71***	-4.75***
		(0.13)	(0.13)	(0.13)	(0.13)
Constant (Country)		-0.31**	-0.30*	-0.30*	-0.30*
		(0.12)	(0.12)	(0.12)	(0.12)
Observations		483,584	483,584	483,584	483,584
Number of Countries		38	38	38	38
Year Effects		YES	YES	YES	YES
Log-likelihood		-117,664	-117,660	-117,666	-117,629
AIC		82,601	82,597	82,603	82,579

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.10: Climate Change Adaptation and Opportunity New Venture Creation

DV	Opportunity-based New Venture Creation				
VARIABLES	**19**	**20**	**21**	**22**	**23**
Tertiary Education	0.17***	0.17***	0.17***	0.17***	0.17***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.52***	0.53***	0.53***	0.53***	0.53***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Age Squared	-1.06***	-1.07***	-1.06***	-1.06***	-1.07***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Gender	-0.12***	-0.12***	-0.12***	-0.12***	-0.12***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel	0.09***	0.09***	0.09***	0.09***	0.09***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Established Business Owner	0.87***	0.87***	0.87***	0.87***	0.87***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur	0.37***	0.37***	0.37***	0.37***	0.37***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur (Country)	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Early-stage Entrepreneurship (Country)	0.12***	0.12***	0.11***	0.12***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Established Business Ownership (Country)	-0.07***	-0.06***	-0.07***	-0.07***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel (Country)	-0.00	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gross Domestic Product per capita	-0.05***	-0.06***	-0.07***	-0.05***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment	-0.15***	-0.14***	-0.15***	-0.15***	-0.14***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Inflation	-0.01	-0.00	-0.01	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income Tax	-0.00*	-0.00+	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
REDD+ Adoption		0.04***			0.04***
		(0.01)			(0.01)
Climate Change Adaptability			0.05***		0.05***
			(0.01)		(0.01)
Corruption Freedom				0.02*	0.02+
				(0.01)	(0.01)
Constant (Individual)	-3.59***	-3.53***	-3.57***	-3.58***	-3.49***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Constant (Country)	-0.80***	-0.79***	-0.80***	-0.80***	-0.80***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,584	483,584	483,584	483,584
Number of Countries	38	38	38	38	38
Year Effects	YES	YES	YES	YES	YES
Log-likelihood	-88,247	-88,240	-88,239	-88,245	-88,228
AIC	176,539	176,526	176,524	176,536	176,507

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.11: Climate Change Adaptation and Opportunity New Venture Creation

	DV	Opportunity-based New Venture Creation			
VARIABLES		**24**	**25**	**26**	**27**
		ALL CONTROLS INCLUDED			
REDD+ Adoption		-0.04**	-0.02	-0.03*	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)
Climate Change Adaptability		0.04*	0.05**	0.05**	0.03
		(0.02)	(0.02)	(0.02)	(0.02)
Corruption Freedom		0.02	0.03*	0.03+	0.05**
		(0.01)	(0.01)	(0.02)	(0.02)
REDD+ Adoption X Climate Change Adaptability		0.03+			0.06***
		(0.02)			(0.02)
REDD+ Adoption X Corruption Freedom			-0.04**		-0.05*
			(0.02)		(0.02)
Climate Change Adaptability X Corruption Freedom				-0.01	0.02
				(0.01)	(0.02)
REDD+ Adoption X Climate Change Adaptability X Corruption Freedom					-0.06***
					(0.02)
Constant (Individual)		-4.75***	-4.68***	-4.71***	-4.75***
		(0.13)	(0.13)	(0.13)	(0.13)
Constant (Country)		-0.31**	-0.30*	-0.30*	-0.30*
		(0.12)	(0.12)	(0.12)	(0.12)
Observations		483,584	483,584	483,584	483,584
Number of Countries		38	38	38	38
Year Effects		YES	YES	YES	YES
Log-likelihood		-117,664	-117,660	-117,666	-117,629
AIC		176,506	176,503	176,491	176,469

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.12: Climate Change Readiness and New Venture Creation

DV	New Venture Creation				
VARIABLES	**28**	**29**	**30**	**31**	**32**
Tertiary Education	0.06***	0.06***	0.06***	0.06***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.77***	0.77***	0.77***	0.77***	0.77***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Age Squared	-1.10***	-1.10***	-1.10***	-1.10***	-1.10***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Gender	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel	0.10***	0.10***	0.10***	0.10***	0.10***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Established Business Owner	0.44***	0.44***	0.44***	0.44***	0.44***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Knows an Entrepreneur	0.37***	0.37***	0.37***	0.37***	0.37***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Knows an Entrepreneur (Country)	0.01	0.01	0.00	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Early-stage Entrepreneurship (Country)	0.04***	0.04***	0.03***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Established Business Ownership (Country)	-0.03***	-0.02**	-0.03***	-0.03***	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Business Angel (Country)	0.04***	0.04***	0.03***	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gross Domestic Product per capita	-0.10***	-0.10***	-0.11***	-0.10***	-0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment	-0.17***	-0.17***	-0.17***	-0.17***	-0.16***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Inflation	0.03**	0.02*	0.03***	0.03**	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income Tax	-0.00**	-0.00**	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
REDD+ Resources		0.03***			0.03***
		(0.01)			(0.01)
Readiness for Climate Change			0.06***		0.06***
			(0.01)		(0.01)
Control of Corruption				-0.02*	-0.01
				(0.01)	(0.01)
Constant	-2.74***	-2.70***	-2.69***	-2.74***	-2.65***
	(0.11)	(0.12)	(0.12)	(0.11)	(0.12)
Constant	-0.38**	-0.38**	-0.37**	-0.38**	-0.37**
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,458	483,584	483,584	483,458
Number of Countries	38	38	38	38	38
Year Effects	YES	YES	YES	YES	YES
Log-likelihood	-117,728	-117,682	-117,702	-117,724	-117,656
AIC	235,499	235,411	235,450	235,495	235,361

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.13: Climate Change Readiness and New Venture Creation

	DV	New Venture Creation		
VARIABLES	**33**	**34**	**35**	**36**
ALL CONTROLS INCLUDED				
REDD+ Resources	0.03**	0.03***	0.03***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)
Climate Change Readiness	0.06***	0.06***	0.05***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)
Control of Corruption	-0.01	-0.01	-0.02*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
REDD+ Resources X Climate Change Readiness	0.01			-0.01
	(0.01)			(0.01)
REDD+ Resources X Control of Corruption		-0.02*		-0.02+
		(0.01)		(0.01)
Climate Change Readiness X Control of Corruption			0.03***	0.04***
			(0.01)	(0.01)
REDD+ Resources X Climate Change Readiness X Control of Corruption				-0.01+
				(0.01)
Constant (Individual)	-2.66***	-2.66***	-2.66***	-2.66***
	(0.12)	(0.12)	(0.12)	(0.12)
Constant (Country)	-0.37**	-0.37**	-0.38**	-0.37**
	(0.12)	(0.12)	(0.12)	(0.12)
Observations	483,584	483,584	483,584	483,584
Number of Countries	38	38	38	38
Year Effects	YES	YES	YES	YES
Log-likelihood	-117,655	-117,653	-117,649	-117,643
AIC	235,362	235,358	235,350	235,344

Note: Standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

REFERENCES

Acs, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: measurement issues and policy implications. Research Policy, 43, 476–494.

Acs, Z. J., Desai, S., & Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small business economics*, *31*(3), 219-234.

Adler, P. S., & Obstfeld, D. (2007). The role of affect in creative projects and exploratory search. *Industrial and Corporate Change*, *16*(1), 19-50.

Agrawal, A., Nepstad, D., & Chhatre, A. (2011). Reducing emissions from deforestation and forest degradation. *Annual Review of Environment and Resources*, *36*, 373-396.

Aidis, R., Estrin, S., & Mickiewicz, T. M. (2012). Size matters: entrepreneurial entry and government. *Small Business Economics*, *39*(1), 119-139.

Albert, S., & Whetten, D. A. (1985). Organizational identity. *Research in organizational behavior*.

Aldrich, H. E. (2011). Heroes, villains, and fools: Institutional entrepreneurship, NOT institutional entrepreneurs. *Entrepreneurship Research Journal*, *1*(2).

Allison, P. D. (1984). *Event history analysis: Regression for longitudinal event data* (No. 46). Sage.

Álvarez, C., Amorós, J. E., & Urbano, D. (2014). Regulations and entrepreneurship: Evidence from developed and developing countries. *Innovar*, *24*(SPE), 81-89.

Alvarez, S. A., & Barney, J. B. (2014). Entrepreneurial opportunities and poverty alleviation. *Entrepreneurship theory and practice*, *38*(1), 159-184.

Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic management journal*, *22*(6-7), 493-520.

Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001). Taking time to integrate temporal research. *Academy of Management Review*, *26*(4), 512-529.

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations a state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, *40*(5), 1297-1333.

Angelsen, A. (Ed.). (2009). *Realizing REDD+: National strategy and policy options*. CIFOR.

Anokhin, S., & Schulze, W. S. (2009). Entrepreneurship, innovation, and corruption. *Journal of Business Venturing*, *24*(5), 465-476.

Ansari, S., Wijen, F., & Gray, B. (2013). Constructing a climate change logic: An institutional perspective on the "tragedy of the commons". *Organization Science*, *24*(4), 1014-1040.

Aragón-Correa, J. A., Marcus, A., & Hurtado-Torres, N. (2016). The Natural Environmental Strategies of International Firms: Old Controversies and New Evidence on Performance and Disclosure. *The Academy of Management Perspectives*, *30*(1), 24-39.

Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small business economics*, *24*(3), 233-247.

Arin, K. P., Huang, V. Z., Minniti, M., Nandialath, A. M., & Reich, O. F. (2015). Revisiting the Determinants of Entrepreneurship: A Bayesian Approach. *Journal of Management*, *41*(2), 607-631.

Atkinson, G., Dietz, S., Neumayer, E., & Agarwala, M. (Eds.). (2014).*Handbook of sustainable development*. Edward Elgar Publishing.

Ault, J. K., & Spicer, A. (2014). The institutional context of poverty: State fragility as a predictor of cross-national variation in commercial microfinance lending. *Strategic Management Journal*, *35*(12), 1818-1838.

Austin, J., Stevenson, H., & Wei-Skillern, J. (2006). Social and commercial entrepreneurship: same, different, or both? *Entrepreneurship theory and practice*, *30*(1), 1-22.

Azmat, F., & Samaratunge, R. (2009). Responsible entrepreneurship in developing countries: Understanding the realities and complexities. *Journal of Business Ethics, 90*(3), 437-452. doi:10.1007/s10551-009-0054-8

Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic management journal*, *26*(3), 197-218.

Bansal, P., & DesJardine, M. R. (2014). Business sustainability: It is about time. *Strategic Organization*, *12*(1), 70-78.

Bansal, P., & Knox-Hayes, J. (2013). The time and space of materiality in organizations and the natural environment. *Organization & Environment*, *26*(1), 61-82.

Barbier, E.B., Burgess, J.C., Folke, C., 1994. Paradise Lost? — The Ecological Economics of Biodiversity. Earthscan, London.

Barnett, M. L., & King, A. A. (2008). Good fences make good neighbors: A longitudinal analysis of an industry self-regulatory institution. *Academy of Management Journal*, *51*(6), 1150-1170.

Bartel, C. A., & Garud, R. (2003). Narrative knowledge in action: Adaptive abduction as a mechanism for knowledge creation and exchange in organizations. *The Blackwell handbook of organizational learning and knowledge management*, 324-342.

Battilana, J., & Dorado, S. (2010). Building sustainable hybrid organizations: The case of commercial microfinance organizations. *Academy of Management Journal*, *53*(6), 1419-1440.

Battilana, J., Leca, B., & Boxenbaum, E. (2009). 2 how actors change institutions: towards a theory of institutional entrepreneurship. *The academy of management annals*, *3*(1), 65-107.

Baughn, C. C., Chua, B. L., & Neupert, K. E. (2006). The normative context for women's participation in entrepreneurship: a multicounty study. *Entrepreneurship Theory and Practice*, *30*(5), 687-708.

Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy, 98*(5), 893-921. doi:10.1086/261712

Baumol, W.J., Litan, R.E., & Schramm, C.J. (2009). Good capitalism, bad capitalism, and the economics of growth and prosperity. New Haven, CT: Yale University Press.

Bebbington, A. (1999). Capitals and capabilities: a framework for analyzing peasant viability, rural livelihoods and poverty. *World Development*, *27*(12), 2021-2044.

Bebbington, J. (2001). Sustainable development: a review of the international development, business and accounting literature. In *Accounting Forum* (Vol. 25, No. 2, pp. 128-157). Blackwell Publishers Ltd.

Belz, F. M., & Binder, J. K. (2015). Sustainable Entrepreneurship: A Convergent Process Model. *Business Strategy and the Environment*.

Benessaiah, K. (2012). Carbon and livelihoods in Post-Kyoto: Assessing voluntary carbon markets. *Ecological Economics*, *77*, 1-6.

Berk, G., & Galvan, D. (2009). How people experience and change institutions: a field guide to creative syncretism. *Theory and Society*, *38*(6), 543-580.

Bielecki, J. (2002). Energy security: is the wolf at the door? *The quarterly review of economics and finance*, *42*(2), 235-250.

Bird, M., & Wennberg, K. (2016). Why family matters: The impact of family resources on immigrant entrepreneurs' exit from entrepreneurship. *Journal of Business Venturing*, *31*(6), 687-704.

Bjørnskov, C., & Foss, N. J. (2016). Institutions, Entrepreneurship, and Economic Growth: What Do We Know and What Do We Still Need to Know?. *The Academy of Management Perspectives*, *30*(3), 292-315.

Blossfeld, H. P., Golsch, K., & Rohwer, G. (2012). *Event history analysis with Stata*. Psychology Press.

Bothner, M. S., Smith, E. B., & White, H. C. (2010). A Model of Robust Positions in Social Networks1. *American Journal of Sociology*, *116*(3), 943-92.

Bowen, H. P., & De Clercq, D. (2008). Institutional context and the allocation of entrepreneurial effort. *Journal of International Business Studies*, *39*(4), 747-767.

Briassoulis, H. (1999). Sustainable development and the informal sector: An uneasy relationship? *The Journal of Environment & Development*, *8*(3), 213-237.

Brigham, K. H., Lumpkin, G. T., Payne, G. T., & Zachary, M. A. (2014). Researching Long-Term Orientation: A Validation Study and Recommendations for Future Research. *Family Business Review*, *27*(1), 72-88.

Brown, H. S., De Jong, M., & Lessidrenska, T. (2009). The rise of the Global Reporting Initiative: a case of institutional entrepreneurship. *Environmental Politics*, *18*(2), 182-200.

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.

Buhr, K. (2012). The inclusion of aviation in the EU emissions trading scheme: Temporal conditions for institutional entrepreneurship. *Organization Studies*, *33*(11), 1565-1587.

Burgelman, R. A. (1991). Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research. *Organization science*,*2*(3), 239-262.

Burton, I. (1996). The growth of adaptation capacity: practice and policy. In *Adapting to Climate Change* (pp. 55-67). Springer New York.

Busenitz, L. W., Gomez, C., & Spencer, J. W. (2000). Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management journal*, *43*(5), 994-1003.

Caruso, E. M. (2010). When the future feels worse than the past: a temporal inconsistency in moral judgment. *Journal of Experimental Psychology: General*, *139*(4), 610.

Caplow, S., Jagger, P., Lawlor, K., & Sills, E. (2011). Evaluating land use and livelihood impacts of early forest carbon projects: Lessons for learning about REDD+. *Environmental Science & Policy*, *14*(2), 152-167.

Chakrabarty, S., & Wang, L. (2012). The long-term sustenance of sustainability practices in MNCs: A dynamic capabilities perspective of the role of R&D and internationalization. *Journal of Business Ethics, 110*(2), 205-217. doi:10.1007/s10551-012-1422-3

Chambers, R. (1987). Sustainable livelihoods, environment and development: putting poor rural people first.

Chambers, R. (2011). Sustainable livelihoods: An opportunity for the World Commission on Environment and Development.

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies (UK).

Chang, C. (2014). The determinants of green product innovation performance. *Corporate Social Responsibility and Environmental Management,* , n/a-n/a. doi:10.1002/csr.1361

Chen, C., Noble, I., Hellmann, J., Coffee, J., Murillo, M., & Chawla, N. (2015, November). University of Notre Dame Global Adaptation Index: Detailed Methodology Report. In *Notre Dame Global Adaptation Index*. Retrieved 2016, from http://index.gain.org/about/methodology

Child, J., Lu, Y., & Tsai, T. (2007). Institutional entrepreneurship in building an environmental protection system for the People's Republic of China. *Organization studies*, *28*(7), 1013-1034.

Choongo, P., Van Burg, E., Paas, L. J., & Masurel, E. (2016). Factors Influencing the Identification of Sustainable Opportunities by SMEs: Empirical Evidence from Zambia. *Sustainability*, *8*(1), 81.

Chrisman, J. J., Fang, H., Kotlar, J., & De Massis, A. (2015). A note on family influence and the adoption of discontinuous technologies in family firms. *Journal of Product Innovation Management*, *32*(3), 384-388.

Chrisman, J. J., & Patel, P. C. (2012). Variations in R&D investments of family and nonfamily firms: Behavioral agency and myopic loss aversion perspectives. *Academy of management Journal*, *55*(4), 976-997.

Chrisman, J. J., Sharma, P., Steier, L. P., & Chua, J. H. (2013). The influence of family goals, governance, and resources on firm outcomes.*Entrepreneurship Theory and Practice*, *37*(6), 1249-1261.

Clausen, H. B., & Gyimóthy, S. (2016). Seizing community participation in sustainable development: pueblos Mágicos of Mexico. *Journal of Cleaner Production*, *111*, 318-326.

Cleves MA, Gould WW, Gutierrez RG. 2008. An Introduction to Survival Analysis Using Stata. Stata Press: College Station, Texas.

Cohen, B., & Winn, M. I. (2007). Market imperfections, opportunity and sustainable entrepreneurship. *Journal of Business Venturing, 22*(1), 29-49. doi:http://dx.doi.org/10.1016/j.jbusvent.2004.12.001

Cohen, B., Smith, B., & Mitchell, R. (2008). Toward a sustainable conceptualization of dependent variables in entrepreneurship research. *Business Strategy and the Environment*, *17*(2), 107-119.

Corbett, A. C. (2005). Experiential learning within the process of opportunity identification and exploitation. *Entrepreneurship Theory and Practice*, *29*(4), 473-491.

Craig, J., & Dibrell, C. (2006). The natural environment, innovation, and firm performance: A comparative study. *Family Business Review*, *19*(4), 275-288.

Crutzen, P., & Stoermer, E. (2000). The Anthropocene. Global Change Newsletter, 41, 17-18.

Cuervo-Cazurra, A. (2006). Who cares about corruption?. *Journal of International Business Studies*, *37*(6), 807-822.

Cyert, R. M., & March, J. G. (1963). A behavioral theory of the firm. *Englewood Cliffs, NJ*, *2*.

Dacin, M. T., Goodstein, J., & Scott, W. R. (2002). Institutional theory and institutional change: Introduction to the special research forum. *Academy of management journal*, *45*(1), 45-56.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of business venturing*, *18*(3), 301-331.

Davidsson, P., & Wiklund, J. (2001). Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future. *Entrepreneurship theory and Practice*, *25*(4), 81-100.

Das, T. K., & Teng, B. S. (1997). Time and entrepreneurial risk behavior. *Entrepreneurship theory and practice*, *22*, 69-88.

Dawson, J. F. (2014). Moderation in management research: What, why, when, and how. *Journal of Business and Psychology*, *29*(1), 1-19.

De Clercq, D., Danis, W. M., & Dakhli, M. (2010). The moderating effect of institutional context on the relationship between associational activity and new business activity in emerging economies. *International Business Review*, *19*(1), 85-101.

De Clercq, D., Lim, D. S., & Oh, C. H. (2014). Hierarchy and conservatism in the contributions of resources to entrepreneurial activity. *Small Business Economics*, *42*(3), 507-522.

De Haan, L. J. (2000). Globalization, localization and sustainable livelihood. *Sociologia Ruralis*, *40*(3), 339-365

De Young, R., & Kaplan, S. (1988). On averting the tragedy of the commons. *Environmental Management*, *12*(3), 273-283.

Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing, 22*(1), 50-76. doi:http://dx.doi.org/10.1016/j.jbusvent.2005.09.003

Dhanda, K. K., & Hartman, L. P. (2011). The ethics of carbon neutrality: A critical examination of voluntary carbon offset providers. *Journal of Business Ethics*, *100*(1), 119-149.

Dietz, S., & Neumayer, E. (2007). Weak and strong sustainability in the SEEA: Concepts and measurement. *Ecological economics*, *61*(4), 617-626.

Dijksterhuis, M. S., Van den Bosch, F. A., & Volberda, H. W. (1999). Where do new organizational forms come from? Management logics as a source of coevolution. *Organization Science*, *10*(5), 569-582.

DiMaggio, P. J. (1988). Interest and agency in institutional theory. *Institutional patterns and organizations: Culture and environment*, *1*, 3-22.

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

Dionysiou, D. D., & Tsoukas, H. (2013). Understanding the (re) creation of routines from within: A symbolic interactionist perspective. *Academy of Management Review*, *38*(2), 181-205.

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.

Djelic, M. L., & Ainamo, A. (1999). The coevolution of new organizational forms in the fashion industry: a historical and comparative study of France, Italy, and the United States. *Organization Science*, *10*(5), 622-637.

Dodgson, M., Gann, D., Wladawsky-Berger, I., Sultan, N., & George, G. (2015). Managing digital money. *Academy of Management Journal*, *58*(2), 325-333.

Dorado, S. (2005). Institutional entrepreneurship, partaking, and convening. *Organization studies*, *26*(3), 385-414.

Dorado, S., & Ventresca, M. J. (2013). Crescive entrepreneurship in complex social problems: Institutional conditions for entrepreneurial engagement. *Journal of Business Venturing*, *28*(1), 69-82.

Dovers, S. R., & Handmer, J. W. (1992). Uncertainty, sustainability and change. *Global Environmental Change*, *2*(4), 262-276.

Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, *155*(3-4), 413-432.

Easterby-Smith, M., & Araujo, L. (1999). Organizational learning: current debates and opportunities. *Organizational learning and the learning organization: Developments in theory and practice*, 1-21.

Edenhofer, O., Kadner, S., von Stechow, C., Schwerhoff, G., & Luderer, G. (2014). Linking climate change mitigation research to sustainable development. *Chapters*, 476-499.

Ehrlich, P. R., & Raven, P. H. (1964). Butterflies and plants: a study in coevolution. *Evolution*, 586-608.

Ekins, P. (2011). Environmental sustainability from environmental valuation to the sustainability gap. *Progress in Physical Geography*, *35*(5), 629-651.

Ekins, P. (2014). Strong sustainability and critical natural capital. In G. Atkinson, S. Dietz, E. Neumayer, & M. Agarwala (Eds.),*Handbook of Sustainable Development* (2nd ed., pp. 55-72). Northampton, MA: Edward Elgar Publishing

Ekins, P., Simon, S., Deutsch, L., Folke, C., & De Groot, R. (2003). A framework for the practical application of the concepts of critical natural capital and strong sustainability. *Ecological economics*, *44*(2), 165-185.

Ellis, F. (1998). Household strategies and rural livelihood diversification. *The journal of development studies*, *35*(1), 1-38.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, *51*(2), 289-302.

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.

Etzion, D. (2007). Research on Organizations and the Natural Environment, 1992-Present: A Review. *Journal of Management*, *33*(4), 637-664.

Etzion, D., & Ferraro, F. (2010). The role of analogy in the institutionalization of sustainability reporting. *Organization Science, 21*(5), 1092-1107. doi:10.1287/orsc.1090.0494

Etzion, D., Gehman, J., Ferraro, F., & Avidan, M. (2017). Unleashing sustainability transformations through robust action. *Journal of Cleaner Production*, *140*, 167-178.

Evans, D. S., & Leighton, L. S. (1990). Small business formation by unemployed and employed workers. *Small business economics*, *2*(4), 319-330.

Farjoun, M., Ansell, C., & Boin, A. (2015). PERSPECTIVE—Pragmatism in Organization Studies: Meeting the Challenges of a Dynamic and Complex World. *Organization Science*.

Farley, J., & Costanza, R. (2010). Payments for ecosystem services: from local to global. *Ecological Economics*, *69*(11), 2060-2068.

Feldman, M. S. (2005). Management and public management. *Academy of management journal*, *48*(6), 958-960.

Ferraro, F., Etzion, D., & Gehman, J. (2015). Tackling grand challenges pragmatically: robust action revisited. *Organization Studies*, 0170840614563742.

Fischer, E., Reuber, A. R., Hababou, M., Johnson, W., & Lee, S. (1997). The role of socially constructed temporal perspectives in the emergence of rapid-growth firms. *Entrepreneurship: Theory and Practice*, *22*(2), 13-14.

Force, H. S. R. T. (2013). Hurricane Sandy rebuilding strategy. *US Department of Housing and Urban Development, Washington DC*.

Foxon, T. J. (2011). A coevolutionary framework for analysing a transition to a sustainable low carbon economy. *Ecological Economics*, *70*(12), 2258-2267.

Fullerton, D., & Stavins, R. (1998). How economists see the environment. *Nature*, *395*(6701), 433-434.

Gartner, W. B. (1985). A conceptual framework for describing the phenomenon of new venture creation. *Academy of management review*, *10*(4), 696-706.

Garud, R., Hardy, C., & Maguire, S. (2007). Institutional entrepreneurship as embedded agency: An introduction to the special issue. *ORGANIZATION STUDIES-BERLIN-EUROPEAN GROUP FOR ORGANIZATIONAL STUDIES-*, *28*(7), 957.

Geels, F. W. (2010). Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research policy*, *39*(4), 495-510.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental innovation and societal transitions*, *1*(1), 24-40.

George, G., Haas, M. R., & Pentland, A. (2014). Big data and management. *Academy of Management Journal*, *57*(2), 321-326.

George, G., Howard-Grenville, J., Joshi, A., & Tihanyi, L. (2016). Understanding and tackling societal grand challenges through management research. *Academy of Management Journal*, *59*(6), 1880-1895.

George, G., Schillebeeckx, S. J., & Liak, T. L. (2015). The Management of Natural Resources: An Overview and Research Agenda. *Academy of Management Journal*, *58*(6), 1595-1613.

George, J. M., & Jones, G. R. (2000). The role of time in theory and theory building. *Journal of management*, *26*(4), 657-684.

Gibbs, D. (2006). Sustainability entrepreneurs, ecopreneurs and the development of a sustainable economy. *Greener Management International*, *2006*(55), 63-78.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Univ of California Press.

Giddens, A. (2009). The politics of climate change. *Cambridge, UK*.

Gimeno, J., Hoskisson, R. E., Beal, B. D., & Wan, W. P. (2005). Explaining the clustering of international expansion moves: A critical test in the US telecommunications industry. *Academy of Management Journal*, *48*(2), 297-319.

Gladwin, T. N., Kennelly, J. J., & Krause, T. (1995). Shifting paradigms for sustainable development: Implications for management theory and research. *Academy of Management Review, 20*(4), 874-907. doi:10.5465/AMR.1995.9512280024

Global Leadership & Organizational Behavior Effectiveness (GLOBE) (2016), Global Leadership & Organizational Behaviour Effectiveness, www.globeproject.com/studies.

Granqvist, N., & Gustafsson, R. (2016). Temporal institutional work. *Academy of Management Journal*, *59*(3), 1009-1035.

Gras, D., & Nason, R. S. (2015). Bric by bric: The role of the family household in sustaining a venture in impoverished Indian slums. *Journal of Business Venturing*, *30*(4), 546-563.

Gras, D., Moss, T. W., & Lumpkin, G. T. (2014). The use of secondary data in social entrepreneurship research: Assessing the field and identifying future opportunities. *Social Entrepreneurship and Research Methods (Research Methodology in Strategy and Management, Volume 9) Emerald Group Publishing Limited*, *9*, 49-75.

Gray, B. J., Duncan, S., Kirkwood, J., & Walton, S. (2014). Encouraging sustainable entrepreneurship in climate-threatened communities: a Samoan case study. *Entrepreneurship & Regional Development*, *26*(5-6), 401-430.

Greenwood, R., & Suddaby, R. (2006). Institutional entrepreneurship in mature fields: The big five accounting firms. *Academy of Management journal*, *49*(1), 27-48.

Greenwood, R., Oliver, C., Suddaby, R., & Sahlin-Andersson, K. (Eds.). (2008). *The Sage handbook of organizational institutionalism*. Sage.

Gregoire, D. A., Shepherd, D. A., & Lambert, L. S. (2010). Measuring opportunity-recognition beliefs illustrating and validating an experimental approach. *Organizational Research Methods*, *13*(1), 114-145.

Grothmann, T., & Patt, A. (2005). Adaptive capacity and human cognition: the process of individual adaptation to climate change. *Global Environmental Change*, *15*(3), 199-213.

Habib, M., & Zurawicki, L. (2002). Corruption and foreign direct investment. *Journal of international business studies*, *33*(2), 291-307.

Haddad, B. M. (2005). Ranking the adaptive capacity of nations to climate change when socio-political goals are explicit. *Global Environmental Change*, *15*(2), 165-176.

Hahn, R. (2009). The ethical rational of business for the poor - integrating the concepts bottom of the pyramid, sustainable development, and corporate citizenship. *Journal of Business Ethics, 84*(3), 313-324.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). Multivariate data analysis, 5th. *NY: Prentice Hall International*.

Hall, C. A., Cleveland, C. J., & Kaufmann, R. (1986). Energy and resource quality: the ecology of the economic process. *Environmental science and technology (USA)*.

Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing, 25*(5), 439-448. doi:http://dx.doi.org/10.1016/j.jbusvent.2010.01.002

Hall, J., Matos, S., Sheehan, L., & Silvestre, B. (2012). Entrepreneurship and innovation at the base of the pyramid: a recipe for inclusive growth or social exclusion?. *Journal of Management Studies*, *49*(4), 785-812.

Hamilton, K., & Naikal, E. (2014). Comprehensive wealth accounting and sustainable development. *Handbook of Sustainable Development*, 25.

Handmer, J. W., & Dovers, S. R. (1996). A typology of resilience: rethinking institutions for sustainable development. *Organization & Environment*, *9*(4), 482-511.

Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. *American journal of sociology*, 929-964.

Hansen, E. G., & Schaltegger, S. (2013). 100 per cent organic? A sustainable entrepreneurship perspective on the diffusion of organic clothing. *Corporate Governance, 13*(5), 583-598. doi:http://dx.doi.org/10.1108/CG-06-2013-0074

Hardy, C., & Maguire, S. (2008). Institutional entrepreneurship. *The Sage handbook of organizational institutionalism*, 198-217.

Hargadon, A. B., & Douglas, Y. (2001). When innovations meet institutions: Edison and the design of the electric light. *Administrative science quarterly*,*46*(3), 476-501.

Hargrave, T. J., & Van de Ven, A. H. (2006). A collective action model of institutional innovation. *Academy of management review*, *31*(4), 864-888.

Hart, S. L. (2005). Innovation, creative destruction and sustainability. *Research-Technology Management*, *48*(5), 21-27.

Hart, S. L., & Milstein, M. B. (1999). Global sustainability and the creative destruction of industries. *Sloan Management Review, 41*(1), 23-33.

Harrison, J. S., & Freeman, R. E. (1999). Stakeholders, social responsibility, and performance: Empirical evidence and theoretical perspectives. *Academy of management Journal*, *42*(5), 479-485.

Hashmi, M. A., Damanhouri, A., & Rana, D. (2015). Evaluation of Sustainability Practices in the United States and Large Corporations. *Journal of Business Ethics*, *127*(3), 673-681.

Haynie, J. M., Shepherd, D. A., & McMullen, J. S. (2009). An opportunity for me? The role of resources in opportunity evaluation decisions. *Journal of Management studies*, *46*(3), 337-361.

Hayton, J. C., George, G., & Zahra, S. A. (2002). National culture and entrepreneurship: A review of behavioral research. *Entrepreneurship theory and practice*, *26*(4), 33.

Heiskanen, E., Lovio, R., & Jalas, M. (2011). Path creation for sustainable consumption: Promoting alternative heating systems in finland. *Journal of Cleaner Production, 19*(16), 1892-1900. doi:http://dx.doi.org/10.1016/j.jclepro.2011.02.005

Henfridsson, O., & Yoo, Y. (2014). The liminality of trajectory shifts in institutional entrepreneurship. *Organization Science*, *25*(3), 932-950.

Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, *50*(6), 1385-1399.

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.

Hoffman, A. J. (2010). Climate change as a cultural and behavioral issue: Addressing barriers and implementing solutions. *Organizational Dynamics*, *39*(4), 295-305.

Hoffman, A. J., & Jennings, P. D. (2015). Institutional theory and the natural environment: Research in (and on) the Anthropocene. *Organization & Environment*, *28*(1), 8-31.

Hofstede, G. (1983). The cultural relativity of organizational practices and theories. *Journal of international business studies*, 75-89.

Hofstede, G. (1993). Cultural constraints in management theories. *The Academy of Management Executive*, *7*(1), 81-94.

Hofstede, G. (2001) Culture's Consequences, Comparing Values, Behaviors, Institutions, and Organizations across Nations, London: Sage Publications.

Hofstede, G. (2010). The GLOBE debate: Back to relevance. *Journal of International Business Studies*, *41*(8), 1339-1346.

Hollensbe, E., Wookey, C., Hickey, L., George, G., & Nichols, C. V. (2014). Organizations with purpose. *Academy of Management Journal*, *57*(5), 1227-1234.

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.

House, R.J., Hanges, P.J., Javidan, M., Dorfman, P.W., & Gupta, V. 2004. Culture, Leadership and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA: Sage

Howard-Grenville, J., Buckle, S. J., Hoskins, B. J., & George, G. (2014). Climate change and management. *Academy of Management Journal*, *57*(3), 615-623.

Hox, J. J., Moerbeek, M., & van de Schoot, R. (2010). *Multilevel analysis: Techniques and applications*. Routledge.

Hussein, K., & Nelson, J. (1998). Sustainable livelihoods and livelihood diversification.

Husser, J., & Evraert-Bardinet, F. (2014). The effect of social and environmental disclosure on companies' market value. *Management international/International Management/Gestiòn Internacional*, *19*(1), 61-84.

Huy, Q. N. (2001). Time, temporal capability, and planned change. *Academy of management Review*, *26*(4), 601-623.

Ireland, D. R., & Webb, J. W. (2007). A cross-disciplinary exploration of entrepreneurship research. Journal of Management, 33(6), 891-927. doi:10.1177/0149206307307643

Iyer, D. N., & Miller, K. D. (2008). Performance feedback, slack, and the timing of acquisitions. *Academy of Management Journal*, *51*(4), 808-822.

Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International entrepreneurship research (1989–2009): a domain ontology and thematic analysis. *Journal of business venturing*, *26*(6), 632-659.

Kabir, M. S., Hou, X., Akther, R., Wang, J., & Wang, L. (2012). Impact of small entrepreneurship on sustainable livelihood assets of rural poor women in Bangladesh. *International Journal of Economics and Finance*, *4*(3), p265.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.

Kalantaridis, C., & Fletcher, D. (2012). Entrepreneurship and institutional change: A research agenda. *Entrepreneurship & Regional Development*,*24*(3-4), 199-214.

Kallis, G., & Norgaard, R. B. (2010). Coevolutionary ecological economics.*Ecological economics*, *69*(4), 690-699.

Kapoor, R., & Furr, N. R. (2015). Complementarities and competition: Unpacking the drivers of entrants' technology choices in the solar photovoltaic industry. *Strategic Management Journal*, *36*(3), 416-436.

Kapoor, R., & Lee, J. M. (2013). Coordinating and competing in ecosystems: How organizational forms shape new technology investments. *Strategic Management Journal*, *34*(3), 274-296.

Kelley, D. J., Singer, S., & Herrington, M. (2012). The global entrepreneurship monitor. *2011 Global Report, GEM 2011*, *7*.

Kelley, J., Singer, S., & Herrington, M. (2016). Global Entrepreneurship Monitor: 2015/16 Global Report. In *Global Entrepreneurship Monitor*. Retrieved from http://www.gemconsortium.org/report

Keogh, P. D., & Polonsky, M. J. (1998). Environmental commitment: a basis for environmental entrepreneurship?. *Journal of Organizational Change Management*, *11*(1), 38-49.

Kerlinger, F. N. (1986). Foundations of Behavioral Research (Holt, Rinehart and Winston, New York, NY).

Kibler, E., Fink, M., Lang, R., & Muñoz, P. (2015). Place attachment and social legitimacy: Revisiting the sustainable entrepreneurship journey.*Journal of Business Venturing Insights*, *3*, 24-29.

Kim, Y., Brodhag, C., & Mebratu, D. (2014). Corporate social responsibility driven innovation. *Innovation: The European Journal of Social Sciences, 27*(2), 175-196. doi:10.1080/13511610.2014.915191

King, A. A., & Lenox, M. J. (2001). Lean and green? An empirical examination of the relationship between lean production and environmental performance. *Production and operations management*, *10*(3), 244-256.

Kitula, A. G. N. (2006). The environmental and socio-economic impacts of mining on local livelihoods in Tanzania: A case study of Geita District.*Journal of cleaner production*, *14*(3), 405-414.

Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of financial economics*, *82*(3), 591-629.

Klein, K. J., Tosi, H., & Cannella, A. A. (1999). Multilevel theory building: Benefits, barriers, and new developments. *Academy of Management review*,*24*(2), 248-253.

Koellinger, P., & Minniti, M. (2006). Not for lack of trying: American entrepreneurship in black and white. *Small Business Economics*, *27*(1), 59-79.

Koellinger, P., Minniti, M., & Schade, C. (2007). "I think I can, I think I can": Overconfidence and entrepreneurial behavior. *Journal of economic psychology*, *28*(4), 502-527.

Koo, C., Chung, N., & Ryoo, S. Y. (2014). How does ecological responsibility affect manufacturing firms' environmental and economic performance?. *Total Quality Management & Business Excellence*, *25*(9-10), 1171-1189.

Kostova, T. (1997, August). COUNTRY INSTITUTIONAL PROFILES: CONCEPT AND MEASUREMENT. In *Academy of Management Proceedings* (Vol. 1997, No. 1, pp. 180-184). Academy of Management.

Kostova, T., & Roth, K. (2002). Adoption of an organizational practice by subsidiaries of multinational corporations: Institutional and relational effects. *Academy of management journal*, *45*(1), 215-233.

Kroeger, A., & Weber, C. (2014). Developing a conceptual framework for comparing social value creation. *Academy of Management Review*, *39*(4), 513-540.

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. doi:http://dx.doi.org/10.1016/j.jbusvent.2009.09.001

Kulik, C. T., Ryan, S., Harper, S., & George, G. (2014). Aging populations and management. *Academy of Management Journal*, *57*(4), 929-935.

Laland, K. N., & Boogert, N. J. (2010). Niche construction, co-evolution and biodiversity. *Ecological economics*, *69*(4), 731-736.

Laland, K. N., Kendal, J. R., & Brown, G. R. (2007). The niche construction perspective: Implications for evolution and human behaviour. *Journal of Evolutionary Psychology*, *5*(1), 51-66.

Laland, K. N., Odling-Smee, J., & Feldman, M. W. (2001). Cultural niche construction and human evolution. *Journal of Evolutionary Biology*, *14*(1), 22-33.

Lampikoski, T., Westerlund, M., Rajala, R., & Möller, K. (2014). Green innovation games: Value-creation strategies for corporate sustainability. California Management Review, 57(1), 88-116. doi:10.1525/cmr.2014.57.1.88

Langowitz, N., & Minniti, M. (2007). The entrepreneurial propensity of women. *Entrepreneurship theory and practice*, *31*(3), 341-364.

Lans, T., Blok, V., & Wesselink, R. (2014). Learning apart and together: Towards an integrated competence framework for sustainable entrepreneurship in higher education. *Journal of Cleaner Production, 62*, 37-47. doi:http://dx.doi.org/10.1016/j.jclepro.2013.03.036

Lawrence, T. B., & Phillips, N. (2004). From Moby Dick to Free Willy: Macro-cultural discourse and institutional entrepreneurship in emerging institutional fields. *Organization*, *11*(5), 689-711.

Lawrence, T. B., Winn, M. I., & Jennings, P. D. (2001). The temporal dynamics of institutionalization. *Academy of management review*, *26*(4), 624-644.

Leary, N. A. (1999). A framework for benefit-cost analysis of adaptation to climate change and climate variability. *Mitigation and adaptation strategies for global change*, *4*(3), 307-318.

Lele, S. M. (1991). Sustainable development: a critical review. *World development*, *19*(6), 607-621.

Lenox, M. J. (2006). The role of private decentralized institutions in sustaining industry self-regulation. *Organization Science*, *17*(6), 677-690.

Levesque, M., & Minniti, M. (2006). The effect of aging on entrepreneurial behavior. *Journal of Business Venturing*, *21*(2), 177-194.

Lewin, A. Y., & Volberda, H. W. (1999). Prolegomena on coevolution: A framework for research on strategy and new organizational forms.*Organization science*, *10*(5), 519-534.

Leifer, E. M. (1991). *Actors and observers: a theory of skill in social relationships*. Garland.

Lewin, A. Y., Long, C. P., & Carroll, T. N. (1999). The coevolution of new organizational forms. *Organization Science*, *10*(5), 535-550.

Linder, M., Björkdahl, J., & Ljungberg, D. (2014). Environmental orientation and economic performance: A quasi-experimental study of small swedish firms. *Business Strategy and the Environment, 23*(5), 333-348. doi:10.1002/bse.1788

Linnanen, L. (2002). An insider's experiences with environmental entrepreneurship. *Greener Management International*, *2002*(38), 71-80.

Linnenluecke, M. K., Griffiths, A., & Winn, M. I. (2013). Firm and industry adaptation to climate change: a review of climate adaptation studies in the business and management field. *Wiley Interdisciplinary Reviews: Climate Change*, *4*(5), 397-416.

Lockie, S. (2012). Market instruments, ecosystem services, and property rights: Assumptions and conditions for sustained social and ecological benefits. *Land Use Policy*, *31*, 90-98

Lülfs, R., & Hahn, R. (2014). Sustainable behavior in the business sphere: A comprehensive overview of the explanatory power of psychological models.*Organization & Environment*, 1086026614522631.

Lumpkin, G. T., & Brigham, K. H. (2011). Long-Term Orientation and Intertemporal Choice in Family Firms. *Entrepreneurship Theory and Practice*, *35*(6), 1149-1169.

Lumpkin, G. T., & Lichtenstein, B. B. (2005). The role of organizational learning in the Opportunity-Recognition process. *Entrepreneurship Theory and Practice*, *29*(4), 451-472.

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

Lynskey, M. J. (2006). Transformative technology and institutional transformation: Coevolution of biotechnology venture firms and the institutional framework in Japan. *Research Policy*, *35*(9), 1389-1422.

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

Manetti, G., & Toccafondi, S. (2012). The role of stakeholders in sustainability reporting assurance. *Journal of Business Ethics*, *107*(3), 363-377.

Manning, S., & Reinecke, J. (2016). A modular governance architecture in-the-making: How transnational standard-setters govern sustainability transitions. *Research Policy*, *45*(3), 618-633.

Manolova, T. S., Eunni, R. V., & Gyoshev, B. S. (2008). Institutional environments for entrepreneurship: Evidence from emerging economies in Eastern Europe. *Entrepreneurship Theory and Practice*, *32*(1), 203-218.

Marsden, T., & Smith, E. (2005). Ecological entrepreneurship: sustainable development in local communities through quality food production and local branding. *Geoforum*, *36*(4), 440-451.

McFarlane, A. C., & Norris, F. H. (2006). Definitions and concepts in disaster research. *Methods for disaster mental health research*, 3-19.

McMullen, J. S. (2011). Delineating the domain of development entrepreneurship: a market-based approach to facilitating inclusive economic growth. *Entrepreneurship Theory and Practice*, *35*(1), 185-193.

McMullen, J. S., & Dimov, D. (2013). Time and the entrepreneurial journey: the problems and promise of studying entrepreneurship as a process.*Journal of Management Studies*, *50*(8), 1481-1512.

McMullen, J. S., Wood, M. S., & Kier, A. S. (2016). An embedded agency approach to entrepreneurship public policy: Managerial position and politics in new venture location decisions. *The Academy of Management Perspectives*, *30*(3), 222-246.

McKnight, B., & Linnenluecke, M. K. (2016). How Firm Responses to Natural Disasters Strengthen Community Resilience: A Stakeholder-Based Perspective. *Organization & Environment*, *29*(3), 290-307.

McLaughlin, P. (2011). Climate change, adaptation, and vulnerability: Reconceptualizing societal–environment interaction within a socially constructed adaptive landscape. *Organization & Environment*, *24*(3), 269-291.

Meek, W. R., Pacheco, D. F., & York, J. G. (2010). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. *Journal of Business Venturing, 25*(5), 493-509. doi:http://dx.doi.org/10.1016/j.jbusvent.2009.09.007

Milder, J. C., Scherr, S. J., & Bracer, C. (2010). Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society*, *15*(2), 4.

Misangyi, V. F., Weaver, G. R., & Elms, H. (2008). Ending corruption: The interplay among institutional logics, resources, and institutional entrepreneurs. *Academy of Management Review*, *33*(3), 750-770.

Montiel, I. (2008). Corporate social responsibility and corporate sustainability separate pasts, common futures. *Organization & Environment*, *21*(3), 245-269.

Montiel, I., & Delgado-Ceballos, J. (2014). Defining and Measuring Corporate Sustainability Are We There Yet?. *Organization & Environment*, 1086026614526413.

Moss, T. W., Neubaum, D. O., & Meyskens, M. (2015). The effect of virtuous and entrepreneurial orientations on microfinance lending and repayment: A signaling theory perspective. *Entrepreneurship Theory and Practice*, *39*(1), 27-52.

Moss, T. W., Short, J. C., Payne, G. T., & Lumpkin, G. T. (2011). Dual identities in social ventures: An exploratory study. *Entrepreneurship Theory and Practice*, *35*(4), 805-830.

Mossholder, K. W., Settoon, R. P., & Henagan, S. C. (2005). A relational perspective on turnover: Examining structural, attitudinal, and behavioral predictors. *Academy of Management Journal*, *48*(4), 607-618.

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.

Muñoz, P., & Dimov, D. (2015). The call of the whole in understanding the development of sustainable ventures. *Journal of Business Venturing, 30*(4), 632-654. doi:http://dx.doi.org/10.1016/j.jbusvent.2014.07.012

Navis, C., & Glynn, M. A. (2010). How new market categories emerge: Temporal dynamics of legitimacy, identity, and entrepreneurship in satellite radio, 1990–2005. *Administrative Science Quarterly*, *55*(3), 439-471.

Nelson, D. R., Adger, W. N., & Brown, K. (2007). Adaptation to environmental change: contributions of a resilience framework. *Annu. Rev. Environ. Resour.*, *32*, 395-419.

Norgaard, R. B. (1984). Coevolutionary development potential. *Land economics*, *60*(2), 160-173.

Norgaard, R. B., & Kallis, G. (2011). Coevolutionary contradictions: prospects for a research programme on social and environmental change. *Geografiska Annaler: Series B, Human Geography*, *93*(4), 289-300.

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

Odling-Smee, F. J., Laland, K. N., & Feldman, M. W. (2003). *Niche construction: the neglected process in evolution* (No. 37). Princeton University Press.

Odling-Smee, J., Erwin, D. H., Palkovacs, E. P., Feldman, M. W., & Laland, K. N. (2013). Niche construction theory: a practical guide for ecologists. *The Quarterly review of biology*, *88*(1), 3-28.

Parker, S. C. (2009). *The economics of entrepreneurship*. Cambridge University Press.

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.

Pacheco, D. F., York, J. G., & Hargrave, T. (2011). The co-evolution of industries, social movements, and institutions: The case of wind power. In *Academy of Management Proceedings* (Vol. 2011, No. 1, pp. 1-6). Academy of Management.

Pacheco, D. F., York, J. G., Dean, T. J., & Sarasvathy, S. D. (2010). The coevolution of institutional entrepreneurship: A tale of two theories. Journal of management, 36(4), 974-1010.

Padgett, J. F., & Ansell, C. K. (1993). Robust Action and the Rise of the Medici, 1400-1434. *American journal of sociology*, 1259-1319.

Padgett, J. F., & McLean, P. D. (2006). Organizational Invention and Elite Transformation: The Birth of Partnership Systems in Renaissance Florence1. *American journal of Sociology*, *111*(5), 1463-1568.

Padgett, J. F., & Powell, W. W. (2012). *The emergence of organizations and markets*. Princeton University Press.

Parrish, B. D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. *Journal of Business Venturing*, *25*(5), 510-523.

Parrish, B. D., & Foxon, T. J. (2006). Sustainability entrepreneurship and equitable transitions to a low-carbon economy. *Greener Management International*, *2006*(55), 47-62.

Pastakia, A. (1998). Grassroots ecopreneurs: Change agents for a sustainable society. *Journal of Organizational Change Management, 11*(2), 157-173.

Patzelt, H., & Shepherd, D. A. (2011). Recognizing opportunities for sustainable development. *Entrepreneurship: Theory & Practice, 35*(4), 631-652. doi:10.1111/j.1540-6520.2010.00386.x

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management.*Academy of management review*, *23*(1), 59-76.

Perego, P., & Kolk, A. (2012). Multinationals' accountability on sustainability: The evolution of third-party assurance of sustainability reports. *Journal of Business Ethics, 110*(2), 173-190. doi:10.1007/s10551-012-1420-5

Peskett, L., Schreckenberg, K., & Brown, J. (2011). Institutional approaches for carbon financing in the forest sector: learning lessons for REDD+ from forest carbon projects in Uganda. *Environmental science & policy*, *14*(2), 216-229.

Pielke, R. A. (1998). Rethinking the role of adaptation in climate policy. *Global Environmental Change*, *8*(2), 159-170.

Pirard, R. (2012). Market-based instruments for biodiversity and ecosystem services: A lexicon. *Environmental Science & Policy*, *19*, 59-68.

Politis, D. (2005). The process of entrepreneurial learning: a conceptual framework. *Entrepreneurship theory and practice*, *29*(4), 399-424.

Porter, T. B. (2006). Coevolution as a research framework for organizations and the natural environment. *Organization & Environment*, *19*(4), 479-504.

Prasad, P., Prasad, A., & Baker, K. (2016). Smoke and mirrors: Institutional entrepreneurship and gender identities in the US Tobacco Industry, 1920–1945. *Organization*, *23*(2), 227-249.

Rabe-Hesketh, S., Skrondal, A., & Pickles, A. (2005). Maximum likelihood estimation of limited and discrete dependent variable models with nested random effects. *Journal of Econometrics*, *128*(2), 301-323.

Rajasekaran, B. (2013). Sustainable Entrepreneurship: Past Researches and Future Directions. *Journal of Entrepreneurship and Management*, *2*(1), 20.

Rao, H., Morrill, C., & Zald, M. N. (2000). Power plays: How social movements and collective action create new organizational forms. *Research in organizational behavior*, *22*, 237-281.

Rapp, C., & Eklund, J. (2002). Sustainable development of improvement activities—the long-term operation of a suggestion scheme in a Swedish company. *Total Quality Management, 13*(7), 945-969. doi:10.1080/0954412022000017049

REDD+ Partnership (2015). The Voluntary REDD+ Database. Managed by FAO, Rome, Italy. Downloaded 06 Oct 2015.

REDD+ Partnership. (2013). Towards Transparency in Public Financing for REDD+. In *Voluntary REDD+ Database*. Retrieved from http://www.fao.org/forestry/vrd/resources

Rees, W. E. (2002). An ecological economics perspective on sustainability and prospects for ending poverty. *Population and Environment, 24*(1), 15-46.

Reynolds, T. W. (2012). Institutional determinants of success among forestry-based carbon sequestration projects in Sub-Saharan Africa. *World Development*, *40*(3), 542-554.

Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., ... & Chin, N. (2005). Global entrepreneurship monitor: Data collection design and implementation 1998–2003. *Small business economics*, *24*(3), 205-231.

Robbins, D., Pantuosco, D., Parker, D., & Fuller, B. 2000. An empirical assessment of the contribution of small business to US state economic performance. Small Business Economics, 15: 293-302.

Robinson, J. (2006). Navigating social and institutional barriers to markets: How social entrepreneurs identify and evaluate opportunities. *Social entrepreneurship*, 95-120.

Rodriguez, P., Siegel, D. S., Hillman, A., & Eden, L. (2006). Three lenses on the multinational enterprise: Politics, corruption, and corporate social responsibility. *Journal of International Business Studies, 37*(6), 733-746. doi:10.1057/palgrave.jibs.8400229

Rousseau, D. M. (1985). Issues of level in organizational research: Multi-level and cross-level perspectives. *Research in organizational behavior*, *7*(1), 1-37.

Ruffle, B. J., & Tobol, Y. (2014). Honest on Mondays: Honesty and the temporal separation between decisions and payoffs. *European Economic Review*, *65*, 126-135.

Salzmann, O., Ionescu-Somers, A., & Steger, U. (2005). The business case for corporate sustainability:: literature review and research options. *European Management Journal*, *23*(1), 27-36.

Santos, F. (2012). A positive theory of social entrepreneurship. *Journal of Business Ethics, 111*(3), 335-351. doi:10.1007/s10551-012-1413-4

Schaefer, K., Corner, P. D., & Kearins, K. (2015). Social, Environmental and Sustainable Entrepreneurship Research What Is Needed for Sustainability-as-Flourishing?. *Organization & Environment*, *28*(4), 394-413.

Schaltegger, S., & Wagner, M. (2006). Integrative management of sustainability performance, measurement and reporting. *International Journal of Accounting, Auditing and Performance Evaluation*, *3*(1), 1-19.

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

Schumpeter, J. (1942). Creative destruction. *Capitalism, socialism and democracy*, 82-5.

Schüssler, E., Rüling, C. C., & Wittneben, B. B. (2014). On melting summits: The limitations of field-configuring events as catalysts of change in transnational climate policy. *Academy of Management Journal*, *57*(1), 140-171.

Scoones, I. (1998). Sustainable rural livelihoods: a framework for analysis.

Scott, W. R. (1995). *Institutions and organizations* (pp. p-33). Thousand Oaks, CA: Sage.

Scott, W. R. (2008). Approaching adulthood: the maturing of institutional theory. *Theory and society*, *37*(5), 427-442.

Selden, P. D., & Fletcher, D. E. (2015). The entrepreneurial journey as an emergent hierarchical system of artifact-creating processes. *Journal of Business Venturing*, *30*(4), 603-615.

Sharfman, M. P., & Fernando, C. S. (2008). Environmental risk management and the cost of capital. *Strategic management journal*, *29*(6), 569-592.

Shane, S. (2012). Reflections on the 2010 AMR decade award: delivering on the promise of entrepreneurship as a field of research. *Academy of Management Review*, *37*(1), 10-20.

Shane, S. 2000. Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4): 448-469.

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

Sharma, P., & Chrisman, S. J. J. (2007). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship*. In *Entrepreneurship* (pp. 83-103). Springer Berlin Heidelberg.

Shepherd, D. A. (2011). Multilevel entrepreneurship research: Opportunities for studying entrepreneurial decision making. *Journal of Management*, *37*(2), 412-420.

Shepherd, D. A. (2015). Party On! A call for entrepreneurship research that is more interactive, activity based, cognitively hot, compassionate, and prosocial. *Journal of Business Venturing*, *30*(4), 489-507.

Shepherd, D. A., Kuskova, V., & Patzelt, H. (2009). Measuring the values that underlie sustainable development: The development of a valid scale.*Journal of Economic Psychology*, *30*(2), 246-256.

Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking 'what is to be sustained' with 'what is to be developed'. *Entrepreneurship: Theory & Practice, 35*(1), 137-163. doi:10.1111/j.1540-6520.2010.00426.x

Shepherd, D. A., & Patzelt, H. (2017). Researching Entrepreneurships' Role in Sustainable Development. In *Trailblazing in Entrepreneurship* (pp. 149-179). Springer International Publishing.

Shepherd, D. A., Patzelt, H., & Baron, R. A. (2013). "I care about nature, but…": Disengaging values in assessing opportunities that cause harm. *Academy of Management Journal*, *56*(5), 1251-1273.

Shepherd, D. A., & Williams, T. A. (2014). Local venturing as compassion organizing in the aftermath of a natural disaster: The role of localness and community in reducing suffering. *Journal of Management Studies*, *51*(6), 952-994.

Short, J. C., Moss, T. W., & Lumpkin, G. T. (2009). Research in social entrepreneurship: Past contributions and future opportunities. *Strategic entrepreneurship journal*, *3*(2), 161-194.

Short, J. C., Payne, G. T., & Ketchen, D. J. (2008). Research on organizational configurations: Past accomplishments and future challenges. *Journal of Management*.

Simola, S. K. (2007). The pragmatics of care in sustainable global enterprise. *Journal of Business Ethics, 74*(2), 131-147.

Sine, W. D., & David, R. J. (2003). Environmental jolts, institutional change, and the creation of entrepreneurial opportunity in the US electric power industry. *Research Policy*, *32*(2), 185-207.

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390-1412.

Slawinski, N., & Bansal, P. (2012). A matter of time: The temporal perspectives of organizational responses to climate change. *Organization Studies*, *33*(11), 1537-1563.

Smit, B., Burton, I., Klein, R. J., & Wandel, J. (2000). An anatomy of adaptation to climate change and variability. *Climatic change*, *45*(1), 223-251.

Smit, B., & Pilifosova, O. (2003). Adaptation to climate change in the context of sustainable development and equity. *Sustainable Development*, *8*(9), 9.

Smith, P. B. (2006). When elephants fight, the grass gets trampled: The GLOBE and Hofstede projects. *Journal of International Business Studies*, *37*(6), 915-921.

Smith, W. K., Gonin, M., & Besharov, M. L. (2013). Managing social-business tensions: A review and research agenda for social enterprise. *Business Ethics Quarterly*, *23*(03), 407-442.

Smith, A., Stirling, A., & Berkhout, F. (2005). The governance of sustainable socio-technical transitions. *Research policy*, *34*(10), 1491-1510.

Sneddon, C., Howarth, R. B., & Norgaard, R. B. (2006). Sustainable development in a post-Brundtland world. *Ecological economics*, *57*(2), 253-268.

Snow, C. C., & Thomas, J. B. (1994). Field research methods in strategic management: Contributions to theory building and testing. *The Journal of Management Studies,31*(4), 457.

Sobel, R. S. (2008). Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, *23*(6), 641-655.

Sobel, R. S., Clark, J. R., & Lee, D. R. (2007). Freedom, barriers to entry, entrepreneurship, and economic progress. *The Review of Austrian Economics*, *20*(4), 221-236.

Søreide, T. (2009). Too risk averse to stay honest?: Business corruption, uncertainty and attitudes toward risk. *International Review of Law and Economics*, *29*(4), 388-395.

Spence, M., Gherib, J. B. B., & Biwolé, V. O. (2011). Sustainable entrepreneurship: is entrepreneurial will enough? A north–south comparison. *Journal of Business Ethics*, *99*(3), 335-367.

Starik, M., & Kanashiro, P. (2013). Toward a theory of sustainability management: Uncovering and integrating the nearly obvious. *Organization & Environment*, 1086026612474958.

Stavins, R. N. (1997). Policy instruments for climate change: how can national governments address a global problem. *U. Chi. Legal F.*, 293.

Stenholm, P., Acs, Z. J., & Wuebker, R. (2013). Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity. *Journal of Business Venturing*, *28*(1), 176-193.

Stephan, U., Uhlaner, L. M., & Stride, C. (2014). Institutions and social entrepreneurship: The role of institutional voids, institutional support, and institutional configurations. *Journal of International Business Studies*, *46*(3), 308-331.

Sternberg, R., & Wennekers, S. (2005). Determinants and effects of new business creation using global entrepreneurship monitor data. *Small Business Economics*, *24*(3), 193-203.

Strickland, L. H., Lewicki, R. J., & Katz, A. M. (1966). Temporal orientation and perceived control as determinants of risk-taking. *Journal of experimental social psychology*, *2*(2), 143-151.

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

Suddaby, R. (2010). Challenges for institutional theory. *Journal of Management Inquiry*, *19*(1), 14-20.

Sukhdev, P., Prabhu, R., Kumar, P., Bassi, A., Patwa-Shah, W., Enters, T., ... & Greenwalt, J. (2011). REDD+ and a green economy: Opportunities for a mutually supportive relationship. *Geneva, Switzerland: UN-REDD Programme*.

Sunderlin, W. D., Larson, A. M., Duchelle, A. E., Resosudarmo, I. A. P., Huynh, T. B., Awono, A., & Dokken, T. (2014). How are REDD+ proponents addressing tenure problems? Evidence from Brazil, Cameroon, Tanzania, Indonesia, and Vietnam. *World Development*, *55*, 37-52.

Szekely, F., & Strebel, H. (2013). Incremental, radical and game-changing: Strategic innovation for sustainability. *Corporate Governance, 13*(5), 467-481. doi:http://dx.doi.org/10.1108/CG-06-2013-0084

Tang, J., Kacmar, K. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing*, *27*(1), 77-94.

Terjesen, S., Hessels, J., & Li, D. (2016). Comparative International Entrepreneurship A Review and Research Agenda. *Journal of Management*,*42*(1), 299-344.

Thomas, A. S., & Mueller, S. L. (2000). A case for comparative entrepreneurship: Assessing the relevance of culture. *Journal of International Business Studies*, *31*(2), 287-301.

Thompson, N. A., Herrmann, A. M., & Hekkert, M. P. (2015). How sustainable entrepreneurs engage in institutional change: insights from biomass torrefaction in the Netherlands. *Journal of Cleaner Production*, *106*, 608-618.

Thompson, N., Kiefer, K., & York, J. G. (2011). Distinctions not dichotomies: exploring social, sustainable, and environmental entrepreneurship. *Social and Sustainable Entrepreneurship (Advances in Entrepreneurship, Firm Emergence and Growth, Volume 13). Bringley: Emerald Group Publishing Limited*, 201-229.

Thurik, A. R., Carree, M. A., Van Stel, A., & Audretsch, D. B. (2008). Does self-employment reduce unemployment?. *Journal of Business Venturing*, *23*(6), 673-686.

Tolbert, P. S., David, R. J., & Sine, W. D. (2011). Studying choice and change: The intersection of institutional theory and entrepreneurship research. *Organization Science*, *22*(5), 1332-1344.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of management Journal*, *41*(4), 464-476.

UN REDD. (2008, June). UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). In *UN REDD Programme*. Retrieved from http://www.un-redd.org/Portals/15/documents/publications/UN-REDD_FrameworkDocument.pdf

United Nations. (2015).Transforming our world: the 2030 Agenda for Sustainable Development. In *United Nations*. Retrieved from https://sustainabledevelopment.un.org/post2015/transformingourworld

Van de Ven, A. H., & Hargrave, T. J. (2004). *Social, technical, and institutional change* (pp. 259-303). Oxford University Press, Oxford.

Van de Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *Academy of management review*, *31*(4), 802-821.

Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of management review*, *20*(3), 510-540.

Van Den Bergh, J. C. J. M. (2007). Sustainable development in ecological economics. In G. Atkinson, S. Dietz, E. Neumayer, & M. Agarwala (Eds.), *Handbook of Sustainable Development* (2nd ed., pp. 41-55). Northampton, MA: Edward Elgar Publishing

Van Den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization science*, *10*(5), 551-568.

Van Der Vegt, G. S., Essens, P., Wahlström, M., & George, G. (2015). Managing risk and resilience. *Academy of Management Journal*, *58*(4), 971-980.

Van Stel, A., & Carree, M. (2010). *The Relationship between Entrepreneurship and Economic Development: is it U-shaped?*. Now Publishers Inc.

Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in entrepreneurship, firm emergence and growth*, *3*(1), 119-138.

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social--ecological systems. *Ecology and society*, *9*(2), 5.

Walker, R., Moran, E., & Anselin, L. (2000). Deforestation and cattle ranching in the Brazilian Amazon: external capital and household processes.*World development*, *28*(4), 683-699.

Wang, T., & Bansal, P. (2012). Social responsibility in new ventures: profiting from a long-term orientation. *Strategic Management Journal*, *33*(10), 1135-1153.

Webb, J. W., Ireland, R. D., & Ketchen, D. J. (2014). Toward a greater understanding of entrepreneurship and strategy in the informal economy. *Strategic Entrepreneurship Journal*, *8*(1), 1-15.

Webb, J. W., Tihanyi, L., Ireland, R. D., & Sirmon, D. G. (2009). You say illegal, I say legitimate: Entrepreneurship in the informal economy. *Academy of Management Review*, *34*(3), 492-510.

Weick, K. E. 1979. The social psychology of organizing (2nd ed.). Reading, MA: Addison-Wesley

Welter, F. (2011). Contextualizing entrepreneurship—conceptual challenges and ways forward. *Entrepreneurship Theory and Practice*, *35*(1), 165-184.

Wesseling, J. H., Niesten, E. M. M. I., Faber, J., & Hekkert, M. P. (2015). Business strategies of incumbents in the market for electric vehicles: Opportunities and incentives for sustainable innovation. *Business Strategy and the Environment, 24*(6), 518-531. doi:10.1002/bse.1834

Whetten, D. A. (1989). What constitutes a theoretical contribution?.*Academy of management review*, *14*(4), 490-495.

Whiteman, G., de Vos, D. R., Chapin, F. S., Yli-Pelkonen, V., Niemelä, J., & Forbes, B. C. (2011). Business strategies and the transition to low-carbon cities. *Business Strategy and the Environment*, *20*(4), 251-265.

Whitford, J., & Zirpoli, F. (2014). Pragmatism, practice, and the boundaries of organization. *Organization Science*, *25*(6), 1823-1839.

Wicks, A. C., & Freeman, R. E. (1998). Organization studies and the new pragmatism: Positivism, anti-positivism, and the search for ethics.*Organization science*, *9*(2), 123-140.

Wijen, F. (2014). Means versus ends in opaque institutional fields: Trading off compliance and achievement in sustainability standard adoption. *Academy of Management Review*, *39*(3), 302-323.

Wijen, F., & Ansari, S. (2007). Overcoming inaction through collective institutional entrepreneurship: Insights from regime theory. *Organization studies*, *28*(7), 1079-1100.

Wijen, F., & van Tulder, R. (2011). Integrating environmental and international strategies in a world of regulatory turbulence. *California management review*, *53*(4), 23-46.

Wijen, F., Zoeteman, K., Pieters, J., & Van Seters, P. (Eds.). (2012). *A handbook of globalisation and environmental policy: National government interventions in a global arena*. Edward Elgar Publishing.

Williams, L. G. (2013). Putting the pieces together for good governance of REDD+: an analysis of 32 REDD+ country readiness proposals. *World Resources Institute (WRI), Washington DC, USA*.

Williams, T. A., & Shepherd, D. A. (2016). Building resilience or providing sustenance: Different paths of emergent ventures in the aftermath of the Haiti earthquake. *Academy of Management Journal*, *59*(6), 2069-2102.

Williamson, O. E. (2008). The economic institutions of capitalism. *The Political Economy Reader: Markets as Institutions*.

Winder, Nick, Brian S. McIntosh, and Paul Jeffrey. "The origin, diagnostic attributes and practical application of co-evolutionary theory." *Ecological Economics* 54, no. 4 (2005): 347-361.

Winn, M. I., & Pogutz, S. (2013). Business, ecosystems, and biodiversity: New horizons for management research. *Organization & Environment*, 1086026613490173.

Winzer, C. (2012). Conceptualizing energy security. *Energy Policy*, *46*, 36-48.

Wong, P. K., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics*, *24*(3), 335-350.

Wittneben, B. B., Okereke, C., Banerjee, S. B., & Levy, D. L. (2012). Climate change and the emergence of new organizational landscapes. *Organization Studies*, *33*(11), 1431-1450.

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*. Nelson Education.

Woolley, J. L. (2014). The creation and configuration of infrastructure for entrepreneurship in emerging domains of activity. *Entrepreneurship theory and practice*, *38*(4), 721-747.

Woolthuis, R. K., Hooimeijer, F., Bossink, B., Mulder, G., & Brouwer, J. (2013). Institutional entrepreneurship in sustainable urban development: Dutch successes as inspiration for transformation. *Journal of Cleaner Production*, *50*, 91-100.

Wright, A. L., & Zammuto, R. F. (2013). Creating opportunities for institutional entrepreneurship: The Colonel and the Cup in English County Cricket. *Journal of Business Venturing*, *28*(1), 51-68.

Wunder, S., 2005. Payments for Environmental Services: Some Nuts and Bolts. Occasional Paper No. 42. CIFOR, Bogor.

Wunder, S., Engel, S., & Pagiola, S. (2008). Taking stock: A comparative analysis of payments for environmental services programs in developed and developing countries. Ecological economics, 65(4), 834-852.

Xu, D., Pan, Y., & Beamish, P. W. (2004). The effect of regulative and normative distances on MNE ownership and expatriate strategies. *MIR: Management International Review*, 285-307.

Yohe, G. W. (2014). 29 Climate change adaptation: a risk-management approach. *Handbook of Sustainable Development*, *2010*, 463.

York, J. G., Hargrave, T. J., & Pacheco, D. F. (2016). Converging winds: Logic hybridization in the Colorado wind energy field. *Academy of Management Journal*, *59*(2), 579-610.

York, J. G., & Lenox, M. J. (2014). Exploring the sociocultural determinants of de novo versus de alio entry in emerging industries. *Strategic Management Journal*, *35*(13), 1930-1951.

York, J. G., & Venkataraman, S. (2010). The entrepreneur–environment nexus: Uncertainty, innovation, and allocation. *Journal of Business Venturing, 25*(5), 449-463. doi:http://dx.doi.org/10.1016/j.jbusvent.2009.07.007

Yousafzai, S. Y., Saeed, S., & Muffatto, M. (2015). Institutional Theory and Contextual Embeddedness of Women's Entrepreneurial Leadership: Evidence from 92 Countries. *Journal of Small Business Management*, *53*(3), 587-604.

Yu, A., Lumpkin, G. T., Sorenson, R. L., & Brigham, K. H. (2012). The landscape of family business outcomes a summary and numerical taxonomy of dependent variables. *Family Business Review*, *25*(1), 33-57.

Zaccai, E. (2012). Over two decades in pursuit of sustainable development: Influence, transformations, limits. *Environmental Development*, *1*(1), 79-90.

Zahra, S. A., Gedajlovic, E., Neubaum, D. O., & Shulman, J. M. (2009). A typology of social entrepreneurs: Motives, search processes and ethical challenges. *Journal of business venturing*, *24*(5), 519-532.

Zahra, S. A., Wright, M., & Abdelgawad, S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal*, 0266242613519807.

Zettinig, P., & Benson-Rea, M. (2008). What becomes of international new ventures? A coevolutionary approach. European Management Journal, 26(6), 354-365.

Zietsma, C., & Lawrence, T. B. (2010). Institutional work in the transformation of an organizational field: The interplay of boundary work and practice work. *Administrative Science Quarterly*, *55*(2), 189-221.

BIOGRAPHICAL SKETCH: CURRICULUM VITAE

KIVEN E. B. PIERRE

Tel: (315) 383 2668/ Email: kepier01@syr.edu

EDUCATION

Syracuse University, Martin J. Whitman School of Management
PhD Student in Entrepreneurship (Expected Graduation: June 2017)

Syracuse University, Martin J. Whitman School of Management
Master of Business Administration, May 2013
Certificate of Advanced Study in Sustainable Enterprise, May 2013

Morgan State University, Earl G. Graves School of Business and Management
Bachelor of Science in Business Administration, *Summa Cum Laude*, May 2011

RESEARCH

Interests

Social and Environmental Entrepreneurship; Sustainable Development; Entrepreneurial Opportunities Informal Entrepreneurship; International Entrepreneurship; Energy Independence

Manuscripts under Review:

Pierre, K., Lumpkin, T., Moss, T. "Starting the Fight against Climate Change: How National Contexts Influence Institutional Entrepreneurship for Sustainable Development" (Proposal accepted at Academy of Management Perspectives; Manuscript under review)

Working Papers:

Pierre, K., Minniti, M., Moss, T. "Distributed vs. Centralized Electricity Generation: Effects on New Venture Creation" (Finalizing manuscript)

Pierre, K., Lumpkin, T., Moss, T. "Entrepreneurship in the Anthropocene: How National Responses to Climate Change Affect New Venture Creation" (Finalizing manuscript)

Pierre, K., Nason, R. "An Examination of Energy Security, Innovation, and Organizational Performance." (Finalizing Manuscript).

Pierre, K. "Towards Enhancing Resource Perspectives on Internationalization: Bricolage and the Born Global Firm" (Data Analysis)

Pierre, K., Lumpkin, T. "Entrepreneurial Orientation and the Transition from Informal to Formal Entrepreneurship" (Instrument Development)

Academic Presentations: (*delivered alone unless otherwise noted)

Pierre, K., Moss, T., & Lumpkin, G. T. (2017) "Towards Better Understanding How Climate Change Adaptation Affects Entrepreneurship." Paper presented at the 6th Sustainability, Ethics and Entrepreneurship Conference, San Juan, Puerto Rico. ***Received Best Submission Award.***

Pierre, K., Moss, T., & Lumpkin, G. T. (2015) "An Integration and Extension of Sustainable Entrepreneurship and Sustainable Livelihoods." Paper presented at discussion session for The Annual Meetings of the Academy of Management, British Columbia.

Pierre, K., Moss, T., Lumpkin, G. T. (2015) "Towards Understanding Community-based Enterprise Performance in Resource Constrained Environments" Paper presented at the 4th Sustainability, Ethics and Entrepreneurship Conference, Denver, Colorado.

Pierre, K., Minniti, M., Moss, T., & Nason, R. (2015) "Entrepreneurship and the Energy-Economic Growth Nexus" Paper presented at the 35th Babson College Entrepreneurship Research Conference, Wellesley, MA.

Pierre, K., Lumpkin, T. (2014) "Market-based Mechanisms of Development at the Bottom-of-the-Pyramid: Performance Implications for Community-based Enterprise" Paper presented at The 11th Annual Social Entrepreneurship Conference, Boston, Massachusetts.

Pierre, K., Minniti, M., & Moss, T. (2014) "Towards a Path-Dependence of Entrepreneurial Opportunities." Paper presented at discussion session for The Annual Meetings of the Academy of Management, Philadelphia Pennsylvania.

Pierre, K., Moss, T., & Lumpkin, T. (2014) "Sustainable Entrepreneurship and Livelihoods: An Integration and Extension of Perspectives in Geography and Entrepreneurship." Poster presented at the 3rd Sustainability, Ethics and Entrepreneurship Conference, Denver, Colorado.

TEACHING EXPERIENCE

EEE 370 – Introduction to Entrepreneurship (Undergraduate course)
Fall 2015 (35 students); Fall 2016 (49 students)

SELECTED PROFESSIONAL EXPERIENCE

Falcone Center for Entrepreneurship, Syracuse University; Syracuse, NY
Graduate/Teaching Assistant, (09/12 – Present)
C.R. Fletcher Associates; Syracuse, NY
MBA Intern: Social Media, (06/12 – 08/12)
Center for Academic Success and Achievement, Morgan State University; Baltimore, MD
Tutor, (03/09 – 08/11)
Republic Bank (Guyana) Ltd.; Georgetown, Guyana
Electronic Banking Officer, (11/05 – 01/08)

AWARDS, HONORS, AND GRANTS

Doctoral Consortium Participant: *Sustainability, Ethics & Entrepreneurship Conference (2015; 2017); Babson Entrepreneurship Research Conference (2015); Annual Meeting of the Academy of Management (Entrepreneurship Division, 2016)*
Awards/Grants: Syracuse University **–** *Dr. Torpey Teaching Award (2017)*; Government of Guyana – *Go and See Visit (2017) Participant*
Business Plan Competitions: Panasci Business Plan Competition, Syracuse University – *Fetner Prize in Sustainable Enterprise (2014)*; *Holtz Prize for Global Enterprise (2013)*; Raymond von Dran Idea Awards, Syracuse University – *Energy and Sustainability Winner (2013)*