Developing New Ventures and Markets for Social Innovations

by

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Abstract

"Doing good while doing well" has gained significant attention among management and strategy scholars. However, social ventures and markets that provide social innovations in developing countries face challenges in achieving widespread adoption and sustained growth. This dissertation asks three research questions: Why do social ventures and markets for social innovations frequently struggle or experience slow growth? What strategies can be implemented to overcome barriers and foster sustained growth for these ventures and markets? What are the characteristics of sustained growth concerning the actors involved, the promoted social innovations, and the on-ground impact?

To answer these questions, I conducted three studies that focus on the relationships between social ventures and key resource providers. The first study explores the role of social impact framing in persuading potential partners, such as retailers, to collaborate in providing social innovations. Findings from an online experiment and a lab-in-the-field experiment with an India-based social venture, along with surveys and interviews, reveal that the effectiveness of social framing depends on the stakeholders' expertise and the presentation of conflicting information that challenges their mental models. A framework called "expertise-based skepticism" is proposed to explain the conditions under which social impact framing can be persuasive to stakeholders.

The second study examines the relationship between social ventures and potential funders, particularly the discrepancy in early-stage funding received by expatriate social

entrepreneurs compared to local entrepreneurs. Focusing on the emerging clean cooking industry in East Africa, where social innovations like smoke-reducing cookstoves and fuels address health, environmental, and gender equality issues, the study reveals that local entrepreneurs are strongly influenced by the clean cooking development sector, which affects their technological choices, business models, and support received. Consequently, they may appear less attractive to market-building actors and funders. However, I argue that these perceived development-related liabilities can be leveraged into strategies of persistence for local entrepreneurs, highlighting the need to explore alternative forms of scaling social innovations.

The third study examines the impact of knowledge intermediaries on entrepreneurial entry into nascent industries across multiple countries. I analyze 113 country-level industries in the clean cookstoves sector from 2013 to 2019. The findings reveal a positive association between entrepreneurial entry and the presence of organizations operating in countries where knowledge intermediaries are active. I propose a two-stage model of knowledge development and transfer. First, a first-order knowledge intermediary develops industry knowledge by engaging with industry actors, who acquire knowledge and know-how. Second, these industry actors transfer their expertise to countries lacking first-order intermediaries, becoming second-order knowledge intermediaries and expanding the industry knowledge base in those countries. The study further highlights that the effectiveness of second-order knowledge intermediaries depends on the number of countries they operate in, their industry role, the presence of local actors with relevant knowledge, and the culture of the recipient countries.

Through this dissertation, I recognize the potential for social ventures and markets offering social innovations to generate positive health, environmental, and social impacts. Meanwhile, I also recognize the challenges faced by social ventures and markets, and I provide

strategies for addressing them. Finally, through this dissertation, I call upon scholars,

practitioners, social entrepreneurs, and supporting organizations to continue exploring innovative

approaches that acknowledge and manage the inherent tensions between sustainable

development and business, thereby driving genuine and sustained positive change.

Chapter 1 Introduction

There has been renewed interest among strategy scholars about whether companies are able to do good while doing well. Within the fields of management and strategy, a growing body of literature has developed around social entrepreneurship (Dacin et al. 2010, 2011, Short et al. 2009), instrumental stakeholder theory (Bridoux and Stoelhorst 2014, Garcia-Castro and Francoeur 2016, Henisz et al. 2014, Jones 1995, Jones et al. 2018), corporate social responsibility as a competitive strategy (Flammer 2015, Kaul and Luo 2018), shared value creation (Henderson 2020, Porter and Kramer 2006, 2011), and base-of-the-pyramid strategy (Prahalad 2006, Prahalad and Hart 1999) that posits that there is a business case for firms solving global social and environmental problems. However, many of these grand challenges exist because they have been historically intractable — "the classic tools of government policy on the one hand, and market solutions on the other, have proved grossly inadequate" in addressing them (Murray et al. 2010, p. 4). Despite good intentions, new ventures and new markets attempting to provide innovative solutions to social and environmental problems have experienced limited takeoff and stalled emergence (e.g., Ozcan and Santos 2015). Limited attention has been paid to the obstacles confronting these socially-motivated ventures and markets. In this dissertation, I extend the discussion of whether firms can "do good while doing well" by considering how socially-motivated ventures that "run commercial operations with the goal of addressing a societal problem" (Santos et al. 2015, p. 37) can "do well while doing good."

Social innovations succinctly refer to "new ideas that work in meeting social goals" (Mulgan et al. 2007, p. 8). A social innovation can be "a product, production process, or technology (much like innovation in general), but it can also be a principle, an idea, a piece of legislation, a social movement, an intervention, or some combination of them" (Phills et al. 2008, p. 39). Like Schumpeterian innovations, which are entrepreneurial re-combinations of resources in novel ways that potentially generate economic rents (Galunic and Rodan 1998, Henderson and Clark 1990, Kogut and Zander 1992), social innovations emerge from "the creative re-combination of existing assets (from social capital to historical heritage, from traditional craftsmanship to accessible advanced technology)" (Manzini 2014, p. 57). However, they are intended "explicitly for the social and public good," addressing "social needs which can be neglected by traditional forms of private market provision and which have often been poorly served or unresolved by services organized by the state" (Murray et al. 2010, p. 10). As such, social innovations aim to "achieve socially recognized goals in a new way" (Manzini 2014, p. 57) and, like radical Schumpeterian innovations, represent "*discontinuities* with what is locally mainstream, i.e., with the ways of thinking and doing that are considered 'normal' and are most widely applied in the sociotechnical context in which they operate" (Manzini and Coad 2015, p. 13, emphasis theirs).

Specifically, I focus on social innovations that attempt to address the global problem of poor environmental health. Environmental health refers to a branch of public health concerned with addressing and mitigating contaminants in the environment that affect human health and disease, such as water pollution, air pollution, and hazardous waste (Moeller 2005). In low-income and middle-income countries, environmental health among poor populations is a significant social problem. Environmental health innovations, such as improved smoke-reducing

cookstoves that reduce indoor air pollution and related acute respiratory infections (Bonjour et al. 2013, Rehfuess et al. 2014, Seguin et al. 2018) and point-of-use water purification technologies that protect against diarrhea and water-borne disease (Hutton 2013, Luoto et al. 2011) exist and have been designed for low-income, "base-of-the-pyramid" consumers who tend to be most vulnerable to environmental health hazards (Graham et al. 2018). The reality is that these environmental health technologies have struggled to attain hoped-for universal adoption, or full-fledged acceptance, acquisition, and use. Although for-profit business models have taken up the mission to produce, distribute, and sell these products, few have done so successfully (Karnani 2011, Simanis and Milstein 2012). For example, Proctor & Gamble's 2001 attempt to commercialize its PUR water purification powder could not achieve sustainable profits, despite achieving 5 to 10 percent penetration rates in four test markets (Simanis 2012). Additionally, it took eight years for Envirofit, a for-profit improved cookstove manufacturer, to sell its one-millionth product (Richardson 2015), although there are still 3.5 billion people who cook with solid fuel and would benefit from the technology. Across different categories of products, markets have failed or have been slow to take off.

New ventures that offer social innovations are often referred to as "social enterprises" or "social ventures," which are "initiatives that develop new technologies and business models combining social and business objectives … in order to benefit disenfranchised stakeholders and be financially rewarded for doing so" (Luo and Kaul 2019, p. 488). These organizations' "primary objective is to deliver social value to beneficiaries of their social mission, and their primary revenue source is commercial, relying on markets instead of donations or grants to sustain themselves and to scale their operations" (Ebrahim et al. 2014, p. 82). To date, much more is known about the obstacles and incentives that consumers face when deciding whether to

take up social innovations like environmental health products and much less known is about the obstacles and incentives that social ventures face when deciding whether and how to provide them. This is likely due to the disciplines that have taken up this issue as an area of research. Development economists and public health scholars have studied the problem from the angle of consumer adoption (Cohen and Dupas 2010, Dupas 2009, 2014a, b, Lewis and Pattanayak 2012). However, without a thorough consideration of firms' motivations, interests, obstacles, and opportunities, few of their recommended interventions can be implemented by social ventures that aim to use commercial business models to address societal problems through social innovations. For example, product affordability is typically viewed as a primary barrier to consumer adoption (Bensch and Peters 2015), and subsidies and consumer financing are commonly advised as solutions (Ashraf et al. 2010). Social ventures, however, are generally ill-equipped and under-incentivized to implement these interventions. Even microfinance institutions that are experienced at offering financial products to low-income customers are rarely willing to finance environmental health products (Bailis et al. 2009). This just highlights not only the opportunity but the practical need for management and strategy scholars to contribute their expertise to address these critical social, environmental, and health problems through product-based social innovations, while of course remaining humble and open to the perspectives of others who have already been working on these issues.

Given this background, my dissertation research is motivated by the following questions: First, why do markets and new ventures for social innovations fail or are slow to grow? Second, what strategies can be implemented to address the market and institutional barriers to emergence and sustained growth? Third, what does sustained growth look like, in terms of the characteristics of the actors who are involved, the social innovations that are promoted for

dissemination, and the type of impact that is seen on the ground? There is no simple reason for why venture-led efforts to promote social innovations (and environmental health innovations, in particular) often experience little traction or ultimately fail. The barriers to the provision and adoption of these products are complex and involve a deep understanding of the market and the how past institutional contexts continue into the present (for a review, see Jue-Rajasingh and Siegel 2022). Importantly, it's important to consider the myriad of relationships that social ventures need to maintain to get their products to customers. Every single step requires support from resource providers (Aldrich and Fiol 1994), from recognizing that a social problem exists, to designing a product-based social innovation to address it, to choosing and then implementing a business model to deliver this innovation to customers, to applying for grants and challenge innovations for philanthropy-based early-stage funding, to simply running operations for manufacturing, distribution, and manufacturing, and to persuading new funders and customers of the social venture's social and financial value at scale.

Convincing stakeholders to provide resources is no easy feat. Like other ventures in nascent product markets, social ventures bear a "liability of newness" (Stinchcombe 1965) while trying to promote innovations that are unknown to the public. These organizations face various challenges, as highlighted by several studies. They encounter a lack of established legitimacy (Fisher et al. 2016, 2017), resource limitations (Baker and Nelson 2005), an absence of a distinct identity (Lounsbury and Glynn 2001, Wry et al. 2011), and limited influence over other stakeholders (Hallen 2008). Social ventures' nascent and emerging markets are characterized by significant uncertainty (Gao and McDonald 2022, Ozcan 2018), and are characterized by a lack of trust required for effective transactions (Hinings et al. 2017). Furthermore, due to their social and environmental missions, social ventures face additional constraints from their low-margin

economic environments, sociocultural institutional contexts, and internal commitments. In this dissertation, however, the unique constraints placed on social ventures can also provide them with unique opportunities.

For example, C.K. Prahalad (2012) has referred to the bottom of the economic pyramid as a "source of breakthrough innovations," because entrepreneurs have to design products for extreme affordability and innovate business processes that can reach more people at a low cost. Similarly, the categorical uncertainty around hybrid organizations like social ventures is at the same time confusing to stakeholders (Dees 1998) but can provide a wider array of cultural resources that can be strategically harnessed by a social entrepreneur who is a "skilled cultural operator" when it comes to acquiring resources (Hannan et al. 2007, Lounsbury and Glynn 2001, Überbacher et al. 2015). Lastly, social ventures' internal commitments can keep them on a course that may seem limited in terms of both profit and social impact but, through perseverance, enables them to pursue alternative forms of growth that are more enriching for communities, not just for investors (Kim and Kim 2022).

With this "big picture" of how social ventures' constraints can be leveraged as strategic opportunities, I pursue three studies related to the provision and adoption of social innovations. Each study can be characterized by the relationship between the social venture providing an environmental health innovation and other actors that the social venture relies on for resources.

In my first study (Chapter 2), I focus on the relationship between a social venture and its potential exchange partners (i.e., market intermediaries like retailers). Drawing on prior work about social impact framing (Burbano 2016, Lee and Huang 2018) and, eventually, the role of expertise in judgment-making (Falchetti et al. 2022), I ask the following questions: Can a venture's use of social impact framing persuade exchange partners to join them in providing

social innovations? More specifically, why would some potential partners respond negatively to a venture's framing of themselves in terms of the social impact they create, and how can ventures pre-empt these negative responses? Using either a commercial frame or social impact frame, I introduce a venture and its water-purifying, silver-infused ceramic tablet, the MadiDrop+, to 234 survey takers in the role of a retailer in an introductory online experiment and 716 real-world independent retailers in Bangalore, India in a lab-in-the-field experiment. For the latter experiment, I partner with an India-based social enterprise that distributes water purification technologies, Pure Paani, to legitimately interact with and sell to real-world retailers. Both experiments use incentive-compatible methods to measure retailers' decisions to partner with the venture and retailers' willingness to trade off profit for social impact.

I find that even among the same stakeholder group of potential partners, different results arise. In the online experiment, the social impact frame led to more partnerships. In particular, in the lab-in-the-field experiment, the social impact frame led to fewer partnerships when a male used it and more partnerships when a female used it. Through additional surveys and interviews, I develop a framework of expertise-based skepticism to explain these results. I propose that experts use experience-based mental models to evaluate ventures. Because social impact framing is incongruent with these models, experts become skeptical of its usage, and the frame has a negative effect. However, large amounts of incongruent information (i.e., social impact framing and a female surveyor) can result in expert partners adopting simpler, non-experience-based mental models to make sense of the cues. This leads to positive evaluations that are like those of novices.

Research for my second study (Chapter 3) began with a focus on the relationship between a social venture and its potential funders. Drawing on the entrepreneurship and development

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literature (Busch and Barkema 2021, Lall et al. 2019, Lall and Park 2022) and impact investing literature (Hehenberger et al. 2019, Mair and Hehenberger 2014), I ask: Why do expatriate social entrepreneurs receive more early-stage funding than local entrepreneurs? Moreover, why and how do local entrepreneurs continue to persist in a market where they do not receive external funding? To answer these questions, I studied emerging clean cooking markets in East Africa, conducting 73 interviews and 7 field visits in Kenya, Uganda, and Rwanda, collecting 32 documents from the field, and reading and analyzing 271 newspaper articles.

I found that any attempt to understand "business for development" efforts requires an understanding of historical development efforts because those historical development efforts continue to affect market-based actors (i.e., local entrepreneurs) in the present day. Efforts to build the market for clean cooking technologies took place atop decades of a development sector for clean cooking technologies. Local entrepreneurs, but not expatriate entrepreneurs, were strongly influenced by (if not products of) the development sector, as revealed in the accessible technologies they promoted, the community-based business models they adopted, and the type of non-financial support from non-governmental organizations and development agencies they received. In contrast, recent market-building actors had expectations of how social entrepreneurs in the emerging industry should operate, and due to their impact investing ideology, they preferred revolutionary technologies, picking winners and making big bets on scalable business models, and positioning social ventures to receive private sector support. While expatriate entrepreneurs had social and financial goals that were well aligned with market-building actors' preferences, local entrepreneurs experienced strong tensions between their social goals and market-building actors' financial goals. Reinforced by their personal, lived experiences with concrete social problems that they were trying to address through their ventures, local

entrepreneurs did not conform to the expectations of market-building actors, which perpetuated the expat gap.

Despite not receiving external sources of funding, local entrepreneurs persisted and did not exit the industry. What's more, the very characteristics of their ventures that were liabilities to market-building actors became important assets for strategies of persistence. The liability of accessible technology made strategies of *replication* possible. The liability of community embeddedness was the foundation for strategies of *diversification into sub-markets*. And the liability of support from development sector actors led to strategies of *collective resistance*. There were field-level consequences of local entrepreneurs' persistence; the clean cooking industry was slow to emerge. As a result, market-building actors have been slowly and somewhat reluctantly recognizing the successes of local entrepreneurs using business models and promoting technologies that they had once shunned. Though this could seem like a failure of industry emergence, I believe that it signals that the pendulum is necessarily swinging back toward a development ethos – though it will never return fully. In the future, it will likely swing back again, eventually achieving an appropriate blend between the two sectors through true collaboration and experience.

In my third study (Chapter 4), I focus on the relationship between knowledge intermediaries, social ventures, and other supporting organizations that take part in growing the new industry for social innovations. While my second study focuses on building national-level markets, my third study draws attention to cross-national industry-building efforts. I ask the following questions: How does a knowledge intermediary, or an organization that builds the industry base of a nascent industry, affect entrepreneurial entry into the nascent industry across multiple countries?

Through an analysis of 113 country-level industries for clean cookstoves between 2013 and 2019, I find that entrepreneurial entry into the industry is associated with the number of organizations that operated both in these countries and in countries where a knowledge intermediary also operated. I posit that the cross-border effects of knowledge intermediaries occur through the development of second-order knowledge intermediaries. In the first stage of the proposed model, a first-order knowledge intermediary builds the knowledge base for a nascent industry by engaging with industry actors. These industry actors acquire both industry knowledge and know-how of knowledge-building. In the second stage, industry actors transfer their knowledge and know-how to countries where the first-order knowledge intermediary is not present. As second-order intermediaries, they build the industry knowledge base in these countries. Empirical analyses additionally indicate that the effectiveness of second-order knowledge intermediaries additionally depends on how many countries they operate in, their role in the industry, the presence of domestic actors with overlapping industry knowledge in countries receiving the intermediaries, and the culture of non-selected countries. The findings of this research shed new light on knowledge intermediaries, and they carry implications for how the growth of nascent industries promoting new innovations – especially those that generate health, social, and environmental benefits – can be supported globally. They also highlight an important role of the "expatriate entrepreneurs" in my second study: persuading new actors to join the clean cookstove industry in the new countries that they enter.

Though these studies are very different in the literatures they draw on, the methods they employ (experimental methods, qualitative methods, quantitative methods, or combinations of multiple methods), and the type of conclusions they reach (that is, ready-to-implement strategies for use by social entrepreneurs or big ideas for policymakers to consider), they all address

different aspects of problems related to the adoption and provision of social innovations like environmental health products. Chapter 2 examines the problem of gaining business partners, Chapter 3 examines the (assumed) problem of acquiring external funding (and how to persist even if one does not), and Chapter 4 examines how international social ventures, among other organizations, learn from knowledge intermediaries and transfer this knowledge to new geographic markets. Chapter 5 explores three overarching themes and takeaways from the three chapters.

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Chapter 2 New Ventures' Strategic Use of Social Impact Framing in Interfirm Relationships

2.1 Introduction

There has been an ongoing interest in the way that entrepreneurs in nascent markets use framing, or "the use of rhetorical devices in communication to mobilize support and minimize resistance" (Cornelissen and Werner 2014, p. 185; see also Clough et al. 2019, Snihur et al. 2021), to gain legitimacy and attract resources. One type of entrepreneurial framing that has been recently examined is social impact framing, in which ventures frame themselves and their efforts in terms of the benefits they make to society and the environment (Allison et al. 2015, Lee and Huang 2018). Prior research has shown that when firms signal their commitment to improving society, the environment, and less privileged stakeholders' quality of life, they can enhance firm performance by, for example, attracting customers who are willing to pay more for products infused with social meaning (Fosfuri et al. 2015) and hire job candidates who are willing to be paid less to work at a socially responsible firm (Burbano 2016). Such findings motivate new ventures in nascent markets to promulgate frames emphasizing their social mission as an aspect of "what they do" (Navis and Glynn 2011). For example, WeCyclers, a waste management company that provides novel recycling services for low-income communities in Uganda, describes itself as a "for-profit social enterprise that promotes environmental sustainability, socioeconomic development, and community health."[1] In another example, ayzh, a for-profit

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[1] WeCyclers: Our Story, https://www.wecyclers.com/about#our-story

company that provides innovative and affordable women's health products in India, does this work "while empowering underserved women, helping their families and communities thrive."[2]

While the literature on organizations and strategy has frequently cited the instrumental benefits of social impact framing and corporate social responsibility (CSR) more generally (Flammer 2015, Fosfuri et al. 2016), research on the mechanisms driving social impact framing has been limited. The generally accepted view is that social impact frames enhance performance outcomes because stakeholders demand, identify with, or have a preference for the social values promoted by the social impact frame (Burbano 2016, Cassar 2019, Cassar and Meier 2021). Moreover, since researchers have found a generally positive (or at least not negative) effect of social impact framing, stakeholders are assumed to believe in companies' authenticity and sincerity when making social claims (Abraham and Burbano 2022, p. 410). However, it is also becoming increasingly recognized that new ventures must appeal to a plurality of stakeholders (Fisher et al. 2016), some of whom may be less prosocial, more profit-oriented, and have reason to be more skeptical on average than stakeholders like customers and employees. These varying characteristics would alter how they judge the new venture's social impact frame.

Therefore, in this study, I ask how social impact framing could be strategically utilized by new ventures among stakeholders who might not be very receptive to it. I focus specifically on exchange partners in interfirm relationships. The focus on these stakeholders is grounded in a dilemma commonly confronted by new ventures operating in emerging moral markets, or markets that exist to create social value by providing products and services that address global health and human development challenges (Georgallis and Lee 2020). With declining public sector and social sector resources for the provision of public goods, many ventures have stepped

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[2] Ayzh: Founders, http://www.ayzh.com/team

into the role of privately providing public goods like pure water, clean air, and electricity through technological innovations like household water purifiers, clean cooking stoves, and solar lighting, which are often targeted at low-income, "base-of-the-pyramid" customers. Because ventures providing these innovations often lack the resources and expertise to internalize activities (Oviatt and McDougall 1994, Qian et al. 2012), they are often dependent on partners (i.e., market intermediaries like distributors and retailers) to sell their life-improving innovations to end customers (Armanios et al. 2017, Hockerts 2015). For example, a venture providing new water treatment technologies to rural areas of a low-income country may deem it necessary to piggyback their distribution on organizations that already have an audience with target customers, like rural bank branches or retail stores (Power Africa 2021).

These exchange partners may be hesitant to work with the venture to promote social innovations. The venture is new (Singh et al. 1986), and the viability of the emerging market and its new offering are uncertain (Benner and Tripsas 2012, Ozcan and Santos 2015). Moreover, trust is critical to interfirm relationships because of concerns about opportunism (Dyer et al. 2018, Dyer and Chu 2003, Williamson 1981), and a new venture is difficult to assess on this dimension because they have no track record. Concerns about the relationship go both ways, as well. Even if exchange partners choose to work with the venture, the partners' degree of value appropriation may prevent the realization of social welfare (e.g., because they charge end customers too high a price) or prevent the venture from appropriating enough value to keep its business viable (e.g., because they insist on a lower price from the venture supplying the product). Either way, the potential partners' decisions can prevent the new venture from creating both economic and social value in the long run (Argyres et al. 2020), thus affecting firm survival,

the development of its emerging moral market, and the scaling of societal impact that can be delivered through social innovations.

I run two experiments to ask how social impact framing could be strategically utilized with exchange partners. The first experiment is an introductory online experiment with 234 U.S.-based Prolific survey takers. The second experiment incorporates on-the-ground context through a lab-in-the-field experiment with 716 independent retail shops in Bangalore, India. In both experiments, the venture is a supplier of MadiDrop+, a real household water treatment technology that was developed at the University of Virginia. This product generates health benefits for customers who buy and use it. The subject is either a real-world retailer (as in the lab-in-the-field experiment) or an experimental subject who is primed to act as a retailer (as in the online experiment). The venture's use of social impact framing compared to commercial framing is tested on two decisions made by these retail partners: 1) retailers' decision to partner with the venture and 2) retailers' willingness to trade off profit for social impact.

In both experiments, I develop and implement innovative incentive-compatible procedures to ensure that subjects' decisions are not hypothetical but rather involve real payoffs for themselves, the venture, and society. The online experiment is based on a two-player supply chain game in which retailers decide to accept or reject the venture's wholesale price offers (Loch and Wu 2008). If they accept a wholesale price, then the retailers must decide how many units they would purchase. Their decisions affect payoffs for the retailer, the venture, and a water-focused charity (which proxies for the social impact manifested through the exchange; monetary donations were made by the researcher to the charity according to how many units the retailer purchased). In the lab-in-the-field experiment, I ask retailers if they are willing to take three units of the MadiDrop+ on consignment (i.e., credit). If the retailers respond in the

affirmative, then they play a game formatted as a multiple price list (Andersen et al. 2006) to determine their lowest acceptable profit margin (i.e., their highest willingness to pay) to keep the products in their stores. The design of this procedure encourages retailers to truthfully report their willingness to pay, as doing so might lead to their losing the chance to keep the products on consignment.

The two experiments showed that the effect of social impact framing depends on both stakeholders' characteristics and also on other information that is presented alongside the social impact frame. In the online experiment with survey takers primed to act as a retailer, social impact framing *increased* participation with the venture by about 4 percentage points, from an already high base rate of about 93%. In the lab-in-the-field experiment that incorporates on-the-ground context and real-world decision makers, the participation rate depended on the *gender* of the company representative who used the social impact framing. When using a commercial frame, both male and female company representatives resulted in about 30% of retailers agreeing to partner with the venture. But when a male representative used the social impact frame, the participation rate *decreased* by 8.5 percentage points compared to his using the commercial frame, indicating that partners were skeptical when the social impact frame was used by men. When a female company representative used the social impact frame, partnerships *increased* by 16.2 percentage points compared to her using the commercial frame. This indicates that social impact framing was more persuasive when used by women. Moreover, results from the incentive-compatible methods for assessing retailers' willingness to pay for social impact revealed little support that social impact framing affected how much partners were willing to trade off profit for improved societal outcomes. That is, if retailers agreed to work with the venture, the social impact frame did not affect the profits they were willing to keep. However,

other factors, including the presence of a female company representative in the lab-in-the-field experiment, affected this outcome.

Given that the existing literature on the mechanisms of social impact framing is relatively thin, I use these results as an opportunity to develop theory. Drawing on collected survey data and interviews, along with recent research on how novices and experts make evaluations (Cancellieri et al. 2022, Falchetti et al. 2022), I develop a framework based on *expertise-based skepticism* to explain the varying outcomes within and across stakeholder groups. I propose that novices and experts use different mental models to evaluate a venture's use of social impact framing, thereby producing different evaluations. Because they lack experience, novices have simple mental models and evaluate information based on abstract, global features (Gasper and Clore 2002), paying more attention to "the desirability of an idea and its ultimate benefits" (Falchetti et al. 2022, p. 136) and how the information could address important goals in an atypical fashion (Gouvard and Durand 2022). This makes social impact framing attractive to novices. In contrast, experts evaluate information based on more complex models that they have developed through experience. They have a sense of a strong prototype and are skeptical of new information that is incongruent with it (Hannan et al. 2007). Incongruent information could negatively affect the perceived feasibility, quality, or sincerity of the venture being evaluated since experts cannot make sense of the incongruence alongside the prototype (Barreto and Patient 2013, Boulongne and Durand 2021). In the lab-in-the-field experiment, a male company representative's use of social impact framing was incongruent with the mental models of expert, real-world retailers, who expressed skepticism of it. But in the online experiment, novice retailers (i.e., survey takers who were assigned to the role) evaluated social impact framing using

simple mental models. Novices found social impact framing attractive, partly because they did not know that there was anything to be skeptical of.

However, I propose that when a venture signals high amounts of incongruent information, the extreme lack of fit with experts' pre-existing mental models causes experts to switch to a more cognitively accessible, simpler mental model to make sense of it. This leads to experts making evaluations like novices. In the lab-in-the-field experiment, when the female company representative used social impact framing, interviews and survey data revealed that retailers likely evaluated the venture as a charity with a potential for positive business outcomes as opposed to a business with a potential for positive social impact outcomes. Because retailers who are experts in their business domain are novices in the charity domain, they were attracted to, as opposed to skeptical of, social impact framing when presented by a woman.

Through this research, I make important theoretical and methodological contributions. First, I emphasize that ventures can become much more effective in strategically choosing what they frame, how they frame, and to whom they frame. Specifically, my results show that ventures' choices should depend highly on contextual details, such as the characterization of novice versus expert stakeholders, the mental models that expert stakeholders possess, and the types and amount of incongruent information that the ventures present. This specifically answers the call to study the interactions between entrepreneurial framing and different types of stakeholders (Clough et al. 2019, Snihur et al. 2021).

Second, I contribute to relatively recent literature on how social evaluations vary by audience member evaluation modes and the type of information being processed (Boulongne and Durand 2021, Cattani et al. 2020, Falchetti et al. 2022). My results indicate that large amounts of information that are incongruent with existing mental models can cause experts to access

cognitively simpler mental models to make better sense of them. That is, the presence of large amounts of incongruence can cause a switch of evaluation modes (Gouvard and Durand 2022). I propose that ventures can use this finding to their advantage when presenting new frames, identities, or ideas that may be incongruent with stakeholders' expectations.

Third, my results confirm and extend upon recent research concerning gender and social claim-making. Authors have recently argued that, due to gender congruence (i.e., congruence between female-typed social claims and the gender of social claimants), social claims made by organizational leaders are more positively evaluated when females make them as opposed to males (Abraham and Burbano 2022, Lee and Huang 2018). The results of my study confirm that ventures are more highly evaluated when females – even those representing the company at lower levels – use social impact framing compared to when males use it. Moreover, the negative effect of social impact framing when males use it indicates that another mechanism, such as one based on stakeholders' skepticism due to the frame's incongruency with a prototype, may also be at play.

Methodologically, I use innovative, incentive-compatible experimental methods that involve real economic decisions, costs, and payoffs. This enables me to both capture and measure stakeholders' true business decisions concerning social impact framing. The lab-in-the-field experiment combines a naturalistic business exchange (pitching a new product and offering it to retailers on consignment) with an incentive-compatible method to assess willingness to play (multiple price list format) among real-world decision makers (experienced retailers). The online experiment uses a known two-player supply chain game but adds the component of donations to a charity to proxy for social impact that is created through the exchange. Because both experiments involve real stakes, I can study real choices as opposed to hypothetical audience

evaluations that would typically be collected with survey data. These new methods improve the external validity and real-world implications of the results.

More broadly, for both scholars and practitioners, this work speaks to how social issues – both problems and potential solutions – can be strategically framed to mobilize support across stakeholders and sectors. A one-sized commitment to helping society does not fit all audience members. But that does not mean that ventures should stop vocalizing their dedication to improving the well-being of community members and the environment through their businesses. For a venture, talking about social impact creation just needs to be done in a more thought-out, more strategic manner to be persuasive (and not off-putting) to different stakeholders.

In the following section, I review the literature that motivates the research questions studied in my experiments. I will then present my two studies and their results. Afterward, I will discuss a framework for expertise-based skepticism.

2.2 Motivating literature

2.2.1 Ventures' use of social impact framing

New ventures in nascent markets require resources from many stakeholders like customers, employers, suppliers, distributors, and financiers for the survival and growth of both the venture and its market (Aldrich and Fiol 1994). To appeal to resource-holding stakeholders, many ventures use framing to emphasize aspects of their enterprises to "mobilize support and minimize resistance" (Cornelissen and Werner 2014, p. 185; see also Falchetti et al. 2022, Hiatt and Park 2021, Kaplan 2008), both at the level of the individual venture and at the level of the emerging market. When framing, ventures strategically communicate information about external events, their identities, and their activities to shape the interpretations of stakeholders in their favor (Fiss and Zajac 2006, Kaplan 2008, Petkova et al. 2013, Snow and Benford 1988). One

type of framing more recently used by both new ventures and established firms is social impact framing, which "emphasizes a venture's attention to and care for the physical earth as well as the socioeconomic environment" (Lee and Huang 2018, p. 3). Social impact framing has been shown to legitimate new ventures and their nascent markets if implemented successfully (Pache and Santos 2013). However, there is limited research on the variety of outcomes that social impact framing can produce, as prior research in organizations and strategy generally demonstrates a positive (or neutral) relationship between social impact framing and stakeholder evaluations.

Related work on corporate social responsibility indicates that there are two primary mechanisms by which social impact framing would be effective. The first is through stakeholders' preferences for social impact. For instance, Fosfuri et. al. (2016, p. 1276) write that by "engaging with social values, firms establish value-based relationships with [stakeholders] who – while not benefiting directly from the firm's social actions – *choose to support these values*" (emphasis added). The second is through stakeholders' perceptions of how authentic or sincere a venture's use of social impact framing is. Researchers suggest that when stakeholders view social impact claims and activities as incongruent with other organizational attributes, then these social impact cues produced by firms can "backfire" (see Willness 2019 for a review). For example, customers' perceptions of firms decrease when they suspect that firms' social responsibility messaging is driven by instrumental motives rather than values-driven motives (Alhouti et al. 2016, Skarmeas and Leonidou 2013, Yoon et al. 2006). Similarly, efforts to combine philanthropy with capitalism have also been criticized for concealing profit motives in the form of charity (Nickel and Eikenberry 2009, Phu 2010). Indeed, some stakeholders have developed "CSR skepticism" (Connors et al. 2017, Ham and Kim 2020, Rim and Kim 2016), especially as an increasing number of firms engage in making false claims through practices like

environmental greenwashing (Marquis et al. 2016, Nyilasy et al. 2014). Taken together, this implies that stakeholders may not respond positively to social impact framing if they 1) do not prioritize social impact and 2) are likely to be skeptical of social impact framing.

Why these potential negative effects of social impact framing have not been studied in the organizations and strategy literature is somewhat puzzling, especially as more ventures and firms are making social claims. It could be that authors have not been able to study the negative effects of ventures' social impact framing because they have not been able to study stakeholders who meet these criteria. Indeed, authors have implored others to study social claims' influence on other key stakeholder groups (Abraham and Burbano 2022), which will shed further light on how ventures manage framing's strategic complications (Snihur et al. 2021).

2.2.2 Ventures' social impact framing with partners

New ventures operating in emerging markets often lack the resources and expertise to internalize activities (Oviatt and McDougall 1994), making them dependent on exchange partners like distributors and retailers to sell their innovations to end customers (Armanios et al. 2017). This very critical group of stakeholders, however, may not respond positively to a venture's social impact framing. Within interfirm relationships, partners are especially concerned with how value is allocated to them (Dyer et al. 2018). As a result, social impact is likely to be less of a priority; if they choose to work with any firm, it is primarily for commercial reasons. Partners may even be repelled by ventures that vociferously promote welfare-enhancing values, which may indicate that the partner is expected to trade off their profits for social impact (Bridoux et al. 2016). Additionally, trust is foundational in interfirm relationships (Dyer and Chu 2003). Given their previously held mental models of successful interfirm relationships, partners may perceive the incongruence of a venture's social impact frame with other organizational

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attributes that they believe business partners *should* have. That is, partners may be suspicious of a venture's motive for using the framing, or they may wonder if a venture's expressed desire to help society makes them compromise on performance or quality. This idea is especially pertinent with partners, as opportunism, or "self-interest seeking with guile" (Williamson 1975, p. 6), has been identified as a primary factor affecting interfirm relationships (Wathne and Heide 2000).

That said, there could also be reasons why partners would respond positively to ventures' social impact framing. Some scholars have argued that social impact framing could be a signal of the venture's trustworthiness (Dollinger et al. 1997). In interfirm relationships, trust helps mitigate problems associated with information asymmetries (Williamson 1975). Partners would prefer to work with trustworthy firms (i.e., companies that are worthy of others' trust) because trustworthy firms are less likely to act opportunistically, thus decreasing transaction costs and enabling the partnership to be a source of competitive advantage (Barney and Hansen 1994, Dyer and Chu 2003). Furthermore, a venture's social impact framing may encourage partnerships because societal welfare-enhancing activities are sometimes associated with long-term net positive economic outcomes (Kaul and Luo 2018, Margolis and Walsh 2003, Wang and Bansal 2012). Both perspectives presented here lead to the following research question:

> *Research question #1*: Does a venture's use of social impact framing affect whether potential exchange partners will work with the venture?

Another consideration that new ventures must consider is how value is allocated within exchange relationships with value chain partners. Exchange partners may not place importance on social impact goals that may be, at least in the short-term, antithetical to their financial goals of profit maximization. If a venture establishes a relationship with a partner that does not desire to increase societal welfare, then the partner may prevent the realization of social impact (e.g., by

taking too high a margin, preventing needy customers from purchasing the product) or

preventing the venture from continuing its goal of social impact (e.g., by insisting on a lower

price from the firm, which eventually renders it financially unviable). Thus, a partner's decisions

could keep the venture from creating both economic and social value in the long run (Argyres et

al. 2020).

Prior research demonstrates that when firms signal a commitment to societal welfare,

they are able to convince stakeholders to give up value (Burbano 2016, Fosfuri et al. 2015). This

likely occurs because stakeholders who agree to engage with a firm due to its social impact

framing are already those who are motivated to improve societal welfare (Cassar 2019); they

resonate with the frame (Benford and Snow 2000). These stakeholders are likely to contribute to

social impact by giving up their profit (e.g., by purchasing more products from the venture to sell

to customers, or by agreeing to a lower profit margin). However, stakeholders who are partners

and are exposed to the venture's social impact may still want to make an acceptable level of

profit, as their primary motivation is financial. These conflicting viewpoints lead to the second

research question.

> *Research question #2: D*oes social impact framing affect the extent to which exchange
> partners will give up profit for social impact?

2.2.3 Evaluations by novices and experts

While the corporate social responsibility literature discusses backfire effects that result

from a company's implementation of socially responsible activities, one may question whether

the drivers of negative evaluations can apply to new ventures. The basis by which social impact

efforts are viewed as incongruent has to do with the motives that stakeholders attribute to the

firm. These attributions are based on stakeholders' knowledge about the firm, such as its bad

reputation (McDonnell et al. 2015, Yoon et al. 2006), prior wrongdoing (Alhouti et al. 2016), or environmental damage (Marquis et al. 2016). Unlike mature firms, however, new ventures are young, and stakeholders lack knowledge of them. The only assessments that can be made about new ventures are based on the cues that the ventures provide. Stakeholders, therefore, make assessments based on how these pieces of information are congruent with each other (Lee and Huang 2018) and how these pieces of information are congruent with pre-existing mental models that typify how new ventures "should" behave (Hannan et al. 2007).

When attempting to understand how different stakeholders would respond to a venture's use of social impact framing, it is important to consider which stakeholder characteristic(s) would drive these evaluations. Recent research on cognition and the categories concerns how stakeholders would evaluate novelty or atypical information (Falchetti et al. 2022, Gouvard and Durand 2022, Mount et al. 2021). This literature shows that to process new information and make evaluations, different stakeholders rely on different schemas (Rousseau 2001). These mental models are dependent on stakeholders' expertise, or their "high level of domain-specific knowledge acquired through experience" (Dane 2010, p. 580). Therefore, novice stakeholders and expert stakeholders use different mental models to evaluate the same new information, thereby producing different evaluations.

Novices' mental models are simple. Because novices have not developed domain-specific expertise, when presented with new information, the easiest way to evaluate it is based on abstract, global features as opposed to concrete, local features (Gasper and Clore 2002). As such, novices "typically concentrate more on the desirability of an idea and its ultimate benefits" (Falchetti et al. 2022, p. 136), as opposed to the details surrounding its implementation and implications. In the context of this study, novice partners lack domain-specific expertise in

interfirm relationships. When evaluating information that expert partners may see as incongruent with interfirm relationships (e.g., a venture's use of a social impact frame), novice partners lack the mental model to "see" the incongruence, ask critical questions, or be skeptical about this information. That is, there are unknown unknowns for novice partners to be concerned about. Rather, novice partners evaluate the information based on its general desirability, potential benefits, and whether it seems to address important goals in an atypical fashion (Gouvard and Durand 2022).

Experts, on the other hand, use more complex mental models. Experts both recognize and rely on more informational cues than novices, appreciating the details when making evaluations (Boulongne and Durand 2021). They prefer processing new information in concrete ways, attending to questions of implementation and feasibility (Barreto and Patient 2013). However, since they have a well-developed mental model, information that is incongruent with this mental model would be negatively evaluated (Hannan et al. 2007), especially if presented in the abstract (Falchetti et al. 2022). In the context of partners evaluating a new venture that uses social impact framing, expert partners would see the social impact frame as not "fitting" with their extant mental models. They would be skeptical of why ventures are presenting themselves in this way, questioning the venture's legitimacy in terms of their competence as a partner (Hsu et al. 2009) and even their integrity. This would lower evaluations of the venture using social impact framing compared to more typical ventures.

Given these differences between novices and experts, I propose that it is important to consider how stakeholder expertise and their subsequent skepticism would affect stakeholder evaluations of social impact framing. In the following sections, I provide an overview of two experiments that are used to answer the two research questions. I then provide more detail about

each experiment, present results, and develop a framework of expertise-based skepticism that could potentially explain the results of these experiments and other prior work.

2.3 Overview of experiments

This research consists of two experiments: 1) an online experiment that takes place with adult Prolific participants based in the United States who are primed to take on the role of the retailer and 2) a lab-in-the-field experiment that takes place among real-world decision makers in a relevant on-the-ground context (i.e., among owners of independent medical shop owners in Bangalore, India). In both experiments, participants are in the role of a retailer, and the venture is a supplier of a socially beneficial product. In both experiments, the product being sold is a silver ion-infused ceramic tablet that provides drinking water for one year. This product, the MadiDrop+, is a real product that was originally developed at the University of Virginia (see Figure 2.1). In the experiments, the venture exposed the subject to a frame, and the subject decided whether to partner with the venture to sell it to customers. If they decided to partner with the venture, then participants chose how much profit they would be willing to trade off for social impact. Data collection for the online experiment was completed in May 2022. Data collection for the lab-in-the-field collection took place between April 2022 and July 2022. Interviews to contextualize the quantitative results of the lab-in-the-field experiment took place between July 2022 and September 2022.

Figure 2.1 The MadiDrop+

2.4 Introductory online experiment

2.4.1 Online experiment overview

The online experiment studied partnerships between a venture and a retailer to promote a socially beneficial product. Prolific survey takers (novices) were recruited into the role of a retailer. The experiment was based on a well-known two-player supply chain game (Badasyan et al. 2009, Durham 2000, Loch and Wu 2008) in which the retailer responded to a supplier's offered wholesale price (p_A) for a product by providing the quantity (q) that the retailer would purchase at the offered wholesale price. Linear market demand was known and defined as $p = 13 - q$ in this study, where $p = p_A + p_B$ and p_B was the retailer's necessary markup on each purchased unit to sell the chosen quantity. The retailer was shown how much profit would be earned for each quantity at a given wholesale price (retailer's profit is $p_B * q$, or $(13 - q - p_A) * q$). The profit that the retailer and supplier could earn thus depended on the supplier's offered wholesale price and the retailer's chosen quantity. The retailer could also choose to reject the wholesale price by purchasing 0 units, which results in 0 profit for both the supplier and the retailer.

Social objectives were integrated into the experiment through a charitable donation that depended on the retailer's chosen quantity. This charitable donation was intended to reflect the social benefits that the product generated for customers. The charitable donation was made by the researcher; it did not come from the supplier's or the retailer's profits.

The retailer's responses were collected using the strategy method, which is common in ultimatum games used by experimental economists. This allowed me to collect data on responses to six wholesale prices as opposed to only one (Güth et al. 2007, Güth and Tietz 1990). The strategy method is argued to be associated with "cold" decision-making that tends to lead to

more rational (as opposed to emotional) decision-making because it forces the participant to think through his or her full strategy (Roth 1995), indicating that these results would be conservative.

For each decision, the two dependent variables of interest were: 1) whether the retailer accepted the wholesale price offer (i.e., whether the retailer chose to work with the venture) and 2) if so, how many units the retailer chose to purchase (i.e., to what degree the retailer traded off profit for social impact; for each wholesale price, after a certain number of units, the retailer's profit decreased with each additional unit purchased). Two experimental conditions, the commercial frame and the social impact frame, were tested in this study.

2.4.2 Online experimental process and implementation

The full study was run in May 2022 using an adult (over 18 years of age), U.S.-based, online participant pool from Prolific. Two hundred and thirty-four participants in the retailer role successfully completed both parts of a two-part study.[3] Both this study and the lab-in-the-field experiment were pre-registered, with pre-registrations each uploaded to Open Science Foundation repositories.

In the first part, retailers made decisions regarding payoff allocations between themselves and an imaginary other. Subjects were told that they would be paid a bonus according to a randomly selected allocation. These decisions were used to calculate their social value orientations (Murphy et al. 2011), a data point that is collected because of existing theory

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[3] Real online participants also took on the role of the supplier, but their data collection process is not described here because they were not the subjects of primary interest in this study. One hundred participants were recruited into the role of the supplier, and they were asked to choose a message and a wholesale price for retailers. In addition to a participation fee, they were also paid a bonus based on a random match with a retailer. Moreover, I am currently reporting a subset of the different conditions that were tested in this particular experiment, some of which are not theoretically relevant for this particular study.

regarding how inherent prosociality affects reactions to social impact framing (Cassar 2019, Fosfuri et al. 2015). The subjects additionally answered questions about the importance of water

Table 2.1 Online experiment, descriptive statistics (means) by condition

	Commercial frame	Social impact frame
Social value orientation	25.02	23.82
Prosociality (average responses from 3 survey items on a 1-7 scale)	5.85	5.78
Importance placed on water (1-5 scale)	3.77	3.75
Frequency of charitable activities (average responses from 2 survey items on a 1-5 scale)	2.71	2.64
Frequency of making business decisions (1-5 scale)*	2.50	2.15
Age (8 categories)	3.10	2.99
Female	0.44	0.46
Four-year degree*	0.67	0.60
Employed full-time*	0.63	0.60
Has business experience*	0.65	0.54

* Means are significantly different across conditions.

contamination to them (among a range of other social issues), the frequency with which they volunteer, the frequency with which they make donations (Cassar and Meier 2021), the frequency with which they make management or business decisions, and demographic information (age, gender, education, employment, and experience owning or managing a business). They were then told that part two of the study would be available in about three days.

At the beginning of the second part of the study, subjects were randomly assigned to one of two experimental conditions (commercial frame or social impact frame).

Table 2.1 shows the characteristics of both groups.[4] They were then introduced to the supply chain setting and their role as a retailer who purchases a Clean Water Tablet from the supplier to sell to customers. Retailers were told that for each product that the supplier and the retailer sell, a donation made by the researcher to charity: water (a real top-rated nonprofit organization that funds water and sanitation projects around the world) would increase.

The survey then introduced the task of providing quantity decisions to six potential wholesale prices from a supplier, as well as a tool to guide decision-making (i.e., a profit table that included the supplier's and retailer's profit or maximum possible profit for each quantity decision, in Experimental Currency Units (ECU)[5]). Afterward, the retailers underwent a comprehension check to ensure that they know how to use the provided profit table and understand the tradeoffs in their decision-making.

After the comprehension check, retailers were shown a message from their supplier that had either a commercial or social impact frame. These messages are in

Table 2.2. On the same page, retailers were reminded that as retailers who assess potential business partners, they should consider the business partner's ability (competence to achieve their goals), benevolence (whether the supplier will treat the retailer well), and integrity (whether the supplier is honest and has good character). To encourage the retailers to consider the supplier's message in the context of assessing a potential business partner, they were asked to type their first impression of the supplier based on the message according to these important characteristics of a business partner.

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[4] Both participants in the commercial frame condition and the social impact frame condition were balanced in terms of variables related to individual prosociality. However, participants in the commercial frame condition were on average more likely to have a four-year degree and more business experience. To account for this, analyses were also run with individual-level demographic and survey data as controls. Analyses that included these variables as controls were also conducted. None of the variables that differ between the two groups have a significant effect on outcomes of interest.

[5] The conversion rate for ECUs was set to 9.3 ECU = $1 USD.

Table 2.2 Online experiment, messages for each frame condition

Frame	Message
Commercial	The Clean Water Brick is a great opportunity for business. As a supplier, I aim to generate profits for myself.
Social impact	The Clean Water Brick is a great opportunity for business and society. As a supplier, I aim to not only generate profits for myself but also make a social impact by providing clean water.

For the decision task, the retailers were asked to provide quantity decisions for the retailers provided quantity decisions, they answered survey questions. These included questions about perceived social impact, or the extent to which they felt like their own actions affect the welfare of others (Grant 2007, 2008), their opinions of how the supplier would allocate value across stakeholder groups, perceived characteristics of the supplier, and perceived supplier opportunism at low and high wholesale prices. As a manipulation check, the retailers were asked to select which message their supplier sent from a list of messages. Open-ended response boxes were provided for the retailer to provide feedback and concerns regarding the study. After the study, retailers were matched with suppliers upon the completion of their surveys, paid a bonus according to their and the supplier's choices,[6] and were sent a link confirming that a donation was made because of their decisions (if applicable).

Decisions that resulted in a negative profit for retailers were removed, as the motivations behind this decision could not be determined because there was no way for online participants to pay the researcher out of pocket. This left a total of 1,371 decisions to study, or 697 decisions in the commercial frame and 674 decisions in the social impact frame.

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[6] This second part of the two-part study took about 20 minutes to complete. As such, the participation fee was $3.50. The bonus earned from the decision task was given in addition to the participation fee. This study had an average participation fee and a relatively high bonus for subjects sourced from Prolific.

2.4.3 Results

2.4.3.1 Partners' willingness to work with the venture

To answer the first question (*"Does a venture's use of social impact framing affect whether potential exchange partners will work with the venture?"*), I compare participation outcomes for the commercial frame and the social impact frame. For each decision made by retailers, retailers' decision to partner with the venture is defined as accepting (i.e., not rejecting) a wholesale price offer by purchasing a quantity greater than 0. I run logistic and OLS regressions, using clustered robust standard errors (clustering at the level of the subject) to account for variation at the level of the participant since each participant makes six decisions. I also run models with and without control variables.

Results show that social impact framing has a *positive* effect on working with the venture. A simple graph of the outcomes is shown in Figure 2.2, and regression results are shown in Table 2.3. Table 2.3 Model 3 shows that the base rate of participation was very high, with about 92.6% of wholesale price acceptances under the commercial frame. However, when retailers were exposed to the social impact frame, they were 2.6 percentage points more likely to
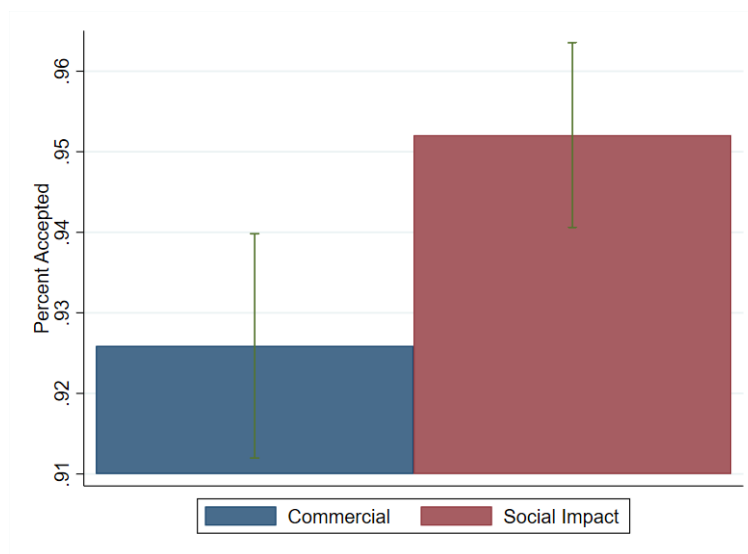
Figure 2.2 Online experiment: Percent of wholesale price offers accepted by retailers

Table 2.3 Online experiment: Logistic and regression results for the effect of frame on partnership participation

	(1) participate	(2) participate	(3) participate	(4) participate
	Logistic	Logistic	OLS	OLS
Social impact frame	.877**	.873**	.041**	.038**
	(.38)	(.404)	(.019)	(.018)
Wholesale price		-.601***		-.024***
		(.121)		(.004)
Social value orientation		.011		0
		(.014)		(.001)
Prosociality		-.202		-.007
		(.222)		(.008)
Water importance		-.554***		-.022***
		(.188)		(.008)
Charitable activity frequency		.236		.013
		(.209)		(.01)
Business activity frequency		-.146		-.007
		(.175)		(.009)
Age		.043		.001
		(.155)		(.007)
Female		-.627		-.028
		(.454)		(.02)
Four-year degree		.334		.018
		(.44)		(.021)
Employed full time		-.332		-.013
		(.438)		(.02)
Business experience		-.444		-.022
		(.453)		(.019)
Constant	2.56***	10.893***	.928***	1.222***
	(.252)	(1.761)	(.017)	(.057)
Observations	1371	1341	1371	1341
R-squared	.z	.z	.008	.068

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

work with the venture to provide the Clean Water Tablet ($p < .05$). According to results from the logistic regression (Table 2.3 Model 1), retailers exposed to the social impact frame had 1.59 (odds ratio, or $e^{0.463}$) times the likelihood of participation than retailers exposed to the commercial frame.

2.4.3.2 *Partners' willingness to trade off profit for social impact*

To answer the second question (*"Does social impact framing affect the extent to which exchange partners will give up profit for social impact?"*), I compare the partners' chosen quantity and profits for the commercial frame and the social impact frame, conditional on their choice to participate in the exchange. I run OLS for both outcome variables, again using clustered robust standard errors (clustering at the level of the subject) and running models with and without control variables.

Results, in Table 2.4, do *not* provide strong evidence that the social impact frame affects the extent to which the partner gives up value for social impact. Table 2.4 Model 6 indicates that there may be a slight increase in the quantity that the retailer chose when exposed to the social impact frame (by 0.12 units), but the coefficient for the *social impact frame* is not statistically significant to the level of $p<.05$ (though it is statistically significant to the level of $p<.1$). Table 2.4 Model 8 shows that the retailer's profit under the commercial frame and the social impact frame did not differ. Taken with results from Table 2.4 Model 6, this indicates that subjects exposed to the social impact frame may purchase more units (and thus increase the venture's profits) when the choice has no impact on *their own* profits. For example, when the wholesale price is 8 ECU, choosing a quantity of either 2 or 3 will result in the retailer earning 6 ECU. However, if the retailer chooses 2 units, then the venture earns 6 ECU, and if the retailer chooses 3 units, then the venture earns 9 ECU. When exposed to the social impact frame, there is weak evidence that retailers did not seem to mind that the venture earns more while increasing social impact, as long as their own profits did not decrease.

Table 2.4 Online experiment: Logistic and regression results for the effect of frame on quantity chosen and partner's profit when wholesale price was accepted

	(5) quantity	(6) quantity	(7) partner's profit	(8) partner's profit
Social impact frame	.106	.12*	.047	.057
	(.067)	(.063)	(.141)	(.143)
Wholesale price		-.536***		-2.623***
		(.012)		(.03)
Social value orientation		.006**		-.003
		(.002)		(.006)
Prosociality		.004		.027
		(.035)		(.078)
Water importance		.018		-.077
		(.031)		(.066)
Charitable activity frequency		.088**		-.148
		(.042)		(.094)
Business activity frequency		-.076***		.06
		(.024)		(.056)
Age		-.02		.063
		(.027)		(.063)
Female		-.088		.025
		(.063)		(.13)
Four-year degree		.074		-.14
		(.07)		(.146)
Employed full time		-.08		.232
		(.076)		(.178)
Business experience		.149**		-.156
		(.07)		(.156)
Constant	3.105***	6.784***	7.867***	27.574***
	(.051)	(.234)	(.115)	(.567)
Observations	1300	1272	1300	1272
R-squared	.002	.638	0	.881

Standard errors are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

2.4.4 Discussion of the online experiment

The primary result of this introductory experiment is that retailers evaluate the social impact frame, and there was a positive effect on partnership creation. This positive effect aligns

with results from prior studies on social impact claims and socially responsible activities. Moreover, it is also seen that the social impact frame does affect the extent to which the partner gives up profit for social impact. While some prior work has shown that stakeholders are willing to relinquish more economic value to be associated with a firm that claims or engages in social responsibility (e.g., Burbano 2016), evidence of this outcome is not seen in this case.

According to the literature on how evaluations between novices and experts differ, a driver of this positive effect of social impact framing could be the novicehood of the subjects participating in the experiment. As such, it is important to consider whether subjects in this experiment are actually novices and whether their naivete led to less skepticism, which then led to a positive effect of the social impact framing. More skeptical subjects would question the earnest usage of the social impact frame, as social impact is not a typical motivation for for-profit ventures. Skeptical retailers would have been more likely to perceive incongruence between the social impact frame and high wholesale price offers, as high wholesale prices would limit the social impact that a partnership could make. Figure 2.3 shows a graph of participation rates under the commercial frame and social impact frame across all wholesale prices. The participation rate under the social impact frame condition was *always higher* than the participation rate under the commercial frame condition, indicating that subjects exposed to the social impact frame were not perceptive of misalignment between the venture's potential action and its social impact frame. Moreover, subjects *were* able to perceive misalignment when *prompted* to do so after they made decisions.[7] This indicates that, as novices, retailers in the

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[7] This survey intended to see whether subjects perceived misalignment between the frame they were exposed to and the venture's highest offered wholesale price of 10 ECU. It consisted of 3 items that retailers disagreed with or agreed with on a 7-point scale ("The supplier's behavior is misaligned with my expectations of them." "The supplier has not stayed true to their mission and values." "The supplier's behavior is misaligned with my expectations of them."). These ratings were then averaged to create a measure of *perceived misalignment*. For the commercial frame, retailers' average perception of misalignment was 2.7 (*std. dev* =.054), and for the firm-focused social impact frame, the retailers' average perception of misalignment was 4.6 (*std. dev* = .057; two-sample $t(1,369)=23.76$).

online experiment lacked the mental model to "see" incongruence without being prompted. This likely led to the positive effect of the social impact frame on the participation outcome because they used more abstract evaluation processes.
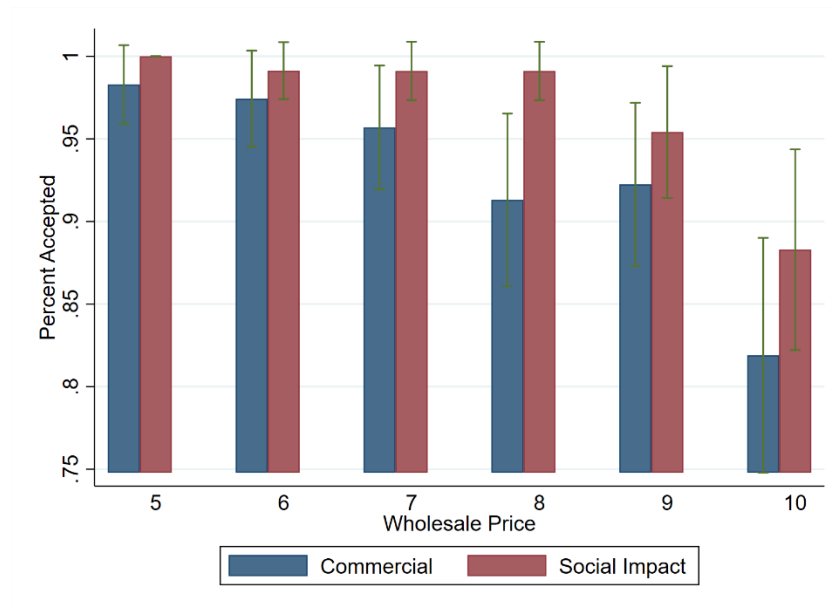
Figure 2.3 Online experiment: Percent of wholesale price offers accepted by retail partners for all wholesale prices

2.5 On-the-ground, lab-in-the-field experiment

2.5.1 Experimental design, development, and process

To investigate whether the same results would hold in an on-the-ground context among real decision makers, I implemented a lab-in-the-field experiment. This experiment asked whether a venture's use of social impact framing would increase the likelihood that retailers would agree to take up the MadiDrop+ on consignment (i.e., credit) and if so, the lowest retail margin that they would be willing to accept if the products were sold to customers (assuming that the product is sold at a maximum retail price or MRP). I worked with Pure Paani, a Bangalore, India-based social enterprise that was founded in 2018 and distributes "point-of-use" water treatment solutions to low-income communities.

I hired four surveyors to co-develop and pilot a survey experiment that was run with independent medical shops in Bangalore. A typical shop can be seen in Figure 2.4. Medical shops were determined to be the best type of shops for retailing the water purification tablet, as these retailers generally had some experience with other water treatment options, and customers came to these stores looking for the same. To determine where shops should be surveyed, I created income-based quintiles for Bangalore's wards. Wards were then picked through a

Figure 2.4 Field experiment: Typical medical store in Bangalore, India
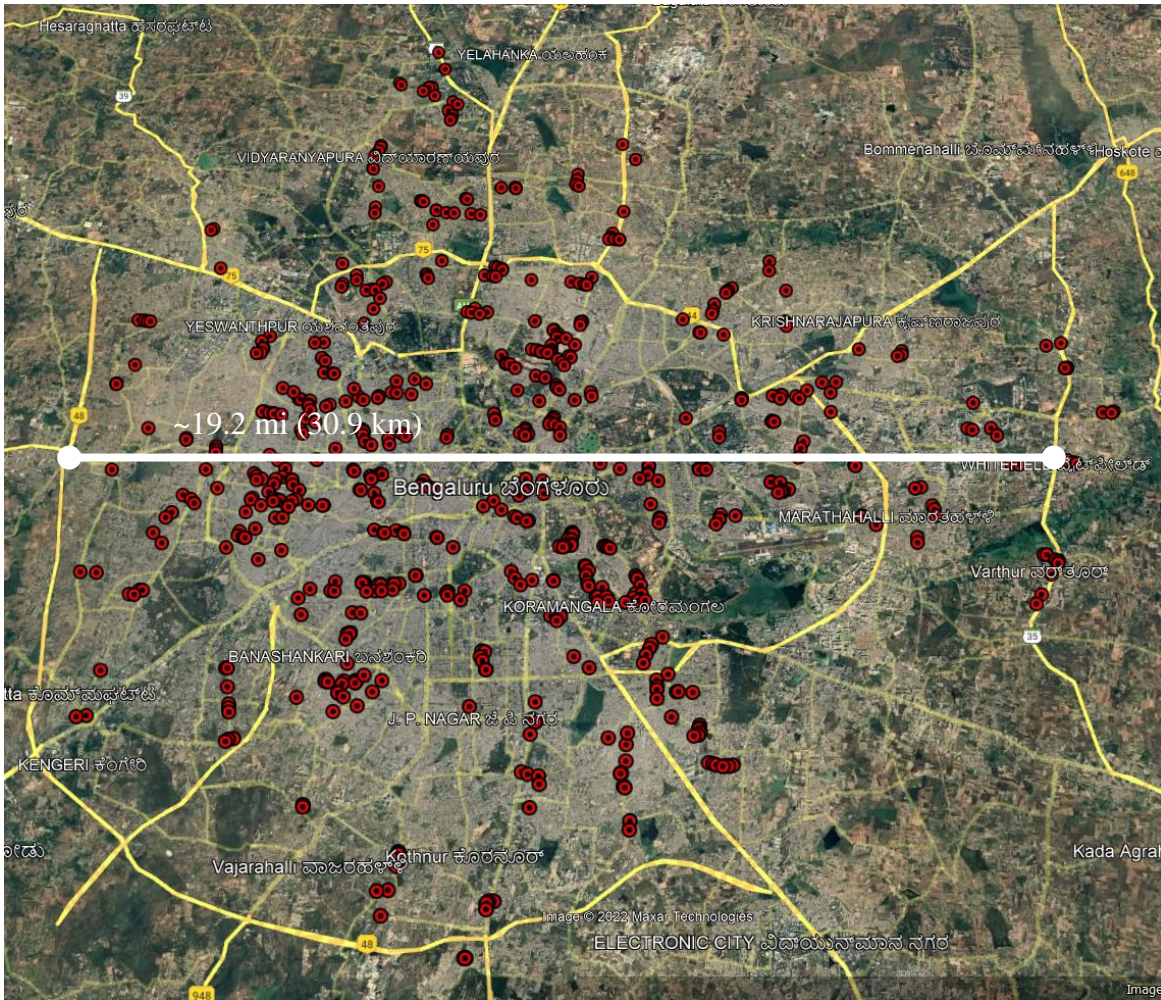
Figure 2.5 Field experiment: Map of surveyed medical stores in Bangalore, India

process of stratified random sampling to ensure that the surveyors surveyed an equal number of shops in each income-based quintile. This process was iterative; new wards were randomly selected as required to balance the number of surveyed shops per ward. Figure 2.5 is a map of these shops throughout the city of Bangalore.

Within each ward, shops were added to the sample through convenience sampling. Even though Google Maps was used to identify medical stores to visit, it was found that the shops on the map do not always align with shops on the ground. Moreover, shops tended to close at certain times of the day, or sometimes randomly. Hence, convenience sampling – walking down

a street and approaching medical shops that were open – was required for this experiment. On average, if a team of surveyors spent about two hours in a ward, they could survey between five and six shops. Throughout the data collection process, I kept aspects of the sample balanced along the lines of the number of shops receiving a commercial frame versus social impact frame per ward, per gender of the lead surveyor, and per surveyor team composition (e.g., one female and one male, two males, and one male). Table 2.5 displays descriptive statistics (means) for variables characterizing the sampling design and retailer characteristics by the commercial frame and social impact frame. For each variable, the average values across the two frames are not significantly different, as confirmed by paired sample t tests.

The treatment – a commercial frame or a social impact frame when used to introduce Pure Paani and the MadiDrop+ – was randomly assigned at the shop upon approach by Qualtrics

Table 2.5 Field experiment: Descriptive statistics (means) by frame condition

	Commercial frame	Social impact frame
Income quintile (1-5)	3.014	3.014
Venture female presence (yes/no)	0.48	0.48
Venture female lead (yes/no)	0.24	0.24
Retailer prosocial impact belief (1-5 scale)	4.245	4.203
Retailer prosocial norms belief (1-5 scale)	3.198	3.170
Retailer charity frequency (1-5 scale)	2.696	2.576
Retailer water experience (yes/no)	0.144	0.148
Retailer work experience (1-4 scale)	2.794	2.842
Shop location duration (1-4 scale)	2.324	2.387
Shop SKUs (1-4 scale)	3.146	3.175
Shop area (1-4 scale)	2.715	2.673
Shop customers per day	114.731	112.464

survey software, which was run on a mobile data-enabled tablet. The commercial and social impact frames were implemented through a series of pictures with captions written in three languages: English, Kannada (the local state language), and Hindi. In the commercial frame, Pure Paani was described as a company that "provides solutions to the everyday problem of clean drinking water." Its mission was to "provide high-quality and practical water purification solutions." In the social impact frame, pictures and captions related to the negative health effects of Bangalore's contaminated drinking water were displayed early on. Pure Paani was then described as a company that "provides solutions to the societal problem of drinking water." Its mission was to "make water purification accessible and affordable to poor households," which is very similar to how Pure Paani's actual mission was stated in its external communications. In both frames, Pure Paani's legitimacy was established through photos of the founder at an award ceremony with Prime Minister Modi, emphasis on rigorous product testing, and Pure Paani's existing catalog of products. Appendix 2 compares some of the pictures and captions associated with the frames.

The survey process was relatively straightforward. A team of one or two surveyors approached a medical shop and asked the shop owner if he was as interested in learning more about a new water purification product. Only shop owners, not employees, were allowed to participate in this experiment, as only they could make decisions about taking products on consignment. About 96% of the shop owners who participated in this experiment were male, so the retailer is referred to as "he" in this experiment description.[8]

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[8] About 96% of the shop owners who participated in this experiment were male, so the subject is referred to as "he" in this experiment description. Moreover, only shop owners, not employees, were allowed to participate in the experiment, as only they could make decisions about taking products on consignment.

If there was a team of two surveyors, then only one surveyor spoke. If the retailer consented, then the surveyor introduced the venture with either the commercial or the social impact frame. A standardized video (played in English, Kannada, or Hindi, depending on the retailer's preference) pitched the MadiDrop+ to the retailer. After the video, the surveyor continued to pitch the MadiDrop+, answering questions that the retailer may have had. The surveyor explained that even though the MadiDrop+'s MRP was fixed at Rs 450 (about US$5.70), the wholesale price was not. The surveyor then asked the retailer if he would like to take three units of the product on consignment (i.e., credit), such that he would keep the product in the shop with no upfront cost for 20 days and only pay for the units that he sold to customers. At this decision point, the retailer was either told that he could "try a new business opportunity" by selling Pure Paani (commercial frame) or that he could "help people" by selling Pure Paani. This outcome binary ("yes" or "no") was used to answer the first research question.

If the retailer agreed to take the products on consignment, then he played a game to determine the retailer's margin (the higher the retailer's margin, the lower the wholesale price, and the more profit the retailer would make on the product if sold at MRP). The game was formatted as a multiple price list (Anderson et al. 2007), which is an incentive-compatible method for eliciting true willingness to pay. In the game, the retailer was shown a list of margins from 5% to 60% in increments of 5%. For each margin, the retailer was asked whether he would accept that margin for the MadiDrop+. At this decision point, the retailer was told that saying "yes" to more margins would "increase [his] chances of selling a new product" (commercial frame) or "increase [his] chances of providing clean drinking water to [his] community" (social impact frame).

After making a "yes" or "no" decision for each margin, the retailer drew a random margin by picking a ball out of a bag. If the retailer had said "yes" to that margin, then he kept the products on consignment, earning that margin for each sale. If the retailer had said "no" to that margin, then he did not get to keep the products on consignment. The game was designed to ensure that the retailer truthfully responded "yes" or "no" to each margin since the likelihood of keeping the products on consignment increased with each "yes." The lowest margin that a retailer was willing to accept for the MadiDrop+ was the outcome variable used to answer the second research question.

Retailers who refused the MadiDrop+ were asked for their reasons for refusal. Retailers answered survey questions about the degree to which Pure Paani balanced a commercial mission or a social impact mission, how much they thought their customers would pay for the MadiDrop+, their beliefs (i.e., the importance of clean drinking water, their shop's ability to create social impact, whether shops, in general, should sell socially beneficial products), their backgrounds (experience selling water products, experience as a business owner, frequency of charitable giving), and their medical shop (i.e., years in the current location, size of their store in terms of square footage, number of SKUs or items sold, number of customers per day). The surveyors collected necessary contact information and recorded the GPS location via WhatsApp upon leaving.

2.5.2 Results

2.5.2.1 Partners' willingness to work with the venture

To answer the first question ("*Does a venture's use of social impact framing affect whether potential exchange partners will work with the venture?*"), I compare expert retailers' participation (i.e., retailers who wanted to take the MadiDrop+ on consignment) under the

commercial frame and the social impact frame. Table 2.6 displays results for logistic regressions, and Table 2.7 displays results for ordinary lead squares (OLS) regressions.

Table 2.6 Field experiment: Logistic regression results for the effect of frame on retailers' participation

	(9) participate	(10) participate	(11) participate	(12) participate	(13) participate
	Logistic	Logistic	Logistic	Logistic	Logistic
Social impact frame	-.125	-.126	-.448**	-.45**	-.467**
	(.166)	(.167)	(.199)	(.204)	(.219)
Female lead		.496***	-.091	-.284	-.691**
		(.187)	(.275)	(.317)	(.341)
Social impact frame x female lead			1.163***	1.282***	1.351***
			(.38)	(.391)	(.409)
Income quintile				.051	.047
				(.061)	(.066)
Female presence				.197	-.245
				(.215)	(.243)
Retailer water experience				.445*	.404
				(.234)	(.252)
Retailer work experience				.194	.218*
				(.12)	(.127)
Shop location duration				-.053	-.059
				(.115)	(.123)
Shop SKUs				.028	.213
				(.161)	(.184)
Shop area				.213	.301*
				(.152)	(.165)
Shop customers per day				0	0
				(.001)	(.001)
Retailer charity frequency					.106
					(.087)
Retailer prosocial impact belief					.179
					(.114)
Retailer prosocial norms belief					.599***
					(.088)
Constant	-.879***	-1.007***	-.858***	-1.738***	-2.483***
	(.116)	(.127)	(.133)	(.571)	(.636)
Observations	716	716	716	692	690
Pseudo R^2	.001	.009	.02	.039	.13

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Table 2.7 Field experiment: OLS regression results for the effect of frame on retailers' participation

	(1) participate	(2) participate	(3) participate	(4) participate	(5) participate
	OLS	OLS	OLS	OLS	OLS
Social impact frame	-.025	-.025	-.085**	-.084**	-.077**
	(.034)	(.033)	(.038)	(.039)	(.037)
Female lead		.105***	-.019	-.058	-.131**
		(.039)	(.055)	(.063)	(.062)
Social impact frame x female lead			.247***	.27***	.255***
			(.078)	(.079)	(.076)
Income quintile				.01	.006
				(.012)	(.012)
Female presence				.037	-.036
				(.042)	(.042)
Retailer water experience				.096*	.081*
				(.049)	(.047)
Retailer work experience				.038	.038*
				(.024)	(.023)
Shop location duration				-.01	-.011
				(.023)	(.022)
Shop SKUs				.003	.025
				(.03)	(.03)
Shop area				.042	.053*
				(.03)	(.029)
Shop customers per day				0	0
				(0)	(0)
Retailer charity frequency					.019
					(.015)
Retailer prosocial impact belief					.028
					(.017)
Retailer prosocial norms belief					.101***
					(.014)
Constant	.293***	.268***	.298***	.137	.084
	(.024)	(.025)	(.027)	(.108)	(.104)
Observations	716	716	716	692	690
R^2	.001	.011	.025	.047	.142

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Results from the 716 shops were starkly different according to the gender of the surveyor using the frame. Table 2.6 Model 11 and Table 2.7 Model 16 show results for interacting the frame and gender. First, in the commercial frame, there is no statistically significant effect of

gender. This is shown by the non-significant odds ratio and the coefficient on *female lead*,

indicating that male and female surveyors using the commercial frame were just as likely to

persuade retailers to participate. Second, in the social impact frame, there are diverging results

that are dependent on gender. When a man used the social impact frame, relatively fewer

retailers were willing to take the products on consignment compared to when he used the

commercial frame (a *decrease* by 8.5 percentage points, $p<.05$, from the coefficient on *social*

impact frame in Table 2.7 Model 16). This indicated that the retailers were *less responsive* to the

social impact frame compared to the commercial frame when a man used it; the social impact

frame had a *negative* effect, indicating that retailers may have been skeptical about their use of

the social impact frame. When a woman used the social impact frame, relatively more retailers

were willing to take the products

Figure 2.6 Field experiment: Predictive margins for percentage of retailers who participate in taking products on consignment, by gender (no control variables)

on consignment compared to when she used the commercial frame (an *increase* of 16.2

percentage points, *p*<.01). These results are summarized in Figure 2.6. Table 2.6 Model 12 and

Table 2.7 Model 17 include other control variables that were collected as part of the experiment.

The results do not qualitatively change.

Since there seemed to be an effect of gender on retailers' participation, it is important to

consider if gender affected anything else that may drive the outcome of interest. Variables that

may be especially affected by gender are survey responses having to do with stated prosocial

beliefs or practices, either due to impression management in the presence of a particular gender

or a desire to support a particular gender's efforts. In the survey that was conducted as part of

this experiment, this would indicate that the following variables may be affected by the gender of

the surveyor: *retailer charity frequency*,[9] *retailer prosocial impact belief*, [10] and *retailer*

prosocial norms belief.[11]

Table 2.8 shows descriptive statistics (means) for these variables. Paired sample *t* tests

indicate that these values varied by gender, although they do not vary by frame. These variables

are included in Table 2.6 Model 13 and Table 2.7 Model 18. For each variable, values are

centered at an integer close to their average values to make for easier interpretation. Results

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[9] Retailers were asked the following question: "With what frequency do you donate money to charity or people in need?" (1=Never; 2=Rarely; 3=Sometimes; 4=Often; 5=Regularly). The 170 retailers who heard a female surveyor's pitch (*mean*=1.84, *std. dev.*=.081), compared to the 534 who heard a male surveyor's pitch (*mean* 2.89, *std. dev.*=.52), stated higher agreement with the statement (two-sample *t*(702)=10.14, *p*<.01).

[10] Retailers were asked how much they agree with the following statement: "My business gives me the opportunity to help people in my community" (1 = "Strongly disagree" and 5 = "Strongly agree"). The 170 retailers who heard a female surveyor's pitch (*mean*=4.59, *std. dev.*=.061), compared to the 534 who heard a male surveyor's pitch (*mean* 4.11, *std. dev.*=.49), stated higher agreement with the statement (two-sample *t*(702)=5.13, *p*<.01).

[11] Retailers were asked how much they agree with the following statement: "Retailers should promote socially beneficial products like the MadiDrop+" (1 = "Strongly disagree" and 5 = "Strongly agree"). The 170 retailers who heard a female surveyor's pitch (*mean*=4.28, *std. dev.*=.92), compared to the 532 who heard a male surveyor's pitch (*mean* 2.83, *std. dev.*=1.39), stated higher agreement with the statement (two-sample *t*(700)=12.67, *p*<.01).

Table 2.8 Field experiment: Descriptive statistics (means) by gender of lead surveyor for relevant variables

	Male lead	Female lead
Retailer charity frequency (1-5 scale)	2.89	1.84
Retailer prosocial impact belief (1-5 scale)	4.11	4.59
Retailer prosocial norms belief (1-5 scale)	2.83	4.28
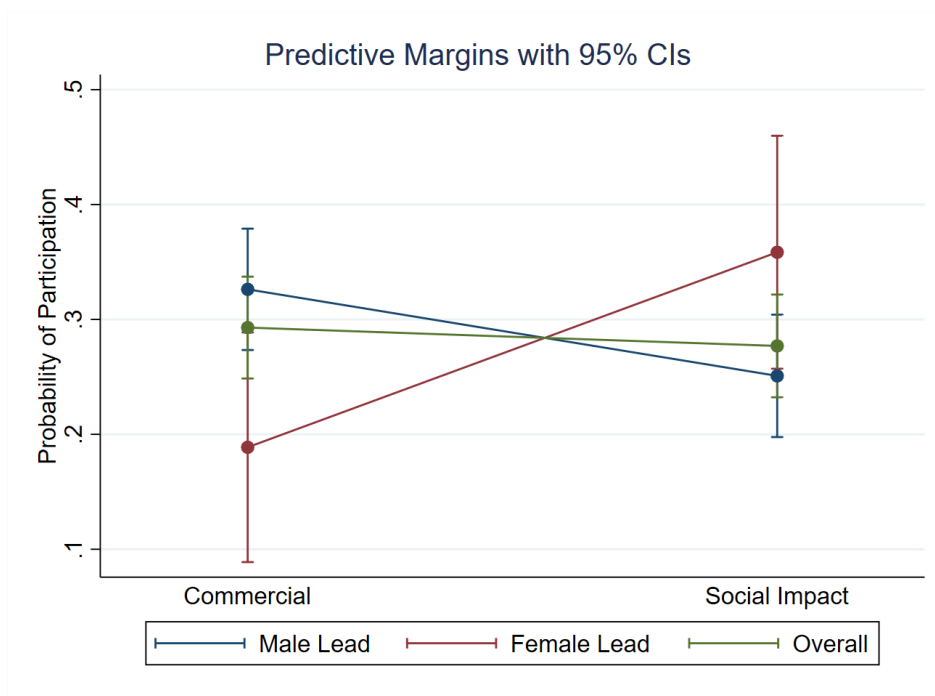
Figure 2.7 Field experiment: Predictive margins for percentage of retailers who participate in taking products on consignment, by gender (with all control variables)

show that *prosocial norms belief* drives a change in the results. There is a relatively positive, large, and statistically significant direct effect of this belief on retailers' willingness to partner with the venture (an increase in the participation rate of about 10 percentage points). Moreover, when *prosocial norms belief* is taken into consideration, the effect of *female lead* on retailer participation is now *negative* in the *commercial* frame (i.e., the "main" effect of *female*). Results in Table 2.6 Model 13 indicate that when retailers' stated beliefs about how shops should act are held constant, retailers are 50% less likely to partner with the venture. OLS regression results are

graphed in Figure 2.7. This indicates that under both frames, the female surveyor experiences a positive "boost" in participation rates due to another gender-related factor that does not have to do with either frame. It also indicates that, without this positive boost, retailers in this experiment viewed a female surveyor as less persuasive than the male surveyor when using the commercial frame.

2.5.2.2 Partners' willingness to trade off profit for social impact

To answer the second question (*"Does social impact framing affect the extent to which exchange partners will give up profit for social impact?"*), I compare the lowest margin that retailers were willing to accept (i.e., the most that they were willing to pay) to keep three units of the MadiDrop+ on consignment under the commercial and social impact frames. The percentage of retailers who agreed to keep the products on consignment was relatively low; out of the 716 retailers surveyed, only 201 wanted to participate in this exchange (28.1%).

Table 2.9 displays OLS regression results for the effect of the social impact frame on retailers' lowest acceptable margin. In Model 19, which only includes the effect of the frame, no statistically significant results are reported. The average lowest margin accepted by retailers under the commercial frame was about 40.5%, and there was a slight decrease in the margin (i.e., a higher willingness to pay) under the social impact frame by another 1.3 percentage points. This result, however, is neither large in magnitude nor statistically significant.

Table 2.9 Model 20 and Model 21 display OLS regression results with the inclusion of *female presence* to show how gender affects this outcome. *Female presence* is a binary variable indicating whether a female surveyor is present on the surveyor team approaching the retailer. If *female presence* is 1, then she was present on the surveyor team but may or may not have been

speaking. If *female presence* is 0, then the surveyor team had zero females on it. Model 20 and

Model 21 show that there is a negative direct effect on the lowest acceptable margin if there is

Table 2.9 Field experiment: OLS regression results for the effect of frame on retailers' lowest acceptable margin

	(19) lowest margin	(20) lowest margin	(21) lowest margin	(22) lowest margin	(23) lowest margin
	OLS	OLS	OLS	OLS	OLS
Social impact frame	-1.257	-.882	-1.855	-2.25	-2.146
	(1.82)	(1.808)	(2.738)	(2.767)	(2.741)
Female presence		-4.176**	-4.984**	-6.159**	-4.983*
		(1.818)	(2.494)	(2.78)	(2.79)
Social impact frame x female presence			1.73	1.382	1.855
			(3.651)	(3.725)	(3.684)
Income quintile				-.231	-.509
				(.648)	(.641)
Female lead				1.621	2.202
				(2.56)	(2.568)
Retailer water experience				-1.337	-.937
				(2.336)	(2.335)
Retailer work experience				-.998	-.773
				(1.216)	(1.189)
Shop location duration				-1.719	-2.024*
				(1.132)	(1.111)
Shop SKUs				.172	-1.079
				(1.779)	(1.855)
Shop area				-.235	-.401
				(1.581)	(1.557)
Shop customers per day				0	.003
				(.009)	(.009)
Retailer charity frequency					-.975
					(.843)
Retailer prosocial impact belief					1.176
					(1.283)
Retailer prosocial norms belief					-3.268***
					(.965)
Constant	40.476***	42.624***	43.039***	50.945***	57.679***
	(1.258)	(1.556)	(1.789)	(6.385)	(6.621)
Observations	201	201	201	198	197
R^2	.002	.028	.029	.079	.139

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

female presence on the surveyor team, such that when there was a female on the surveyor team, the lowest acceptable margin *decreased* by about 5 percentage points. Model 22 includes additional control variables, and the results still hold. This indicates that if the retailer saw a female on the surveyor team, then he was more likely to give up profit to participate in the consignment scheme compared to if he did not see a female on the surveyor team. Her presence made a difference in the amount of profit the retailer was willing to give up across both frames.

Model 23 includes variables for prosocial beliefs and practices that vary by gender. Results from this model show that the effect of female presence becomes is no longer statistically significant at *p*<.05 (though it is still statistically significant at *p*<.1). The retailer's *prosocial norm belief* seems to be driving this effect. A separate regression (not shown here) reveals that *female presence* predicts *prosocial norms belief* (*coef*.=1.19, *p*<.01), indicating that these stated beliefs at least partially, if not fully, mediate the effect of *female presence* on the lowest acceptable margin.

Since this experiment only utilized four surveyors, it's important to ask whether there are individual-level effects at play. Figure 2.8 shows the percentage of retailers who accepted products in the commercial and social impact conditions, according to the leader (i.e., speaker) of the survey team that approached them (one female: F1; three males: M1, M2, and M3). The most experienced surveyor, in terms of sales, was M2, followed by M3; F1 and M1 did not have any sales experience. Only the female leader's usage of the social impact frame resulted in an increase in retailer participation; the male leaders' usage of the social impact frame resulted in significantly lower or similar participations rates as the commercial frame. This indicates that even with sales experience, males performed worse with the social impact frame than the female.

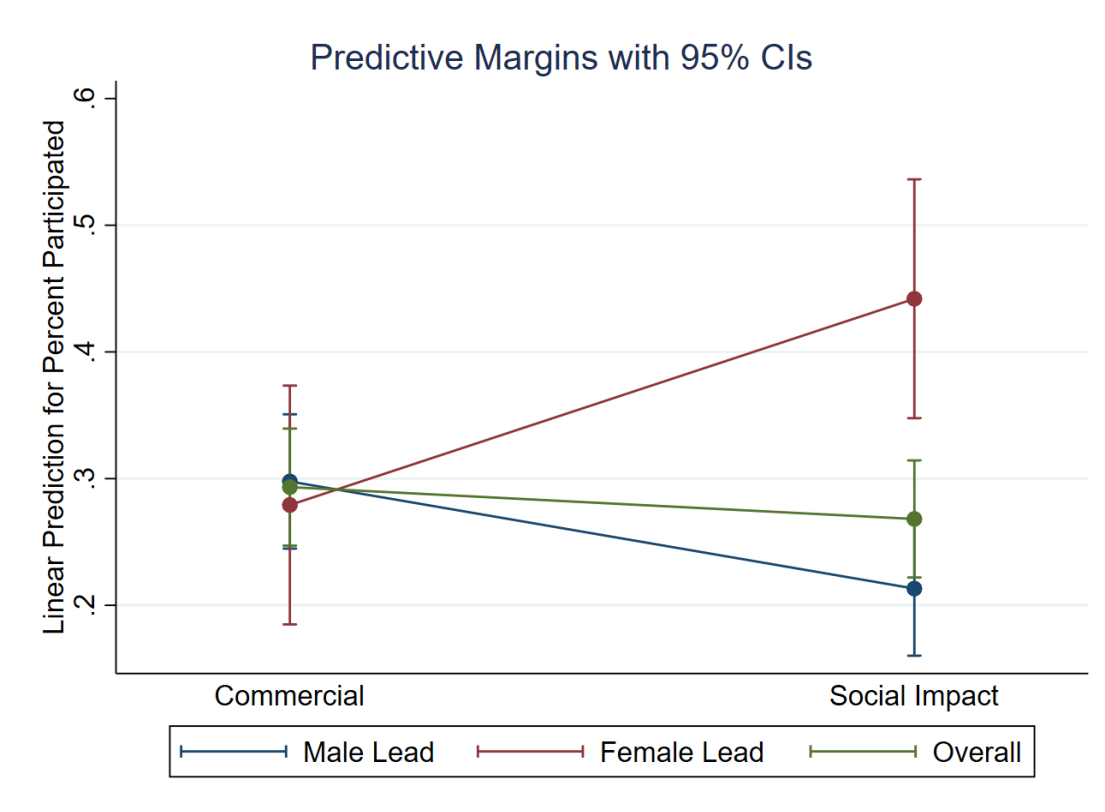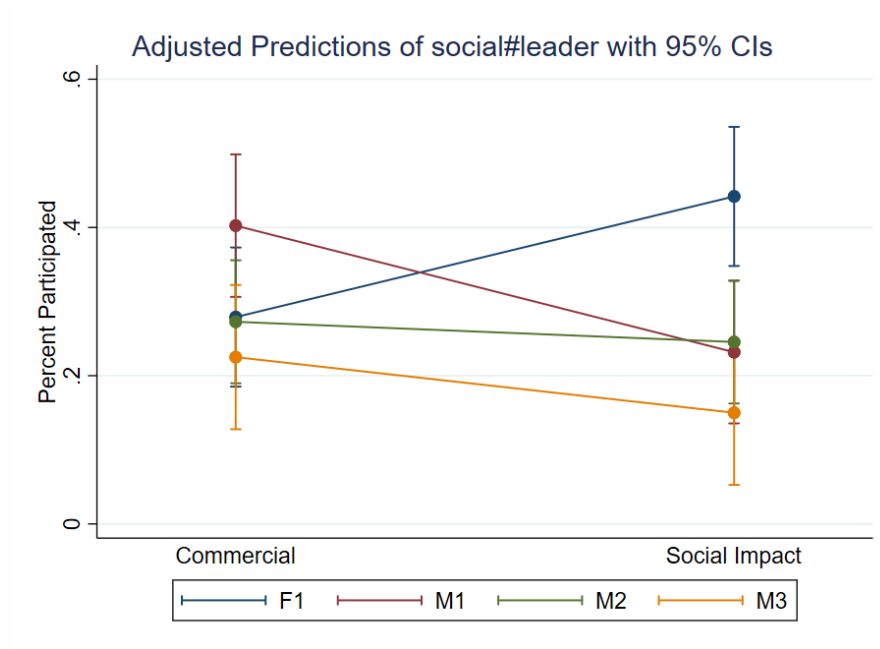**Figure 2.8 Field experiment: Adjusted predictions for percentage of retailers who participate in taking products on consignment, by gender of leader (with no control variables)**

2.5.3 Discussion of the lab-in-the-field experiment with interview and survey data

Results from this experiment showed that retailer participation depended on the gender of the person using the social impact frame. That is, when a male company representative used social impact framing, participation decreased compared to when he used commercial framing. When a female company representative used social impact framing, participation increased compared to when she used commercial framing. In this experiment, there were two potential sources of information: the frame (commercial or social impact) and the surveyor's gender (male or female). Table 2.10 summarizes these different information situations. I discuss the experiment results using literature on how novices and experts make decisions, interviews with

Table 2.10 Field experiment: Perception of information presented according to frame and surveyor gender

	Male surveyor	Female surveyor
Commercial frame	(I) Baseline	(III) Incongruent
Social impact frame	(II) Incongruent	(IV) Very incongruent

Bangalore-based retailers and company representatives who did not participate in the experiment,[12] and survey data collected from the lab-in-the-field experiment.

The real-world retailers who participated in this experiment were experts in the supplier-retailer interfirm relationship. The baseline situation (I) of Table 2.10 is when a male company representative presents the commercial frame. In expert retailers' mental models, this is the most common and prototypical situation. In expert retailers' mental models, the vast majority of company representatives are men, and according to interviews with retailers, they may encounter up to 10 company representatives per day. These company representatives are responsible for tasks like marketing the product, negotiating wholesale prices and minimum order quantities, making deliveries, and collecting payments. With company representatives, retailers talk business. When deciding whether to establish a partnership with a supplier company, retailers take into account whether they trust the product, the company selling it, and the company representative. In interviews with expert retailers who were not in the experiment's sample, one retailer explained that he would work with a venture "if the company is genuine, if the representatives are genuine." He continued, "I have been in this industry for 40 years, and without trust, I cannot run a business … Trust is important."[13] Similarly, a retailer with 25 years of experience explained: "When a new company representative approaches me, in the beginning, I don't trust the product and the company. It is the first time I am seeing this person, and the company is new, and there is no similar product in the market. If any problem happens from

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[12] Although it would have been ideal to follow up with retailers who participated in the study, many were unwilling to spend more time with the surveyors because they had already made decisions about the product. Some who did speak with the surveyors again felt uncomfortable talking about gender issues, which may have factored into their past decisions.
[13] Participant #138, interviewed on August 26, 2022

using the product, then my shop will earn a bad reputation."[14] This general distrust, related to newness, would explain why product take-up was so low in the baseline condition.

In situation (II) of Table 2.10, a male company representative uses a social impact frame. This introduces information (the social impact frame) that is incongruent with experts' mental models. This incongruence leads to more skepticism and, eventually, distrust in the person, the company, and the product. A retailer with 20 years of experience explained, "I don't trust males when they talk about helping society. Most political leaders are male, and they speak in public and on social media about problems in society, but they don't work to solve the problems."[15] Another retailer voiced similar distrust, saying "You are here for business, so how could you expect that you would want us to accept that you are helping society?"[16] Another retailer specifically brought up the idea of congruence: "Most male representatives are focused on their company's well-being and giving them profit because they are almost all into business development. Helping society or charity won't fit them."[17] This distrust of male company representatives using the social impact frame, which arises from increased skepticism due to incongruence in experts' mental models, is likely to explain why participation decreases.

In situation (III) of Table 2.10, a female company representative uses a commercial frame. This also introduces information (a female representative) that is incongruent with experts' mental models. From the results for retailers' participation, there seem to be two opposing effects at play. On the one hand, retailers seem to distrust the female surveyor's ability to conduct business. There exist very few female company representatives. A male company representative with 15 years of experience explained that "being a company representative is a

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[14] Participant #142, interviewed on August 29, 2022
[15] Participant #68, interviewed on August 8, 2022
[16] Participant #141, interviewed on August 29, 2022
[17] Participant #102, interviewed on August 17, 2022

really difficult job. You have to convince the shop person and negotiating and getting money from the shop person is difficult. You will have targets. I don't find any female representatives who are doing my job in the medical field."[18] Due to this rarity of female company representatives, retailers seem to distrust whether they have the experience and know-how to do the job well. According to a retailer who has seen both male company representatives and (few) female company representatives: "Compared to female representatives, male representatives are better when it comes to presenting to retailers because they have more experience and can handle certain situations. A few retailers will be good to them, and a few will be rude to them. But the male representative knows how to manage those situations and build the business. This would be difficult for females."[19] This skepticism of females' business-related abilities in the commercial frame may *decrease* retailer participation when the female representative used the commercial frame (Table 2.7 Model 5).

On the other hand, retailers seem to have a "soft corner" (i.e., soft spot) for women who approach the store and ask for their attention. According to one retailer with 30 years of experience: "Most of the retailers are male. They might feel bad saying NO to a female representative out of having a soft corner!"[20] Many retailers explained that they "think of helping [female representatives] out"[21] when female representatives approach their stores. As one retailer described, "I will give time to female representatives because they work hard. I don't like to disappoint females."[22] Another retailer confirmed this, saying that "most shop people don't have time for new company representatives, as they will be busy responding to their customers.

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[18] Participant #48, interviewed on July 28, 2022
[19] Participant #131, interviewed on August 24, 2022
[20] Participant #34, interviewed on July 26, 2022
[21] Participant #60, interviewed on July 29, 2022
[22] Participant #68, interviewed on August 8, 2022

Maybe the retailers are concerned about female representatives and have a soft corner for them. They would give time to female representatives."[23] This desire to support women is likely to drive responses to the survey question about prosocial norm beliefs (i.e., whether shops should sell socially beneficial products). In condition (III), a comparison between Figure 2.6 and Figure 2.7 shows that retailers' "soft corner" made up for the decrease in retailer participation caused by incongruence stemming from a female representative's use of the commercial frame.

In situation (IV) of Table 2.10, a female company representative uses a social impact frame. This also introduces two pieces of information that are incongruent with experts' mental models, which is so much incongruence that experts may no longer be evaluating the situation with these mental models. There is evidence that, in this situation, retailers were *not* evaluating the consignment opportunity as a *business decision*. A subset of the retailers was asked to what degree the venture balanced the commercial mission with the social impact mission that was presented in the experiment.[24] On this scale, a higher value indicated that they believed that the venture weighted the social impact goal more, and a lower value indicated that they believed the venture weighted the commercial goal more. Results are presented in Figure 2.9. When the woman used the social impact frame, the venture was seen as being *less* motivated by social impact goals than when a man used it ($p<.01$). This indicates that retailers may have been using a different mental model to make evaluations – one that did not typify business transactions, which was their area of expertise.

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[23] Participant #140, interviewed on August 29, 2002

[24] A sub-sample of retailers (263 out of 716 retailers, or 37%) were shown two goals, each of which was placed at opposite endpoints of a slider survey question with values from 0 to 8: (1) "Providing high-quality and practical water purification solutions" and (2) "Making water purification accessible and affordable to poor households." The question asked: "In the first part of this survey, you learned about Pure Paani. In your opinion, how do you think Pure Paani gives weight to the following two goals?" The slider was initially placed in the middle of the bar, but the retailer could move it in either direction.
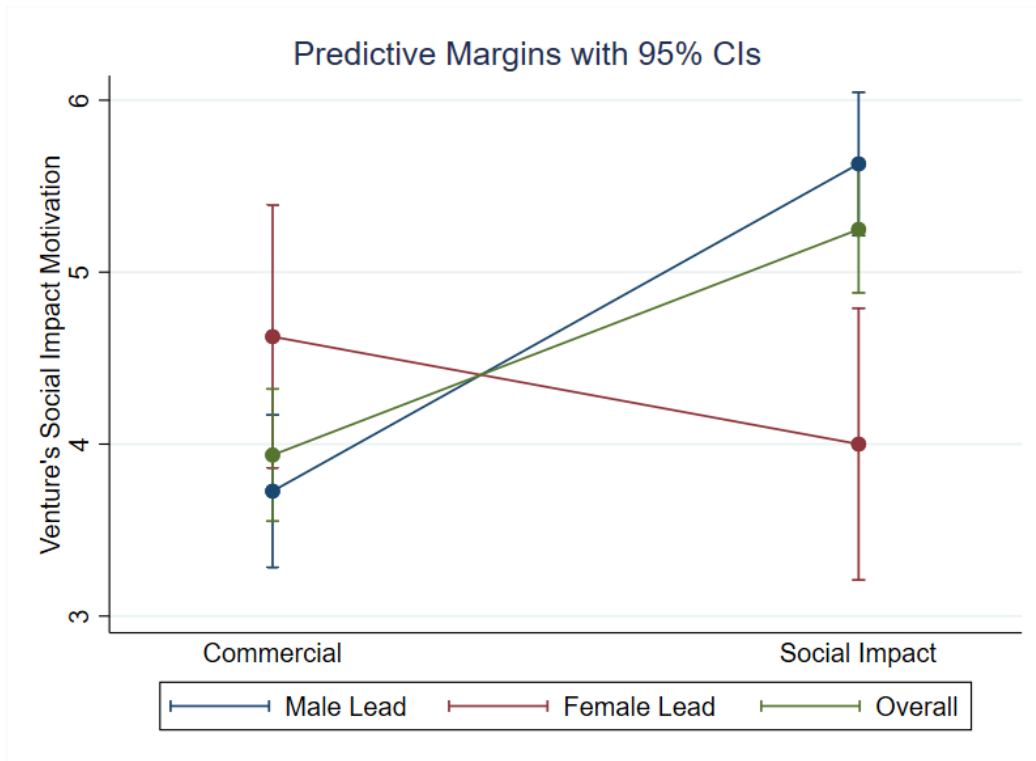
Figure 2.9 Field experiment: Predictive margins for degree to which retailers believe the venture balances the commercial mission versus the social impact mission

Indeed, interview results indicate that they could have been evaluating the female company representative in a role closer to that of a charity worker. Charity workers sometimes approach shops to ask for donations, and "most of the charity workers are female."[25] This may explain the survey question results. It could be that when retailers heard the female company representative talk about social impact, they thought that the venture was a more business-focused charity as opposed to a charity-focused business. That is, the messenger of the social impact message (a female) could have altered how the retailer categorized the organization, now viewing it as a charity instead of a business. Since retailers were not experts on charities, they evaluated the venture, the product, and the consignment opportunity like a novice would –

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[25] Participant #84, interviewed on August 11, 2022

abstractly, focusing on the desirability of the idea (i.e., the potential for profit that could arise from a social initiative), and being less able to be skeptical about the idea.

Finally, the lowest acceptable margin (the second outcome of interest) was less impacted by the social impact frame, regardless of gender. However, when there was a female present among the company representatives who approached the shop, the lowest acceptable margin decreased slightly in both frame conditions (i.e., there was a higher willingness to pay for the products). According to survey data and interviews, this seems to be driven by the retailers' desire to support work involving women. The results mainly suggest, though, that retailers expect a profit margin of a certain amount, regardless of whether social impact framing is used.

2.6 Discussion

2.6.1 A proposed framework of expertise-based skepticism

For this chapter's research, I ran two experiments to study the effect of a venture's use of social impact framing on 1) retailers' participation and 2) retailers' willingness to trade off profit for social impact. The first experiment was an introductory online experiment with Prolific survey takers who were primed to take on the role of a retailer in a two-player supply chain game. One result from this experiment is that the social impact frame produced a positive effect on retailer participation. Drawing on the literature on how novices and experts evaluate new information differently, as well as other aspects of the experimental results (e.g., no signs of skepticism as the venture's wholesale price increased), I propose that a critical reason for why subjects in this experiment responded positively to social impact framing is because of their novicehood. They used simple mental models to evaluate the venture, and social impact framing was seen as generally desirable and not incongruent with the mental model. As such, I propose the following proposition.

Proposition #1: Novices will have positive evaluations of ventures using social impact framing compared to commercial framing.

The second experiment, a lab-in-the-field experiment, was run to see if the results would hold in a real-world context with real-world decision makers. Results revealed that social impact framing's effect on retailer participation depended on the gender of the company representative using the frame. Compared to the baseline case (commercial frame, male company representative), adding incongruence via the social impact frame or a female company representative resulted in lowered retailer participation rates (the latter when controlling for retailers' "soft corner" for female company representatives). Interviews revealed that this was likely due to skepticism about the sincere use of the social impact frame and the ability of the female company representative. That is, compared to novices who did not see the social impact frame as incongruent information to be skeptical about, experts saw the social impact frame and the female company representative as information that was incongruent with their expertise-based mental model of the supplier-retailer relationship. This led to lower evaluations of the venture compared to the baseline situation (Hannan et al. 2007).

However, expert retailers responded positively to the social impact frame when a female company representative wielded it. From this result, I propose that if potentially incongruent information is presented differently, then experts might evaluate it differently. For example, Falchetti et al. (2022) show that when novel ideas are presented in concrete, low-level terms, experts are more likely to evaluate them highly because the framing aligns with how they process information using their mental models. I suggest that it could also be the case that *additional incongruent* information can "break" the mental model commonly used by experts due to extreme lack of fit and motivate a switch to a more accessible, simpler mental model. This would lead to evaluating like a novice. In the context of this study, I propose that when presented

with the social frame in addition to other incongruent information, experts will revert to

evaluations that are higher than evaluations made when only exposed to the social impact frame,

which may also be higher than evaluations made in the baseline condition. This is because they

do not know what to do with so much incongruent information, and they need to cognitively

access a simpler mental model to make more sense of it. With a simpler model, they evaluate the

social frame based on its desirability and potential benefits, not its feasibility, implementation, or

veracity. That is, they become less skeptical of it.

> *Proposition #2: There is a U-shaped relationship between the amount of incongruent information presented to experts (i.e., social impact framing plus additional incongruent information) and their evaluation of the venture presenting this incongruent information.*

2.6.2 Theoretical contributions

These findings and the proposed framework of expertise-based skepticism make at least

three contributions to our understanding of how new ventures in emerging moral markets can

acquire resources from stakeholders using framing strategies. First, my results emphasize that

ventures can become much more effective in strategically choosing not just *what* they frame but

how they frame and *to whom* they frame. Specifically, I show that ventures' choices should

depend highly on contextual details, such as the characterization of novice versus expert

stakeholders, the mental models that expert stakeholders possess, and the types and amount of

incongruent information that the ventures present. These findings answer a recent call to more

deeply study the interactions between entrepreneurial framing and different types of stakeholders

(Clough et al. 2019, Snihur et al. 2021). This is especially pertinent to new ventures that attempt

to create both economic and social value (Battilana and Lee 2014, Pache and Santos 2013) who

face conflicting demands from resource providers that are "typically embedded in the

institutional logics from which the new venture diverges" (Almandoz et al. 2017, p. 37). For these ventures, knowing how to strategically communicate core entrepreneurial identities and narratives in ways that are attractive across different stakeholders is critical.

Second, my findings suggest that ventures can strategically pre-empt negative evaluations from expert stakeholders who possess mental models that are incongruent with the ventures' frames, identities, and narratives by presenting this information alongside additional incongruent information. In the lab-in-the-field experiment, when the incongruent social impact frame was presented by an incongruent female company representative, retailers saw the venture as more of a business-oriented charity than a socially-minded business. Because retailers were novices with respect to evaluating charities, they were more likely to partner with the venture compared to when only one piece of incongruent information was provided. These findings build upon recent research in the cognition and categories literature about how social evaluations vary by audience member expertise, evaluation modes, and the type of information being processed (Boulongne and Durand 2021, Cattani et al. 2020, Falchetti et al. 2022).

Third, I contribute to an emerging body of literature concerning gender and social claim-making. An important finding in this literature is that social impact framing is more positively evaluated when associated with a female entrepreneur or company leadership, since social claims are female-typed, and stakeholders make judgments based on gender congruence (Abraham and Burbano 2022, Lee and Huang 2018). Responding to a suggestion to further explore "how other key stakeholders … respond to congruence between … gender and social claims" (Abraham and Burbano 2022, p. 409), my lab-in-the-field experiment first confirms the results of these studies across a different stakeholder group and geography. It additionally extends them by showing that gender's interaction with social claim-making still exists at lower levels of company

representation. Furthermore, my results indicate that, in addition to gender congruence, another mechanism (experienced-based skepticism) may also be driving these results.

2.6.3 Limitations and future research

I recognize that there are many limitations to this research that open avenues for future research. The first is that the framework of expertise-based skepticism emerged from the results of these experiments, which were not designed to explicitly test the propositions proposed in this chapter. Many of the propositions raise questions that require further experimental testing, whether in the laboratory or in the field. For example, are business-domain experts only skeptical of a venture's use of social impact framing, or are charity-domain experts also skeptical of a venture's use of social impact framing? The proposed theory would indicate that both types of experts would be skeptical of it. Moreover, why exactly are experts skeptical of social impact framing? Does social impact framing signal insincerity, incompetence, or both? Knowing this may help entrepreneurs decide how else to bolster the message of social impact. For example, if social impact framing signals insincerity to stakeholders, then perhaps ventures can provide more evidence about how their efforts are helping marginalized communities and the environment. If social impact framing signals incompetence to stakeholders, then perhaps ventures can provide more evidence of their business acumen. Disclosure of social and/or financial performance may play an important role here. Furthermore, do other types of incongruent information (i.e., not gender) produce similar results, or is this just a gender-related outcome? For example, if the incongruent information has to do with a new scientific process that was outside of the experts' domain of expertise, would expert stakeholders be just as attracted to the venture? The proposed theory indicates that any type of incongruent information that makes it difficult for experts to process with the extant mental models would result in a shift toward a simpler, more cognitively

Table 2.11 Propositions and questions for future research

Propositions	Questions for Future Research
Novices are attracted to venture's social impact framing, resulting in positive evaluations.	• Under what conditions could novices be skeptical of social impact framing? Relatedly, do the definitions of domain-based novice/expert need to encompass other forms of knowledge? For example, prior research on CSR skepticism has shown that stakeholders can be skeptical of firms' CSR activities depending on their knowledge of the firms' unethical actions, poor reputations, and even *other* firms' greenwashing.
Experts are skeptical of venture's social impact framing when it is incongruent with their existing mental models, resulting in negative evaluations.	• Are business-domain experts only skeptical of a venture's use of social impact framing, or are charity-domain experts also skeptical of a venture's use of social impact framing? The proposed theory would indicate that both types of experts would be skeptical of it. • Why exactly are experts skeptical of social impact framing? Does social impact framing signal incompetence, insincerity, or something different? Can disclosure of social or financial performance help bolster the social impact frame?
When presented with additional incongruent information to experts, social impact framing results in positive evaluations because they adopt a simpler, more cognitively accessible mental model to make sense of this information.	• Do other types of incongruent information (i.e., not gender) produce the same results? The proposed theory would indicate that any type of incongruent information would make experts less skeptical. • How exactly do stakeholders' mental models or expectations change when additional incongruent information is presented to them? In this study, it seemed that stakeholders adopted a different mental model (e.g., a business-oriented charity as opposed to a socially-minded business) that they had less expertise with. This, however, may not be the right way to characterize the change in evaluation modes.

accessible mental model to make sense of it, but further research should test this result. Table

2.11 provides a list of propositions, along with questions for further research that will help

determine whether expertise-based skepticism is a generalizable framework.

Additional limitations have to do with the gender-related findings. The online experiment, which was implemented before the lab-in-the-field experiment, does not test for a gender effect. Future studies can include gender in a similar analysis to see if gender perceptions also affect novice stakeholders. It could be the case that gender-related stereotypes are mental models commonly held by all stakeholders, regardless of expertise level. Additionally, I could only hire one female surveyor in the lab-in-the-field experiment.[26] It could be the case that gender-related effects are not actually driven by gender but by that individual. Though I attempted to control for frame implementation by, for example, having the surveyors present standardized images with captions and showing a video instead of relying on the surveyor to make the first pitch about the product, this woman still could have affected results. That said, the results still confirm prior findings about gender and social claims (Abraham and Burbano 2022, Lee and Huang 2018). A future follow-up experiment could hire more male and female company representatives to see if there is truly a gender-related effect.

Other limitations have to do with how the online experiment is designed. In the online experiment, it could be argued that the subjects did not face real economic stakes. The economic consequences of accepting or rejecting a wholesale price, as well as choosing between one's individual profit and charity, were high for a single online experimental study but low for an individual subject's overall income. This would explain why the acceptance rate was high (over 90 percent) across most wholesale prices, making it a less reasonable comparison to the lab-in-the-field experiment. Also, subjects for the online experiment were based in the U.S., where social impact implemented through businesses is generally institutionalized and accepted by the

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[26] It was even difficult to hire one female surveyor, as there are few women willing to take up such a role. Moreover, it was a requirement from this female surveyor's family that she only approached shops while accompanied by a male surveyor.

public. This could have also affected the overall acceptance rate. Future studies may want to run the online experiment in India. Additionally, the commercial frame in the online experiment was significantly more expressive of the venture's self-interest than in the lab-in-the-field experiment. Surprisingly, the retailer participation rate was still very high on average, so perhaps this did not make a difference to the results. That said, future research may want to test the rhetoric of different commercial frames, along with different social impact frames. This may uncover yet another strategy for new ventures operating in emerging moral markets. Moreover, it would be prudent to run the online experiment with experts to see if my results from the lab-in-the-field experiment still hold. This would enable a more direct comparison of the two experiments. If experts are too difficult to access (for example, having Indian retailers take the online experiment would not be feasible), then there may be ways to create experts by, for example, having subjects gain experience by playing multiple rounds or by priming them to be more skeptical through a vignette about a venture that was being manipulative through social impact framing.

2.6.4 Implications for methods and practice

This research has implications for methodologies used to assess stakeholders' evaluations. I designed innovative, incentive-compatible experimental methods that involve real economic decisions, costs, and payoffs, which enabled me to both capture and measure stakeholders' true business decisions with respect to social impact framing. In the lab-in-the-field experiment, I combined a naturalistic business exchange (pitching a new product and offering it to retailers on consignment) with a laboratory method (the multiple price list) among real decision makers (experienced retailers). Even though retailers did not pay for the products upfront, there were still real costs to consider, such as shelf space, opportunity costs, and

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investment in learning how to sell the product. This explains why baseline take-up was so low at about 30%. The online experiment may have been less naturalistic, but it still included an incentive-compatible assessment of willingness to pay for social impact. Retailers' decisions had real (though small) payoffs for the retailer, the venture, and a water-focused charity, and they made tradeoffs across the three entities. In both experiments, subjects' choices resulted in real decisions and outcomes, indicating that results from these experiments are more believable than hypothetical decisions.

Moreover, through the process of developing, piloting, and running the lab-in-the-field experiment, I was able to assess what types of incentive-compatible methods were appropriate for different settings. From my experience and the experience of other researchers (e.g., Asioli et al. 2021), the multiple price list (MPL) format was found to be a relatively transparent and simple way to elicit true willingness to pay. It provided truer responses than simply asking retailers for their willingness to pay, and it was easier to understand than the Becker-DeGroot-Marschak (BDM) auction (Lemken et al. 2017, Noussair et al. 2004). I had piloted the BDM auction but found that the procedure was difficult to explain to retailers who faced time constraints and distractions, such as customers and salespeople who visited the shop. While BDM auctions are useful in field experiments where the researcher can conduct multiple practice rounds and allow ample time for questions (e.g., Berry et al. 2020), I find that the MPL format is useful for eliciting true willingness to pay when there are constraints on time and attention. That said, future research could also ask which types of incentive-compatible methods for eliciting willingness to pay are most feasible and appropriate under real-world experimental conditions in the field.

Lastly, this research has practical implications for social entrepreneurs. Framing one's venture in terms of social impact may be trendy, but expert stakeholders might be skeptical of entrepreneurs doing this. Entrepreneurs need to carefully assess whether stakeholders are experts in either a business domain that would see social impact as incongruent, such as partners or investors. In these cases, entrepreneurs should be careful to place primacy on social impact goals, or they should present other information that would enable the stakeholder to evaluate social impact according to a different mental model. However, the latter may not be possible with all stakeholders (e.g., some investors must evaluate all ventures in terms of a strict business opportunity). A similar strategy likely applies to stakeholders in the social impact domain who may see the business aspects as incongruent with their mental models (i.e., activists, pure charities).

2.7 Conclusion

Growing scholarly attention has been paid to the role of new ventures in creating positive social impact. Yet, several questions about how ventures can do so strategically, in a way that results in positive responses from critical stakeholders, continue to abound. By explaining that social impact framing can result in evaluations that differ by stakeholders' expertise level, I suggest that entrepreneurs should use strategic discretion in how they use social impact framing, as some stakeholders will be more skeptical than others. Moreover, I propose that entrepreneurs can strategically provide more incongruent information to experts such that they begin to evaluate social impact more positively, as novices do. While I speak primarily to scholars of entrepreneurial strategy in emerging markets, audience evaluations, and gender and social claim-making, I additionally inform a broader audience about the evaluation of environmental and society-enhancing efforts. I speak to both scholars and practitioners about how societal issues –

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both problems and potential solutions – can be strategically framed to mobilize support across

stakeholders possessing different levels of domain-specific expertise in the future.

Chapter 2 References

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Appendix 2 Field Experiment Conditions

Figure 2.10 Excerpts from the commercial and social impact frame pictures and captions

Chapter 3 Unpacking the "Expat Gap": Why and How Local Entrepreneurs Nonetheless Persist in Developing Countries' Moral Markets

3.1 Introduction

There has been growing interest in entrepreneurship in moral markets, or "sectors whose *raison d'être* is to create social value by offering market solutions to social and environmental issues" (Georgallis and Lee 2020, p. 50). Prior research has been conducted on moral markets such as socially responsible investing, grass-fed meat, recycling, solar photovoltaic sales, and childcare (Arjaliès 2010, Durand and Georgallis 2018, Lounsbury et al. 2003, Vermeulen et al. 2016, Weber et al. 2008), typically demonstrating the critical role of intermediaries like social movement actors in establishing market infrastructure. While authors have studied how these institutional factors affect both entry and survival in these markets (e.g., Durand & Georgallis, 2018; Vedula, York, Conger, & Embry, 2022), less attention has been paid to how present-day market-building efforts interact with historical institutional contexts and individual-level differences in entrepreneurs to affect heterogeneous choices in terms of business models, solutions commercialized, and means of persistence in these moral markets. There exist *many* ways for entrepreneurs to create social value for a single social issue through the provision of market-based solutions. Understanding why these differences arise is critical, as they can shed light on why moral markets "fail" (i.e., do not succumb to institutional pressures to commercialize; Vermeulen et al., 2016), why moral markets succeed commercially but are limited in their creation of social value, and, perhaps, how moral markets can succeed on both fronts of creating economic value and social value.

An increasingly important context for moral markets is developing countries, where weak institutional contexts create problems of economic and human development (such as those described by the United Nations Sustainable Development Goals) while also making it more difficult for entrepreneurs to provide market-based solutions for these problems. As a starting point for this research, one interesting phenomenon that has been noted by some practitioners and researchers is that even though philanthropic and commercial funding is flowing into moral markets in developing countries from developed economies, very little of this money is going to local entrepreneurs. In a blog post for the *Stanford Social Innovation Review*, Nwuneli (2015) writes that of the 195 awards for social entrepreneurs working in Africa provided by Echoing Green, the Schwab Foundation for Social Entrepreneurship, and Skoll Foundation, only 33 percent of the awardees are locals. The problem is not that local entrepreneurs are not entering moral markets in developing countries. Using data from global accelerator programs, Lall et al. (2019) show that foreign-born entrepreneurs in moral markets – expatriates from developed countries from where financial support generally flows – tend to receive more early-stage funding than local entrepreneurs operating in moral markets. This persistent "expat gap" cannot be explained by education level or prior experience, indicating that inequality may not be driven by entrepreneurial capability or competence. Given that funding is critical to the success of new ventures and, consequentially, the successful or failed development of moral markets in developing countries, it would make sense to unpack reasons for why the expat gap exists and how it affects market outcomes.

I explore these research questions in the case of social enterprises operating in the clean cooking market in East Africa. Clean cooking technologies include cookstoves and fuels that are designed to address problems of indoor air pollution, a leading killer of children in developing

countries. Though these technologies have existed for over 60 years (Morrison 2018), the widespread adoption of these innovations has been limited. Since around 2010, global cross-sector actors have taken up the banner of promoting clean cooking technologies, with funders pouring financial resources into the "development of a thriving global market for clean cookstoves and fuels" (Global Alliance for Clean Cookstoves 2011, p. 5). An interesting characteristic of this market is that both local and expatriate entrepreneurs enter and persist in the market, even though expatriate entrepreneurs attract more resources from funders.

In this chapter, I attempt to unpack why local entrepreneurs tend to receive less funding than expatriate entrepreneurs. In particular, I explore how present-day marketing efforts interacted with historical institutional contexts and individual-level differences to discover why local entrepreneurs make different choices in terms of business models and technologies vis-à-vis expatriates. Then I ask how they continue to persist in the clean cooking industry, despite industry funders' preferences. Lastly, I consider how these heterogeneous choices shape the moral market's development.

I find that, like many moral markets in developing countries, clean cooking was (and is) transitioning from a development sector into a new industry, or at least an industry that exists for sustainable development. While the development sector sought to provide accessible technologies through a community-focused model of "small is beautiful" (Schumacher 1973) that was sponsored by non-governmental organizations and development agencies, the emerging industry focused on revolutionary technology, picking early winners and placing big bets, and the (eventual) involvement of private sector actors. Unlike expatriate entrepreneurs, local entrepreneurs entered the clean cooking market with strong knowledge of their country's historical context, which was reinforced by their personal lived experiences at the community

level. Even though many desired to adopt a commercial mindset, local entrepreneurs found that it was difficult for them to do so. The tensions they felt between the goals of development and the goals of the market were strong, and they chose business models and technologies that were unattractive to funders.

While not receiving external funding would be thought to lead to the exit of a social venture, I find that local entrepreneurs continued to persist in the clean cooking industry without it. They did this, however, without achieving the goals of scale that the clean cooking industry expected of its producers. Moreover, what was a liability of local entrepreneurs to funders became an asset of persistence. Local entrepreneurs' emphasis on accessible technology enabled them to *replicate* their technologies in other similar geographical regions through micro-franchising and open-source sharing. Their community embeddedness enabled them to implement strategies of *diversification*, vertically filling gaps in the value chain and horizontally entering into specialized sub-markets in which only they could succeed. Lastly, their non-financial support from development sector actors enabled them to *collectively resist* the market-based direction that the clean cookstove industry was headed, by having a broad base of voices supporting local entrepreneurs and garnering support from stakeholders outside of the industry.

The clean cooking market has been criticized for both progressing too slowly and being ineffective overall (Gill 2016, Shafer 2019). Local entrepreneurs' persistence contributed to this outcome. Market-building actors were weakened; conflicting demands from local entrepreneurs and expatriate entrepreneurs prohibited the collective action required to set industry norms. New stakeholders, like government actors, took sides and supported local entrepreneurs and more development-related outcomes. Funders grew weary of clean cooking altogether. Transitioning from a development sector to a market was not as quick or easy as market-building actors hoped

it would be. But this should have been expected, as attempting to build a market atop a context that is characterized by decades of history – history that shapes how entrepreneurs make sense of opportunities, costs, and purpose – would affect how they cooperate and compete. As the clean cooking field is working itself out, local entrepreneurs and their supporters continue to create field-level guardrails (Smith and Besharov 2019), such that neither strictly financial goals nor strictly social goals are prioritized. At the very least, today's conflicting presence of local entrepreneurs among expatriate entrepreneurs enables the field to simultaneously address short-term and long-term needs – helping a rural woman earn money for tonight's dinner while also exploring the development of technologies that are both efficient and affordable. And one day, it is hoped that the pendulum between the clean cooking field's characteristics as a development sector and industry will settle in a place that purposefully and effectively blends aspects of both worlds.

3.2 Theoretical background

3.2.1 Funding social value creation

Entrepreneurs in moral markets generally require a wide range of funding sources, which are especially needed for their companies' earliest stages of growth (Branzei et al. 2018). Even though funding sources are diverse, the most common ones operate according to an ideology that combines social welfare logic with commercial logic (Gordon 2014, Hehenberger et al. 2019, Lall and Park 2022, Mair and Hehenberger 2014). Over the past 15 years, an ideology of impact investing has come to refer to "investing with the intention to generate positive, measurable social and environmental impact alongside financial return" (quoted in Hehenberger et al., 2019: 1672). This ideology echoes that of commercial venture capital and emphasizes, for example, standardized solutions, enterprise self-sufficiency and scale, rational thinking, impact

measurement, and selecting early-stage, innovative ventures to support early on (Hehenberger et al. 2019). These means of evaluation are intended to establish and enhance the markets into which funders (both impact investors and also venture philanthropists) provide capital.

Despite practices that are intended to identify and support the most evidence-based, scalable social venture, there continues to exist a persistent pattern of unequal funding across local and expatriate social entrepreneurs, such that local social entrepreneurs receive less funding than expatriate social entrepreneurs operating in developing countries. Across all startups, 90 percent of capital in East Africa from 2015-2016 went to companies with one or more European or North American founders (Matranga et al. 2017, p. 48). The pattern is similar in the domain of social entrepreneurship. Using a data set of 3.434 ventures from 92 developing countries, Lall et al. (2019) find evidence of an "expat gap" in developing countries between social enterprises led by expatriates and social enterprises led by locals, holding constant education and prior experience. Expatriate-led organizations are significantly more likely to raise grant funding, which is known to be a stepping stone to commercial financing. Some researchers have speculated that these inequalities persist because of foreign investors' reliance on personal social networks and signals of quality that local entrepreneurs are less likely to have than expatriate entrepreneurs, such as ties to prestigious universities (Matranga et al. 2017). Other authors consider the lack of access that foreign investors have to local entrepreneurs, who may be unfamiliar with funding application processes (Lall et al. 2019). Less discussed, however, are fundamental differences in how local entrepreneurs and expatriate entrepreneurs create value and make tradeoffs – and how this is related to present-day market-building efforts and the historical contexts of the moral markets in which they operate.

3.2.2 Perceiving tradeoffs between financial and social goals

Even though some prior authors have asserted that the pursuit of financial and social

goals can occur without tradeoffs (Freeman et al. 2020, Porter and Kramer 2011), many scholars

of hybrid organizations recognize that social ventures experience these tradeoffs regularly (Hahn

et al. 2015, Smith and Besharov 2019). However, there is still much to uncover about why

different social ventures perceive tradeoffs to varying degrees. In a theoretical piece, Battilana et

al. (2020) propose that hybrid organizations' intensity of experiencing tradeoffs depends not only

on factors external to the firm but on governance arrangements within the firm. For example,

they propose that if the social venture has a longer time horizon for its social and financial goals,

and the more its top executives are socialized in financial and social logics, then the social

venture would experience less intensity of social and financial tradeoffs. When considering

moral markets in developing countries, it would be important to consider whether social

ventures' time horizons and top executives' financial and social logics are determined

systematically, how they vary systematically across groups of entrepreneurs (i.e., local and

expatriate entrepreneurs), why they vary systematically, and what the consequences are of this

variance.

3.2.3 Emerging moral markets: new products vs new means of providing products

In the existing literature on market emergence, markets are usually new. New markets, by

definition, "form around things that do not fit established categories" (Kennedy 2008, p. 270),

such as a new technology or innovation (Moeen and Agarwal 2017, Shermon and Moeen 2022).

What makes the market "new" is the product or service being offered by ventures in the market.

Moral markets in developing countries are not always new in this sense, though. The product

category, such as point-of-use water filters and clean cooking technologies, may already exist.

What is new about these moral markets is not the technology itself but the market-based means

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of providing the technology to customers. Markets that emerge (or transition) in this way have been previously understudied by management and strategy scholars but are prevalent in practice, as global sustainable development efforts are increasingly being implemented by entrepreneurs – a process of "rendering development entrepreneurial" (Irani 2019). It is imperative to understand how these markets and social entrepreneurs operate and what the consequences are not just for the companies but for their customer-beneficiaries.

3.3 Methods

3.3.1 Research context

I explore these issues through an inductive study of the moral market for clean cooking technologies in developing countries, with a focus on East Africa. Approximately half of the world's population—and up to 90 percent of rural, base-of-the-pyramid households in developing countries—still rely on unprocessed biomass fuels, such as wood, dung, and crops leftover from the harvest (Global Alliance for Clean Cookstoves 2011, p. 5). When used for cooking and heating, these biomass fuels are typically burnt indoors in open fires or poorly functioning stoves. As a result, vulnerable populations – especially women in charge of cooking and their young children – are exposed to high levels of air pollution (Bruce et al. 2000). Indoor air pollution is related to an increased risk of acute respiratory infections in childhood, chronic obstructive pulmonary disease, and lung cancer (Smith 2013), and indoor air pollution from cooking kills over 4.3 million people every year (World Health Organization 2017). Social and environmental problems are also associated with using traditional cookstoves and fuels, such as gender inequality, which emerges because women are generally responsible for spending time on fuel collection and cooking (Lewis and Pattanayak 2012) and greenhouse gas emissions (Sagar and Kartha 2007).

One solution to this problem is the use of clean cooking technologies. Clean cookstoves come in a range of culturally differentiated designs, use different types of fuels, are somewhat affordable at different prices and qualities, and include categories such as improved biomass stoves, solar stoves, and stoves that run on liquefied petroleum gas (USAID and Winrock International 2017). Most of these cookstoves were initially developed to address adverse health, social, and environmental problems by reducing fuel usage, using cleaner-burning fuels, decreasing fuel-gathering time, and reducing cooking time. However, although clean cookstoves have existed for 60 years (Morrison 2018), efforts to promote these innovations confronted obstacles to diffusion, dissemination, and implementation. There had been early efforts to produce and promote clean cooking technologies, but these initiatives typically depended on donor funding and operated on a project-by-project basis (Abdelnour and Branzei 2010). Moreover, the different organizations involved in manufacturing, distributing, and funding cookstoves have typically operated independently, attempting to fill multiple positions in the value chain and attempting to create awareness and advocate for policy change on their own. The few clean cookstove enterprises that did exist struggled to achieve profitability and growth (Shrimali et al. 2011).

Since around 2010, global intermediaries have taken up the banner of promoting clean cooking technologies as market-based solutions, inviting funders to contribute to the "development of a thriving global market for clean cookstoves and fuels" (Global Alliance for Clean Cookstoves 2011, p. 5). This effort has been led by the Global Alliance for Clean Cookstoves (henceforth known as the Alliance), a public-private partnership housed within the United Nations Foundations with initial founding members that include the Shell and Morgan Stanley company and foundations, United States government agencies, and United Nations

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agencies. From the beginning, the Alliance's goal was to scale clean cooking solutions, As explained by a former director of the Shell Foundation, which was instrumental in pioneering the Alliance, "To succeed, we need new solutions that can be scaled across countries and replicated throughout regions in ways that benefit large numbers of people. As financial resources available to help these vast problems will always be limited, we started with the view that we needed to design solutions that were lasting and could exit a financial dependency on ourselves" (West, 2013: 165-166).

The emerging clean cooking market is one with a long history in the social and public sectors. The grand health and environmental challenges addressed by the industry are urgent, and past attempts to create financially sustainable businesses to provide these products to the neediest customers have mostly failed to attain scale and longevity. This clean cooking industry is not unlike other markets that have recently emerged to address global challenges, such as low-cost toilets and drip irrigation.

3.3.2 Research design

The methods for this research project follow those employed by Mair and Hehenberg (2014). I use a revelatory case study (Corley and Gioia 2004, Eisenhardt 1989) to document the history, emergence, and development of the clean cooking market in East Africa, focusing primarily on the actors and their interactions. The actors include local and expatriate entrepreneurs, funders, intermediaries, and governments. I gained interview access to these field actors and became immersed in the phenomenon as both an outside researcher and as a prior practitioner. In my analysis, I alternate between immersing myself in the phenomenon (i.e., coding and conducting interviews) and developing a conceptual understanding of its contribution to theory (i.e., spending time in the literature and writing memos). This resulted in a variant of

Table 3.1 Interviews and field visits by type of person interviewed

Interviewee category	# of interviews	# of field visits
Local-led enterprise		
Local entrepreneur	19	1
Expatriate employee		2
Local employee	2	1
Customer	1	
Expatriate-led enterprise		
Expatriate entrepreneur	14	1
Expatriate employee	4	
Local employee	8	2
Non-market actors		
Development organization	7	
Government	5	
Local incubator	1	
International market-developing intermediary	5	
Local trade association	5	
Media organization	1	
University	2	
Total interviews and field visits	73	7

inductive grounded theory (Charmaz and Belgrave 2015, Glaser and Strauss 1999, Suddaby 2006).

3.3.3 Data sources, collection, and analysis

My study drew from three main sources of data: 1) interviews with important clean-cooking sector actors, 2) field observations of some actors' organizations, and 3) archival materials (documents collected from my field sites, newspaper articles, industry association newsletters, and organizations' websites and social media). I collected 73 interviews and 7 field observations, which are described in Table 3.1. My interviews began with phone and video calls in the spring of 2019, fieldwork in three East African countries (Kenya, Uganda, and Rwanda) in the late spring and summer of 2019, and follow-up phone and video calls in the fall of 2019 and

2021. The bulk of the data was collected in person in mid-2019. This data included archival documents collected from my field sites (32 documents, consisting of informational sheets, newsletters, event agendas, and marketing materials). The other archival documents were 271 newspaper articles, which were collected using the AllAfrica database. The newspaper articles focused on Africa at large and the three countries that I visited. They were identified using a variety of search terms (e.g., "improved cookstoves," "clean cooking," and "jikos") before my field visits in 2019. For additional information about the organizations I visited, I additionally referred to their websites and social media. For additional information about the Alliance and other industry-level news, I referred to newsletters of field-level organizations.

Data collection began using purposeful sampling of interviewees and archival materials (Patton 2005) to better understand the context of clean cooking in East Africa, including reports from global and local industry associations and newspaper articles. With this knowledge, I cold-contacted organizations that I would interview in person in East Africa. My initial list of contacts consisted of winners of Alliance grants, as these were easiest to access while abroad. Interviews lasted between 30 minutes and two hours. They were recorded with permission and transcribed for analysis. While in the field, I was introduced to other organizations that I had not known about through my preliminary research, and I continued to meet as many organizations as my schedule could allow. I accepted all opportunities to visit organizations' field operations, and I documented my observations in field notes, which were also analyzed. After my fieldwork, I began transcribing and coding my interviews and field notes, writing memos after every three to five coded documents to keep track of potential lines of inquiry. As themes have been emerging from the codes, I iterated between engaging with the relevant literature and returning to my data.

To fill in gaps of understanding, I collected additional archival data and conducted follow-up interviews where needed.

3.4 From a development sector to an industry

In this section, I briefly explain why and how efforts to build markets for clean cooking technologies in developing countries have occurred. Historically, clean cooking has been an international development sector, focusing on making technologies accessible in communities through global and local non-governmental and development agency actors. In 2010, the Global Alliance for Clean Cookstoves was established, representing the first concerted global push to commercialize clean cooking technologies by global non-governmental and development agency actors employing an impact investing ideology, with the goal of bringing private sector actors into what has historically been a development sector. The historical institutional context of the clean cooking development sector and more recent efforts to build the clean cooking market exert influence and pressure on local and expatriate entrepreneurs in different ways.

3.4.1 Historical institutional context of the clean cooking development sector

The negative health and environmental impacts arising from cooking on open fires present one of the quintessentially stickiest problems in international development. Approximately half of the world's population—and up to 90 percent of rural households in developing countries—still rely on unprocessed biomass fuels, such as wood, dung, and crops leftover from the harvest (World Resources Institute et al. 1998). When used for cooking and heating, these biomass fuels are typically burnt indoors in open fires or poorly functioning stoves. There are consequences both for households and environments. At home, vulnerable populations are exposed to high levels of air pollution (Bruce et al. 2000) which leads to

respiratory illnesses (Smith 2013). The World Health Organization estimates that indoor air pollution from cooking kills over 4.3 million people every year (World Health Organization 2017). In the outdoor environment, the acquisition and burning of various forms of fuels have motivated concerns about deforestation Cooking on open fires has also been linked with problems like climate change and deforestation and climate change (Smith et al. 2009). Problems of gender inequality crop up both inside the home, where women bear the primary responsibility for both cooking food and collecting fuel for cooking (Lewis and Pattanayak 2012, Rosenberg et al. 2020).

Technological solutions designed to address this problem are known as "clean" or "improved" cookstoves and fuels (Bailis et al. 2009). These cookstoves come in a range of culturally differentiated designs, use different types of fuels (e.g., biomass, charcoal, liquified petroleum gas, and ethanol), and are affordable at different price points (USAID and Winrock International 2017). Most of these technologies were developed to address the adverse health, social, and environmental problems by reducing the amount of fuel that is required, using cleaner-burning fuels, decreasing fuel-gathering time, and reducing cooking time. Versions of clean cookstoves and fuels have existed since the 1950s (Morrison 2018, Smith and Sagar 2014), and major cookstove programs, typically sponsored by non-governmental organizations and development agencies were implemented from the 1980s through the 1990s (for a review of global efforts, see Gifford 2010).

East Africa was a target region for cookstove programs because of its heavy dependence on biomass. The first cookstoves in Kenya appeared in the early 1980s and were introduced by international non-governmental organizations like CARE-Kenya, UNICEF, and USAID. Versions of this product, now known as the Kenya Ceramic *Jiko* (or KCJ by practitioners and

users), consist of a metal casing with a ceramic lining that helps to direct 25 to 40 percent of the heat from a fire to a cooking pot (as opposed to 10 to 20 percent of the heat, which was common in the metal stoves that the KCJ was replacing) (Kammen 1995). Various aid organizations trained local artisans in Kenya's informal *jua kali* sector to produce the KCJ using locally available materials, reducing production costs and disseminating knowledge locally in the event of product failure (Urmee and Gyamfi 2014). Seeing the benefits of these products, women's organizations began influencing the design of the KCJ and participated in its promotion (Kammen 1995). The KCJ was never subsidized, and its cost ranged between $2 and $5, and they were never subsidized (Kammen 1995, Karekezi and Turyareeba 1995). While the KCJ was appealing to urban customers who spent money on fuel, it was still too expensive for rural customers who collected firewood for free at the time. A collaboration between the government, development agencies, and non-governmental organizations (mostly women's groups) led to a modification of the KCJ, known as the *Maendeleo* stove, which cost as little as 80 cents and was broadly disseminated in rural areas (Kammen 1995).

Kenyan stove programs based on these designs were replicated throughout East Africa. Though there are many new improved biomass cookstove designs, the cookstove programs are similar. For example, the GIZ PSDA program (now known as GIZ EnDev, a joint development effort of Germany, the Netherlands, Norway, the United Kingdom, Switzerland, and Sweden as donors) still promotes clean cookstoves among rural farmers by training local artisans to produce and market a range of designs (The Partnership For Clean Indoor Air 2012a). These programs have three overarching characteristics: accessible technologies, community-based initiatives, and involvement of non-governmental organizations and development agencies.

Accessible technologies. Cookstove programs tend to follow a model for technology development and established proposed by British economist E.F. Schumacher in his classic book, *Small is Beautiful* (1973). In this book, Schumacher makes the case for "appropriate technology" that is small-scale, relatively simple, and affordable. Many non-governmental organizations (e.g., the Oregon-based Aprovecho Research Lab that has pioneered clean cookstove research) and organizations in higher education (e.g., MIT D-Lab, which has a group focused on clean fuels) draw ties between themselves and the appropriate technology movement of the 1970s. In general, these technologies may not be of the highest quality in terms of technological efficiency or aesthetic finish, but they are accessible to poor populations.

Even though there's been a push toward more advanced technologies, today's development-based cookstove programs continue to support appropriate, accessible technologies, even if they become bundled with other types of products. For example, on an information sheet promoting the 2018 Clean Cooking Investment Forum in Kigali, Rwanda, GIZ EnDev (operating in Kenya) stated clearly that it "supports a broad spectrum of modern cooking solutions to realize a broad transition of the sector. In such a transition, all types of cooking solutions are on the table. From locally produced artisanal stoves, semi-industrial produced stoves, internationally produced stoves in the higher price segment, as well as biogas installations for households" (GIZ EnDev). They were seeking investment for entrepreneurs that emerged from its training programs.

Community-based initiatives. A characteristic of Schumacher's appropriate technologies is that they are produced and maintained locally, within targeted communities. This was a dominant feature of early cookstove programs. Though in West Africa, an early Senegalese project report from 1980 (Gifford 2010) stated:

"If stoves are to be easily available to everyone they must be built in the villages, of local materials by local people … the people lack only technical expertise and the assurance that solutions are possible to be able to solve their own problems."

Moreover, these accessible technologies are supposed to be labor-intensive and not capital-intensive. This mirrors the realities of rural areas in developing countries where laborers are plentiful but sources of income are not. As such, clean cookstove and fuel programs not only provide technologies to users but create small business owners who build organizations that employ workers and generate income. During a panel discussion at the 2018 Renewable Energy Capacity Building Workshop, rural Kenyan county officials discussed how they "embarked on training and equipping youth and women groups to produce energy saving jikos (cookstoves)" and that "300 youth have been trained and equipped" (Clean Cookstoves Association of Kenya 2018). Across clean cookstove and fuel programs, there has been an emphasis on the training of local people in the targeted community and providing jobs to both rural youth and women. While many of these initiatives are small businesses, others are donor-supported and operate as non-profit organizations.

Involvement of non-governmental organizations and development agencies.
Historically, the clean cooking development sector has been supported by donors implementing projects through non-governmental organizations and development agencies (except for China and India; these countries ran massive cookstove programs in the 1980s and 1990s). In the clean cooking development sector, these non-market actors support clean cooking ventures through training and small grants. They are also involved in the supply chain for clean cooking technologies, either through financing distributors or taking up the role themselves (in the case of non-governmental, community-based organizations). These organizations' projects depend wholly on grants, so the support that social entrepreneurs receive from them is stop-and-go. One

local entrepreneur noted, "You just have the development agencies as part of distribution. They call them the supply chain, but the development agencies are project-based. Once a project stops, they'll have to look for new financing to continue rolling it out."

As described by an interviewee representing a development agency based in East Africa, "You see, initially [the clean cooking sector] has always been a donor-funded initiative. But now we have reached the point where the public sector is getting involved and over time, the private sector is really taking a very big role into this whole thing." An informant representing an international market-developing intermediary somewhat disparagingly described a similar scenario, also highlighting that many of these projects were implemented on a piecemeal basis without much coordination:

> "Basically, the clean cooking sector is not new. It has been in the region for many years. For over maybe 35 years, over 40 years, it was still there. But, unfortunately, then it was "donor-driven," or what we can term as "NGO-driven," with very little participation of the private sector as well as the government. As a result, they were mainly focused on just providing the necessary capacity to artisans or the local technicians to be able to manufacture or produce those improved cookstoves as well as the distribution. And these were project-based type [of initiatives]. The other element also with the sector was that it was highly fragmented. And I think that was one of the greatest drawbacks, in the sense that the voice of the sector could not be heard because there was no common coordinated platform that could be able to air the grievances, the challenges of the sector."

3.4.2 Recent market-building efforts of the clean cooking industry

As can be seen from the previous quotation, actors promoting the clean cooking industry (as opposed to the clean cooking development sector) had many criticisms about how clean cooking efforts were being implemented. Indeed, according to scholars, "initial efforts to promote these technologies have run into challenges surrounding diffusion, dissemination, and

implementation" (Lewis and Pattanayak 2012, p. 637). Many barriers to the wide dissemination and adoption of clean cooking technologies exist, and they include but are not limited to a lack of widespread awareness and behavior change among users (Lindgren 2020), deeply held beliefs around traditional cooking methods (Armanios 2020, Malakar and Day 2020), culturally inappropriate product design (Abdelnour et al. 2020), the high upfront cost to consumers (Bensch et al. 2015), and distribution and supply chain problems (Pattanayak et al. 2019). Researchers were concerned about whether clean cookstoves were actually "clean" enough to truly mitigate health and environmental risks (Foote et al. 2013, U.S. Department of Energy 2011), and there was growing concern that development aid was being wasted on products that didn't work.

To address the myriad of problems related to technological development, product dissemination and adoption, and project implementation, the Global Alliance for Clean Cookstoves (i.e., the Alliance) was launched in September 2010 as a public-private partnership initiated by multiple U.S. government agencies and four other countries. It was sponsored by large philanthropic foundations (e.g., Shell Foundation and Morgan Stanley) and hosted by the United Nations Foundation, with the support of four other United Nations agencies.

While many U.S. government agencies, such as the Environmental Protection Agency's (EPA) Partnership for Clean Indoor Air (PCIA), provided the political will to mobilize other agencies toward establishing the Alliance, it was the Shell Foundation that influenced the Alliance's market-based approach to clean cooking. The foundation began efforts to reduce indoor air pollution in 2002, but after five years of learning from failed pilots, it "realized [reducing indoor air pollution] could only be achieved through the market-based development, production, distribution, and sale of high-quality, durable, and affordable cookstoves to

households affected by [indoor air pollution]" (Pursnani, 2011: 103). It was around this time that Shell Foundation began restructuring its operations toward only supporting strategic partners in ways that help them achieve scale. Scale became a metric of success for Shell Foundation, as its former director explained:

> "To succeed, we need new solutions that can be scaled across countries and replicated throughout regions in ways that benefit large numbers of people. As financial resources available to help these vast problems will always be limited, we started with the view that we needed to design solutions that were lasting and could exit a financial dependency on ourselves." (West, 2013: 165-166)

Achievement of scale was defined as "delivering cost-efficient solutions that benefit large numbers of poor people in multiple locations in ways that are ultimately financially viable" (West, 2013: 166). Like other funders, the Shell Foundation had a sector focus, invested in long-term partnerships with high levels of involvement, believed in high investment and high risk, saw the poor as customers (not beneficiaries), and expected its investees to reach financial viability so that the Shell Foundation could eventually exit. The model was soon applied to the problem of indoor air pollution, which the Shell Foundation believed required "market thinking and private-sector involvement" and a "radical departure from most traditional methods, which have seen NGO and governments give away or subsidize improved stoves" (Pursnani, 2011: 103) to address.

The Shell Foundation was already a leader in addressing indoor air pollution, and the organization insisted that the Alliance also take up a market-based approach to addressing the social problem. This market-based approach was written into the Alliance's 10-year roadmap and first strategic plan, which emphasized "action pillars" that all utilized wording from commercial, as opposed to development ideas: 1) enhancing demand for clean cookstoves and

fuels, 2) strengthening the supply of clean cookstoves and fuels, and 3) fostering an enabling

environment for a thriving market for clean cookstoves and fuels. The Alliance's market-based

approach was framed as a defining characteristic of the emerging sector, as the organization's

2011 strategic report, *Igniting Change*, described:

> "Foremost among these priority actions is the development of a thriving global market
> for clean cookstoves and fuels, with the ability to sell tens of millions of clean cookstoves
> a year. Without a market, it will be almost impossible to adequately and sustainably
> address the vast cooking needs of the more than 600 million of the world's households
> still using solid fuels in inefficient cookstoves and open fires." (Global Alliance for
> Clean Cookstoves 2011, p. 5)

It is additionally interesting to note that the launch of the Alliance's market-building

efforts took place against the greater backdrop of a transition from development to using

business to achieve development goals. As the face of the Alliance, then Secretary of State

Hillary Clinton, described in her remarks at the 2012 Clinton Global Initiative meeting that "the

landscape of development has changed" and that the United States needed to "move from aid to

investment" (U.S. Department of State 2012). Clean cooking is only one example of a

development sector that is transforming into an industry, and characteristics of the Alliance's

market-building efforts in the clean cooking industry typified this transition away from an

ideology of development to an ideology of impact investing. In particular, market-building actors

emphasized revolutionary technology, picking early winners and placing big bets, and private

sector involvement.

Revolutionary technology. In contrast with the accessible incremental technologies that

typified the cookstove development sector, the clean cooking technologies that were prioritized

by funders in the clean cooking industry were considered to be revolutionary. In 2012, the

Alliance, the Partnership for Clean Indoor Air (PCIA), and the American National Standards Institute (ANSI) led a group of experts in an International Workshop Agreement to determine "tiers" for the categories of cookstove emissions, efficiency (fuel use), indoor emissions, and safety (PCIA and GACC 2012), which later developed into International Organization for Standardization (ISO) standards. These tiers ranged from tier 0 (no improvements) to tier 4 (stretch goals for targeting ambitious health and environmental outcomes). Biomass cookstoves, which were the only stoves produced by local artisans, achieved tier 0, tier 1, or tier 2 across the different categories. Only new clean cooking technologies that utilize a different fuel source, such as ethanol, LPG, or electricity, would be considered tier 3 or tier 4 (Global Alliance for Clean Cookstoves 2017).

The presence of technological standards made it possible to use carbon financing as a means to subsidize clean cooking companies. As such, market-building actors took a greater interest in higher-tired cooking technologies, arguing that these would be required to finally revolutionize the industry and achieve certain health and environmental benefits. These cleaner technologies would also maintain the credibility of the industry, which was already under fire by the media. For example, the Alliance's own Spark Fund for Clean Cooking Enterprises was developed to mirror early-stage investment in 2012, with the goal of investing "$2 million in grant capital annually in enterprises with scalable approaches that have the potential to transform the sector through their success" (Global Alliance for Clean Cookstoves n.d.). In its first year, the Spark Fund supported five organizations that all produced and/or distributed low-tier biomass cookstoves. In its second year, the Spark Fund supported six organizations; only two were biomass cookstove ventures, and the others dealt in biogas, briquettes, pellets, and ethanol. Similarly, to be considered eligible to apply for GIZ EnDev's Results Based Financing (RBF)

program in Kenya, cookstove producers must "meet rigorous efficiency, emission, and safety parameters" and be tested locally by a national government institute (Weber, Hirner, & Geres, 2018: 11).

By 2018, there was a strong adverse reaction toward biomass in East Africa. Dalberg, the global development consulting firm, published a report entitled "Scaling up clean cooking in urban Kenya with LPG and Bio-ethanol" that promoted the adoption of "modern, clean fuels" for urban markets (Dalberg 2018). The UK-based Modern Energy Cooking Services (MECS) program was established to "break out of business-as-usual approaches as rapidly accelerate the transition from biomass to clean cooking on a global scale" on an information brochure aptly titled "Sparking a revolution." The program later offered grants to social ventures that promoted technologies like electric pressure cookers in East Africa. Some biomass companies (all led by expatriates) began diversifying into cleaner fuels. For example, in 2018, Envirofit, a pioneering improved biomass company that is based in Colorado, launched its SmartGas Pay-As-You-Cook LPG service in one of Nairobi's informal settlements. Even though its main business was still in biomass cookstoves, the company justified its diversification by writing that "LPG, despite being a fossil fuel, is a better environmental option that unsustainably sourced biomass fuel … While studies are still being conducted to determine the health impact of biomass stoves, LPG has had clear results as one of the only fuels with emissions below the World Health Organization guidelines" (Envirofit 2018).

But the expectations to produce revolutionary technology could not be met equally by all entrepreneurs. I interviewed a representative of MIT's D-Lab, a university initiative to make technology accessible in developing countries, about his work in the clean cookstoves and fuels space. Though American, this person spent most of his time working with

local entrepreneurs. Regarding the requiring technologies to meet standards and testing for funding, he said:

"Some people are able to access those kinds of things and others are not. I just felt somewhat obligated, especially with the people that we're like directly engaged with, the smaller local manufacturers to try to inform them about what was happening with the ISO process and with the Ugandan Bureau of Standards starting to implement a certification program. Most people didn't really know how it worked, and they couldn't afford $2,000 to do the testing at the regional testing center. They were looking like they were going to be left out of that. And then, in a lot of cases, their products aren't that great and they probably wouldn't have reached the targets anyway. On the other end then, these global companies, they have the resources, they can go after the financing, carbon financing, and they can put in the R&D to meet the performance requirements that are being set up, and they can do all the research to kind of tune their products and tailor it."

Market-building actors' emphasis on revolutionary technology stemmed from the belief that it was the technology – not the systems or people that produced or distributed it – that would cause the revolutionary health, environmental, and social change they sought. If solving the big, hairy problems associated with cooking on open fires could be achieved by simply selling more high-quality clean cooking technologies, then an important step was to identify companies that could produce and sell these at scale. Yes, they figured that some entrepreneurs and their communities would be left out, but their incremental technologies were not good enough to create significant health and environmental impacts anyway. Revolutionary technologies, along with the social ventures that could make them, would change the game:

"'Game changing' developments in the market for clean cookstoves and fuels also include the success of various innovative business models. These models help manufacturers expand beyond local and artisanal cookstove production efforts to those that offer standardized, high-quality clean cookstoves at a price and scale that can

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improve their accessibility to the poor." (Global Alliance for Clean Cookstoves 2011, p. 21)

Picking early winners and making big bets. In contrast with the many relatively similar community-based initiatives that characterized the clean cooking development sector, the clean cooking industry focused on picking early winners and making "big bets." In venture philanthropy, picking winners is "a perspective about identifying and investing in highly innovative organizations with a potential to grow rapidly and produce significant impact and financial returns" (Hehenberger et al. 2019, p. 1685). Winners continued winning due to successive rounds of support, and this made them more likely to receive "big bets" – multi-million dollar grants or investments from funders to implement their social mission. Indeed, the Alliance saw its funding mechanism more as a pipeline; the winners of small grants were set up early on to receive larger follow-on funding, which would eventually lead to very large grants or even commercial investments (Lediju et al. 2015). Identifying winners and placing big bets allowed success stories to emerge and proliferate, which added legitimacy to the clean cooking industry and attracted additional resources to the market (Hehenberger et al. 2019, p. 1685).

While the ideas of picking early winners and placing big bets were relatively new in the world of donor-driven development. In the development sector, it was more common to see "peanut butter philanthropy" – spreading donations around instead of concentrating it on one innovative endeavor that was most likely to succeed (Foster et al. 2016). Even though gifting and investing more money into ensuring a social venture's success was helpful to the nascent clean cooking market, the process was highly dependent on funders' success criteria and their belief in which types of early-stage ventures could meet these criteria. For funders in the clean cooking industry, a core characteristic of winning social ventures was the potential for global scalability, which required a particular type of business model and, perhaps, a particular type of social

entrepreneur. For example, Envirofit, the pioneering Colorado-based clean cookstove company previously mentioned, had no prior experience producing clean cookstoves but was still selected as the Shell Foundation's first investee in the clean cooking industry. Envirofit received $15.6 million in grant funding from the Shell Foundation between 2007 and 2012 – an unheard-of sum in the clean cooking industry – and just the beginning of its fundraising efforts. The funder justified this selection by citing the venture's experience in engineering other environmental solutions for developing countries, its relationship with Colorado State University, and the fact that Envirofit's chairman and CEO had managed several for-profit companies involved in product development, distribution, and sales (West 2013). The social venture shared the core value of scale and would work easily with the Shell Foundation to achieve it.

Private sector involvement. Lastly, in contrast with the non-governmental organizations and development agencies that sponsored and implemented programs in the clean cooking sector, the clean cooking industry had (or was strongly trying to encourage) private sector involvement.

Private sector involvement can occur in the supply chain (e.g., suppliers of raw materials, distributors, and financiers for consumer purchases who wouldn't be development sector actors), but it primarily refers to commercial investments in clean cooking ventures. While the clean cooking industry started with venture philanthropy and has staged into impact investment, market-building actors hope that commercial investors would eventually be interested. The involvement of the private sector in the clean cooking industry echoes remarks by then Secretary of State Hillary Clinton during the 2012 Clinton Global Initiative:

> "Now, I have to say this was controversial. When [my Chief of Staff Cheryl Mills] and I first started working on this, there were a lot of development professionals and experts who really were quite concerned, and even skeptical. But you cannot have development

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in today's world without partnering with the private sector, and that has been our mantra, and we are now creating examples. Are there pitfalls? Are there problems? Of course there are. There is with any kind of organized effort at development. But the fact is that including the private sector gives developing economies new opportunities." (U.S. Department of State 2012)

To attract private sector investment, the clean cooking industry must appear investable. According to many market-building actors, the development sector, with its small-scale models and local artisans, does not appear to be worthy of investment. The sector was stuck in ways that were not investable, and something had to change. A representative of an international market-building intermediary said the following about the local entrepreneurs in the clean cooking development sector in Kenya:

> "There are these small, small boys. There are a bit many, but they're quite active … If we are going to have universal access to clean cooking by the year 2030, definitely with that pace, we are not going to get anywhere. So, we have to think outside box. It has to be 'business unusual' so that we look at strategies that are able to attract significant investment … Most of them are still not viable when they start. Actually, if you look at their balance sheet, it's maybe negative or something in their P&L."

While it was understood that clean cooking businesses are difficult to run (even expatriate-led social ventures took years to break even after significant grant funding), market-building actors were predisposed to supporting an unproven idea that they believed had the potential to scale the production and distribution of clean cooking technologies and receive investment. Market-building actors were less likely to support efforts that were already creating social value on the ground, because they were too small in scale and, perhaps, because they were not creating the type of social value that they cared about (i.e., they were creating employment

opportunities for rural youth as opposed to producing more high-quality clean cooking technologies).

In East Africa, there are only a few clean cooking enterprises in operation that are backed by venture capital. Most of them are led by expatriate entrepreneurs, such as Envirofit, BioLite, and BURN, and they are the darlings of the global clean cookstove industry. To reach the point of even being considered for commercial investment, these social ventures received round after round of early-stage financial support – millions of dollars in grants and loans – from market-building actors along the way. However, not all early winners and big bets were able to raise the coveted infusion of private-sector investment. Those that were able to raise venture capital had something in common: they focused on urban customers, who tended to be wealthier and easier to reach with physical goods, as opposed to rural customers, who tended to be poorer and more difficult to reach. These social ventures believed that selling more clean cooking technologies was equivalent to creating more social value and were willing to sell their products to anyone who was willing and able to afford them, which resulted in business model pivots and expansions into urban markets (e.g., Envirofit's relatively recent LPG business targeting urban customers), likely at the expense of rural operations.

An example of a company that did *not* receive private sector funding, despite being picked as an early winner by market-building actors, was Inyenyeri. Inyeyeri was a social venture in Rwanda that I had the opportunity to visit while it was on its last legs. Led by expatriate Eric Reynolds (who was also a co-founder of Marmot, the outdoor clothing company), Inyenyeri was an early example of the "tool and fuel" business model: truly clean cookstoves were too expensive for poor people to buy, so lease it to them for free and make money by charging them for special fuel (in Inyenyeri's case, pellets that the company also produced).

Inyenyeri received positive media attention; it was covered in a three-page business review in a Sunday issue of the *New York Times* (Goodman 2018). Even though the social venture was able to raise a respectable $13 million from a smattering of lenders, grant donors, and challenge funds during its ten-year lifetime, it ultimately shut its doors in 2020 because it lacked sufficient capital – it was not able to raise private sector funding, at least on its own terms. In a post-mortem analysis written by the Alliance (Ferguson 2022), a significant portion of Inyenyeri's unattractiveness stemmed from a values-driven strategic decision that was at its core: the company would focus on people living in extreme poverty. According to a consultancy that was commissioned by one of Inyenyeri's early lenders, Inyenyeri would have a "plausible business case" if it pivoted its customer split to 75% urban customers, 17% as rural customers, and 8% as refugee customers. But this customer mix contradicted the company's mission, which its management team was unwilling to compromise on. According to Reynolds, as quoted in Ferguson (2022),

> "I wanted to prove that the model worked in the toughest places in the world, including in refugee camps, which were assumed to be impossible. If you can get to the poorest of the poor, then of course you can serve those above it, but serving our rural customers was our most significant accomplishment: *It's the last thing I would have given up*." (emphasis added)

As can be seen from these examples, market-building actors' preference for revolutionary technologies, picking early winners and placing big bets, and private sector involvement necessarily filter out the types of business models that are sustained and esteemed as successful, the types of social entrepreneurs who are financially supported, and the types of customer-beneficiaries who receive clean cooking technologies. This was the idealized transformation of the clean cooking development sector into a clean cooking industry (see Figure 3.1). When

considering the decisions of market-building actors, it begs the question of why and how social entrepreneurs who are unsupported – the "small boys" who are still "quite active" – continue to persist in the industry.

DEVELOPMENT SECTOR	INDUSTRY	SOLUTIONS OF SCALE
Accessible Technologies	Revolutionary Technologies	
Community-Based Initiatives	Pick Winners / Make Big Bets	
Non-Profit (Development) Actors	For-Profit Actors	
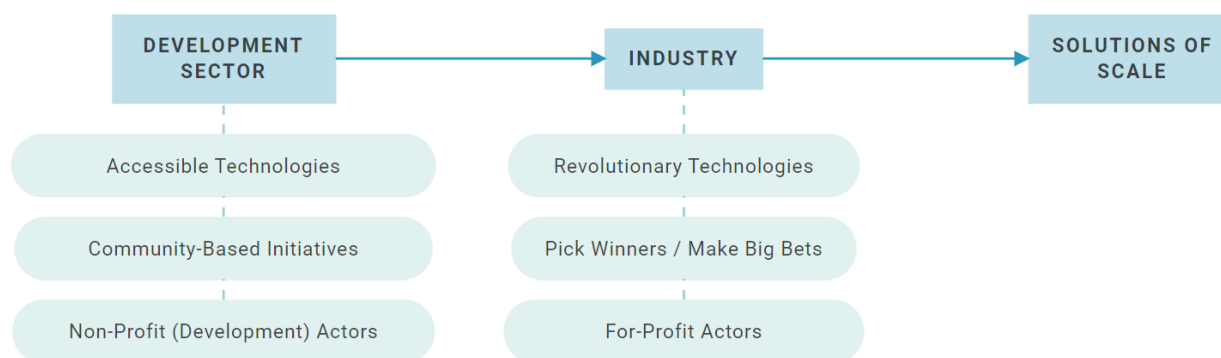
Figure 3.1 Idealized transformation of the clean cooking development sector into a clean cooking industry

3.5 Local entrepreneurs: Lived experiences, development-related liabilities, and assets for strategies of persistence

In the context of market-building efforts being made atop historical institutions of development, one can begin to understand why market-building actors would be hesitant to support local entrepreneurs, especially when compared to expatriate entrepreneurs. In most cases, the clean cooking social ventures created by local entrepreneurs have the flavor of development; they produced accessible technologies, were community-based initiatives, and were the types of endeavors that non-governmental organizations and development organizations had traditionally sponsored. Some local entrepreneurs, but not all, emerged directly from the development sector; they were trained by a non-governmental organization or development agency on how to make clean cooking technologies, and they were attempting to grow these small businesses. Other local entrepreneurs' businesses were not rooted in the development sector but were established after the Alliance's market-building efforts began. The common

refrain among local entrepreneurs, however, was an emphasis on their lived experiences. These lived experiences tended to lend themselves to models common to the clean cooking development sector.

For local entrepreneurs, having personal lived experiences with the problems of cooking on open fires led to more concrete conceptualizations of the social problems that clean cooking could and should address, as well as the types of business models that they considered to be most appropriate to address these problems. While expatriate entrepreneurs described their motivations in abstract ways, pointing to long-term problems (e.g., climate change, deforestation, indoor air pollution), local entrepreneurs described their motivations in concrete ways, pointing to short-term problems (e.g., having enough money to buy food for the day, watching a grandmother cough while coughing, a daughter getting physically burned by an unsafe, low-quality cookstove). While expatriate entrepreneurs talked about social problems in a very geographically global manner, local entrepreneurs talked about social problems in a very geographically local manner – these are problems affecting their neighbors, families, and even themselves. While expatriate entrepreneurs viewed clean cooking technologies as the solution to addressing critical social problems, for local entrepreneurs, the processes that produced and marketed clean cooking technologies were the primary means of addressing critical social problems. As a point of contrast concerning the motivations of local entrepreneurs and expatriate entrepreneurs, I present three quotations to support these points. The first is from a recorded interview with an expatriate entrepreneur and the second and third quotes are from my interviews with local entrepreneurs in the clean cooking industry of East Africa:

> "I've kind of devoted my whole life to trying to save forests in Africa. When I was 20, I
> went to Congo and I saw deforestation there for charcoal production. I got down on my

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knees and wept and really said, 'I'm gonna devote my whole life to try to save forests.'" (Scott 2019)

"I had a young sister who was twelve years old, and I was keeping her in school. I live in a small village in western Uganda, but I was in the capital, working for this bank. One day I made the journey home to see my sister. Instead of being at school, I found her gathering wood. It didn't surprise me at first because I also gathered wood as a kid -- everyone does in the village. But when she saw me, she started crying. At first, I thought that maybe she was so happy to see me, but it later emerged that she was crying because she was tired of missing school to gather wood. ... That's when I started thinking about alternative sources of fuel that would not require girls to miss school to go to gather wood." (Ugandan local clean cooking entrepreneur)

"If we are able to produce cookstoves ourselves, then we will have opened up accessibility for the stoves in rural areas, and we can make it a lucrative business and a vibrant business to keep the community there active. Because the biggest challenge we face in Homa Bay is a lack of business opportunities for women. Homa Bay is known for HIV/AIDS. And mostly because men have a lot of sexual demand in women for any business or job. So actually, this clean cooking can solve so much." (Kenyan local clean cooking entrepreneur)

For Scott, the expatriate entrepreneur, clean cooking technologies directly address the problem of deforestation, which could occur anywhere in the world (this quotation refers to the Congo, but his company is based in Kenya) and has an unknown, future deadline for addressing. His social venture, BURN, reflected this – the company mass produced cookstoves in Nairobi and distributed them broadly in sub-Saharan Africa. In the second quotation, the Ugandan local entrepreneur also reflects on the problem of deforestation, but more concretely – it directly affected someone he loved. His solution had to immediately benefit the people around him; in another interview, he claimed that he was just an "everyday community guy trying to make his community a little bit better" (Moses 2015). In the third quotation, the Kenyan local entrepreneur

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discusses how her clean cookstove manufacturing facility would address important economic development problems in her community. Addressing the social problem important to her – jobs for rural women – did not depend on using clean cookstoves as much as it depended on the processes of producing them.

I bring up the importance of understanding the importance of local entrepreneurs' lived experiences because they help explain why so many local entrepreneurs – despite being overlooked by market-building actors in terms of financial support – continued to persist in the clean cooking industry. They could have stopped doing their work once they saw that it was not going to be as scalable or profitable as market-building actors expected clean cooking companies to be. But the influence of clean cooking's historical institutional context as a development space, reinforced by their lived experiences with problems at the root of the clean cooking movement, led them to create businesses that were unappealing to market-building actors. I argue that these liabilities were used by local entrepreneurs as assets that enabled them to implement strategies of persistence in the clean cooking industry.

3.5.1 From the liability of accessible technology to the strategy of replication

A characteristic of local entrepreneurs was that they produced accessible and relatively simple clean cooking technologies, such as artisanal or "semi-industrialized" (i.e., made with both mechanized and manual means of production) improved biomass cookstoves and briquettes. While they were affordable to poor customers, these products were criticized by market-building actors for their lower efficiency, higher emissions, and questionable quality, especially when compared to the higher-tiered technologies. This made accessible technology a liability when it came to attracting funders in the clean cooking industry. Local entrepreneurs used unattractive

accessible technology to implement strategies of *replication*, which enabled them to persist in the market.

One form of replication was micro-franchising (Beckmann and Zeyen 2014). In the clean cooking industry, an example of franchising was Eco-Fuel Africa (EFA), a social venture based in Uganda. The company worked in rural communities to turn agricultural waste into charcoal briquettes using simple kilns. The briquettes were then sold through local retailers. Initially, the company worked directly in villages. The founder explained to me that "We grew and reached an extent of where we couldn't bring waste from one village to another. It became clear that the only way we could continue growing was to decentralize production and make these villages self-energy-sufficient by making their own fuel and selling it." In the micro-franchising model, EFA works with non-governmental organizations and community-based organizations to identify women who were then trained and paid to lease the machinery and launch briquette production. The social venture then played an advisory role, earning money from the micro-franchisee through the kiln lease and training fees (Theron 2016).

Another form of replication was open-source sharing, which involved training for skills transfer. Local entrepreneurs who trained other producers in their craft typically emerged directly from the development sector, having been trained by a development agency or non-governmental sector on improved cookstove or briquette production. In a profile published in the newsletter of the Clean Cookstoves Association of Kenya (2017), the country-level industry association for clean cooking, one local entrepreneur describes his early involvement with GIZ EnDev's efforts to train local artisans on stove production: "I was trained as a builder and trainer of trainees. These are very key activities at the rural level, which is our target market" (Clean Cookstoves Association of Kenya 2017). As a builder and a trainer, the local entrepreneur not only

established his own improved cookstove production company but had also been able to "train more than 600 artisans, of whom 200-300 have built vibrant businesses in [improved cookstoves]." His reputation as a well-regarded trainer contributed to his election into leadership positions in the Improved Stove Association of Kenya, an industry association specifically for artisanal producers of improved cookstoves, through which he regularly engaged with many non-governmental organizations, community-based organizations, and national and county government agencies to promote rural-focused improved cookstoves. Even though training local artisans does not generate tangible income (he describes that he was never "on their payroll"), he claimed that he was always "in business" when sharing skills and knowledge with other artisans.

As can be seen in these two examples, replicating one's accessible technology through micro-franchising or open-source sharing was a strategy of persistence. Through micro-financing, replication generated tangible financial benefits for local entrepreneurs. Both micro-financing and open-source sharing generated significant social capital, which was leveraged for one's own business. Replication additionally had the effect of quickly bringing more small-scale, local entrepreneurs into the clean cooking industry, not just as individuals but as members of a community. This not only strengthened the voices from marginalized areas in the clean cooking industry, but it also gave the replicating local entrepreneur a greater base of supporters in collective action efforts within the clean cooking industry.

3.5.2 From the liability of community embeddedness to the strategies of diversification

Given the development sector's focus on community-based initiatives and the personal histories of local entrepreneurs growing up in local communities, local entrepreneurs were very much embedded in their communities. Social ventures often start their operations in a specific community of beneficiaries, and their ability to deliver social value depends on a deep

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understanding of the local population's needs (Light 2008). However, scholars have also noted that "the advantage of being entrenched in local communities to access resources might turn into a liability in constraining the adaptation of the network" once the social venture begins to grow (Busch and Barkema 2019, p. 471). The conflux of mutual obligations and personal expectations in relationships that are simultaneously for personal and business reasons can make it difficult for a social venture to form the new relationships that are required for scale. For these reasons, a local entrepreneur's community embeddedness – such as their social mission to serve their specific community, even if they lose out on profit by not working somewhere else, and their insistence on involving community members in all aspects of production, even when mechanization would produce a higher quality product – would be seen as a liability by market-building actors.

Instead of viewing their community embeddedness as a liability and attempting the painful task of disembedding, local entrepreneurs utilized their strong ties with community members as means of persistence. They relied on their community embeddedness to implement strategies of *diversification*. First, they vertically *filled institutional voids* throughout the clean cooking industry. Second, they horizontally *entered specialized sub-markets* that depended on their relationships but did not directly compete with expatriate-led companies.

The clean cooking industry suffered from a problem of institutional voids; there was a lack of intermediary organizations that could support the transaction between the producers of clean cooking technologies and customers of clean cooking technologies. This was especially problematic for expatriate-led, larger, centralized producers of clean cooking technologies; while they could manufacture products, they faced obstacles in distribution and marketing. Though they had community ties, typical non-governmental organizations, community-based

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organizations, and micro-finance organizations were not the most effective partners for moving clean cooking technologies because clean cooking technologies took lower priority than other projects or products that they (or their donors) cared about.

Many local entrepreneurs in the clean cooking industry gladly stepped into the intermediary role, filling institutional voids and making it possible for clean cooking technologies to reach communities by acting as distributors, transporters, and marketers of clean cooking products. These activities often happen alongside local entrepreneurs' community-based production of clean cooking technologies, serving to supplement their revenue amidst an inability to acquire external funding. Local entrepreneurs, who were both knowledgeable about clean cooking and also had ties to the local community members, were particularly well-positioned to fill these voids. For example, one local entrepreneur (born and operating her cookstove production venture in a rural Kenyan community), after my interview with her, also began distributing other companies' cookstoves through her clean cooking business. She was able to do this because she had community connections and insights that many large-scale, expatriate-led clean cookstove companies did not. Moreover, she had been genuinely frustrated by the lack of effort that clean cooking sector actors and the government had failed to make to change people's behaviors around cooking, resulting in the push of products into communities where people did not care for them. In her discussion with me, she explained:

> "I keep on saying this is one place where you have to prepare the ground before you go sowing. But you see here, it's the other way around. People are sowing without preparing the ground. So, it's really a challenge. Sometimes this work gets so frustrating. Very, very frustrating."

This local entrepreneur's community embeddedness enabled her to see how utterly far off present efforts were at speaking to local communities, and it also motivated her to fill that void.

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For example, she noted that the message around the benefits of clean cooking had to be tailored to each community. Her community was located on a bay, and fish was an important source of food. Clean cooking technologies were not marketed appropriately for her community. She explained to me, "Because for me, you see, the smoke is very, very helpful to my community. Why? Because they use the smoke to smoke the fish as a way of preserving the fish to stay longer." Most of the clean cooking sector was telling a message about clean cooking technologies reducing smoke, but smoke was a positive aspect of traditional cooking methods within this community, which did not endear clean cooking technologies to people living there. Eventually, this local entrepreneur began to use her understanding of local communities (hers and other nearby ones) to create awareness for and distribute other companies' clean cooking technologies alongside her own. This strategy generated revenue and leveraged her expertise, both in terms of clean cooking and community preferences, enabling her to survive in the clean cooking industry.

Another local entrepreneur who persisted in the clean cooking industry by filling voids was a local entrepreneur in the Ugandan improved cookstove sector. He also diversified into complementary downstream supply chain activities to support his clean cookstove venture, which he described as "a social business where you don't care about profit, you care about people, and you care both about getting your stoves out there and saving the environment. You make a [small] margin. The thing is, you don't make a loss." To continue persisting in his improved cookstove business in a way that precluded him from making a lost, the local entrepreneur financially supported it with a transport business that was based on being able to move products to and from communities. He explained:

"Even if you make zero profit, it's okay, you can survive with that. Then you have to cross-subsidize. Like, I am in the transport sector. I have trucks, so my trucks are able to transport the stoves. So let me have another source of income – I make the margin on my transport. I make it myself and get the truck to bring. So you have to cross-subsidize to survive. And that's what has helped us."

In addition to filling voids using community ties, local entrepreneurs used their community ties to horizontally enter sub-markets where there was less competition from expatriate-led clean cooking ventures. For example, the charcoal briquette market attracted many more local entrepreneurs than expatriate entrepreneurs, even though it also had the potential to scale. One reason for this was that charcoal briquette production, especially at scale, required managing many more local, community-based relationships compared to making industrialized cookstoves at a factory. For example, I interviewed the founder of a charcoal briquette venture that had to lay the relational groundwork with many actors before starting production: farmers who supplied agricultural waste, transporters who moved the waste, employees who processed the waste into charcoal briquettes, and local individual retailers, institutions, and other community-based distribution partners who would distribute the charcoal briquettes. Conceiving of, actualizing, persuading, and maintaining this large network of informal sector and private sector actors would be much easier for a local entrepreneur to accomplish compared to an expatriate entrepreneur. Not only did local entrepreneurs know the language and the culture, but they were more likely to be trusted. This may also explain why, among the few briquette ventures that were founded by expatriates, there is no text or visual mention of them on their company website – it's as if they never existed.

Hence, local entrepreneurs' community embeddedness, which was viewed as a liability by market-building actors, was leveraged into strategies of persistence involving diversification

into different sub-markets. Local entrepreneurs' deep relationships with community members enabled a deeper understanding of their needs, and it also made it possible for them to act as effective brokers between other clean cooking actors and local community members. Community relationships also enabled local entrepreneurs to create and maintain relationships that enabled entry into specialized sub-markets that expatriate entrepreneurs had less of an ability to successfully compete within.

3.5.3 From the liability of support from development sector actors to the strategy of collective resistance

Lastly, local entrepreneurs depended on development sector actors for non-financial support, much more than expatriate entrepreneurs. Support mostly came in the form of technical assistance, which was guidance on topics like technology, business model, or financial management. When discussing the type of support that GIZ EnDev gave to local clean cookstove entrepreneurs, a representative I interviewed clarified that "we didn't put money into the whole setup. You see, for us, it's about giving the necessary technical skills and assistance to make it happen." This involved but was not limited to training social ventures on how to produce quality products using simple machinery; ensuring that the local entrepreneurs had land to build a production site, dry shade for pressing iron sheets, and a kiln for firing ceramic; and basic entrepreneurial skills, such as financial management and marketing skills. In addition to technical assistance, other development sector actors created spaces for intentional peer-to-peer learning for local entrepreneurs, mentorship programs between local entrepreneurs and foreign mentors, and additional services that were intended to improve local entrepreneurs' small businesses. When local entrepreneurs repeatedly took up support from these development sector actors, however, it signaled to market-building actors that they not only had limited skills but

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also that they were strongly influenced by development sector beliefs, which did not necessarily prescribe scalable business models as the best means of delivering social impact through clean cooking technologies. Local entrepreneurs continued persisting in the industry, however, by leveraging their support from development sector actors in strategies of *collective resistance*.

In the clean cooking sector, collective resistance among local entrepreneurs manifested in two ways. The first is through ensuring that local entrepreneurs had a *broad-based voice* in initiatives that were intended for the entire clean cooking industry. Because meetings held by the Alliance and other market-building actors usually took place in capital cities, where many of these organizations were based, local entrepreneurs (who primarily worked in rural areas) had a difficult time making the long journey to attend. However, some local entrepreneurs were committed to participating. The local entrepreneur who operated in the bayside Kenyan county took regular trips to Nairobi to show up at meetings and workshops. She even joined multiple committees of the country-level industry association to ensure that the voices of marginalized rural women were represented. In an interview with me, she explained:

> "If we are not [on the standards, labeling, and marketing committees], then women and their work will be completely forgotten. In Nairobi, we have BURN, Envirofit, and EcoZoom … the big ones that mainly import stoves. So that means that the low cost of the mama down there will be completely forgotten, and there's no one to represent them here … Who is talking about local stoves? No one."

Different development sector actors in the clean cooking industry felt similarly, and they also lent their voices to represent or amplify the voices of local entrepreneurs. For example, the MIT D-Lab representative interviewed for this study was directly involved in creating standards for clean cookstoves and fuels. He told me, "The thing that interested me is trying to be an advocate and a voice for the smaller local manufacturers, like the ones we've been working with,

so they didn't kind of get left out of the conversations. There were opportunities for their products to also get in and at least stand a chance against some of the bigger organizations." Similarly, GIZ EnDev attempted to promote social ventures manufacturing semi-industrial stoves for private sector investment. For the Clean Cooking Investment Forum in 2018, the organization announced in its information sheet about the event, "When looking at investment opportunities, the group of semi-industrial stove producers are of particular interest. Many of these stove producers are on the verge of becoming investable companies, on the point of turning into mass production and looking for investment capital" (GIZ EnDev). Hence, a broad spectrum of development sector actors also attempted to shine a positive light on local entrepreneurs' social ventures among market-building actors within the clean cooking industry.

Collective resistance also manifested through local entrepreneurs' efforts to garner support from actors who were not initially in the clean cooking industry and, therefore, not as institutionalized in the industry's priorities. This could be as simple as applying for funding not from broader-based funders or funders who funded other social problems that overlapped with local entrepreneurs' clean cooking ventures. Gaining supporters from outside the clean cooking industry would effectively allow local entrepreneurs to operate their own way, with less pressure to grow using the business models and technologies prescribed by the clean cooking sector. For example, the local entrepreneur who founded Mukuru Clean Stoves was operating a rather typical semi-industrial stove production business – one that would not receive interest from the clean cooking sector. Instead of seeking support from the clean cooking industry, she sought support from organizations that prioritized issues like women's empowerment, technology distribution, and youth leadership. Their support provided her company with enough resources to scale semi-industrialized, women-produced cookstoves among poor urban customers. These non-

clean-cooking supporters were more likely to see her company's potential than market-building actors in the clean cooking industry who would have likely written her company off because of its accessible technology and community-based business model.

Government actors also supported local entrepreneurs in the clean cooking industry, not because these entrepreneurs were promoting clean cooking, but because they were local manufacturing, poverty alleviation, and economic development. In many East African countries, local manufacturing had become a strategic priority. In Kenya, it was even listed as part of the nation's "Big 4 Agenda." These interests, espoused by powerful actors that could have direct effects on the clean cooking through policy, also helped local entrepreneurs resist the direction that market-building clean cooking actors tried to take the industry. For example, one informant from a Kenyan government ministry articulated his position to me:

> "While the industry has grown, of course we don't see that it has reached where we wish it to, especially for the artisanal manufacturers of cookstoves. We still feel that they need to be better placed to produce better things so that they can be able to compete with the ones coming from outside. We're not saying that we shall block anything from outside, although we are insisting that they can also be manufactured locally. It would be better than bringing parts all the way from America or other places."

A government official in Uganda expressed similar sentiments to me, though in a more colorful way:

> "The challenge we have in clean cooking is that you [foreigner] come here, with money … and when the money comes, you get your friend to make a company to access the money. The local sector doesn't grow … The money that comes to the sector is taken by the people who bring it. They're thieves!"

Having a government that prioritized local manufacturing created a situation that savvy local manufacturers had taken advantage of in 2018. These ventures worked through non-clean-

cooking business associations to increase the import duty on finished biomass cookstoves from 10 to 35 percent (though it would later be reduced). At the time, this not only provided concessions to local entrepreneurs (e.g., tax-exempt inputs), but it also made high-quality, foreign-manufactured, imported cookstoves produced by expatriate-led companies too expensive for Kenyan consumers. Although this lobbying effort did not involve local entrepreneurs (rather, a handful of expatriate entrepreneurs who led clean cooking ventures that manufactured or assembled locally), it exemplifies how actors from outside of the clean cooking industry can directly affect it – and highlighted pathways for how local entrepreneurs could leverage support from these actors in strategies of collective resistance.

Results for local entrepreneurs are summarized in Figure 3.2. Due to their exposure to the clean cooking development sector and bolstered by their lived experience with the problems associated with clean cooking, these entrepreneurs either did not apply for or were not selected for industry-building investments. They instead leveraged what was considered to be liabilities into assets that became different strategies of persistence.
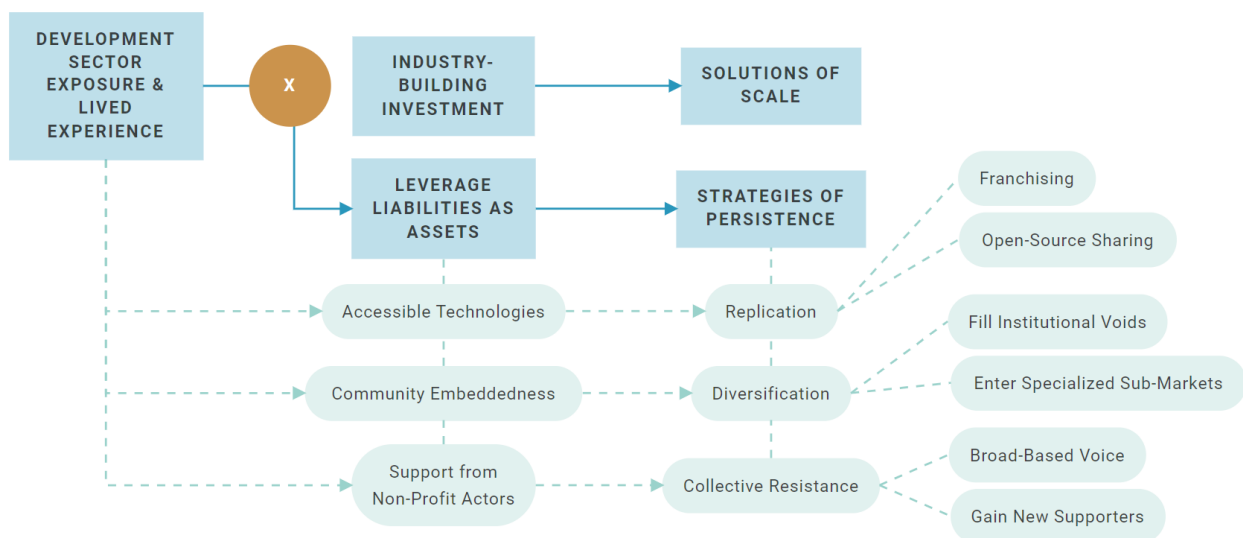
Figure 3.2 Local entrepreneurs' strategies of persistence

3.6 Field-level consequences

The persistence of local entrepreneurs occurred much to the chagrin of market-building actors. Organizations that were set up to promote market-building actors' priorities found themselves struggling with entrepreneurs who were often at odds with each other. It became impossible to collectively set universally acceptable standards and to collectively lobby for agreed-upon policies. According to a representative of a national-level industry association with whom I spoke, "Whenever we make decisions, we have to consult everyone. Then it must be the right decision, whereby each and every person feels represented and not that we are leaning toward one side more than the other." Regarding the same trade association, an expatriate entrepreneur that I interviewed said, "They don't have any clout." Similarly, the plight of local entrepreneurs was also used as a rationale for powerful government actors to not make decisions that market-based actors believed would help the industry grow. In an interview with me, an Uganda-based expatriate entrepreneur who was involved with a national-level clean cooking industry association described conversations between its members and the government: "We'll be like, 'Hey, we need more support,' and the government is kind of like, 'We already give you a lot of support,' and we're like, 'Well … we really need tax exemption,' and they're like, 'No, that's not gonna help [all of] you, that's only gonna help the foreign companies."

The consequences of local entrepreneurs' persistence in the clean cooking industry indirectly contributed to growing public sentiment that clean cooking ventures were failing. Even though large, expatriate-led ventures were identified as early winners of significant grant funding, they continued to struggle with their goals of scale and profitability. Evaluating the success of local entrepreneurs' ventures was less straightforward, as success depended on what their individual goals were. Even though local entrepreneurs did not receive much attention or

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support from market-based actors in their nascent startup stage, those that were able to grow in a way that market-based actors deemed to be fit *were* eventually co-opted as models of successful clean cooking ventures (for example, Kenya's Mukuru Clean Energy). The clean cooking industry just played a much smaller role in their growth than it let on.

3.7 Discussion and conclusion

At the beginning of this chapter, I wrote that this research was motivated by a desire to unpack the "expat gap" – to understand why local entrepreneurs receive less early-stage funding than expatriate entrepreneurs in developing countries' moral markets. My results reveal that the expat gap was the result of a process that spanned time, places, and people.

Local entrepreneurs were strongly influenced by the historical context of the development sector, as revealed in the technologies they promoted, the business models they adopted, and the type of support they received. Recent market-building actors had expectations of how social entrepreneurs should operate, and due to their impact investing ideology, they preferred different technologies, business models, and means of support. Unlike expatriate entrepreneurs who were not products of historical development and, therefore, had social and financial goals that were well aligned with market-building actors' ideology, local entrepreneurs experienced strong tensions between social and financial goals that were obviously misaligned with market-building actors' ideology. Reinforced by their personal, lived experiences with concrete social problems that they were trying to address through their ventures, local entrepreneurs did not conform to the expectations of market-building actors, which perpetuated the expat gap.

Interestingly, I found that despite not receiving funding from the industry's market-building actors, local entrepreneurs persisted in the industry. The very characteristics of their

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ventures that were liabilities to market-building actors became important assets for strategies of persistence. The liability of accessible technology made strategies of *replication* possible. The liability of community embeddedness was the foundation for strategies of *diversification into sub-markets*. And the liability of support from development sector actors led to strategies of *collective resistance*. Ultimately, the consequences of local entrepreneurs' persistence contributed to the stalled development of the clean cooking industry. Market-building actors were weakened as they could not move forward on technology standards or policies that required entrepreneurs' collective action. New stakeholders entered the industry who pushed for more development-related outcomes. Funders were growing weary of clean cooking altogether. Moving from a development sector to an industry was not as seamless or unidirectional as market-building actors hoped that it would be.

But perhaps one should never have expected it to be so easy. Though there were institutional voids in the industry, the industry was not being built in a void (Mair et al. 2012). This stands in contrast with research that treats the pre-conditions of nascent markets' emergence like a *tabula rasa*. The historical institutional context of the development sector was taken for granted not just by non-market actors but also by market actors – the local entrepreneurs. As the clean cooking sector-industry advanced in age, the pendulum would necessarily need to swing back toward the development sector. And in the future, it will be likely to swing back toward the industry once again, eventually settling in a place that uniquely blends characteristics of the development sector and industry as opposed to being fragmented by trying to hold distinct elements of both (see Figure 3.3). Until that point is achieved, local entrepreneurs and their supporters continue to create field-level guardrails (Smith and Besharov 2019), such that neither strictly financial goals nor strictly social goals are prioritized. For the time being, today's

conflicting presence of local entrepreneurs among expatriate entrepreneurs at least enables them

to simultaneously address short-term and long-term needs – helping a rural woman earn money

for tonight's dinner while also exploring the development of technologies that are both efficient

and affordable.
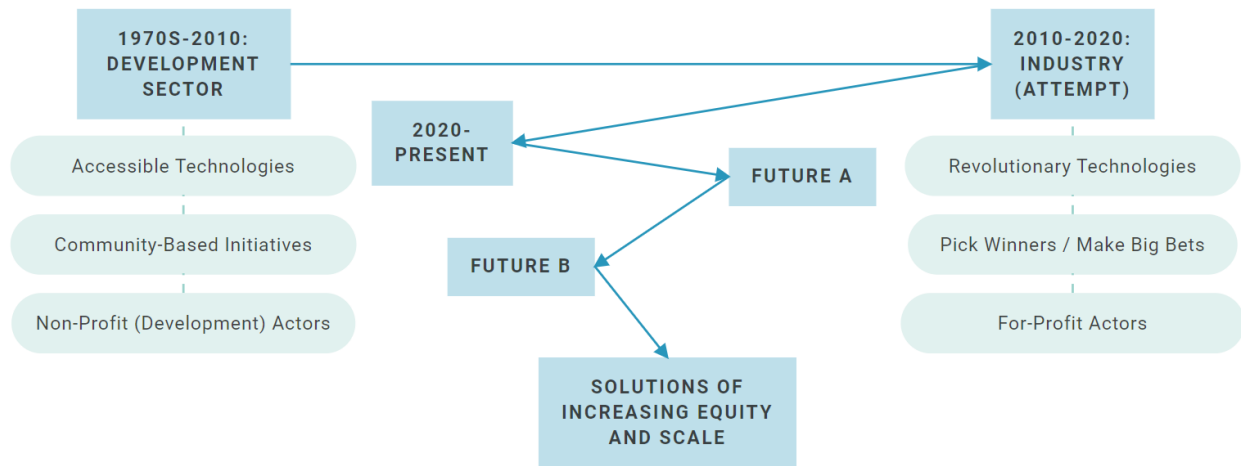
Figure 3.3 Transitioning to a new future for the clean cooking development sector and industry

Even though this research began as an exploration of the expat gap in funding between

local entrepreneurs and expatriate entrepreneurs, it leaves open many questions about the

building of markets to addressing global health, environmental, and social challenges. For

example, can these findings help explain why some moral markets emerge more easily than

others? Further work should compare the clean cooking industry to the off-grid solar industry,

which became established in less than a decade, in terms of their histories (or lack of histories) as

development sectors, variance (or lack of variance) in how the core technology can be produced,

collective action strategies, and strategies toward persuading non-market actors to hand

responsibility of the sector to market actors instead of non-market ones. Additionally, further

cross-regional research on the clean cooking industry could help clarify the relationships

between concepts in my findings. For example, did the clean cooking industry face similar

outcomes in places where there was not a clean cooking development sector? Perhaps introducing clean cooking technologies in a place without historical baggage would result in more acceptance of a market-based industry approach. The findings of this chapter also warrant further investigation on whether and how a single social entrepreneur can draw on aspects of both the development sector and industry to combine them at the level of a social venture. Anecdotally, some of the most commercially successful social ventures that are also accepted by locals are founded by expatriates but present as extremely local, to the point where all non-local names and faces have been scrubbed from their websites and social media accounts. Understanding these few cases may also help identify strategies for local economic development.

Finally, this chapter demonstrates that to understand how nascent markets – especially nascent moral markets – in developing countries emerge and grow, it is necessary for business scholars to also understand how being steeped in a historical context of international development will shape the goals, leadership, and success of entrepreneurial efforts. The insights that we have and the recommendations that we make need to incorporate local perspectives or, even better, be co-developed with those who have a firmer grasp of the local historical context and lived experiences with the social problems we want to address. These would make for more impactful scholarship.

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Chapter 4 The Cross-Border Effects of Knowledge Intermediaries on Entrepreneurial Entry into a Nascent Industry

4.1 Introduction

Entrepreneurial entry into a nascent industry is an important condition for industry emergence that has been studied by many prior scholars (Agarwal and Bayus 2002, Agarwal and Tripsas 2008, Aldrich and Fiol 1994, Hannan and Freeman 1977, Hiatt et al. 2009, Santos and Eisenhardt 2009, Tushman and Anderson 1986). Industry emergence is only possible when gaps in a nascent industry's knowledge base (Agarwal et al. 2017, Moeen et al. 2020), including aspects of the institutional environment, are addressed (Lounsbury et al. 2003, Pacheco et al. 2014). Prior studies have highlighted multiple factors that contribute to filling knowledge gaps. These factors include knowledge spillovers (Agarwal et al. 2007, 2010), interactions between industry actors (Hannah and Eisenhardt 2018, Moeen and Mitchell 2020, Ozcan and Eisenhardt 2009), development of capabilities (Moeen 2017), the proliferation of new categories and identities (Navis and Glynn 2010, Powell and Baker 2017, Santos and Eisenhardt 2009, Zuzul and Tripsas 2020), collective action among industry actors (Lee et al. 2018), and development of industry-supporting institutions (Armanios and Eesley 2021, Eesley 2016, Sine et al. 2005, Tolbert et al. 2011). However, studies of entrepreneurial entry into nascent industries typically focus on a single-country context, and much less is known about how nascent industries emerge across multiple countries.

This multi-country perspective is particularly relevant because many industries are initiated globally by mission-oriented grand challenges (Agarwal et al. 2017). Actors in the

public sector (Agarwal et al. 2021) and the social sector (Georgallis and Lee 2020, Pacheco et al. 2014, Sine and Lee 2009) attempt to address global grand challenges like climate change, water security, poverty, and infectious disease. It is critical to consider how industries offering market-based solutions to these problems not only emerge in individual countries but transnationally, across multiple countries, and especially in emerging economies where the brunt of grand challenges are born by vulnerable populations (e.g., Vakili and McGahan 2016). Such countries are characterized by greater knowledge gaps and more institutional voids (Eesley 2016, Hoskisson et al. 2000, Marquis and Raynard 2015, Wright et al. 2005), which serve as impediments to the growth of a nascent industry. How, then, are the knowledge bases of early-stage, nascent industries created and developed in places where industry-supporting knowledge is limited?

Drawing on the nascent industries literature and the institutional intermediaries literature, this research proposes a novel factor of industry emergence in emerging economies: industry actors that act as cross-border knowledge intermediaries, or intermediaries that address gaps in the industry knowledge base through knowledge aggregation processes[27]. I describe how this occurs with a two-stage model. In the first stage, a first-order intermediary, such as a large nonprofit (Mair et al. 2012) or industry trade association (Sine et al. 2005), engages with industry actors in a selected country to develop the nascent industry knowledge base through knowledge aggregation processes. Industry actors acquire knowledge and additionally learn to aggregate knowledge. In the second stage, industry actors transfer industry-specific knowledge and know-

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[27] The nascent industries literature observes that nascent industries are hampered by knowledge gaps across multiple dimensions that include, but are not limited to, formal institutions (e.g., policies) and other normative and cognitive institutions (Moeen et al. 2020, Moeen and Agarwal 2017). The knowledge intermediaries in this research act as institutional intermediaries, in the sense that they work with industry actors to create and develop industry-supporting institutions (Dutt et al. 2016), but they additionally work with industry actors to create and develop other types of knowledge that would address gaps in the nascent industry's knowledge base.

how to non-selected countries, where they also develop the industry knowledge base. In doing

so, they act as second-order knowledge intermediaries in non-selected countries. Because of their

knowledge transfer and knowledge-building activities, the presence of second-order knowledge

intermediaries is proposed to be associated with an increase in entrepreneurial entry into the

nascent industry of non-selected countries.

I explore this two-stage model in the context of the nascent global clean cookstove

industry. A knowledge intermediary in the form of a public-private partnership, the Global

Alliance for Clean Cookstoves (henceforth known as the Alliance), selected eight countries in

which to tackle the health, environmental, and gender issues associated with cooking with

traditional stoves and fuels. Using observational data about industry actors in the clean cookstove

industry, I show how the work of second-order intermediaries that operate in both selected and

non-selected countries was associated with entrepreneurial entries into these countries' nascent

clean cookstove markets. In Appendix 4.B, I use interviews and archival data to qualitatively

describe how actors learn to become intermediaries through the knowledge transfer and

knowledge aggregation activities of the Alliance in the eight selected countries, as well as what

knowledge second-order knowledge intermediaries transfer to non-selected countries.

This study contributes to prior research on industry emergence (Hannah and Eisenhardt

2018, Moeen 2017, Moeen and Agarwal 2017, Moeen and Mitchell 2020, Navis and Glynn

2010, Ozcan and Eisenhardt 2009, Ozcan and Santos 2015, Wormald et al., Zuzul and Tripsas

2020) by expanding our understanding of how an industry emerges in a single, developed

country to how an industry emerges across multiple, emerging economies. This specifically

addresses calls to "shed light on how nascent industries in developing and global contexts may

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require different processes" in industry development (Moeen et al. 2020, p. 240), especially for industries that address worldwide mission-oriented grand challenges (Agarwal et al. 2021).

This work additionally contributes to research on institutional intermediaries in emerging economies (Armanios et al. 2017, Armanios and Eesley 2021, Mair et al. 2012, Mitchell et al. 2022). Prior authors have identified how entrepreneurs in weak institutional contexts benefit from the cognitive understandings and norms provided by "intermediaries that create and develop institutions" (Dutt et al. 2016, p. 818). The benefits accrued to these entrepreneurs are experienced locally, through localized interactions between intermediaries and entrepreneurs. Building upon this, this work sheds light on previously underexplored global dimensions of institutional intermediaries: how they access and transfer global institutions, how they themselves carry institutions to distant places, and how they can train other organizations to do their institutional work elsewhere. In many ways, institutional intermediaries can help bridge the local-global divide experienced by many under-resourced entrepreneurs around the world.

In the following section, I first provide theoretical background regarding the development of an industry knowledge base for industry emergence. Then, I describe the model's first stage during which industry actors learn by engaging with first-order knowledge intermediaries in selected countries. Lastly, I describe and develop hypotheses for the model's second stage, in which industry actors transfer knowledge and become second-order knowledge intermediaries in non-selected countries.

4.2 Theoretical framework and hypothesis development

4.2.1 Knowledge, intermediaries, and nascent industries in emerging economies

Scholars of new industry emergence have explained that extreme uncertainty prevails in nascent industries (Benner and Tripsas 2012). Moeen et al. (2020) identify four dimensions of

industry-specific uncertainty that can stave off emergence: technology, demand, ecosystems, and institutions. Technological uncertainty occurs when industry actors lack information about technical designs, technical components, and how to combine components within an architecture (Helfat and Raubitschek 2000, Henderson and Clark 1990, Tushman and Anderson 1986). Demand uncertainty occurs when industry actors have only partial knowledge about customer demand and preferences (Adner and Levinthal 2001, Santos and Eisenhardt 2009). Ecosystem uncertainty occurs when industry actors lack information about the nature and configuration of ecosystem activities, such as vertical supply chain activities and the provision of complementary goods and services (Adner and Kapoor 2010, Hannah and Eisenhardt 2018, Moeen and Mitchell 2020).

Special attention needs to be given to institutional uncertainty in emerging economies. Institutional uncertainty occurs when industry actors have only partial knowledge about social and formal institutions that determine how an industry's offerings are exchanged. Institutional uncertainties include fuzzy meanings of a new market category (Hsu and Grodal 2021, Navis and Glynn 2010, Weber et al. 2008) and regulatory ambiguities in a nascent industry (Gao and McDonald 2022). In economies that are characterized by weak economic and institutional conditions, the need for industry-supporting institutions is greater because of missing or weak country-level institutions. A significant body of research on entrepreneurship in emerging economies has focused on institutional strategies to address institutional voids, or the lack or marginal development of institutional infrastructure needed to facilitate market exchange (Armanios et al. 2017, Armanios and Eesley 2021, Khanna and Palepu 1997, Mair et al. 2012) (Armanios et al. 2017, Armanios and Eesley 2021, Khanna and Palepu 1997, Mair et al. 2012).

These country-level institutional uncertainties can contribute to greater industry-specific institutional uncertainties.

To achieve industry emergence, uncertainties in technology, demand, ecosystems, and institutions must be addressed by building the industry's knowledge base (Kirsch et al. 2013, Moeen et al. 2020). Doing so requires "purposeful action" (Moeen et al. 2020, p. 221), both by individual industry actors and by the nascent industry as a collective. Prior work has identified several strategies that individual industry actors have undertaken to manage uncertainty in nascent industries that involve adaptive learning and knowledge generation, such as experimentation (Murray and Tripsas 2004, Thomke 2003), probing (Brown and Eisenhardt 1997), and pivoting (McDonald and Gao 2019). However, since knowledge generated by industry actors is distinct yet complementary (Gavetti and Levinthal 2000, Shane 2000), it must be aggregated into the industry's knowledge base through a recursive process.

Knowledge intermediaries are industry-specific intermediaries that address industry knowledge gaps primarily by implementing knowledge aggregating processes. Knowledge intermediaries can be organizations like trade associations, standards organizations, nonprofit organizations, and social movement organizations (King and Pearce 2010, Lee et al. 2017, Powell et al. 2017, Sine et al. 2005). As intermediaries, they perform three activities to address uncertainties in an industry's knowledge base, as highlighted by Moeen et al. (2020). First, they promote knowledge sharing by bringing two or more industry actors together. Prior authors have described how intermediaries perform this task in ways that are not industry specific. For example, Armanios and Eesley (2021) highlight how Chinese Academy of Sciences research institutes facilitated the development of shared knowledge among public sector and private sector actors by demonstrating the market relevance of public sector science to potential private

sector entrepreneurs. Other authors have explained how an explicit role of intermediaries is to convene cross-sector actors for knowledge sharing according to a set agenda (Abbott 2018, Dorado 2005, Powell et al. 2017). In these examples, the expressed purpose of knowledge intermediaries is to enable industry-level knowledge accumulation via knowledge sharing by bringing actors together and guiding how knowledge is shared.

In addition to promoting knowledge sharing, knowledge intermediaries also implemented selecting mechanisms for knowledge accumulation. Selecting occurs when actors block or inhibit the relevance of other actors' knowledge. Though this can happen through the market (e.g., customers demanding one type of technology over or another), it can also occur through knowledge intermediaries, which have access to multiple pieces of knowledge but can choose which pieces of knowledge to transfer to other industry actors. For example, Sine et al. (2005) explain how trade associations in the independent-power sector tended to promote established technologies over novel ones because of the organizations that dominated the industry associations. Knowledge intermediaries that set agendas, cast visions for the industry, and resolve conflicts among industry actors additionally select which knowledge to promote over others (Powell et al. 2017). It additionally means that knowledge intermediaries that have access to both local and global knowledge can transfer and then prioritize local knowledge globally or global knowledge locally.

The third activity that knowledge intermediaries implement to address uncertainties in an industry's knowledge base involves organizing collective action. Collective action is especially important for creating and developing industry-supporting institutions, which are the "cultural, structural, and relational foundations that shape and guide exchange within and across" industries (Logue and Grimes, p. 6). Industry-supporting institutions address institutional

uncertainties in the industry knowledge base. When knowledge aggregation occurs collectively, industry actors agree on an aligned and coordinated plan about what pieces of knowledge to include or exclude in the industry knowledge base (Moen et al. 2020, p. 222). They manifest as technological standards for a nascent industry (Lee et al. 2017), industry-supporting policy change through lobbying (Hiatt et al. 2009, Sine and Lee 2009)(Hiatt et al. 2009, Sine and Lee 2009), and collective producer identities or narratives to help legitimize the nascent industry (Hiatt and Park 2022, Weber et al. 2008). Very often, an intermediary is required to again bring industry actors together, provide some sort of high-level guidance or agenda, and enable collective action to occur.

In this sub-section, I have discussed industry emergence and the knowledge aggregating role of knowledge intermediaries in emerging economies. In the following sub-sections, I propose how industry actors first learn from engaging with first-order knowledge intermediaries in selected countries and then transfer knowledge to non-selected countries, where they act as second-order knowledge intermediaries.

4.2.2 First stage: Learning from first-order knowledge intermediaries in selected countries

In this model for industry emergence in emerging economies, there are two actor groups: 1) the first-order knowledge intermediary, which is the industry-supporting intermediary that engages industry actors in selected countries through knowledge aggregation processes to generate the industry knowledge base, and 2) the local industry actors who learn from the first-order knowledge intermediary's knowledge aggregation efforts in selected countries and become second-order knowledge intermediaries in non-selected countries by transferring knowledge and knowledge-building know-how. It should be reiterated that these knowledge intermediaries are aggregating knowledge for a specific nascent industry and are not just providing general

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entrepreneurial support, as in much prior work (e.g., Armanios and Eesley 2021, Assenova 2020). Moreover, their organizational form (e.g., trade association, public-private partnership, nonprofit, etc.) is less important compared to their knowledge aggregation activities.

In the first stage of the model, a new industry is triggered in one or more selected countries. This trigger may be a scientific discovery or an unmet need (Agarwal et al. 2017). Given this research's context of a global industry that is relevant in multiple emerging economies, however, the trigger is likely to be a mission-oriented grand challenge. Mission-oriented grand challenges are "complex and ambitious problems whose solutions in the form of new technologies and products are critical to addressing the public sector's unmet needs and speculated to be very impactful" (Agarwal et al. 2021, p. 385). A first-order knowledge intermediary for a nascent industry in selected countries begins forming the industry knowledge base, first by articulating the unmet need and then by persuading other industry actors to join in addressing it. As more actors from diverse sectors and backgrounds join the industry, the recursive processes of knowledge generation and knowledge aggregation via the first-order knowledge intermediary begin. As previously described, these knowledge aggregation processes include promoting knowledge sharing, implementing knowledge selection, and organizing collective action. A knowledge base emerges from aggregated knowledge that was initially generated not just from locally generated knowledge, but also from globally-generated knowledge, assuming that the first-order intermediary possesses knowledge from global sources.

At this point, the focus of the model shifts from the first-order knowledge intermediary to the local industry actors and, specifically, their learning from the first-order knowledge intermediary's knowledge aggregation efforts in selected countries. Organizational learning through interactions with other organizational actors has been well documented (Alvarez and

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Barney 2001, Brown and Duguid 1991, Doz 1996, Hallen et al. 2020, Hitt et al. 2000, Larsson et al. 1998, Powell et al. 1996, Zollo et al. 2002). Industry actors learn the industry knowledge base, whether through direct engagement with the first-order knowledge intermediary via knowledge aggregation processes, or indirectly through knowledge that is disseminated throughout the industry. They gain technological knowledge (Alcácer and Chung 2007, Owen-Smith and Powell 2004), learning and endearing themselves to the innovative solution promoted by the industry (Durand and Georgallis 2018, Powell et al. 2017). They learn about the market and consumer demand. They gain knowledge about the ecosystem and the actors who complement, compete, and collaborate with them (Holmqvist 2004, Lacetera 2009, Larsson et al. 1998, Moeen and Mitchell 2020). They learn the informal and formal institutions that support the nascent industry, such that how "things are done" is taken for granted (Tracey 2016). This knowledge enables organizations to better pursue their goals. Knowledge learned from the first-order intermediaries' efforts improves the performance of industry actors. Nascent industries in selected countries, therefore, progress through the stages of industry nascency and experience entrepreneurial entries.

In addition to learning the industry knowledge base, industry actors that were directly involved in the knowledge aggregation processes also learn *how* to do the work of a knowledge intermediary: how to aggregate knowledge to address specific industry-related uncertainties. Just as prior authors have shown that firms co-creating regulations with regulators "provides intangible knowledge on the regulations being created and on how to engage regulators" (Gao and McDonald 2022, p. 947), industry actors that engage with first-order knowledge intermediaries in knowledge aggregation processes gain the intangible knowledge of *how* to aggregate knowledge. Collective action is inextricably linked to collective learning (Spender

1996), and "organizations remember by doing" (Nelson and Winter 1982, p. 99). It is this collective learning and learning-by-doing that aids with the diffusion of an industry knowledge base and its ongoing development in new contexts (Perez-Aleman 2011).

4.2.3 Second stage: Transferring knowledge to non-selected countries

Although first-order knowledge intermediaries directly affect industry emergence in selected countries, I propose that they can have an indirect effect on industry emergence in non-selected countries via second-order knowledge intermediaries that transfer knowledge there. These second-order knowledge intermediaries need not be new companies that entered the industry during the first stage; they could be pre-existing cross-sector organizations that learned from the first-order intermediary's efforts during the first stage. These second-order knowledge intermediaries become "carriers" of knowledge (Armanios and Eesley 2021) both within selected countries and also across borders in non-selected countries, where the knowledge base for the nascent industry has considerably more uncertainties and knowledge gaps. Prior work has shown that knowledge learned in one context can be applied in new contexts (Barkema et al. 1996, 1997, Delios and Henisz 2003), so it is plausible that knowledge about the industry that is learned in selected countries can be applied to address knowledge gaps in the industry knowledge base of non-selected countries.

Second-order intermediaries do not just transfer knowledge from abroad but also aggregate knowledge in non-selected countries. That is, they engage in knowledge aggregation processes with various industry actors to address uncertainties in the local nascent industry. Why would they be motivated to do this? Perhaps the second-order knowledge intermediary is a company that wants to expand to non-selected countries, where the nascent industry is underdeveloped, because they sense a market opportunity. Instead of waiting until that market

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becomes more mature, the company decides to develop knowledge and institutions with the necessary participation of other local actors. This could involve, for example, lobbying the government for policy changes or building a network of distributors and training them about the new product. As Khanna and Palepu (2010, p. 110) describe, one potential strategy for multinational companies in emerging markets is to "augment capabilities through collaboration or context-changing initiatives" – to work with others to address institutional voids and knowledge gaps. Second-order intermediaries may be successful where local industry actors are not because their knowledge is new in the context and could be valuable (Berry 2006), enabling them to pursue a market opportunity that local actors could not see. Second-order intermediaries that are not companies (e.g., nonprofits, multilateral organizations) can also have incentives to build the industry knowledge base in non-selected countries, such as organizational mandates or strongly held beliefs about the value of the nascent industry.

One can also look to the literature on organizational learning and knowledge transfer to further understand why second-order intermediaries would be motivated and effective knowledge builders. Second-order knowledge intermediaries have "sending" units in selected countries that learn from the first-order knowledge intermediaries' efforts. Second-order knowledge intermediaries also have "receiving" units in non-selected countries. Prior work on intraorganizational knowledge transfer argues that knowledge transfer between units broadly depends on four factors: (i) characteristics of the knowledge being shared, (ii) characteristics of the sending unit, (iii) characteristics of the receiving unit, and (iv) the relationship between the sending and receiving units (Eisenhardt and Santos 2002, Gupta and Govindarajan 2000, Minbaeva 2007, Szulanski 2000). The first two factors are associated with knowledge outflows from the sending units, the third factor and the fourth factor are associated with knowledge

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inflows to the receiving units, and the fourth factor is associated with both (Gupta and Govindarajan 2000, p. 477). Due to their sending units' learning from first-order intermediaries in selected countries, second-order knowledge intermediaries are likely to be associated with a high degree of knowledge outflow.

Why would second-order knowledge intermediaries be associated with a high degree of knowledge outflows, and how does this relate to their sending units' learning from first-order knowledge intermediaries in selected countries? First, consider the characteristics of the knowledge being shared. This knowledge consists of the more tangible nascent industry knowledge base, as well as the more tacit knowledge of *how* to do the work of an intermediary and continue developing this industry knowledge base elsewhere. Due to much of the industry knowledge base being articulated and codified by the first-order intermediary, the former is relatively easy to share (Zander and Kogut 1995). The intangible nature of the latter knowledge is more difficult to share, but second-order knowledge intermediaries may believe it to be valuable, non-duplicative (i.e., only available in selected countries and not in non-selected countries due to the absence of opportunities for experiential learning), and relatively advantageous for receiving units to learn (Gupta and Govindarajan 2000, Rogers 2003). That is, the nascent industry's knowledge base is viewed as important enough to share.

Second, consider the characteristics of second-order knowledge intermediaries' sending units. Prior authors have argued that sending units need to be motivated to share knowledge (Gupta and Govindarajan 2000, Minbaeva 2007). Sending units' learning from first-order knowledge intermediaries, especially if they directly engage in knowledge aggregation processes, in selected countries can increase motivations to share. This engagement can transform selected countries into "catalyzing" places for the nascent industry (Aversa et al.

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2022), with industry actors that experience "intense, often transformational experiences" that are related to the location (Aversa et al. 2022, p. 2059). After experiencing collective learning in these localized communities of practice (Brown and Duguid 1991, Perez-Aleman 2011, Wenger et al. 2002), "centrifugal forces" (e.g., a desire to champion the nascent industry elsewhere or a recognition of business opportunities abroad that come through leveraging this locally-learned knowledge) motivate the sharing and application of this knowledge in other locations (Aversa et al. 2022). Thus, sending units' engagement with first-order intermediaries in selected countries makes them more motivated to share this knowledge.

> *Hypothesis 1: In non-selected countries, more second-order knowledge intermediaries are associated with a higher number of entrepreneurial entries into the nascent industry*

4.2.3.1 Characteristics of second-order knowledge intermediaries

It is unlikely that second-order knowledge intermediaries are equally effective. While some prior work has given identical treatment to the organizational ties that facilitate the flow of knowledge (e.g., Davis 1991, Haunschild 1993), the knowledge transfer by second-order intermediaries requires that differences between these industry actors are understood.

The first characteristic of second-order knowledge intermediaries that I examine is their quantity of cross-border organizational units, or the number of countries in which they operate. As mentioned previously, the relationship between a second-order knowledge intermediaries' sending units and receiving units can affect how knowledge is transferred across an organization. In particular, knowledge transfer is affected by whether the relationship between sending and receiving units is characterized by the richness of the communication channel: "numerous individual exchanges" (Szulanski 1996), interpersonal communication like visits and meetings (Bresman et al. 1999), face-to-face interaction between small groups (Kogut and Zander 1992),

strong interpersonal relationships (Uzzi 1997), and direct relations that involve extensive communication (Hansen 1999, 2002). This richness of relationship and communication between a second-order intermediary's sending and receiving units is likely to be affected by the number of organizational units within the organizations. As the number of organizational units increases, knowledge transfer from sending to receiving units becomes more difficult to manage because intensive interpersonal communication is costly. Sending units cannot concentrate their knowledge-sharing efforts on a few receiving units.

The number of second-order knowledge intermediaries' cross-border organizational units may also be related to their willingness and ability to learn, share, and receive knowledge. As the number of organizational units increases, the complexity of hierarchical linkages and relationships also increases, leading to structural inertia (Hannan and Freeman 1984). Structural inertia can demotivate all second-order knowledge intermediaries' units from learning new knowledge (Szulanski 1996), as well as impede the development of flexible learning structures that are important for knowledge transfer (Huber 1991).

More cross-border organizational units can also imply that an organization has already achieved high performance and is in possession of high achieved status. It may fear deviating from the status quo and facing serious consequences to its position (Prato et al. 2019). As a result, established second-order knowledge intermediaries may be averse to promoting a nascent industry in non-selected countries, just as established players in the independent-power sector were averse to opting for novel green technologies (Sine et al. 2005). Relatedly, if these established second-order knowledge intermediaries are companies, then potential entrepreneurs in non-selected countries may believe that they are unable to compete with them and choose not to enter.

Hypothesis 2: In non-selected countries, second-order intermediaries with more cross-border organizational units are associated with a weaker effect of second-order intermediaries on entrepreneurial entries.

The second characteristic of second-order intermediaries that is examined is their role in the nascent industry. This may again affect their sending and receiving units' willingness and ability to learn, share, and receive. Nascent industries consist of many diverse actors, including nonprofit organizations, public agencies, foundations, startups, and established firms (Malerba 2002), since the promotion of a nascent industry requires different activities, such as technological research and development, manufacturing, distribution, consumer education, and financing. Within a nascent industry, industry actors take on roles that align with their sector capabilities, histories, expertise, mission and values, logics, and power (Gray and Purdy 2018, Hardy and Phillips 1998). Different roles provide different opportunities for learning and transferring knowledge to non-selected countries. Three roles in a nascent industry are investigated here: complements, nominal champions, and companies.

Complements refer to second-order intermediaries that take up complementary roles to the industry's companies. There are many reasons why a nascent industry would consist of few vertically integrated firms (Helfat and Campo-Rembado 2016), instead being characterized by collaborative arrangements between organizations that take on a division of labor of roles in the value chain (Jacobides et al. 2006, Ozcan and Eisenhardt 2009, Pisano 1990, 1991, Powell et al. 1996). In prior research on nascent industries, many of these collaborations occur between complementary actors. For example, Hannah and Eisenhardt (2018) document how the U.S. residential solar industry had five distinct components, each of which drew on distinct capabilities, and each of which was complementary to the others. The authors discover that a viable strategy for navigating this nascent industry was to emphasize cooperation and create

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value through mutual specialization. These collaborative arrangements are especially beneficial to ventures that are resource-constrained, enabling them to overcome liabilities of newness and smallness (Baum et al. 2000), or ventures that initially specialize and have not yet developed integrative capabilities to expand to other areas of the value chain (Moeen 2017).

Due to their interdependence on other industry actors, complements are motivated to form relationships with others (Gulati 1995, Katila et al. 2008, Pfeffer and Salancik 1978). As such, in the first stage of the model, complements' sending units are motivated to engage with the first-order knowledge intermediary to participate in collective learning experiences and acquire the industry knowledge base (Aversa et al. 2022, Perez-Aleman 2011). In the second stage of this model, complements are driven to share, receive, and implement knowledge in non-selected countries. Successful knowledge transfer is well-received by potential entrepreneurs who seek complements' complementary capabilities and knowledge, making complements effective second-order knowledge intermediaries.

> *Hypothesis 3a: In non-selected countries, second-order intermediaries in the role of complements are associated with a positive effect on entrepreneurial entries.*

In contrast to complements that play a direct, narrow role in the nascent industry's value chain, some second-order knowledge intermediaries associate themselves with a nascent industry as champions of the nascent industry, but only nominally. This could be especially true in the case of nascent industries that are triggered by mission-oriented grand challenges. For example, in criticism of multilateral organizations' ineffectiveness in addressing global energy issues, the G8 and G20 summits have been thought to have "cherry-picked easy and low-controversy issues for attention," and some of their "commitments have been so vaguely worded as to have little practical value" (Wilson 2015, p. 98). Other scholars have commented that many multilateral

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organizations are ineffective because they are poorly managed, have ill-defined missions, run too many projects, and face considerable legitimacy crises among professionals (Annen and Knack 2018, Brill 2012, Edwards et al. 2018, Esty 2002). Thus, even if nominal champions support the nascent industry on paper, their sending units' engagement with first-order knowledge intermediaries may be merely ceremonial and not contribute to actual organizational learning. It could also be the case that these nominal champions align with the social problem, but because of their mandates, they are using a different approach to address it (e.g., a development intervention approach as opposed to a commercial approach). Because they do not fully engage in knowledge accumulation processes or desire to learn the industry knowledge base that has been shaped by first-order knowledge intermediaries, nominal champions are less likely to learn, share, and receive knowledge in non-selected countries, even if they operate in many of them. Moreover, potential entrepreneurs in non-selected countries may perceive nominal champions' lack of legitimacy and doubt the legitimacy of the nascent industry because of their endorsement.

> *Hypothesis 3b: In non-selected countries, second-order intermediaries in the role of nominal champions are associated with no effect or a negative effect on entrepreneurial entries.*

Lastly, second-order knowledge intermediaries that are viewed as competitors to potential entrepreneurs in non-selected countries likely have an inverted-U-shaped relationship with entrepreneurial entries. Even though they are likely motivated to learn, share, and receive knowledge across cross-border organizational units, how competing companies are viewed by potential entrepreneurs matters to entry. Organizational ecology describes a density-dependence model of entrepreneurial entry that depends on the forces of competition and legitimation (Hannan and Carroll 1992, Haveman 1993). At low levels of density (i.e., when there are few companies in the nascent industry), the nascent industry is not viewed as legitimate, so there are

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fewer entrepreneurial entries. As the level of density increases, entrepreneurial entries increase. However, at high levels of density (i.e., when there are many companies in the nascent industry), the effects of competition inhibit entrepreneurial entry.

> *Hypothesis 3c: In non-selected countries, second-order intermediaries that are companies are associated with an inverted-U effect on entrepreneurial entries.*

4.2.3.2 Characteristics of non-selected countries

The effectiveness of second-order knowledge intermediaries depends not only on characteristics of these organizations but also on the characteristics of the external industry actors in places where successful knowledge transfer occurs. Even though first-order knowledge intermediaries do not exist in non-selected countries, for various historical reasons, these places may already possess some industry-related knowledge and be "already rich in other institutional arrangements" (Mair and Martí 2009, p. 422). Even if a nascent industry's knowledge base is successfully transferred to these new contexts, it may not be well-received or applicable there (e.g., Claus et al. 2021). For example, consider the work of microfinance organizations that operate in emerging economies. One of microfinance's goals is to address issues of gender inequality by making loans to women (Zeller and Meyer 2002). However, countries where this lead is greatest also experience the most patriarchy, and in these countries, microfinance organizations tend to lend less to women (Zhao and Wry 2016). I propose two characteristics of non-selected countries that would make them less receptive to second-order knowledge intermediaries' successful knowledge transfer: the presence of domestic industry actors with pre-existing, overlapping knowledge and a cultural orientation toward autonomy.

Domestic industry actors are organizations that operate only in non-selected countries. They may exist due to some historical circumstances, and they operate according to knowledge

and institutions that have been developed historically within a local cluster (Klepper 2010, Saxenian 2000). On the one hand, knowledge-based theories may argue that the prior possession of relevant knowledge would increase domestic industry actors' absorptive capacities (Cohen and Levinthal 1990), making them better able to acquire and implement new knowledge that was successfully transferred by second-order knowledge intermediaries. On the other hand, it is also expected that "as an organizational population grows, member organizations become more embedded in their institutional environment" (Baum and Oliver 1992, p. 540). If there are many domestic industry actors, then the more "enculturated" these organizations are likely to be in their knowledge and institutions (Brown and Duguid 1991, p. 48). They may be territorial about their specific work and may develop a "not-invented-here" attitude that leads them to reject non-locally developed knowledge (Antons and Piller 2015, Katz and Allen 1982) that would be exacerbated by growing anti-Western sentiment in emerging economies.

Domestic industry actors already have industry-related knowledge, but that knowledge may differ from second-order knowledge intermediaries' knowledge. For example, domestic industry actors and second-order knowledge intermediaries may have different perspectives about what constitutes a high-quality technology or how relationships with other industry actors should be appropriately pursued. As such, domestic industry actors may be unmotivated to receive or even be hostile toward second-order knowledge intermediaries, even if the second-order intermediaries successfully transfer knowledge. Prior studies have shown that even if there exist interdependencies between industry actors, if there is a lack of consensus about the industry knowledge base, collaboration that enables industry emergence can fail (Ozcan and Santos 2015). Hence, the presence of more domestic industry actors with pre-existing knowledge that categorically overlaps with the knowledge of second-order knowledge intermediaries (but differs

in terms of content) could prevent consensus-building between the domestic industry actors and the second-order knowledge intermediaries, thus weakening the effect of second-order intermediaries on entrepreneurial entry.

> *Hypothesis 4: In non-selected countries, more domestic industry actors with pre-existing, categorically overlapping knowledge are associated with a weaker effect of second-order intermediaries on entrepreneurial entries.*

Culture may also affect the effectiveness of second-order knowledge intermediaries on entrepreneurial entries. Culture is conceptualized as a "fundamental social institution tightly linked to historical and ecological conditions that render cross-cultural differences quite stable" (Siegel et al. 2012, p. 1174), and differences in national culture affect how successfully foreign actors can operate within a country (Siegel et al. 2011). National culture can encourage entrepreneurial activities by impacting the cognition and motivations of potential entrepreneurs (Chand and Ghorbani 2011, George and Zahra 2002). It may also create obstacles to second-order knowledge intermediaries that transfer knowledge to non-selected countries, since the ongoing development of the industry knowledge base requires ongoing interaction, consensus, and collaboration — all of which are affected by national culture.

One dimension of national culture that affects both entrepreneurial activity and the effectiveness of second-order knowledge intermediaries is autonomy. Autonomy is the "desirability of individuals independently pursuing their own ideas and intellectual directions" (Schwartz 1999, p. 27). It has been observed as a "cornerstone of entrepreneurship" (Hwang and Powell 2005, p. 201) that grants potential entrepreneurs the "freedom and flexibility to develop and enact entrepreneurial initiatives" (Lumpkin et al. 2009, p. 47). Prior literature suggests an inverted-U relationship between autonomy and entrepreneurship (Kreiser et al. 2010), since too little autonomy limits risk-taking (Morris et al. 1993), and too much autonomy is related to

"gamesmanship, zero-sum competition, sequestering of information, and the chaotic pursuit of tangential projects" (Morris et al. 1994, p. 72), as well as an inability to act proactively in order to "obtain cooperation from those having the expertise and resources necessary for implementation of the entrepreneurial concept" (Morris et al. 1994; see also Puranam et al. 2006 and de Rond and Bouchikhi 2004 for the tension between autonomy and coordination). Autonomy may additionally incentivize potential entrepreneurs to try starting companies by breeding hubris and overconfidence (Hmieleski and Baron 2009, Lowe and Ziedonis 2006), but these entrepreneurs may not be able to follow through.

The drivers behind the direct effect of autonomy on entrepreneurial entry could also speak to how autonomy changes the effectiveness of second-order knowledge intermediaries on entrepreneurial entries in non-selected countries. For potential entrepreneurs, the presence of more second-order knowledge intermediaries lowers uncertainties in a nascent industry. However, taking advantage of this transferred knowledge requires potential entrepreneurs to coordinate across more industry actors. When there are fewer second-order intermediaries, it is presumable that fewer uncertainties are addressed. Entrepreneurs in high-autonomy cultures would be more likely to enter when there are fewer second-order intermediaries than in low-autonomy cultures, simply because they are willing to take on more risk. However, when there are many second-order intermediaries, more coordination is needed to take advantage of their knowledge. Entrepreneurs in low-autonomy cultures would be better able to coordinate across many second-order intermediaries than entrepreneurs in high-autonomy cultures. The result is a curvilinear interaction effect between the number of second-order knowledge intermediaries and autonomy on entrepreneurial entries.

Hypothesis 5: In non-selected countries, autonomy interacts in a curvilinear fashion with the number of second-order intermediaries on entrepreneurial entries.

4.3 Empirical context: The nascent clean cookstove industry

The industry studied in this research is the clean cookstove industry. Approximately half of the world's population—and up to 90 percent of rural households in developing countries—still rely on unprocessed biomass fuels, such as wood, dung, and crops leftover from the harvest (World Resources Institute et al. 1998). When used for cooking and heating, these biomass fuels are typically burnt indoors in open fires or in poorly functioning stoves. As a result, vulnerable populations – especially women in charge of cooking and their young children – are exposed to high levels of air pollution (Bruce et al. 2000) which leads to respiratory illnesses (Smith 2013). The World Health Organization estimates that indoor air pollution from cooking kills over 4.3 million people every year (World Health Organization 2017). The use of traditional cookstoves is also associated with problems like gender inequality (Lewis and Pattanayak 2012, Rosenberg et al. 2020) and climate change (Smith et al. 2009).

One intervention for the problems created by using traditional cooking methods is the use of "clean" cookstoves (Bailis et al. 2009). These cookstoves come in a range of culturally differentiated designs, use different types of fuels, and are affordable at different price points (USAID and Winrock International 2017). Most of these cookstoves were developed to address the adverse health, social, and environmental problems by reducing the amount of fuel that is required, using cleaner-burning fuels, decreasing fuel-gathering time, and reducing cooking time. However, even though versions of clean cookstoves have existed since the 1950s (Morrison 2018, Smith and Sagar 2014), and even though cookstove programs implemented by governments and development agencies were common in the 1980s and 1990s (Gifford 2010),

"initial efforts to promote these technologies have run into challenges surrounding diffusion, dissemination, and implementation" (Lewis and Pattanayak 2012, p. 637).

Many barriers to the widespread adoption of clean cookstoves existed, including but not limited to a lack of widespread awareness and behavior change among users (Lindgren 2020), deeply held beliefs around traditional cooking methods (Armanios 2020, Malakar and Day 2020), culturally inappropriate product design (Abdelnour et al. 2020), the high upfront cost to consumers (Bensch et al. 2015), and distribution and supply chain problems (Pattanayak et al. 2019). However, according to the Alliance (2011), it was the "lack of a cohesive vision for the sector" that was identified as the fundamental problem that "led to a failure to build the enabling environment necessary to foster a robust market for clean cookstoves." Indeed, many organizations involved in clean cookstove projects operated independently of each other, contributing to a situation described as "a patchwork of cookstove manufacturers, non-governmental organizations, and other stakeholders," resulting in "missed opportunities." The absence of coordination "contributed to a failure to develop international standards, address key outstanding research needs, … rectify the alarming lack of awareness of the issue, … [and address the] long-standing existence of a piecemeal, project-based approach to the problem" (Global Alliance for Clean Cookstoves 2011, p. 18).

To address the myriad of problems related to diffusion, dissemination, and implementation, the Global Alliance for Clean Cookstoves (i.e., the Alliance) was launched in September 2010 as a public-private partnership initiated by multiple US government agencies, sponsored by large philanthropic foundations (e.g., Shell Foundation), and hosted by the United Nations Foundation. The goal of the Alliance and its member organizations was to provide 100 million clean cookstoves by 2020 (Smith 2010), and its mission was to "save lives, improve

livelihoods, empower women, and combat harmful pollution by creating a thriving global market for clean and efficient household cooking solutions" (Collins 2012).

Even though the Alliance was based in Washington, D.C., to "maximize impact and strengthen national markets for clean cooking" (Global Alliance for Clean Cookstoves 2016, p. 18) it selected eight countries' for more intensive, on-the-ground engagement: Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria, and Uganda. In these selected countries, the Alliance "[worked] with private sector manufacturers and distributors of cookstoves and fuels, local and international non-governmental organizations, national government ministries, and in some cases, local and regional associations, to develop and execute 'country action plans' (CAPS)" that were used to establish a country-level vision and strategy for the industry (London and Fay 2018). Alliance market managers were hired to implement the CAPS, design campaigns to legitimate the product category, collaborate across stakeholder groups, and monitor and evaluate the Alliance's market-enabling activities (United Nations Foundation 2015). In some countries, the Alliance also assisted with creating and funding an industry association "to ensure sector players and facilitators are working towards a cohesive coordinated strategy and are learning from each other, leveraging each other's work, not duplicating efforts, and are able to advocate for the sector with one unified voice" (Government of the People's Republic of Bangladesh 2013). These in-country efforts established the knowledge base for national clean cookstove industries by addressing uncertainties in the supply of clean cookstove companies, clean cookstove technologies, consumer demand, partnerships within the ecosystem, and industry-supporting institutions (e.g., technological standards, norms, values, and beliefs around clean cooking, and policies). While this knowledge base accelerated the growth of the clean cookstove industry in selected counties, lessons were also transferred to non-selected countries

Table 4.1 The nascent clean cookstove industry

Historical conditions and uncertainties	The Alliance's knowledge-aggregating activities in selected countries	Knowledge learned and transferred by second-order knowledge intermediaries to non-selected countries
Supply dimension		
• Despite years of clean cookstove interventions, existing cookstove companies were not scalable or profitable • Lack of long-term private investment	• Mobilized investment from development sector and eventually private sector • Encouraged entry/upskilling of scalable, profitable companies through funding mechanisms	• Knowledge of what was required to become and how to operate a scalable and profitable clean cookstove company • Knowledge of funders' expectations
Technological dimension		
• Little data about what constituted a "clean" cookstove in terms of health improvements • Lack of knowledge on how to reduce emissions and increase efficiency while keeping the cookstove affordable	• Invested in developing technological standards and cookstove testing facilities • Expanded the category of clean cookstoves to include clean fuels and non-biomass stoves	• Knowledge of what constituted a quality clean cookstove • Knowledge of the acceptability of a wide range of clean cooking technologies
Demand dimension		
• Uncertainty about what exactly would convince consumers to purchase a clean cookstove (i.e., information, behavior change, experience with product) • Lack of knowledge about what kind of marketing would be effective	• Ran consumer awareness and behavior change communication through funded partners	• Knowledge of what marketing interventions are more successful than others and why
Ecosystem dimension		
• Magnified by extreme difficulty distributing clean cookstoves to rural areas • Uncertainty about identifying who would be effective partners	• Convened industry actors in-person and online to reduce partner search costs • Vetted partners through funding applications	• Knowledge of who was working in the industry and their values and incentives • Knowledge of how to assess good partners through from experience
Institutional dimension		
• Taxes, tariffs, and duties increased costs of clean cookstoves • Lack of government acknowledgement of the clean cookstove sector as an industry • Lack of unified collective action among industry actors limited lobbying efforts	• Organized industry actors for collective action through industry associations and vision casting • Identified specific policies for lobbying and made concerted effort toward them	• Knowledge of how to lobby collectively, leveraging associations, and also independently when associations were not an option

by second-order knowledge intermediaries.

Table 4.1 summarizes historical conditions in selected and non-selected countries, how the Alliance acted as a first-order knowledge intermediary in selected countries, what industry actors learned through the Alliance's knowledge aggregation efforts, and what knowledge these industry actors transferred to non-selected countries as second-order knowledge intermediaries. A fuller description of these results is available in Appendix 4.A and Appendix 4.B, which draw on 23 interviews with global clean cookstove industry actors and archival documents.

4.4 Data and methods

4.4.1 Data

The data used for hypothesis testing was sourced from the publicly available Global Alliance for Clean Cookstoves online partner directory, which as of January 2023 contained 2,371 entries. This partnership directory is considered to be the ultimate database of clean cookstove industry actors by multiple international development programs, including the World Bank's Energy Sector Assistance Program and the Partnership for Clean Indoor Air. The Alliance's online partner directory included information such as organization name, country where the organization is based, country or countries where the organization is operating, organization type (i.e., carbon asset/project developer, consultant, foundation, government, investor, multilateral organization, national or multinational enterprise, non-governmental organization, research, small or medium enterprise, or other), whether the organization works in specific roles in the clean cooking industry ("cookstove design / manufacture / assembly," "cookstove distribution / retail / consumer finance," fuel distribution / retail," and "fuel production / processing"), technologies and fuels that the organization is involved with, organizational expertise (selected from a list of options), description of the organizational

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mission, description of the organization's clean cooking activities, description in the type of partnership the organization is interested in, primary and potentially secondary points of contact, and website.[28] The directory was scraped using R in the order that the organizations were added.

The year that an organization joined the Alliance was determined using 64 webpages on which the Alliance announced new members. Announcements began in October 2012 and were made periodically until July 2019. Organizations that were listed multiple times but with different countries of operations were combined into a single organization. Organizations that listed duplicate information and organizations that did not list a country of operation were removed. Unless they were newly founded companies, organizations that joined the Alliance in or after 2019 were additionally removed from the dataset, as the Alliance underwent a change of leadership in 2018 that expanded its focus from clean cookstoves to cleaner technologies that did not rely on biomass energy (i.e., liquified petroleum gas and electric cooking). This left 1,996 distinct organizations that were used to create the dataset for this study.

From here, country-year observations were created. Because this research is only interested in countries where there is potential demand for clean cookstoves in the general population, only countries for which at least one of the following statements is true were included: 1) over five percent of the country's population used solid fuels according to data maintained by the Alliance as of 2018 (Global Alliance for Clean Cookstoves 2018) and 2) over five percent of the country's population primarily relied on polluting fuels and technologies for cooking in 2010 according to data maintained by the World Health Organization (2022).

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[28] This information is voluntarily self-reported. Although it needs to be approved by the Alliance before being made publicly available, there may be some systemic biases in which organizations join the directory. For example, it is more likely that industry actors seeking partnerships are more likely to join the directory. However, this aligns with the proposed theory, which explains that engagement with the first-order knowledge intermediary's knowledge aggregation efforts is how second-order knowledge intermediaries learn.

Table 4.2 Countries in dataset

Afghanistan	Georgia	Peru
Albania	Grenada	Philippines
Angola	Guinea	Republic of the Congo
Armenia	Guinea-Bissau	Romania
Azerbaijan	Guyana	Rwanda
Belize	Haiti	Samoa
Benin	Honduras	Sao Tome and Principe
Bhutan	Indonesia	Senegal
Bolivia	Iraq	Serbia
Bosnia and Herzegovina	Jamaica	Sierra Leone
Botswana	Kazakhstan	Solomon Islands
Brazil	Kiribati	Somalia
Bulgaria	Kyrgyzstan	South Africa
Burkina Faso	Laos	South Sudan
Burundi	Latvia	Sri Lanka
Cape Verde	Lesotho	Sudan
Cambodia	Liberia	Suriname
Cameroon	Macedonia	Swaziland
Central African Republic	Madagascar	Tajikistan
Chad	Malawi	Tanzania
Colombia	Maldives	Thailand
Comoros	Mali	Timor-Leste
Cook Islands	Marshall Islands	Togo
Costa Rica	Mauritania	Tonga
Cote d'Ivoire	Mexico	Turkey
Croatia	Micronesia	Tuvalu
Cuba	Moldova	Ukraine
Democratic Republic of the Congo	Mongolia	Uzbekistan
Djibouti	Montenegro	Vanuatu
Dominica	Mozambique	Vietnam
Dominican Republic	Myanmar	Yemen
Ecuador	Namibia	Zambia
El Salvador	Nepal	Zimbabwe
Equatorial Guinea	Nicaragua	
Eritrea	Niger	
Estonia	Niue	
Ethiopia	Pakistan	
Fiji	Panama	
Gabon	Papua New Guinea	
Gambia	Paraguay	

Moreover, the countries could not be those that the Alliance selected to operate as a first-order intermediary. This left 113 countries in the dataset. These countries are listed in Table 4.2. The first year in this dataset was 2013 and the last year was 2019, for a total of seven years. The final dataset had 791 country-year observations, and each observation contained information about the present year and the previous year.

4.4.2 Dependent and explanatory variables

The dependent variable for all hypotheses is *entrepreneurial entries in year$_t$*, or the current year. Organizations that contributed to this count were those that listed themselves as a "small or medium enterprise" or "national companies" in the Alliance partner directory, indicated some type of cookstove or fuel "work" on their profile, only operated in one non-selected country, and joined the directory in or after 2013. The second condition was added to observe entrepreneurial entries by companies that were working as producers or complements as opposed to, for example, media companies or consultants that only tangentially worked in the clean cookstoves industry. The third condition was added to observe the nascent industry development that is localized in non-selected countries. Depending on data availability, the founding year was determined as the 1) incorporation year according to the Orbis or Open Corporates database, 2) domain name registration date from the WHOXML or WHOXY database, 3) self-reported founding year on the company's social media or website, or 4) the year that the organization joined the Alliance partner directory. Founding years were required to be earlier than or equal to the year that the company joined the Alliance partner directory. For each country-year observation, this information was used to determine how many entrepreneurial entries occurred in the current year.

The explanatory variable for Hypotheses 1, 2, and 5 is *second-order knowledge intermediaries in year$_{t-1}$*, or the previous year. This variable is the number of second-order knowledge intermediaries in a non-selected countries in the previous year, which is equivalent to the number of organizations that operated in at least one selected country and the observed non-selected country in the previous year.

The explanatory variables for Hypotheses 3a, 3b, and 3c are second-order knowledge intermediaries (SOKI) which are *complements in year$_{t-1}$*, *nominal champions in year$_{t-1}$*, and *companies in year$_{t-1}$*, respectively. These variables are the number of second-order knowledge intermediaries that are categorized by their self-reported organization type. Complements are second-order intermediaries self-reported as non-governmental organizations or research organizations. Conceptually, these organization were engaged in the clean cookstove industry value chain activities of research and development and distribution, though not as companies. Nominal champions are second-order intermediaries self-reported as multilateral organizations. Conceptually, these organizations were engaged with the nascent clean cookstove industry in name only, for reasons such as being ceremonially aligned with an important grand challenge. Companies are second-order knowledge intermediaries self-reported as small or medium enterprises or national or multinational companies.

Because Hypothesis 4 is about categorically overlapping knowledge bases, the explanatory variable for the hypothesis is the number of *second-order knowledge intermediaries with cookstove knowledge in year$_{t-1}$*. This means that the second-order knowledge intermediaries listed "cookstove design / manufacture / assembly" or "cookstove distribution / retail / consumer finance" as their line of work.

4.4.3 Moderator variables

The moderator variable for Hypothesis 2 is the *average number of cross-border organizational units in year$_{t-1}$* across all second-order knowledge intermediaries. For each country-year, this is calculated as the total number of countries that second-order knowledge intermediaries worked in divided by the total number of second-order knowledge intermediaries in the previous year.

The moderator variable for Hypothesis 4 is the *percentage of domestic industry actors with cookstove knowledge in year$_{t-1}$*. Domestic organizations are organizations that only work in the non-selected countries. This variable is the number of domestic organizations that listed their work as "cookstove design / manufacture / assembly" or "cookstove distribution / retail / consumer finance" divided by the total number of domestic organizations in the previous year. If there are zero domestic organizations in the previous year for an observation, then this value is empty.

The moderator variable for Hypothesis 5 is the country-level score of the cultural dimension of *autonomy*. This score is taken directly from Schwartz's survey of cultural orientations, which asked schoolteachers[29] in 80 countries to rate each end of each continuum (i.e., both autonomy and embeddedness) as "a guiding principle in my life" using a scale from 7 (of supreme importance) to 0 (not important) and -1 (in opposition to beliefs) (Schwartz 2014). Because characteristics that are emphasized on one end of a cultural dimension are deemphasized on the other end of the dimension, only autonomy is analyzed.

4.4.4 Control variables

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[29] Given that these are schoolteachers rating autonomy (who may operate in highly regulated contexts), this measure of autonomy may be a conservative estimate for a country's cultural autonomy.

Several control variables were added, and they were selected carefully to avoid multicollinearity. The first set of control variables are calculated directly from the Alliance partner directory. The *percentage of domestic industry actors in year$_{t-1}$* is the number of industry actors that only work in the non-selected country divided by the total number of industry actors in the non-selected country in the previous year. The *percentage of non-second-order knowledge intermediaries in year$_{t-1}$* is the number of industry actors that work in the non-selected country and at least one other country that is not a selected country divided by the total number of industry actors in the non-selected country in the previous year. The *percentage of industry actors that work in cookstoves or fuels in year$_{t-1}$* is the number of industry actors in a non-selected country that listed one of the four cookstove or fuel "work" options in their profile divided by the total number of industry actors in the country in the previous year.

To control for the industry actors' average level of professionalism in a country-year, the *log(average profile character count in year$_{t-1}$)* across second-order knowledge intermediaries was included. This is the number of characters in the sections of the Alliance partner profile that the industry actor had to write (i.e., sections for its mission, clean cooking activities, and desired partnership), taken as an average across all industry actors operating in a country in the previous year, logged.

To account for a country's experience with clean cookstoves, an indicator variable describing the presence of a *prior cookstove program* in the country before 2010 was additionally included as a control variable (1 for program presence, 0 for program absence). This data was collected for a University of California Berkeley thesis and was graciously provided by the thesis' author (Gifford 2010).

To control for factors that affect the global diffusion of knowledge and institutions, two variables were added. Prior research shows that networks formed by intergovernmental organizations can assist with the diffusion of norms (Ingram and Torfason 2010). Therefore, the *log(joint IGO memberships)* between the non-selected country and all selected countries in 2014, logged. IGO membership data comes from the Correlates of War Project, which tracks the membership of countries in IGOs from 1815 to 2014 (Pevehouse et al. 2021). *English* is a categorical variable describing whether a non-selected country speaks English (1 for English-speaking, 0 for non-English-speaking). A country's English-speaking status is determined by whether English is listed as a language in the CIA World Factbook.

Lastly, to account for other country-level factors that would affect cookstove demand, a non-selected country's rural population is controlled for as the *log(rural population in year$_{t-1}$)*. According to World Health Organization data, rural populations have a higher percentage of people relying on polluting fuels compared to urban populations, so demand is presumably greater in rural areas. However, it is also more difficult to address rural markets due to the high costs related to poor infrastructure, as well as overall lower incomes in rural areas.

4.4.5 Analytical method

Because the dependent variable is count data, Poisson regressions for country-year observations were run for all hypotheses.[30] All time-variant explanatory and control variables were lagged by one year, and time-invariant control variables were held constant. Regressions were run with year fixed effects to control for global shocks or historical trends that may affect

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[30] A negative binomial model was also run due to concerns with overdispersion in the data. However, in the full model for Hypothesis 1, a likelihood-ratio test of the null hypothesis that the dispersion parameter was zero could not be rejected (chi-squared value was equal to 0 with 1 degree of freedom, p-value=0.5). As a result, the simpler Poisson regression was used for all hypotheses.

entrepreneurial entry in a year or in a country. Heteroskedasticity and cluster-robust standard

errors by country are reported to account for the fact that observations in each country were not

independent.

4.5 Results

4.5.1 Hypothesis testing

Table 4.3 depicts descriptive statistics for the variables included in the following models.

Because the data for these variables come from different datasets that may be missing data for

some countries and some years (*percentage of domestic actors with cookstove knowledge in*

year$_{t-1}$ and *autonomy*), some variables' counts are less than the number of observations in the

dataset (791). Table 4.4shows pairwise correlations for variables in regressions testing

Hypotheses 1 to 5. These variables were carefully selected to avoid multicollinearity when

running the

Table 4.3 Descriptive statistics

	count	mean	sd	min	max
(1) entrepreneurial entries$_t$	791	0.1	0.38	0.0	4.0
(2) second-order knowledge intermediaries$_{t-1}$	791	27.8	20.77	0.0	105.0
(3) SOKI complements $_{t-1}$	791	12.2	9.56	0.0	54.0
(4) SOKI champions $_{t-1}$	791	1.5	0.92	0.0	5.0
(5) SOKI companies $_{t-1}$	791	5.7	5.27	0.0	27.0
(6) SOKI w/ cookstove knowledge $_{t-1}$	791	8.1	7.80	0.0	45.0
(7) avg cross-border org units $_{t-1}$	785	85.8	36.60	17.0	199.5
(8) % domestic actors w/ cookstove knowledge $_{t-1}$	387	46.9	33.71	0.0	100.0
(9) autonomy	210	4.1	0.27	3.6	4.7
(10) % domestic actors $_{t-1}$	785	5.1	7.32	0.0	58.8
(11) % non-SOKI $_{t-1}$	785	5.9	5.88	0.0	33.3
(12) % actors that work in cookstoves or fuels $_{t-1}$	785	0.3	0.13	0.0	0.7
(13) log(avg SOKI profile char count $_{t-1}$)	785	6.8	0.17	6.2	7.9
(14) prior cookstove program	791	0.3	0.47	0.0	1.0
(15) log(joint IGO memberships)	756	5.7	0.20	4.9	6.1
(16) English	791	0.5	0.50	0.0	1.0
(17) log(rural population $_{t-1}$)	770	14.8	2.01	8.4	18.7
Observations	791				

Table 4.4 Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) entrepreneurial entries$_t$	1.00						
(2) second-order knowledge intermediaries$_{t-1}$	0.25*	1.00					
(3) SOKI complements $_{t-1}$	0.25*	0.95*	1.00				
(4) SOKI champions $_{t-1}$	-0.06	0.41*	0.45*	1.00			
(5) SOKI companies $_{t-1}$	0.28*	0.95*	0.85*	0.26*	1.00		
(6) SOKI w/ cookstove knowledge $_{t-1}$	0.28*	0.95*	0.88*	0.35*	0.93*	1.00	
(7) avg cross-border org units $_{t-1}$	-0.27*	-0.50*	-0.55*	-0.11*	-0.48*	-0.49*	1.00
(8) % domestic actors w/ cookstove knowledge $_{t-1}$	-0.01	0.20*	0.12	0.23*	0.19*	0.24*	0.15*
(9) autonomy	-0.26*	-0.28*	-0.24*	-0.10	-0.34*	-0.31*	0.23*
(10) % domestic actors $_{t-1}$	0.37*	0.53*	0.55*	0.11*	0.51*	0.57*	-0.50*
(11) % non-SOKI $_{t-1}$	0.04	0.10*	0.10*	-0.06	0.09*	0.12*	-0.21*
(12) % actors that work in cookstoves or fuels $_{t-1}$	0.18*	0.47*	0.38*	0.18*	0.49*	0.61*	-0.30*
(13) log(avg SOKI profile char count $_{t-1}$)	0.04	0.16*	0.08	0.14*	0.21*	0.23*	0.09
(14) prior cookstove program	0.28*	0.57*	0.56*	0.06	0.58*	0.56*	-0.54*
(15) log(joint IGO memberships)	0.22*	0.44*	0.43*	0.13*	0.44*	0.38*	-0.52*
(16) English	0.09	0.10*	0.09*	0.14*	0.08	0.12*	-0.05
(17) log(rural population $_{t-1}$)	0.25*	0.52*	0.55*	0.02	0.51*	0.52*	-0.60*

Variables	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(8) % domestic actors w/ cookstove knowledge $_{t-1}$	1.00						
(9) autonomy	0.11	1.00					
(10) % domestic actors $_{t-1}$	-0.05	-0.35*	1.00				
(11) % non-SOKI $_{t-1}$	-0.08	0.29*	0.17*	1.00			
(12) % actors that work in cookstoves or fuels $_{t-1}$	0.44*	-0.23*	0.44*	0.36*	1.00		
(13) log(avg SOKI profile char count $_{t-1}$)	0.18*	-0.34*	0.15*	-0.05	0.28*	1.00	
(14) prior cookstove program	-0.08	-0.18*	0.54*	0.15*	0.37*	0.04	1.00
(15) log(joint IGO memberships)	-0.09	-0.32*	0.40*	0.32*	0.31*	-0.06	0.41*
(16) English	0.07	-0.55*	0.17*	-0.16*	0.10*	0.17*	0.03
(17) log(rural population $_{t-1}$)	-0.18*	-0.30*	0.56*	0.16*	0.41*	0.07	0.44*

Variables	(15)	(16)	(17)
(15) log(joint IGO memberships)	1.00		
(16) English	-0.02	1.00	
(17) log(rural population $_{t-1}$)	0.53*	-0.11*	1.00

* shows significant at p<0.01

models, and the pairwise correlations indicates that strong correlation between independent variables (i.e., pairwise correlation > 0.6) is not a concern. However, there may be some weak or moderate correlation. When running the following models, care was taken to manage

multicollinearity by removing impact variables.

Table 4.5 presents Poisson regression results for the control variables (Models 1 and 2) and Hypothesis 1 (Models 3 to 5). Because *percentage of domestic actors with cookstove knowledge in year$_{t-1}$* nearly halves the sample size, separate models are run to include it.

Table 4.5 Poisson regression results for controls and Hypothesis 1

Dependent variable: entreprenuerial entries$_t$	(1) Controls	(2) Controls	(3) H1	(4) H1
second-order knowledge intermediaries$_{t-1}$			0.045*** (0.013)	0.046** (0.015)
avg cross-border org units$_{t-1}$	-0.028*** (0.008)	-0.028** (0.009)	0.012 (0.010)	0.017 (0.011)
% domestic actors $_{t-1}$	0.015 (0.015)	0.015 (0.016)	0.034* (0.015)	0.034* (0.016)
% non-SOKI $_{t-1}$	-0.043+ (0.024)	-0.031 (0.032)	-0.047* (0.023)	-0.041 (0.030)
% actors that work in cookstoves or fuels $_{t-1}$	5.315*** (1.431)	4.591** (1.569)	6.390*** (1.487)	5.810*** (1.567)
log(avg SOKI profile char count $_{t-1}$)	-0.480 (1.567)	0.402 (2.154)	-0.033 (1.527)	0.976 (2.060)
prior cookstove program	0.326 (0.339)	0.485 (0.400)	0.132 (0.373)	0.283 (0.405)
log(joint IGO memberships)	2.485* (1.240)	2.458+ (1.398)	2.913** (1.110)	2.628* (1.229)
English	-0.007 (0.278)	-0.008 (0.336)	-0.219 (0.257)	-0.145 (0.293)
log(rural population $_{t-1}$)	0.247* (0.118)	0.236+ (0.131)	0.197 (0.129)	0.154 (0.146)
% domestic actors w/ cookstove knowledge $_{t-1}$		0.006 (0.007)		0.002 (0.006)
Constant	-17.468* (7.998)	-23.347* (10.360)	-26.613*** (7.259)	-31.484*** (9.113)
Observations	746	381	746	381
Pseudo R^2	0.310	0.220	0.332	0.244

Standard errors in parentheses
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Hypothesis 1 posits that more second-order knowledge intermediaries in the prior year in non-selected countries are associated with an increase in entrepreneurial entries in the current year. Models 3 and 4 provide support for Hypothesis 1. All effects on coefficients for the primary explanatory variable are positive and statistically significant ($p<0.05$). Model 3 can be used to interpret the results. A Poisson regression models the log of the expected count as a function of the independent variables, so each additional second-order knowledge intermediary is associated with an increase in entrepreneurial entries by a factor of 1.05 (i.e., $e^{0.045}$), or about a 5% more entrepreneurial entries.
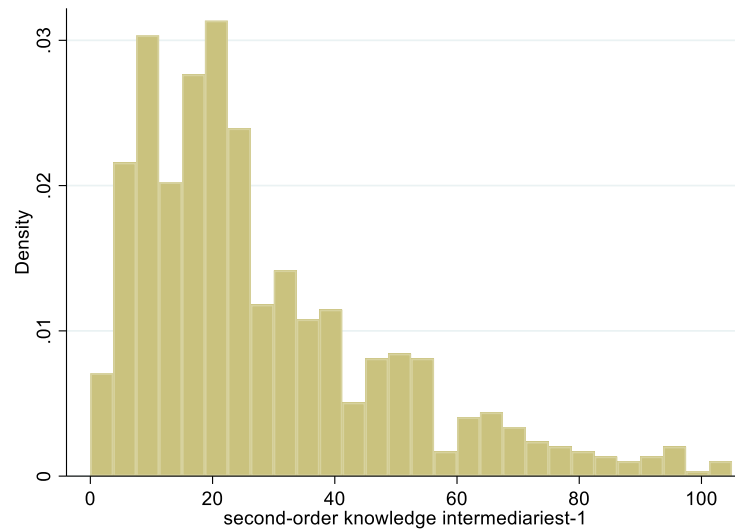
Figure 4.1 Histogram of second-order knowledge intermediaries in year$_{t-1}$

Figure 4.1 shows the distribution of second-order knowledge intermediaries across all observations. According to the summary statistics, the median number of second-order knowledge intermediaries across all observations is only 22. Given this distribution, it is likely that the marginal effect of second-order knowledge intermediaries on entrepreneurial entries may not be constant. Hence, a piecewise model was additionally fitted to the data. This was done by beginning with a model with many knots and iteratively eliminating those where the marginal

Table 4.6 Hypothesis 1 piecewise regression and interaction with years 2018-2019

Dependent variable: entreprenurial entries$_t$	(5) Piecewise	(6) Piecewise	(7) 2018-2019	(8) 2018-2019
second-order knowledge intermediaries$_{t-1}$ (<15)	0.304** (0.099)	0.402** (0.145)		
second-order knowledge intermediaries$_{t-1}$ (>=15)	0.044** (0.015)	0.040** (0.015)		
second-order knowledge intermediaries$_{t-1}$ # year2018_2019=0			0.057*** (0.015)	0.059*** (0.015)
second-order knowledge intermediaries$_{t-1}$ # year2018_2019=1			0.031* (0.013)	0.029* (0.014)
avg cross-border org units$_{t-1}$	0.023* (0.012)	0.024^{+} (0.013)	0.014 (0.010)	0.019^{+} (0.010)
% domestic actors $_{t-1}$	0.047** (0.015)	0.053** (0.016)	0.038* (0.015)	0.038* (0.016)
% non-SOKI $_{t-1}$	-0.025 (0.030)	0.005 (0.031)	-0.049* (0.024)	-0.038 (0.031)
% actors that work in cookstoves or fuels $_{t-1}$	8.069*** (1.636)	7.945*** (1.815)	6.805*** (1.595)	6.382*** (1.704)
log(avg SOKI profile char count $_{t-1}$)	0.161 (1.465)	0.692 (1.535)	-0.050 (1.569)	0.882 (2.041)
prior cookstove program	0.056 (0.383)	0.311 (0.401)	0.062 (0.376)	0.235 (0.408)
log(joint IGO memberships)	2.784** (1.003)	2.933** (1.037)	3.093** (1.126)	2.936* (1.276)
English	-0.227 (0.275)	-0.228 (0.317)	-0.254 (0.261)	-0.196 (0.301)
log(rural population $_{t-1}$)	0.158 (0.140)	0.169 (0.149)	0.178 (0.132)	0.143 (0.145)
% domestic actors w/ cookstove knowledge $_{t-1}$		-0.000 (0.006)		0.001 (0.007)
Constant	-31.669*** (8.475)	-38.280*** (8.690)	-27.652*** (7.454)	-32.941*** (9.113)
Observations	746	381	746	381
Pseudo R^2	0.350	0.266	0.338	0.253

Standard errors in parentheses
$^{+} p < 0.10$, $^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

effect was not statistically significant (i.e., there was no change in effect between the knot and the previous knot). Ultimately, the data was modeled as a piecewise model with a single knot at 15 second-order knowledge intermediaries. Table 4.6 Models 5 and 6 depict piecewise regression results. As shown in Model 5, when 1 to 14 second-order knowledge intermediaries are present in the previous year, each additional second-order knowledge intermediary is associated with an increase in entrepreneurial entries by a factor of 1.36 (i.e., $e^{0.304}$), or about 36% more entrepreneurial entries. When 15 or more second-order knowledge intermediaries are present in the previous year, each additional second-order knowledge intermediary is associated with an increase in entrepreneurial entries by a factor of 1.04 (i.e., $e^{0.044}$), or about 4% more entrepreneurial entries. Each of these slopes is significantly different from 0 ($p<0.01$), and the difference between the second slope and the first slope is also statistically significant ($p=0.011$).

The Alliance's change of leadership in 2018 that shifted its focus from clean cookstoves to clean cooking more broadly (and, particularly, technologies like liquified petroleum gas and electric cooking) additionally affected the association between second-order knowledge intermediaries and entrepreneurial entries. Prior to 2018, second-order knowledge intermediaries learned and transferred an industry knowledge base focused on clean cookstoves that used biomass fuel. After the Alliance expanded its focus to include cleaner technologies, it would be expected that second-order knowledge intermediaries would be associated with fewer entrepreneurial entries. Given their prior knowledge, second-order knowledge intermediaries may not value or be able to absorb new knowledge about cleaner technologies, and they may be less motivated to learn and transfer this knowledge. Models 7 and 8 in Table 4.6 interact second-

order knowledge intermediaries with a dummy variable valued 0 if the year is 2013 to 2017 and 1 if the year is 2018 to 2019. Model 7 shows that in the years 2013 to 2017, second-order intermediaries are more strongly associated with entrepreneurial entries than in the years 2018 to 2019 (coefficient of 0.057 compared to 0.031). Both coefficients are statistically significant ($p<0.001$ and $p<0.05$, respectively), and the difference between these coefficients is also statistically significant ($p<0.05$). The results of this analysis support the idea of knowledge transfer by second-order knowledge intermediaries.

Hypothesis 2 posits that in non-selected countries, second-order knowledge intermediaries with more cross-border organizational units are associated with a weaker effect of second-order knowledge intermediaries on entrepreneurial entries. The 423 second-order knowledge intermediaries accounted for in this research varied by how many cross-border organizational units they had, or how many countries they operated in. Some second-order
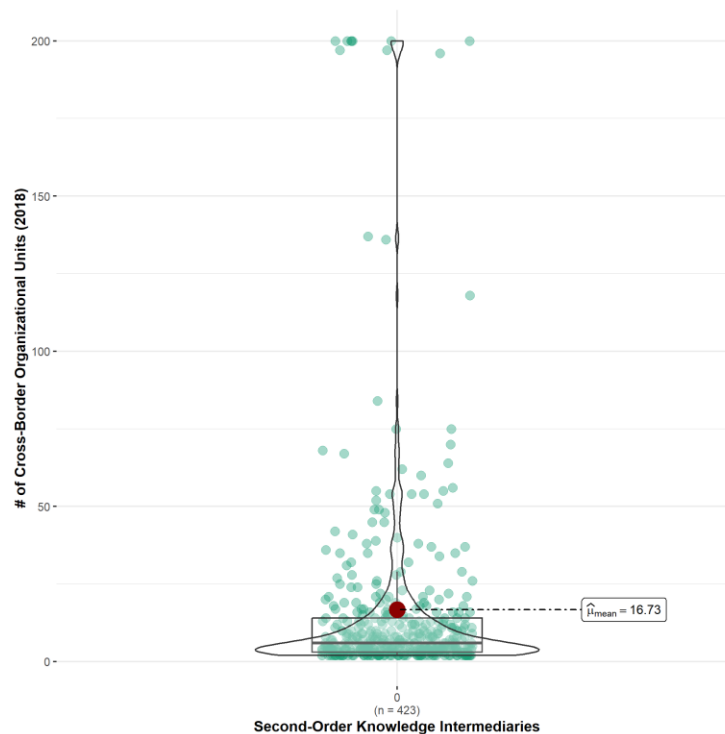
Figure 4.2 Distribution of cross-border organizational units across all second-order knowledge intermediaries

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knowledge intermediaries operated in 200 countries, and some operated in only 2. On average, second-order knowledge intermediaries operated in 16.7 countries, and half of them operated in fewer than 6 countries (see Figure 4.2).

Table 4.7 presents Poisson regression results for Hypothesis 2. First, the number of second-order knowledge intermediaries and average number of cross-border organizational units were interacted in Models 5 and 6. Even though Model 5 produces a positive and statistically significant (p<0.05) coefficient on this interaction term, the main effect of second-order intermediaries becomes insignificant. It was recognized that this was likely not the best-fitting model for the direct and moderating effects of the average number of cross-border organizational units. A quadratic term was included, as there is theoretical backing it. If second-order knowledge intermediaries have only a few cross-border organizational units on average, this may be a sign that they are young and/or less capable compared to those that have more. They may be less able to successfully transfer knowledge from selected to non-selected countries, and fewer entrepreneurial entries would occur as a result. However, if second-order knowledge intermediaries have many cross-border organizational units on average, then they may not be motivated to transfer knowledge, as previously theorized. This would also result in fewer entrepreneurial entries.

Models 11 and 12 in Table 4.7 include the squared average number of cross-border organizational units as a variable and its interaction with second-order intermediaries. Model 11 shows that, once these terms are included, the direct effect of second-order intermediaries is statistically significant (p<0.01). The coefficient on the interaction term between second-order knowledge intermediaries and the average cross-border organizational units is negative as predicted, yet it is only statistically significant at p<0.10. The direct effect of the additional

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Table 4.7 Poisson regression results for Hypothesis 2

Dependent variable: entrepreneurial entries$_t$	(9) H2	(10) H2	(11) H2	(12) H2
second-order knowledge intermediaries$_{t-1}$	0.025 (0.016)	0.026 (0.020)	0.124** (0.045)	0.162** (0.062)
avg cross-border org units $_{t-1}$	0.007 (0.011)	0.009 (0.013)	0.086+ (0.047)	0.128+ (0.077)
second-order knowledge intermediaries $_{t-1}$ # avg cross-border org units $_{t-1}$	0.001* (0.000)	0.001 (0.000)	-0.003+ (0.002)	-0.005+ (0.002)
avg cross-border org units$^2_{t-1}$			-0.001+ (0.000)	-0.001 (0.001)
second-order knowledge intermediaries$_{t-1}$ # avg cross-border org units$^2_{t-1}$			0.000* (0.000)	0.000* (0.000)
% domestic actors $_{t-1}$	0.039* (0.016)	0.037* (0.017)	0.046** (0.017)	0.048** (0.018)
% non-SOKI $_{t-1}$	-0.060* (0.027)	-0.047 (0.034)	-0.054+ (0.028)	-0.029 (0.036)
% actors that work in cookstoves or fuels $_{t-1}$	8.096*** (1.896)	7.361*** (2.144)	7.858*** (1.885)	7.468*** (2.092)
log(avg SOKI profile char count $_{t-1}$)	-0.203 (1.469)	0.773 (1.970)	0.136 (1.473)	1.202 (1.802)
prior cookstove program	0.014 (0.372)	0.230 (0.402)	0.010 (0.374)	0.261 (0.410)
log(joint IGO memberships)	2.649* (1.104)	2.520* (1.198)	2.758* (1.111)	2.770* (1.194)
English	-0.251 (0.253)	-0.175 (0.304)	-0.301 (0.261)	-0.238 (0.312)
log(rural population $_{t-1}$)	0.201 (0.127)	0.182 (0.143)	0.158 (0.135)	0.138 (0.146)
% domestic actors w/ cookstove knowledge $_{t-1}$		0.002 (0.006)		0.001 (0.006)
Constant	-25.046*** (7.523)	-30.664*** (9.199)	-30.034*** (8.286)	-38.527*** (10.108)
Observations	746	381	746	381
Pseudo R^2	0.337	0.247	0.344	0.260

Standard errors in parentheses
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

squared variable is negative, and it is also only statistically significant at p<0.10, indicating some support for what was theorized. Curvilinear moderation is present and statistically significant (p<0.05), though it is effectively 0. This means that if the average cross-border organizational units negatively moderates the effect of second-order knowledge intermediaries on entrepreneurial entries, then it is not diminished by the curvilinear moderating effect.

Given the distribution of cross-border organizational units across all second-order knowledge intermediaries (Figure 4.2), there may also be concern that the few second-order intermediary with many organizational units are skewing the results and should be considered as outliers. To investigate this, Models 11 and 12 were rerun with maximum limits on all industry actors' number of cross-border organizational units (Table 4.8 and Table 9). For example, for Model 13 in Table 4.8, only industry actors that operate in 1 to 175 countries were included in the analysis; industry actors that operate in more than 175 countries were excluded.

Table 4.8 reveals that across all maximum limits on cross-border organizational limits, there is a negative coefficient on the interaction term of the average number of cross-border organizational units and second-order knowledge intermediaries. However, the effects are only statistically significant for the maximum limits of 125 cross-border organizational units (though only at p<0.10), 100 cross-border organizational units (p<0.01), 75 cross-border organizational units (p<0.01), and 50 cross-border organizational units (p<0.01). It can be more confidently said that Hypothesis 2 holds for second-order knowledge intermediaries that operate in between 26 and 100 countries.

Table 4.9 includes the percentage of domestic actors with cookstove knowledge as a control variable. Interestingly, the negative interaction effect argued in Hypothesis 2 becomes much more pronounced. The coefficient on the interaction term of interest is negative and

Table 4.8 Poisson regression results for Hypothesis 2 with limits to the maximum number of cross-border organizational units possessed by industry actors

Dependent variable: entrepreneurial entries$_t$	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Max number of cross-border organizational units:	175	150	125	100	75	50	25
second-order knowledge	0.066$^+$	0.066$^+$	0.113*	0.216***	0.218***	0.387**	0.607$^+$
intermediaries$_{t-1}$	(0.037)	(0.037)	(0.055)	(0.062)	(0.059)	(0.132)	(0.338)
avg cross-border org	-0.062	-0.062	0.011	0.402**	0.371**	0.590*	1.770
units $_{t-1}$	(0.066)	(0.066)	(0.109)	(0.145)	(0.132)	(0.252)	(1.339)
second-order knowledge	-0.004	-0.004	-0.008$^+$	-0.015**	-0.016**	-0.044**	-0.101
intermediaries$_{t-1}$ # avg cross-border org units $_{t-1}$	(0.002)	(0.002)	(0.004)	(0.006)	(0.006)	(0.017)	(0.062)
avg cross-border	0.000	0.000	-0.001	-0.007**	-0.007**	-0.017*	-0.071
org units$^2_{t-1}$	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.008)	(0.058)
second-order knowledge	0.000*	0.000*	0.000*	0.000**	0.000**	0.001*	0.005$^+$
intermediaries$_{t-1}$ # avg cross-border org units$^2_{t-1}$	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-15.669*	-15.669*	-15.238$^+$	-19.690*	-16.911$^+$	-21.987*	-32.027**
	(7.624)	(7.624)	(8.020)	(9.375)	(9.038)	(8.661)	(10.139)
Observations	744	744	744	738	736	728	672
Pseudo R^2	0.346	0.346	0.351	0.355	0.352	0.343	0.321

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

statistically significant at p<0.05 for all models in this table (i.e., for all maximum limits on cross-border organizational units). These results are likely due to the reduction in sample size that occurs by including this variable, as these models only include observations for which there is at least one domestic industry actor present in the previous year. Many mechanisms could potentially drive this result. For example, from a knowledge-based perspective, perhaps second-order knowledge intermediaries operating in many countries prioritize knowledge that is irrelevant or not useful for domestic industry actors. Or perhaps second-order knowledge intermediaries operating in many countries are associated with entrepreneurial entries because

Table 4.9 Poisson regression results for Hypothesis 2 with limits to the maximum number of cross-border organizational units possessed by industry actors, including percentage of domestic actors with cookstove knowledge as a control variable

Dependent variable: entrepreneurial entries$_t$	(20)	(21)	(22)	(23)	(24)	(25)	(26)
Max number of cross-border organizational units:	175	150	125	100	75	50	25
second-order knowledge intermediaries$_{t-1}$	0.131**	0.131**	0.184*	0.277***	0.294***	0.479*	1.189***
	(0.051)	(0.051)	(0.074)	(0.067)	(0.065)	(0.189)	(0.301)
avg cross-border org units $_{t-1}$	0.073	0.073	0.139	0.595**	0.662**	0.835$^+$	4.449**
	(0.108)	(0.108)	(0.158)	(0.224)	(0.217)	(0.464)	(1.419)
second-order knowledge intermediaries$_{t-1}$ # avg cross-border org units $_{t-1}$	-0.009*	-0.009*	-0.014*	-0.022***	-0.024***	-0.056*	-0.210***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.007)	(0.025)	(0.056)
avg cross-border org units$^2_{t-1}$	-0.002	-0.002	-0.004	-0.012**	-0.014**	-0.025	-0.191**
	(0.002)	(0.002)	(0.003)	(0.004)	(0.005)	(0.015)	(0.060)
second-order knowledge intermediaries$_{t-1}$ # avg cross-border org units$^2_{t-1}$	0.000*	0.000*	0.000*	0.000***	0.001***	0.002*	0.010***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)
% domestic actors w/ cookstove knowledge $_{t-1}$	0.002	0.002	0.002	0.000	0.002	0.008	0.014
	(0.006)	(0.006)	(0.006)	(0.007)	(0.010)	(0.014)	(0.029)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-17.825$^+$	-17.825$^+$	-17.365$^+$	-24.523*	-23.528*	-28.132**	-45.158***
	(9.695)	(9.695)	(8.910)	(11.859)	(11.559)	(9.736)	(12.650)
Observations	381	381	381	381	381	381	380
Pseudo R^2	0.263	0.263	0.267	0.272	0.270	0.264	0.271

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

their established reputations bring legitimacy to the industry. Legitimacy from foreign actors is not as important if domestic industry actors are already present. Taken together, the results for regressions testing Hypothesis 2 show that there is mixed support for the argument, which depends on boundary conditions.

Hypothesis 3a proposes that second-order knowledge intermediaries which are complements are associated with an increase in entrepreneurial entries. In the clean cookstove

Table 4.10 Poisson regression results for Hypothesis 3a-3c

Dependent variable: entrepreneurial entries$_t$	(27) H3a	(28) H3b	(29) H3c	(30) H3a-H3c
SOKI complements$_{t-1}$	0.050* (0.020)			0.053* (0.023)
SOKI champions$_{t-1}$		-0.273$^+$ (0.165)		-0.454** (0.174)
SOKI companies$_{t-1}$			0.350*** (0.084)	0.282** (0.093)
SOKI companies$^2_{t-1}$			-0.007** (0.002)	-0.007* (0.003)
avg cross-border org units$_{t-1}$	-0.010 (0.009)	-0.030*** (0.008)	0.015 (0.012)	0.018$^+$ (0.010)
% domestic actors$_{t-1}$	0.020 (0.014)	0.015 (0.016)	0.050*** (0.015)	0.046*** (0.014)
% non-SOKI$_{t-1}$	-0.049* (0.025)	-0.036 (0.024)	-0.032 (0.026)	-0.030 (0.027)
% actors that work in cookstoves or fuels$_{t-1}$	6.936*** (1.772)	4.427** (1.515)	6.242*** (1.742)	6.356*** (1.890)
log(avg SOKI profile char count$_{t-1}$)	-0.270 (1.480)	-0.432 (1.563)	-0.757 (1.697)	-0.311 (1.574)
prior cookstove program	0.179 (0.355)	0.312 (0.343)	-0.086 (0.346)	-0.174 (0.368)
log(joint IGO memberships)	2.998** (1.124)	1.920$^+$ (1.121)	1.924$^+$ (1.031)	1.317 (1.075)
English	-0.147 (0.284)	0.028 (0.277)	-0.079 (0.247)	-0.104 (0.249)
log(rural population$_{t-1}$)	0.224$^+$ (0.119)	0.282* (0.134)	0.216 (0.133)	0.292$^+$ (0.151)
Constant	-23.878** (7.863)	-14.318$^+$ (7.854)	-17.071* (7.758)	-17.670* (7.073)
Observations	746	746	746	746
Pseudo R^2	0.322	0.315	0.342	0.353

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

Table 4.11 Poisson regression results for Hypothesis 3a-3c, including percentage of domestic organizations with cookstove knowledge as a control variable

Dependent variable: entrepreneurial entries$_t$	(31) H3a	(32) H3b	(33) H3c	(34) H3a-H3c
SOKI complements$_{t-1}$	0.048*			0.056*
	(0.020)			(0.023)
SOKI champions$_{t-1}$		-0.322$^+$		-0.548**
		(0.185)		(0.201)
SOKI companies$_{t-1}$			0.312**	0.241*
			(0.108)	(0.118)
SOKI companies^2$_{t-1}$			-0.006*	-0.006$^+$
			(0.003)	(0.003)
avg cross-border org units$_{t-1}$	-0.009	-0.030***	0.010	-0.009
	(0.009)	(0.009)	(0.014)	(0.009)
% domestic actors$_{t-1}$	0.003	0.008	0.003	0.003
	(0.007)	(0.007)	(0.007)	(0.007)
% non-SOKI$_{t-1}$	0.020	0.015	0.046**	0.020
	(0.014)	(0.016)	(0.017)	(0.014)
% actors that work in cookstoves or fuels$_{t-1}$	-0.033	-0.029	-0.016	-0.033
	(0.032)	(0.031)	(0.034)	(0.032)
log(avg SOKI profile char count$_{t-1}$)	6.495***	3.267$^+$	5.335**	6.495***
	(1.946)	(1.798)	(1.937)	(1.946)
prior cookstove program	0.605	0.374	-0.089	0.605
	(1.969)	(2.171)	(2.206)	(1.969)
log(joint IGO memberships)	0.349	0.426	0.140	0.349
	(0.398)	(0.408)	(0.420)	(0.398)
English	2.957*	1.632	1.984$^+$	2.957*
	(1.254)	(1.330)	(1.180)	(1.254)
log(rural population$_{t-1}$)	-0.091	-0.032	-0.097	-0.091
	(0.335)	(0.314)	(0.314)	(0.335)
Constant	-29.548**	-18.316$^+$	-21.544*	-19.783*
	(9.724)	(10.411)	(9.722)	(8.824)
Observations	381	381	381	381
Pseudo R^2	0.232	0.227	0.249	0.264

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

industry, few industry actors were vertically integrated, and many relied on complementary others. For example, a research organization designed high-quality cookstoves but lacked manufacturing experience and access to low-income customers. A company manufactured cookstoves but did not possess the technical expertise in research and development or how to reach the "last mile." A nonprofit organization regularly engaged with low-income beneficiaries and provided consumer financing, but it did not produce products. Table 4.10 Model 27 and 30, as well as Table 4.11 Model 31 and 34, provide support for Hypothesis H3a.

Hypothesis 3b proposes that second-order intermediaries which are nominal champions are associated with no effect or a negative effect on entrepreneurial entries. In only five years, the Alliance was able to bring attention to the problem of indoor air pollution and the solution of clean cookstoves, attracting more than $413 million in government, foundation, and corporate funding to the nascent industry, and onboarding actress Julia Roberts and chef José Andrés as global ambassadors (Global Alliance for Clean Cookstoves 2016). Clean cookstoves became a much hyped topic, and many multilateral organizations, regardless of their sector focus, adopted clean cookstoves as part of their agendas, including the World Bank, United Nations Development Programme, United Nations Women, International Energy Agency, and the World Health Organization. Table 4.10 Model 28 and 30, as well as Table 4.11 Model 32 and 34, show that some multilateral organizations' support as champions may have been nominal, as multilateral organizations are not associated with an increasing in entrepreneurial entries. They may even be associated with a decrease in entrepreneurial entries. These results provide support for Hypothesis 3b.

Table 4.12 Poisson regression results for Hypotheses 4 and 5

Dependent variable: entrepreneurial entries$_t$	(35)	(36)	(37)
SOKI w/ cookstove knowledge$_{t-1}$	0.206***		
	(0.050)		
% domestic actors w/ cookstove knowledge $_{t-1}$	0.029**		0.012
	(0.011)		(0.015)
SOKI w/ cookstove knowledge $_{t-1}$ # % domestic actors w/ cookstove knowledge $_{t-1}$	-0.002**		
	(0.001)		
second-order knowledge intermediaries $_{t-1}$		8.860*	8.340*
		(3.492)	(3.766)
autonomy		217.227**	219.627**
		(77.722)	(81.842)
second-order knowledge intermediaries $_{t-1}$ # autonomy		-4.288*	-4.005*
		(1.734)	(1.883)
autonomy^2		-26.589**	-26.816**
		(9.701)	(10.152)
second-order knowledge intermediaries $_{t-1}$ # autonomy^2		0.519*	0.481*
		(0.216)	(0.236)
avg cross-border org units $_{t-1}$	0.004	-0.023	-0.006
	(0.014)	(0.040)	(0.039)
% domestic actors $_{t-1}$	0.029*	0.039**	0.035^{+}
	(0.014)	(0.013)	(0.020)
% non-SOKI $_{t-1}$	-0.027	-0.063	-0.104*
	(0.028)	(0.043)	(0.050)
% actors that work in cookstoves or fuels $_{t-1}$	2.048	2.410	1.444
	(1.850)	(3.336)	(4.309)
log(avg SOKI profile char count $_{t-1}$)	1.156	-3.390	-4.430
	(2.393)	(3.238)	(3.693)
prior cookstove program	0.348	0.890	0.401
	(0.395)	(1.235)	(1.042)
log(joint IGO memberships)	2.889*	4.284	3.974
	(1.464)	(3.613)	(3.794)
English	-0.110	-0.777	-1.183
	(0.302)	(0.582)	(0.765)
log(rural population $_{t-1}$)	0.158	0.108	0.087
	(0.169)	(0.132)	(0.113)
Constant	-33.069**	-449.302**	-446.461**
	(10.868)	(152.988)	(161.991)
Observations	381	207	125
Pseudo R^2	0.251	0.355	0.240

Standard errors in parentheses
$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Hypothesis 3c proposes that second-order intermediaries which are companies are associated with entrepreneurial entries in an inverted-U, curvilinear fashion. Table 4.10 Model 29 and 30 and Table 4.11 Model 33 and 33 additionally provide support for Hypothesis 3c.

Table 4.12 presents Poisson regression results for Hypotheses 4 and 5. Hypothesis 4 posits that more domestic industry actors with pre-existing, categorically overlapping knowledge are associated with a weaker effect of second-order knowledge intermediaries on entrepreneurial entries. As described previously, the explanatory variable for this model is second-order knowledge intermediaries that knowledge about cookstove design and/or distribution. The moderator is the percentage of domestic industry actors with the same categories of cookstove knowledge. Results in Model 35 of Table 4.12 provide support for Hypothesis 4, as seen by the negative sign on the coefficient of the interaction term and the statistical significance of this effect ($p<0.01$).

To check that another of overlapping knowledge between second-order knowledge intermediaries and domestic industry actors — that which stems from overlapping organizational type — is not driving this effect, Models 38 and 39 in Table 4.13 are also run. These regressions include interactions between second-order intermediaries that are NGOs/companies and the percent of domestic industry actors that are NGOs/companies. Both models show that there is no statistically significant moderating effect. Categorical knowledge about clean cookstoves transcends organizational type.

Hypothesis 5 posits that there is a curvilinear interaction effect of the number of second-order knowledge intermediaries and cultural autonomy on entrepreneurial entries. Tests of this hypothesis are in Table 4.12. They are carried out as an interaction between the number of second-order intermediaries in a country and Schwartz's cultural value orientation score for

Table 4.13 Poisson regression results testing overlapping organizational type between second-order intermediaries and domestic actors

Dependent variable: entrepreneurial entries$_t$	(38)	(39)
SOKI NGOs$_{t-1}$	0.063$^+$	
	(0.034)	
% domestic actors NGOs $_{t-1}$	-0.004	
	(0.007)	
SOKI NGOs$_{t-1}$ # % domestic actors NGOs$_{t-1}$	0.000	
	(0.001)	
SOKI companies$_{t-1}$		0.123*
		(0.053)
% domestic actors companies$_{t-1}$		0.003
		(0.008)
SOKI companies$_{t-1}$ # % domestic actors companies $_{t-1}$		-0.000
		(0.001)
avg cross-border org units $_{t-1}$	-0.006	0.000
	(0.009)	(0.012)
% domestic actors $_{t-1}$	0.023	0.034*
	(0.018)	(0.016)
% non-SOKI$_{t-1}$	-0.037	-0.026
	(0.033)	(0.029)
% actors that work in cookstoves or fuels $_{t-1}$	7.260***	4.590**
	(2.082)	(1.561)
log(avg SOKI profile char count $_{t-1}$)	0.470	0.418
	(1.728)	(2.285)
prior cookstove program	0.264	0.229
	(0.427)	(0.421)
log(joint IGO memberships)	3.211**	2.086
	(1.119)	(1.272)
English	-0.104	-0.051
	(0.328)	(0.300)
log(rural population$_{t-1}$)	0.217	0.182
	(0.132)	(0.151)
Constant	-30.615**	-22.963*
	(9.336)	(10.425)
Observations	381	381
R^2		
Pseudo R^2	0.236	0.237

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

Table 4.14 Poisson regression results for Hypotheses 1 through 4, including autonomy as a control variable

Dependent variable: entrepreneurial entries$_t$	(40) H1	(41) H1	(42) H2	(43) H2	(44) H3	(45) H3	(44) H4
second-order knowledge intermediaries$_{t-1}$	0.024 (0.018)	0.028 (0.022)	0.127 (0.143)	0.158 (0.141)			
SOKI complements$_{t-1}$					0.020 (0.048)	0.025 (0.050)	
SOKI champions$_{t-1}$					-0.171 (0.508)	-0.423 (0.568)	
SOKI companies$_{t-1}$					0.127 (0.160)	0.099 (0.191)	
SOKI companies$^2_{t-1}$					-0.004 (0.004)	-0.003 (0.004)	
SOKI w/ cookstove knowledge$_{t-1}$							0.135 (0.125)
avg cross-border org units$_{t-1}$	-0.019 (0.024)	-0.011 (0.028)	0.009 (0.154)	0.051 (0.183)	-0.028 (0.033)	-0.026 (0.038)	-0.038 (0.032)
second-order knowledge intermediaries$_{t-1}$ # avg cross-border org units$_{t-1}$			-0.004 (0.005)	-0.005 (0.005)			
avg cross-border org units$^2_{t-1}$			-0.001 (0.001)	-0.001 (0.001)			
second-order knowledge intermediaries$_{t-1}$ # avg cross-border org units$^2_{t-1}$			0.000$^+$ (0.000)	0.000* (0.000)			
% domestic actors w/ cookstove knowledge$_{t-1}$		0.014 (0.014)		0.012 (0.017)		0.015 (0.013)	0.036 (0.026)
SOKI w/ cookstove knowledge$_{t-1}$ # % domestic actors w/ cookstove knowledge$_{t-1}$							-0.002 (0.001)
autonomy	-2.141* (0.867)	-2.766$^+$ (1.441)	-2.147*** (0.604)	-2.522* (1.205)	-2.080$^+$ (1.173)	-2.669 (1.787)	-2.934$^+$ (1.590)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-8.974 (9.896)	-1.159 (11.000)	-6.063 (21.123)	0.641 (18.647)	-4.313 (14.847)	8.061 (17.927)	-5.090 (14.040)
Observations	207	125	207	125	207	125	125
Pseudo R^2	0.323	0.199	0.355	0.234	0.326	0.204	0.202

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

autonomy squared (Schwartz 1999). Models 36 and 37 provide support for Hypothesis 5, as indicated by a statistically significant coefficient on the interaction term ($p<0.05$). As expected, autonomy also has a statistically significant positive effect on entrepreneurial entries ($p<0.01$), and autonomy squared has an inverted-U effect on entrepreneurial entries ($p<0.01$).

It is worth noting, however, that due to data limitations, many fewer observations are used in models testing Hypothesis 5 (207 and 125 observations). Given that it is unclear as to why some countries were selected to survey for cultural orientation scores and others do not, it is difficult to understand whether there are other underlying mechanisms driving these effects. Table 4.14 includes autonomy as a variable for Hypotheses 1 through 4. These models show that autonomy wipes out all effects of second-order intermediaries. However, these models are improperly specified, as neither autonomy's squared term nor the linear interaction nor the curvilinear interaction are included. Including them would lead to problems of multicollinearity in the models. Therefore, analyses for Hypotheses 1 through 4 have been presented without autonomy.

4.5.2 Alternative explanation: Already advanced industry stage in selected countries

An alternative explanation for this outcome is that selected countries could be that the stage of the nascent industry is more advanced by the time the Alliance begins operating there as a first-order intermediary (see Moeen et al. 2020 for a description of nascent industry stages). Even if the first-order intermediary were not in selected countries, second-order intermediaries operating in selected countries and non-selected countries would still transfer knowledge to non-selected countries, and their presence in non-selected countries would still be associated with entrepreneurial entries.

Table 4.15 Countries that had Partnership for Clean Indoor Air partner organizations

Country	# of PCIA partner organizations	Country	# of PCIA partner organizations
United States	129	Costa Rica	2
India	52	Dominican Republic	2
Uganda	39	Italy	2
Bangladesh	33	Laos	2
Kenya	29	Mali	2
Nigeria	27	Morocco	2
United Kingdom	24	Mozambique	2
Nepal	19	South Korea	2
Ghana	15	Sweden	2
Peru	15	Vietnam	2
China	13	Zambia	2
South Africa	12	Zimbabwe	2
Germany	10	Belgium	1
Mexico	10	Benin	1
Netherlands	10	Denmark	1
Cameroon	9	El Salvador	1
Philippines	9	Gambia	1
Tanzania	9	Guatemala	1
France	8	Ireland	1
Bolivia	6	Israel	1
Canada	6	Lesotho	1
Switzerland	6	Liberia	1
Cambodia	5	Malaysia	1
Ethiopia	5	Mauritania	1
Malawi	5	Mauritius	1
Pakistan	5	Namibia	1
Australia	4	Nicaragua	1
Brazil	4	Niger	1
Indonesia	4	Senegal	1
Rwanda	4	Sierra Leone	1
Sri Lanka	4	Singapore	1
Haiti	3	Slovenia	1
Honduras	3	Spain	1
Norway	3	Swaziland	1
Burkina Faso	2	Togo	1
Colombia	2		

Selected countries are highlighted in gray. The four non-selected countries with the highest number of PCIA partner organizations are highlighted in black.

It is true that the Alliance did not choose its selected countries at random. Because the intermediary wanted to mobilize private sector investment to accelerate the global clean cookstove industry, it chose countries where local success would be more likely to occur in a shorter amount of time. However, there were still countries that they chose *not* to select.

Table 4.15 lists all of countries that had partner organizations of the Partnership for Clean Indoor Air (PCIA), as well as the number of PCIA partner organizations that were in them. The PCIA is considered to be the Alliance's predecessor, although its focus was to "reduce smoke exposure from cooking and heating practices in households around the world" (The Partnership For Clean Indoor Air 2012b), not to create a clean cookstove industry. Between 2002 and 2012, 590 partner organizations joined the organization. Table 4.15 lists where they were operating. Apart from Guatemala, it is evident that the Alliance chose countries for increased engagement (i.e., the selected countries) where there were already many clean cookstove organizations operating. These 8 selected countries are highlighted in gray in the table.

The 4 countries that are highlighted in black are the non-selected countries with the highest number of PCIA partner organizations (Nepal, Peru, South Africa, and Mexico). The top-4 non-selected countries had 14 PCIA partner organizations operating in them, on average. The bottom-4 selected countries (Nigeria, Ghana, China, and Guatemala) also had 14 PCIA partner organizations operating in them, on average. It could be argued that, on average, the top-4 non-selected countries and the bottom-4 selected countries had about the same level of nascent industry development. However, the Alliance only chose to work in the bottom-4 selected countries and not the top-4 non-selected countries. According to the theory developed so far, one would expect that second-order intermediaries operating in the bottom-4 selected countries

would have a greater effect on entrepreneurial entry in non-selected countries compared to their analogs operating in the top-4 non-selected countries.

I run Poisson regressions to explore this, and results are in Table 4.16. The explanatory variables in these regressions are the *percentage of second-order knowledge intermediaries from the top-4 selected countries in year$_{t-1}$*, the *percentage of second-order knowledge intermediaries from the bottom-4 selected countries in year$_{t-1}$*, and the *percentage of global actors from the top-4 non-selected countries in year$_{t-1}$*. The first explanatory variable is calculated as the number of industry actors that operate in at least one of the top-4 selected countries divided by the total number of global actors. The others are calculated accordingly. The same controls as the previous models are included in this analysis, with the exception of the percentage of non-second-order knowledge intermediaries due to multicollinearity. Two additional controls are also added (the percentage of global actors only operating in the other non-selected countries and the total number of global actors). None of the variables in these regressions have pairwise correlations greater than 0.6 except for the *percentage of second-order knowledge intermediaries from the bottom-4 selected countries in year$_{t-1}$* and the *percentage of global actors from the top-4 non-selected countries in year$_{t-1}$*, which is why they are not run in the same model.

Results in Table 4.16 show that second-order knowledge intermediaries from the top-4 selected countries consistently associated with more entrepreneurial entries, which is to be expected. Second-order knowledge intermediaries from the bottom-4 selected countries are associated to a lesser degree than the first group, but this is not consistently statistically significant (and when it is, it is only at $p<0.1$). Global actors from the top-4 non-selected countries seem to be associated with entrepreneurial entries to a much lesser extent, and none of these associations are statistically significant.

Table 4.16 Exploring the alternative explanation of already advanced nascent industry stage in selected countries

Dependent variable: entrepreneurial entries$_t$	(45)	(46)	(47)	(48)	(49)
% SOKI from top-4 selected countries $_{t-1}$	0.037* (0.018)			0.039* (0.018)	0.046* (0.019)
% SOKI from bottom-4 selected countries $_{t-1}$		0.018 (0.014)			0.027$^+$ (0.014)
% global actors from top-4 non-selected countries $_{t-1}$			0.001 (0.017)	0.006 (0.017)	
% global actors from all other non-selected countries only $_{t-1}$	0.001 (0.031)	-0.020 (0.033)	-0.031 (0.031)	0.008 (0.034)	0.027 (0.035)
global actors $_{t-1}$	0.035* (0.016)	0.040** (0.015)	0.041** (0.015)	0.035* (0.016)	0.031$^+$ (0.016)
avg cross-border org units$_{t-1}$	-0.002 (0.013)	0.003 (0.013)	0.008 (0.012)	-0.005 (0.013)	-0.014 (0.016)
% domestic actors $_{t-1}$	0.048** (0.017)	0.056** (0.020)	0.045** (0.017)	0.048** (0.017)	0.064*** (0.019)
% actors that work in cookstoves or fuels $_{t-1}$	4.701** (1.506)	5.944*** (1.637)	5.405** (1.673)	4.883** (1.654)	5.350** (1.658)
log(avg SOKI profile char count $_{t-1}$)	-0.122 (1.620)	-0.555 (1.527)	-0.368 (1.681)	-0.164 (1.650)	-0.335 (1.469)
prior cookstove program	0.024 (0.417)	0.086 (0.394)	0.091 (0.413)	-0.010 (0.427)	-0.020 (0.403)
log(joint IGO memberships)	2.291$^+$ (1.270)	1.926 (1.276)	2.221$^+$ (1.294)	2.331$^+$ (1.282)	1.813 (1.226)
English	-0.396 (0.295)	-0.173 (0.313)	-0.202 (0.303)	-0.404 (0.290)	-0.409 (0.296)
log(rural population $_{t-1}$)	0.111 (0.140)	0.184 (0.133)	0.190 (0.136)	0.111 (0.139)	0.083 (0.133)
Constant	-22.769** (8.798)	-18.252$^+$ (9.811)	-19.970* (9.589)	-23.193** (8.924)	-20.543* (9.073)
Observations	718	718	718	718	718
Pseudo R^2	0.321	0.317	0.314	0.321	0.325

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

Based on the results, the alternative explanation cannot necessarily be ruled out. However, rather than viewing advanced industry stage in selected countries as an alternative explanation, it should be viewed instead as a mechanism. That is, the first-order intermediary plays the role of an industry accelerator (London and Fay 2018); it accelerates an industry through the stages of industry nascency. More effective second-order intermediaries are likely to come from countries where the nascent industry is at a later stage, regardless of how it got there.

4.6 Discussion

In this study, I have proposed and found support for a novel factor associated with entrepreneurial entries across multiple emerging economies: second-order knowledge intermediaries. As industry actors in selected countries, second-order knowledge intermediaries acquire a nascent industry's knowledge base through their engagement with a first-order knowledge intermediary, which exists to accelerate the nascent industry by aggregating knowledge into the industry's knowledge base. As they enter non-selected countries where first-order knowledge intermediaries are absent, second-order knowledge intermediaries not only transfer their knowledge from selected countries but also act as knowledge intermediaries for the nascent industry in these places. Through an analysis of both qualitative and quantitative observational data, this two-stage model is studied in the case of the clean cookstove industry. In this global nascent industry, the Global Alliance for Clean Cookstove acted as a first-order knowledge intermediary by aggregating clean cookstove knowledge in eight selected countries. Industry actors who benefited from the more complete knowledge database in selected countries carried this knowledge to other places, acting themselves as second-order intermediaries by developing the clean cookstove knowledge database in these other locations.

4.6.1 Theoretical contributions and practical implications

This research makes many important contributions. Theoretically, I contribute to prior work on nascent industries and industry emergence (Hannah and Eisenhardt 2018, Moeen 2017, Moeen and Agarwal 2017, Moeen and Mitchell 2020, Navis and Glynn 2010, Ozcan and Eisenhardt 2009, Ozcan and Santos 2015, Wormald et al., Zuzul and Tripsas 2020) by expanding our understanding of how industry emergence occurs in a single, developed country by highlighting a novel factor that is associated with industry emergence in multiple developing and emerging countries. Specifically, this research addresses calls to "shed light on how nascent industries in developing and global contexts may require different processes" of industry emergence (Moeen et al. 2020, p. 240), especially because the large knowledge gaps and institutional voids in these countries (Hoskisson et al. 2000, Marquis and Raynard 2015) would typically disqualify them from being initial targets of industry "trigger" events (Agarwal et al. 2017). This research shows that even though these emerging economies do not receive the direct engagement of first-order intermediaries, they can still experience industry development and eventual emergence through second-order intermediaries that transfer external knowledge into their contexts while working to build the knowledge base locally. This is one way that global nascent industries triggered by mission-oriented grand challenges (Agarwal et al. 2021), such as those intended to address global health and livelihoods among the world's most vulnerable populations, can eventually arrive in lower-income, more developing countries where intended customer-beneficiaries live.

Through this work, I additionally contribute to theory about institutional intermediaries, and institutional entrepreneurship more generally, in emerging economies (Armanios et al. 2017, Armanios and Eesley 2021, Mair et al. 2012, Mitchell et al. 2022). Prior authors have identified how entrepreneurs in weak institutional contexts benefit from "institutional carriers" that create,

develop, maintain, and refine the cognitive, normative, and regulatory institutions that support commercial activity (Armanios and Eesley 2021). As a type of institutional carrier, institutional intermediaries connect actors to create and develop institutions (Armanios et al. 2017, Dutt et al. 2016). The benefits that institutional carriers create for entrepreneurs are both generated and accrued locally, as consequences of the institutional intermediaries' proximal actions and interactions (Assenova 2020).

Building upon these observations, this research reveals more information about the underexplored global dimensions of institutional intermediaries or institutional carriers more broadly. First, findings from this research highlight that institutional carriers have access to institutions from different places, and they can transfer interpretations of global institutions to local contexts in ways that support entrepreneurs by giving them access to a wider variety of ideas and ways of doing (Strang and Meyer 1993). Second, this work highlights that institutional carriers can also create benefits for distant entrepreneurs, either directly or indirectly. Institutional carriers can directly support distant entrepreneurs by physically traversing the local-global divide; they are not fixed in a geographical place. This is especially true for institutional intermediaries that are not large organizations, such as "peer entrepreneurs" (Mitchell et al. 2022). Indirectly, institutional carriers can support distant entrepreneurs by training other organizations to act on their behalf. These "second-order" institutional carriers can then carry out the institutional work of the "first-order" institutional carriers that trained them. By carrying institutions "from place to place" (Scott 2003, p. 879), institutional carriers can bridge the local-global divide experienced by entrepreneurs around the world.

For practitioners, this research underscores the unique role of knowledge intermediaries in accelerating global nascent industries. Moreover, I highlight knowledge intermediaries'

indirect effects on nascent industries in countries where they did not make direct investments. This is good news; since knowledge intermediaries are limited in budget, capacity, and manpower, they can still build knowledge bases in multiple countries by successfully building knowledge bases in a few. If this becomes a strategy for accelerating global nascent industries around the world, then this research explains that knowledge industries should be cognizant of engaging with industry actors that can become effective second-order knowledge intermediaries, such as complements and companies that operate in relatively few, as well as the characteristics of countries where these second-order knowledge intermediaries additionally operate.

4.6.2 Limitations

I recognize that this research has many limitations. As a single industry study, there exist potential generalizability boundaries. It is important to acknowledge that the clean cookstove industry was not brand new when the first-order knowledge intermediary began developing it in selected countries. Decades of international development initiatives led by governments and nonprofits exposed different countries to the product at different times and to different intensities. While the nascent industry was very early-stage in most countries, the Alliance selected countries for in-country engagement based on their potential to emerge, which was necessary to mobilize private sector resources into the industry. The Alliance's relatively quick acceleration of the clean cookstove industry and training of second-order intermediaries in selected countries may not have been replicated in other countries and, potentially, in other contexts. The one-year lag that is used in this research would need to vary depending on how quickly the nascent industry develops in places where first-order knowledge intermediaries operate. Moreover, arguments about the presence of domestic organizations may not carry over into other industry contexts, as domestic organizations may simply be absent or much less

enculturated than those in the clean cookstove industry. In general, future work can explore the role and effectiveness of first-order and second-order knowledge intermediaries in brand-new industries, which would test causal claims that cannot be made here.

Additionally, even though the database used in this research is believed to be the most complete global database of clean cookstove industry actors, its data is still self-reported. As a result, it could be incomplete, have errors, or have systemic biases related to voluntary contribution. If available, further work can use more complete, more accurate, and less biased regional or subnational data to investigate the same mechanisms on a smaller scale, either for the clean cookstove industry or another nascent industry. Special care would have to be taken to understand how local institutions affect the proposed mechanisms if limited to a particular country or context.

4.6.3 Conclusion

How nascent industries emerge across multiple countries characterized by different levels of knowledge and institutions is an important question for both scholars and practitioners. The question is especially relevant for nascent industries that address global grand challenges, like climate change, water security, poverty, and access to clean energy like clean cookstoves and fuels. This research has described how knowledge intermediaries can spur the development of nascent industries not just in one place but in many via industry actors' learning, transfer, and building of knowledge across borders. The findings of this research shed new light on knowledge intermediaries, and they carry implications for how the growth of nascent industries promoting new innovations – especially those that generate health, social, and environmental benefits – can be supported globally.

Chapter 4 References

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Appendix 4.A: Qualitative Data for the Two-Stage Model of Knowledge Learning and Transfer in the Nascent Clean Cookstove Industry

The qualitative data for this research is based on reports published by the Alliance and other industry actors, as well as interviews that were conducted between April 2018 and February 2021 with clean cookstove industry actors from across the globe. For this research, a subset of 23 interviews across 17 organizations and 23 individuals were utilized because these organizations had experience working in the clean cookstove industry across borders. Of these 17 organizations, 8 were companies, 3 were nonprofit organizations, 4 were bilateral or multilateral development agencies, and 2 were intermediaries that accelerate their respective industries (including the Alliance). These interviews took place over virtual meetings and during in-person fieldwork in East Africa in May 2019. These organizations primarily operated in a

Table 4.17 Interviews by organization ID and type

Interview #	Organization ID	Organization Type
1	A	Company
2	B	Company
3	C	NGO
4	D	Industry Intermediary
5	E	NGO
6	F	Company
7	B	Company
8	G	Bilateral/multilateral development agency
9	H	Company
10	I	Company
11	J	Bilateral/multilateral development agency
12	J	Bilateral/multilateral development agency
13	K	Company
14	L	Industry Intermediary
15	J	Bilateral/multilateral development agency
16	M	Company
17	N	Company
18	G	Bilateral/multilateral development agency
19	O	Bilateral/multilateral development agency
20	P	NGO
21	B	Company
22	N	Company
23	Q	Bilateral/multilateral development agency

range of countries, including India, Honduras, Kenya, Uganda, Rwanda, Tanzania, and the Democratic Republic of the Congo, although each of these organizations and the interviewees representing them had significant cross-border experience. Details about the interviews are provided in Table 4.17.

The archival data sourced from industry reports and the interview data are used to provide a description of how the two-stage process of knowledge learning and knowledge transfer occurred according to the four existing dimensions of uncertainty and knowledge in nascent markets (technological, demand, ecosystem, and uncertainty) and a fifth additional dimension (supply).

Appendix 4.B: Qualitative Results for the Two-Stage Model of Knowledge Learning and Transfer in the Nascent Clean Cookstove Industry

Supply Dimension: Though not listed as a dimension of uncertainty in the literature on nascent industries (Moeen et al. 2020), there was uncertainty around the supply in the nascent clean cookstove industry. Supply uncertainty is defined here as partial knowledge about how the industry and its companies' path to scale and profitability. Clean cookstoves were invented as an international development intervention, and they were implemented through a smattering of governments, multilateral organizations, and/or nonprofit organizations (Gifford 2010) operating on one-off projects limited by both time and funding. According to an Alliance manager of East African countries, "The clean cookstove sector is not new. It has been in the region for many years … talking about over 35 years, over 40 years. But unfortunately, it was donor-driven, or what we can term as 'NGO-driven,' with very little participation of the private sector as well as the government" (Interview #4).

These short-lived development interventions did not consider the long-term development of a clean cookstove industry. This had two consequences. First, few profitable companies emerged from these early initiatives. The East Africa Alliance manager explained, "As a result [of little private sector engagement], [donors] were mainly focused on just providing the necessary capacity to artisans or the local technicians to be able to manufacture or produce those improved cookstoves, as well as the distribution" (Interview #4). These producers only served their local communities, and many only operated in the informal sector. A representative of a capacity-building nonprofit described that in his regional context, "[Local producers] mostly just focused on surviving, getting the next contract, and executing on the next contract so they can get the rest of their money" (Interview #20). While there were some positives to enabling small-

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scale, local producers (e.g., increasing the likelihood that cookstoves designed for low-income rural markets are produced), the abundance of these smaller, not very profitable players did not motivate potential entrepreneurs to join the nascent industry.

The second consequence of short-lived clean cookstove interventions was a lack of long-term private investment. The presence of few profitable clean cookstove companies discouraged significant commercial investment, and the lack of significant financing discouraged entrepreneurs from entering the nascent industry. A representative of a multilateral development agency working in a non-selected country echoed these sentiments: "I think the investment in the clean cooking sector has been not that much of a continuous approach. It's in-and-out interventions. Sometimes it's the World Bank, sometimes whoever comes in. I think the good thing would be to invest in a long and comprehensive kind of manner. Otherwise, the private sector will struggle for long" (Interview #15).

Because of uncertainty about the nascent industry's supply, one of the Alliance's approaches to industry development literally became "strengthening supply." This involved two actions: mobilizing investment into the sector and encouraging scalable clean cookstove companies. London and Fay (2018) describe how the Alliance "created a wide investment proposition that enabled it to mobilize resources from a range of potential investors," first from the development sector but eventually from the private sector. This funding was first funneled into the Alliance and then distributed to clean cookstove companies as technical assistance, grants, loans, and investments (Global Alliance for Clean Cookstoves 2016). By managing the distribution of money clean cookstove companies, the Alliance could identify high performers who would qualify for follow-on funding. Ultimately, these companies became success stories that made the nascent industry more attractive to private-sector investors.

In selected countries, the Alliance's efforts at strengthening supply increased industry actors' knowledge of what is required to become a scalable clean cookstove organization, as well as what funders required for larger investments (recall that many clean cookstove organizations were not even thinking about scale, investment, or profitability beyond what was required for survival before this). Most of the Alliance's funding applications required that operations take place in selected countries. Moreover, these requirements reflected what was important for scale, such as a business model, management team, sufficient capacity, and data management practices (Lediju et al. 2015). The Alliance's encouragement of scalable companies led to the entry of new scalable clean cookstove companies into selected countries, as well as an upskilling of existing clean cookstove companies through nonprofits and incubators.

When clean cookstove companies entered non-selected countries and become second-order knowledge intermediaries, they transferred their knowledge of how to organize as scalable clean cookstove companies, which was new knowledge in contexts where similar countries were absent. For example, the representative of a multilateral development agency expressed that he was looking forward to a clean cookstove company from a selected country entering his non-selected country. He explained, "They want to be the one who sells more … and these kinds of things which are really market-led really encourage people to sell and to buy and to promote. Of course, there is local production and local artisans. But they can only service their neighborhood … We need somebody else. We need some other stories" (Interview #15). Moreover, second-order knowledge intermediaries required their partners in non-selected countries to be similarly capable. Achieving this sometimes depended on the literal transfer of knowledge to industry actors in non-selected countries through training or support. While discussing a pilot project to explore expansion into a new continental region, a representative of a clean cooking company

explained that their managers there are "all trained up, and they're providing support for these local distributors to try it out and see what happens" (Interview #21).

Technological Dimension: When the Alliance launched in 2010, clean cookstoves were not a new technology. Improved biomass cookstoves had existed for decades prior (Morrison 2018, Smith and Sagar 2014). Nonprofit and research organizations had been supporting the design, development, testing, and knowledge-sharing of cookstoves, which were consistently evolving. Different designs proliferated due to differences in cooking habits and fuel availability across geographies. By 2015, GACC's Clean Cooking Catalog listed 299 stoves across four characteristics (traditional, non-traditional, institutional, and household) and four fuel types (biogas, briquettes, charcoal, and coal) ranging from under $5 USD to over $300 USD (Penumetcha 2015).

Technological uncertainty has been defined as "partial knowledge about technical designs comprising technical components and their connecting architecture" (Moeen et al. 2020, p. 221). In the nascent clean cookstove industry, technological uncertainty arose from a lack of knowledge about what constituted a "clean" cookstove and, relatedly, a lack of knowledge about how to further reduce cookstove emissions and increase cookstove efficiency while keeping the product affordable. According to the Alliance, there had been a "dearth of compelling evidence regarding the health benefits of clean cookstove and fuel interventions" that damaged the credibility of the sector (Global Alliance for Clean Cookstoves 2011, p. 17). A report published by the U.S. Department of Energy (2011) stated that cookstoves needed to achieve at least 90% emissions reductions and 50% fuel savings to meet World Health Organization guidelines for indoor air quality and achieve significant health benefits. Not even well-funded, professionalized, multinational companies in the clean cookstove industry were meeting both

targets (Envirofit International 2015). It would be even more difficult for the local producers to achieve these targets, due both to a lack of knowledge of better-designed cookstoves and their target market of low-income rural consumers. A representative of a multilateral development agency operating in Uganda described, "There are a lot of stove producers around, but a majority of them produce low-quality stoves. So they're cheaper and people tend to focus more on the price than necessarily the performance of the stove" (Interview #18).

The Alliance took two actions to address technological uncertainty around what constitutes a "clean" cookstove and how to improve cookstove emissions and efficiency. First, it invested in developing technological standards and cookstove testing facilities. Through the International Standards Organization process, a tiered system was developed with a group of experts to characterize differences in efficiency, emissions, safety, and durability. According to London and Fay (2018), "these standards were developed to facilitate comparisons across similar products by providing a consistent approach for testing, characterizing and reporter performance, and labeling that provided a way to share this information to consumers." As a first-order knowledge intermediary in selected countries, the Alliance helped to establish working groups to adapt these global standards to the local context. In other selected countries, the Alliance helped to facilitate the development of local cookstove testing centers to implement these standards.

Second, the Alliance encouraged the development of a wider variety of clean cooking innovations and eventually focused on those that were cleaner. The clean cookstove category had historically centered around improved biomass cookstoves, but these also generated the greatest concerns about emissions, efficiency, and health benefits. The Alliance encouraged technological innovation by providing grants to companies offering a wide range of clean cooking technologies beyond improved biomass stoves. For example, the Alliance's 2014 grantees included companies

that designed and distributed biodigesters, ethanol gel and ethanol stoves, and vacuum tube solar cookers (Global Alliance for Clean Cookstoves 2014). The Alliance's leadership change in 2018 ushered in a renewed focus on more advanced clean cooking technologies, such as liquefied petroleum gas and electric cookers.

The Alliance's global and localized efforts in selected countries led to second-order knowledge intermediaries' learning and transfer of knowledge to non-selected countries. Technological standards filled in knowledge gaps concerning product quality and design, and industry actors in selected countries learned about them through applications for Alliance funding and participation in working groups that attempted to adapt international standards to local conditions. Because they highlighted the differences between multinational companies producing higher-quality cookstoves and local companies producing lower-quality cookstoves, these standards were not well-received by all industry actors. However, for those that went abroad as second-order knowledge intermediaries, clarity around what constituted "clean" cookstoves and the standards that measured this were critical pieces of knowledge that were used to promote and develop the nascent industry in non-selected countries. For example, one clean cookstove company leveraged this knowledge to promote similar technology standards in non-selected countries. Representatives of this company described that some non-selected countries have "a major issue with counterfeits" (Interview #21), and the company was working with governments "to stop counterfeit products from coming into the market" (Interview #2). It would be more difficult to declare products as low-quality counterfeits without having prior knowledge of what constituted high quality.

Expanding the market category of clean cookstoves resulted in many industry actors not working on improved biomass cookstoves entering the clean cookstoves and clean fuels industry.

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As of March 2022, the Alliance's Clean Cooking Catalog contained 476 different cookstoves, covering 11 cookstove designs (gasifier, rocket, griddle/plancha, sunken pot, multiple burners, fan, pot skirt, chimney, thermoelectric, electric cooking, and other/undefined) and 14 fuels (wood, charcoal, liquefied petroleum gas, kerosene, biogas, briquettes, coal, crop residues, dung, electricity, ethanol/alcohol, methane/natural gas, pellets, and solar), ranging from less than $5 USD to over $100 USD. Other industry actors began operating as second-order knowledge intermediaries to develop markets for specific innovations. For example, CLASP, a nonprofit organization that works across stakeholders to promote efficient appliances, began promoting the uptake of electric pressure cookers in off-grid and weak-grid communities in Kenya and Tanzania (PowerGen Renewable Energy and Efficiency for Access Coalition 2020). The support of cleaner cooking technologies led to increased donor funding for the research and development of cleaner technologies. A representative of one cookstove manufacturer explained that donors wanted to promote the technologies, even though there was little market opportunity: "It's almost like a little bit of 'pie in the sky' in that the market's not quite ready. It's pretty underdeveloped … but donors are also glomming onto it" (Interview #21). And although this company was famous for its improved biomass cookstoves, it was also developing an electric pressure cooker that could be used across the continent. Due to the Alliance's widening of the "clean" cookstove category, it is evident that second-order knowledge intermediaries gained knowledge of what technologies were acceptable and began promoting these technologies in non-selected countries.

Demand Dimension: The clean cookstove industry faced significant demand uncertainty, which refers to a lack of knowledge about customers' explicit and latent preferences for functional and price features (Moeen et al. 2020, p. 221). Clean cookstoves were more of a "push" product than a "pull" product, which may have been due to the industry's history as a

development sector, where clean cookstoves were given away for free or heavily subsidized without considering whether users wanted them.

As a result, industry actors were uncertain about what would convince consumers to purchase clean cookstoves – where their real pain points lay. Some believed that "the lack of end-user knowledge about the health and economic impacts of traditional cookstoves, and the benefits from the use of clean cookstoves and fuels" (Global Alliance for Clean Cookstoves 2011, p. 24), and that providing more information would help. Others thought that more extensive engagement efforts were needed beyond providing information. One nonprofit cookstove distributor representative suggested that "a lot more attention needs to go into behavioral change and behavioral understanding... instead of all the attention going into innovation and design and manufacturing [to produce cleaner stoves]" (Interview #5). However, changing cooking behaviors was difficult, as they were deeply ingrained in culture and tradition. Additionally, some industry actors believed that consumer awareness and behavior change were insufficient and that these efforts needed to convert into sales. A representative from a clean cookstove company noted, "Having a billboard up that says 'new to the market' or 'new products' is good at creating awareness, but unless people know where they can buy it, how they can buy it, how they get to the distribution point and stare at it as merchandise, and maybe there's an incentive to buy it … I would imagine that companies would fall short." (Interview #2).

However, marketing was expensive, and clean cookstove manufacturers and distributors were hesitant to experiment with it. A representative from a multilateral development organization in a non-selected country observed, "It's not easy to get capital that is invested in awareness raising because with awareness raising, you don't try exactly to get your return on

investment." He added, "I think there is a role for the government, there is a role for organizations like ours, to support those companies in terms of reaching out to communities. So we would become like bridges, since they don't have enough investment and capital to do it by themselves" (#Interview 15).

In selected countries, this is what the Alliance did. The first-order knowledge intermediary funded industry actors to run consumer awareness and behavior change communication campaigns. These campaigns included radio ads, live demonstrations, soap operas, a cooking-focused reality television show, mobile messaging for community engagement, roadshows, and street theater to promote clean cooking and specific cookstove solutions (Global Alliance for Clean Cookstoves 2016). These efforts helped reduce demand uncertainty while contributing to building industry-supporting institutions for the clean cookstove industry.

Second-order knowledge intermediaries engaged with the Alliance in selected countries by running campaigns or participating in them. They experienced the campaigns' successes and failures, and cookstove manufacturers and distributors could roughly gauge how different types of interventions affected sales. This knowledge was then transferred to non-selected countries.

Ecosystem Dimension: Ecosystem uncertainty refers to "partial knowledge about the nature and configuration of ecosystem activities that deliver value to customers" (Moeen et al. 2020, p. 221). In the nascent clean cookstove industry, ecosystem uncertainty was magnified by the difficulty of distribution. A multilateral development organization representative in a selected country explained, "One of the biggest issues is the distribution chain. Like how to get all those things from the capital city all the way to the rural areas. It's something that is still being developed" (Interview #11). Clean cookstoves were heavy and bulky, and most of their intended

customers lived far from where they are produced. Poor roads in rural areas sometimes made it impossible to reach villages by anything other than by motorcycle, and one motorcycle could not transport many clean cookstoves. The cost of distributing the stoves was prohibitively high for manufacturers. A representative from a multilateral development organization in a selected country pointed out that "distribution has been a big challenge for all these businesses because of their low margins. It's very hard to create an elaborate distribution. So that's why they end up with partnerships" (Interview #19).

Partnering with other organizations was crucial for the distribution of clean cookstoves, but uncertainty persisted about which organizations would make good partners. Alignment of incentives was key, but in a nascent industry where everyone aimed to increase the adoption of clean cookstoves, it was challenging to assess. For instance, a representative from a multilateral development organization explained that "distributing cookstoves or selling to Mercy Corps to sell on to refugees might give you a big boost when the order is placed. But how do you build that refugee market in a much more sustainable way so that you can continue making sales?" (Interview #19). Misalignments also arose from working with non-profit organizations, as a representative of a clean cooking company attested: "An NGO started up with the distribution of [a branded clean cookstove], but since they were an NGO and their values and mission were way different from selling cookstoves, in the long run they failed" (Interview #17). Poor partnerships between companies could also result from misalignment, as a representative of another clean cookstove company noted: "I can think of many examples of financial institutions that are massive, that have buy-in from the top-down, the consumer demographic overlaps, and they are in theory filling some gap, which is credit and financing for the consumer. But they could not be well-aligned with us in the sense that they've never sold a physical good. … They've never had

to explain a product or sell it. They've never had inventory. They've never had to think about how to get a product from the branch to the end consumer" (Interview #2).

The Alliance undertook two distinct activities to reduce uncertainties in the partnering. First, it organized conferences locally, regionally, and globally, as well as maintained an online partner directory to bring industry actors together, thereby minimizing search costs. Second, the Alliance vetted potential partners through its funding mechanism. Consequently, the Alliance functioned as a first-order knowledge intermediary, raising awareness about potential partners in the nascent industry, and providing crucial quality signals for some. This heightened the probability of successful partnerships, allowing second-order knowledge intermediaries to learn what kinds of organizational characteristics they should seek in future partnerships and how to successfully manage them. This knowledge was transferred to non-selected countries. Indeed, a representative from a multilateral development organization noted, "About those international companies, the difference is distribution. They have more distribution partners in the country through supermarkets or NGOs and CBOs [community-based organizations]" (Interview #19).

The Alliance reduced uncertainties in the partnering process through two different activities. First, it reduced search costs by convening industry actors locally, regionally, and globally through conferences, as well as online through the online partner directory. Moreover, through its funding of clean cookstove distributors and other complementary organizations, the Alliance vetted potential partners. Thus, as a first-order knowledge intermediary, the Alliance increased knowledge about the presence of potential partners in the nascent industry and also provided important quality signals for some. This increased the likelihood of successful partnerships, from which second-order knowledge intermediaries learned how to manage successful partnerships. It also gave second-order knowledge intermediaries an idea of what

characteristics to look for in future partnerships – knowledge that they transferred to non-selected countries. Even one representative of a multilateral development organization commented, "About those international companies, the difference is distribution. They have more distribution partners in the country through supermarkets or NGOs and CBOs [community-based organizations]" (Interview #19).

Institutional Dimension: Institutional uncertainty refers to "partial knowledge about social and formal institutions that structure exchange of an industry's products" (Moeen et al. 2020, p. 222). Many industry-supporting institutions have already been discussed in other dimensions, such as introducing new technological standards to help define the meaning of "clean" cookstoves and changing norms, values, and beliefs about clean cookstoves among potential users. There were also significant formal institutions that needed to be addressed, such as government regulations and policies. Despite their health and environmental benefits, there were no tax breaks for clean cookstoves and fuels. When discussing her choices for international expansion, a representative of a clean cookstove company explained that it depended on the import duties levied on cookstoves: "Because it's free trade, there are no additional duties that you have to pay when stoves go from India to Nepal. Bangladesh, on the other hand, imposes a 65 percent duty on stoves. It's just not possible to get a product out there" (Interview #1). Import duties and sales taxes made clean cookstoves more expensive for poor end customers and depressed profits for manufacturers and distributors.

Changing policies was critical for the clean cookstove industry but difficult to implement. First, even though clean cooking is related to multiple issues like deforestation, energy, health, environment, agriculture, and gender, it was typically siloed within a single government ministry (e.g., the Ministry of Energy) and it did not receive broad-based support. Moreover, there was

still hesitation among governments to treat clean cookstoves as a sector. Many of their experiences with clean cookstoves were through government or donor-sponsored programs and interventions, not through policy changes that would support private sector involvement in the industry. Lastly, due to the industry being historically fragmented, industry actors were not accustomed to collective action. When commenting on the clean cookstove industry's scattered efforts in his region, the Alliance representative commented, "I think that was one of the great drawbacks, in the sense that the voice of the sector could not be heard because there was no common coordinated platform that could be used to air grievances and the challenges of the sector" (Interview #4).

To address factors related to policy uncertainty, the Alliance aided with organizing industry actors for collective action. When the Alliance began working in selected countries, it helped form local industry associations to answer the following questions, which were laid out by a representative of a multilateral development organization who took part in early discussions about collective action: "Can we get a home for clean cooking? We should be able to talk with one voice now and not dilute the sector … Who is acting in this space? Can we come together and an association?" (Interview #8). When industry actors were brought together by the Alliance and these newly formed industry associations, they worked together to write county action plans to assess who was working in the industry, where gaps existed, and the industry's vision for the sector. From here, the industry actors were better able to present themselves as a cohesive industry to important stakeholders, namely the government. Despite some tensions between industry actors, as a collective, the clean cooking sector was able to achieve a few key policy changes, such as an elimination of a 16% tax on cooking gas in Kenya, a 10% reduction on cookstove import duties in Bangladesh (Global Alliance for Clean Cookstoves 2016, p. 11).

Through their engagement with the Alliance, second-order intermediaries learned how to effectively lobby the government for policy change, whether by leveraging the collective action of an association or through lobbying independently. A clean cookstove company representative explained the process of getting value-added tax removed from clean cookstoves: "For the VAT removal in Kenya, we worked very closely with [the local industry association]. It was us plus our competitors, us manufacturers and other interested parties in cookstoves. It was a group effort, so we could go to [the government] and say that there's a logical reason to remove VAT" (Interview #2). This company leveraged other associations for different changes in policy. When they needed tariffs reduced for the importation of raw materials, the company went through the manufacturers' association, where there was more support for this non-cookstove-specific policy change. In non-selected countries, "trade associations might not be as strong … and we might have easy access to the government directly and can [lobby for policy change] effectively" (Interview #2). The company's preference, however, was to advocate collectively, since it experienced success with this in selected countries.

Chapter 5 Conclusion

5.1 In summary

With this dissertation, I set out to explore not just how companies can "do good while doing well" but how social ventures could "do well while doing good." Based on my personal experience as a social entrepreneur doing similar work, I focused my research on social ventures providing social innovations – specifically, environmental health innovations – in developing countries. Three questions motivated me. First, why do new ventures and markets for social innovations fail or are slow to grow? Second, what strategies can be implemented to address the market and institutional barriers to emergence and sustained growth? Third, what does sustained growth even look like in developing countries, in terms of the characteristics of the actors who are involved, the social innovations that are promoted for global dissemination and adoption, and the extent of social, environmental, and health impacts that are experienced by marginalized communities on the ground?

My three dissertation chapters, though different in terms of the literature they draw on, methods they use, and implications they make, all relate to relationships that social ventures need to manage with stakeholders as they start up and grow social ventures that provide environmental health innovations. My first study (Chapter 2) focused on the relationship between a social venture and its exchange partners. I asked whether social impact framing can be used to persuade exchange partners to partner with the social venture in distributing an environmental health innovation. After two experiments and many surveys and interviews, I found that expert retailers

viewed social impact framing more negatively than the commercial frame when a male company representative used it, and more positively than the commercial frame when a female representative used it. Moreover, novices seemed to like the idea of social impact framing, period. I proposed a model of "expertise-based skepticism" to demonstrate how experts are skeptical of information that doesn't fit with their mental models, and that social ventures can shift the mental models they use for evaluation use by providing even more incongruent information, which leads to them acting like novices. Social ventures should, then, consider the expertise of stakeholders that they are speaking with and know whether their efforts are being seen as incongruent with their mental models.

My second study (Chapter 3) took me on a qualitative exploration of the clean cooking industry in East Africa, which has been transforming from a development sector into an industry by market-building actors. Though I initially set out to "unpack the expat gap" in external funding, I ended up understanding how local entrepreneurs persist in the industry without it. I find that that which market-building actors deemed as liabilities (i.e., accessible technologies, community-based initiatives, and development sector support) were leveraged as assets for strategies of persistence: replication, diversification into markets that play to their strengths, and the collective resistance of local entrepreneurs alongside other development-oriented actors who disagreed with the direction that the industry had been going. Even though it looked like the local entrepreneurs were stalling the take-off of the clean cooking industry, they were swinging the pendulum back toward development – though probably not as far as before. And that, I believe, is a hopeful outcome.

My third study (Chapter 4) geographically zoomed out and considered the effect of a knowledge intermediary on entrepreneurial entry across national borders. Through an analysis of

113 country-level industries for clean cookstoves between 2013 and 2019, I found that

entrepreneurial entry into the industry was associated with the number of organizations that

operated both in these countries and in countries where a knowledge intermediary also operated.

This suggests that knowledge intermediaries can have cross-border effects through the industry

actors that it engages. That is, industry actors, such as social ventures, that engage with the

knowledge intermediary in selected countries themselves can become knowledge intermediaries

in non-selected countries, though their effectiveness depends on a variety of factors: the number

of countries they operate in, their role in the industry, the presence of domestic actors with

overlapping industry knowledge, and the culture of non-selected countries.

5.2 Overarching themes and takeaways

Considering these chapters together, I believe that my dissertation has three overarching

themes and takeaways. The first is that social ventures have liabilities that can become assets.

The second theme is that social ventures and markets promoting social innovations must

understand the historical context in which they are trying to do good. The third theme is that

Management and strategy scholars and practitioners need to be open to other models of

successful social ventures and markets.

Theme 1: Social ventures and markets have liabilities that can become assets. While

prior literature on hybrid organizing recognizes the many constraints that organizations and

industries experience when attempting to pursue both social and financial goals, the three

chapters in my dissertation show that these liabilities can become assets. Chapter 2 implies that

social ventures can leverage social impact framing alongside other signals that are incongruent

with experts' mental models to gain their support. Chapter 3 demonstrates the many ways that

development sector-related liabilities can be used as assets of persistence in the clean cookstove

industry. Chapter 4 shows that even though industry-building efforts by knowledge intermediaries are delineated by national boundaries, knowledge can be transferred indirectly, across borders, by industry actors. A commitment to pursuing social, environmental, and health benefits among marginalized communities in developing countries through a business model is possible, but social entrepreneurs and other market actors need to act skillfully.

Theme 2: Social ventures and markets promoting social innovations must understand the historical context in which they are trying to do good. In all three of the chapters in my dissertation, historical institutions play a role. In Chapter 2, beliefs around who does business and who does charity shape the mental models of audience members. In Chapter 3, the historical institutions of the development sector strongly influenced local entrepreneurs' decision-making and business development. And in Chapter 4, domestic actors in non-selected countries that exist for historical reasons, as well as country-level cultural orientations, can affect whether knowledge transfer to non-selected countries is associated with entrepreneurial entry. The takeaway is that social ventures and markets promoting social innovations in developing countries are never emerging from a blank slate. Social ventures and markets need to acknowledge this and not expect that their framing, technologies, business models, and commercial means of support will be accepted by anyone already embedded in that context. All these activities may in fact be completely misinterpreted.

Theme 3: Scholars and practitioners need to be open to other models of successful social ventures and markets. One of the biggest questions asked by scholars and practitioners regarding social ventures and markets is why they don't seem to scale or grow. Chapter 3, in particular, looks at market-building efforts for the clean cooking industry and questions whether goals that derive from venture capital are what's best for developing countries, both in terms of

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the social entrepreneurs and in terms of the beneficiaries. This chapter additionally espouses alternative models of growth which may be more appropriate for the provision and adoption of social innovations. It's worthwhile to note, however, that these alternative models of venture and market growth have also been evolving, taking elements from market-based institutions to professionalize and "scale" in a way that suits local needs. That is, change is happening on both ends of the development-to-industry spectrum. Although Chapter 4 examines the cross-border effects of industry-building efforts, the strong association of domestic actors with entrepreneurial entries implies that localized efforts are also important to examine. While Chapter 2 focuses on the social venture and not the market, the strategies that this chapter promotes can be used in alternative models of growth, as well.

5.3 In conclusion

This dissertation contributes insights to multiple bodies of research in management and strategy, highlighting the potential for social ventures providing social innovations to grow while creating positive health, environmental, and social impact. By leveraging liabilities as assets, understanding historical contexts, and embracing alternative models of growth, social ventures can navigate the tensions between the social and profit goals of their work, ultimately contributing to the inclusivity and sustainability of marginalized communities. This research calls upon scholars, practitioners, social entrepreneurs, and the organizations that support them to continue exploring innovative approaches that acknowledge and manage the tensions between sustainable development and business, driving true, sustained positive change. It is my hope that this work will continue moving the needle toward this outcome.