

IMMIGRATION AND ENTREPRENEURSHIP

by

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Abstract

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This dissertation studies immigrant entrepreneurship, with a special focus on the impact remittances, money sent by immigrants to family back home, have on entrepreneurship. While entrepreneurship can be broadly defined to include a variety of profit-seeking behavior in an environment of uncertainty, this dissertation focuses on entrepreneurship in the form of business creation, a particularly relevant form of entrepreneurship for immigrants and the family members of immigrants who receive remittances.

This dissertation provides a holistic approach to studying the intersection of research on immigration and research on entrepreneurship by addressing the following questions: How might immigration impact entrepreneurship in the host country? How does immigration impact entrepreneurship in the home country? Do immigrants impact cultural attitudes that then have an influence upon propensities to start new businesses?

Chapter one of this dissertation focuses on the question of immigrant entrepreneurship in the receiving country by studying differences in propensities to start a

business between first-generation immigrants, second-generation immigrants, and natives. My coauthor and I show entrepreneurs are more likely than non-entrepreneurs to be immigrants compared with natives, and this higher propensity begins to diminish as soon as the second generation. In other words, there are assimilating entrepreneurial tendencies between generations of immigrants, and future generations of immigrants begin to behave more like natives in that entrepreneurs are more likely than non-entrepreneurs to be immigrants compared to both natives and second-generation immigrants. Those second-generation immigrants that do not assimilate entrepreneurially, a process known as “downward assimilation,” suffer poor labor market outcomes. More interesting, we find these differences exist even after controlling for variables such as host-country institutional environment and income levels and growth rates in the host country. This suggests that immigrants are simply more entrepreneurial than natives, either because of what my coauthor and I identify as an “entrepreneurial selection bias” or some other mechanism, like exposure to other cultures. We also identify income as an important mechanism in determining rates of opportunity-motivated entrepreneurship, or business creation for the purpose of pursuing profit opportunities, and necessity-motivated entrepreneurship, or business creation because more desirable, traditional labor market opportunities are unavailable.

Chapter two of this dissertation, forthcoming with Shaomeng Jia and Claudia Williamson in the *International Journal of Entrepreneurship and Small Business*, shifts focus to the question of the impact immigration has on entrepreneurship in the home country by studying how remittances impact entrepreneurial outcomes. My coauthors and

I find remittances lead to an increase in early stage, opportunity-motivated entrepreneurship and a decrease in necessity-motivated entrepreneurship. The mechanism behind this relationship appears to be a decrease in capital constraints, with remittances representing a jolt of capital for potential and existing entrepreneurs. For potential entrepreneurs with no capital to start a business, remittances serve as a way to finance a new enterprise for purposes of pursuing profit opportunities. For current entrepreneurs engaging in necessity-motivated entrepreneurship, remittances provide a means to transition into more productive opportunity-motivated entrepreneurship or to exit necessity-motivated enterprises in pursuit of more traditional employment; in essence, remittances provide necessity-motivated entrepreneurs the capital to “stay afloat” as they look for other employment opportunities.

Finally, chapter three of this dissertation continues the study of the impact of remittances on entrepreneurship in the receiving country by studying another mechanism whereby remittances may lead to increases in business creation. Specifically, on top of representing an increase in capital, remittances may also lead to more “entrepreneurship friendly” beliefs and cultural attitudes. Because remittances represent a sudden growth in income and the reception of a bundle of property rights, I hypothesize remittances to lead to more market-oriented and entrepreneurship-oriented beliefs. Capital is not the only thing transferred from immigrants to their families back home – immigrants also send back social remittances, or beliefs and attitudes from the host country that may be different from standard beliefs and attitudes in the home country. I find this to be the case by noting a negative and significant relationship between the reception of remittances and

positive attitudes about equality at the country level. I also find the reception of remittances to be positively associated with positive beliefs about the status and desirability of self-employment as well as positive representation of entrepreneurs in the media. Importantly, I find these associations even after controlling for overall self-employment. This suggests remittances can increase entrepreneurship indirectly through the mechanism of directly changing cultural beliefs and attitudes, not just directly as a sudden boost in capital.

Getting Out When the Going's Good: A Tale of Entrepreneurial Propensities

1. Introduction

Is immigration associated with entrepreneurship in host countries? While the effects of immigration on host country entrepreneurship have received little attention historically in the past ten years, the topic has piqued the interests of academics, for good reason (Aliaga-Isla & Rialp, 2013). From 1990 to 2013, global immigrant populations increased 51% from 154 million to 232 million (United Nations, 2014), while the total global population rose by only 34% in the same timeframe (World Bank, 2014).

Fittingly, attention to the broad topic of immigration's impact on host country outcomes has received wide attention. Research has spanned multiple fields and includes immigration's impacts on economic growth in not only host countries (Wadhwa et al., 2008; Boubtane et al., 2016; Morley, 2006; Clemens, 2011), but also home countries (Oberman, 2013; Easterly & Nyarko, 2008; Carrington, 1999); wages (Card, 1990; Peri & Sparber, 2009; Butcher & Card, 1991); unemployment (Withers & Pope, 1985; Winegarden & Khor, 1991; Marr & Siklos, 1994); public finance (Borjas, 1995; Rector & Richwine, 2013; Ekberg, 2011); crime (Sampson, 2008; Martinez & Lee, 2000; Reid et al., 2005); and institutions (Clark et al., 2015; Powell et al., 2017; Borjas, 2015).

Academics are not the only group that has noticed the importance of understanding the effects of immigration. Rising immigration has also received widening attention in media and popular political discourse, with anxiety over immigration seen as a dividing issue during the Brexit vote (Adam & William, 2018), the election of U.S. president Donald Trump (Winders, 2016), and French presidential elections in 2017 (Dearden, 2017). More recently, the Department of Homeland Security has considered suspending the United States' Optional Practical Training (OTP) program, a postgraduation program tailored to helping high-skilled immigrants obtain practical training (Di Martino, 2020). Further, there exists no shortage of pop articles and media depictions of the immigrant entrepreneur, with the stereotypical Indian gas station owner, Apu of *The Simpsons*, being perhaps the most famous and contentious example (Gottschlich, 2011).

The purpose of this paper is to systematically explore the much more specific topic of the impacts of immigration on host country entrepreneurship. Specifically, this paper asks: To what degree do immigrants display different entrepreneurial propensities compared to their non-immigrant counterparts? Recent research on this topic provides somewhat scattered and mixed results.

For example, Maré et al. (2011) find positive relationships between innovative outcomes and average workforce characteristics such as the proportion of the workforce consisting of immigrants or high-skilled workers. However, this relationship does not hold for all innovation outcomes, and this relationship all but disappears after controlling

for firm characteristics like firm size, industry, and research and development expenditures, though the authors admit this could represent distinctive features of the immigration or innovation system of New Zealand. New Zealand is a relatively small country with a low population density, which may limit the possible scope for potential knowledge spill overs and networks of innovators to which immigrants could contribute.

In contrast, Hunt and Gauthier-Loiselle (2010) find a 1.3 percentage point increase in the share of the population of immigrant college graduates has the effect of a 20-percentage point increase in patents per capita, while a 0.7 percentage point increase in the share of post-college immigrants leads to a 21-percentage point increase in patents per capita. Furthermore, a 0.45 percentage point increase in the amount of immigrant engineers and scientists explains a 22-percentage point increase in patents per capita. These figures include spill-over effects, suggesting instead of being crowded out by immigrants, non-immigrant innovators are being aided by the presence of their immigrant counterparts.

Ozgen et al. (2012), on the other hand, find regions with a relatively high number of immigrants do not exhibit correspondingly high levels of patents per capita. However, the authors also find the diversity of immigrants may have beneficial and complementary effects on non-immigrant workers, though effects are not present in all measures of diversity.

Similarly, Li et al. (2015) find immigrant share is positively related to entrepreneurial activity in the host country, and they find this relationship is mitigated by negative non-immigrant attitudes towards immigration, while Shami and Mickiewicz

(2017) find entrepreneurial tendencies among immigrants are strengthened in institutional environments with high degrees of political and economic freedom.

More closely related to this paper, a few other studies have found a connection between immigration and business creation. Peroni et al. (2016) use evidence from the Global Entrepreneurship Monitor (GEM) to study immigration in Luxembourg and find first-generation immigrants show more interest in starting a business than their non-immigrant counterparts, and this greater interest is especially pronounced among the highly educated migrants. However, these authors also find this relationship holds only for newly established businesses and vanishes in the following entrepreneurial stages.

Similarly, Lofstrom (2019) finds while business ownership is high among foreign-born individuals and high-skilled immigration contributes to innovation, many immigrant business owners are poor and low-skilled. The author concludes by calling for a prioritization of high-skilled immigration.

This paper contributes to the above literature by expanding the analysis to include the descendants of migrants and how entrepreneurial propensities differ not only between non-immigrants and first-generation immigrants, but between non-immigrants and descendants of immigrants, or second-generation immigrants, as well as between immigrants and descendants of immigrants. In addition, this paper also adds to current literature focusing on different motivations behind entrepreneurial behaviour and whether these motivations are necessity-driven or opportunity-driven; specifically, we are the first, to our knowledge, to tackle this topic using cross-country, individual-level data. In doing so, we can account for both individual-level and country-level determinants of

entrepreneurial behaviour and lend greater external validity to previous single-country case studies (Peroni et al., 2016). Finally, we more closely examine one of the driving mechanisms behind differences in entrepreneurial propensities between natives, first-generation immigrants, and second-generation immigrants: differences in income.

Throughout this paper, we will use the terms “immigrant” and “first-generation immigrant” interchangeably, while we use the terms “second-generation immigrant” or “descendants of immigrants” and “non-immigrant” or “native” to describe two other categories non-inclusive of first-generation immigrants. However, in comparisons of immigrants and natives, second-generation immigrants are included as natives.

2. Theory and Related Literature

Our first hypothesis is that first-generation migrants will display a higher entrepreneurial propensity than their non-immigrant counterparts, for a few reasons. First, we predict entrepreneurial individuals to self-select into immigration. If entrepreneurship is considered profit-seeking behaviour in the face of uncertainty (Mises, 1949), and if the primary motivation behind immigration is to follow economic opportunity, evidenced by the strong causal relationship between relative wages and migration (Hanson & Spilimbergo, 1999), it follows immigration is an inherently entrepreneurial act or investment; thus, while we recognize some immigrants, including refugees, migrate for reasons other than to improve economic conditions (David, 1969), we also expect many immigrants to display more entrepreneurial propensity than their non-immigrant and second-generation counterparts who, for the most part, have not chosen to migrate in order to seek out better economic opportunity.

Accordingly, we expect an “entrepreneurial selection bias” among first-generation immigrants. Indeed, in this paper, selection bias of this sort does not pose a statistical or econometric issue but becomes part and parcel of the theoretical explanation underlying differences in entrepreneurial propensities between non-immigrants, second-generation immigrants, and immigrants. Indeed, this “entrepreneurial selection bias” is well documented, and researchers point to a few reasons why it exists. Borjas (1987) and Mahroum (2001) note this selection bias may exist because of a tendency for the immigration policies of rich countries to favour immigrants with traits positively correlated with entrepreneurial capabilities, including high human capital and business experience. Davidsson (2006), in contrast, highlights the possibility that individuals with propensities for entrepreneurship may self-select into immigration, because migration represents a radical and risky break from old traditions and a willingness to start over in a different area; Vandor and Franke (2016) reinforce this notion by recognizing the inherent high risks and potentially high returns that characterize both entrepreneurial ventures and migration.

Finally, Vandor and Franke (2016) highlight another channel through which entrepreneurial individuals may self-select into migration by providing evidence from a longitudinal quasi-experiment that cross-cultural experiences improve one’s ability to recognize profitable opportunities. The theoretical validity of this empirical finding can be understood through an appreciation of the role of localized knowledge (Hayek, 1945) — immigrants bring with them a local knowledge foreign to many non-immigrants in the host countries and see the world through a different cultural and interpretive lens. As

such, immigrants who see new opportunity elsewhere may be motivated to try, in the host country, business ventures and ideas that have been successful elsewhere by utilizing this unique, location-specific knowledge.

However, as has been discussed, immigrant business owners are usually low-skilled and have lower income compared to their non-immigrant counterparts (Lofstrom, 2019) and compared to their second-generation descendants (Abramitzky et al., 2020). If the main barrier to starting or expanding a business is capital, immigrants may have an entrepreneurial selection bias as described above, but if immigrants are relatively low-skilled with low incomes, this selection bias could be all for naught.

Because many immigrant business owners are relatively low-skilled with low income, it is also true that many immigrants are often over-qualified and unable to find full-time jobs compared to their non-immigrant counterparts (OECD/European Union, 2015), making self-employment a relatively appealing option. Further, Wang and Lofstrom (2020) provide evidence using immigration restrictions enacted after 9/11 as a natural experiment to show immigration restrictions have the unintended consequence of pushing immigrants into necessity-driven entrepreneurship: when immigrants are unable to find work due to immigration restrictions, they are pushed into entrepreneurship as a means of survival in an environment with no other desirable alternatives.

Thus, we take the following literature into account and qualify our first hypothesis by predicting differences in entrepreneurial propensity to be primarily driven by differences in necessity-driven entrepreneurship. Related, we also expect immigrants with higher incomes to be relatively more likely to engage in opportunity-motivated

entrepreneurship, or entrepreneurship undertaken to take advantage of perceived profit opportunities, and relatively less likely to engage in necessity-motivated entrepreneurship, or entrepreneurship undertaken because no other desirable alternatives are available, than other immigrants.

Still, further research suggests immigrant business ownership is more pronounced than native business ownership only at the early stage, with greater entrepreneurial tendencies among migrants compared to natives vanishing at further stages of business ownership. Peroni et al. (2016) interpret this evidence, gathered from a study of immigration in Luxembourg using data from the Global Entrepreneurship Monitor (GEM), to suggest immigrants are less adept than natives at maturing businesses into the established stage. However, this relationship could be an artifact of the data instead of a causal relationship – immigrants reside, by definition, in the host country less time on average than natives of similar age. Therefore, without being able to account for length of residence in the host country, if we assume immigrants and natives to have similar entrepreneurial propensities, we should *simultaneously* record immigrant early stage entrepreneurial rates to be higher than native rates and immigrant established stage entrepreneurial rates to be lower than native rates. We return to this theme in greater detail later.

As such, we further qualify our hypothesis by predicting differences in entrepreneurial propensity among immigrants, non-immigrants, and second-generation immigrants to primarily be driven by differences in early stage business creation. Related,

we also expect immigrants with high incomes to be relatively more likely than other immigrants to nurture business ventures into the established stage.

Our second hypothesis predicts second-generation immigrants, defined as the children of at least one first-generation immigrant parent, to be less entrepreneurial than their first-generation parents, but more entrepreneurial than natives. If first-generation immigrants exhibit higher propensities to engage in necessity-driven entrepreneurship and early-stage entrepreneurship because of an entrepreneurial selection bias, and if these intentions are limited due to capital constraints, second-generation immigrants should display lower levels of necessity motivation at the early stage of entrepreneurship than their first-generation parents as these capital constraints are relaxed, at least to some extent. Further, insofar as differences in necessity-driven entrepreneurship between non-immigrants and immigrants are driven by immigration restrictions on employment (Wang & Lofstrom, 2020), second-generation immigrants should become more like non-immigrants and less like their parents, because second-generation migrants are less likely, by definition, to face the same immigration restrictions their parents faced.

More generally, we expect second-generation immigrants to become more like non-immigrants and less like their first-generation parents in terms of entrepreneurial propensities for similar reasons researchers find assimilating tendencies among the descendants of first-generation immigrants in other areas. For example, researchers have found assimilating tendencies among the descendants of immigrants in terms of host country language acquisition (Rumbaut et al., 2006), criminal activity (Bersani, 2014), and IQ (Dalen et al., 2008).

Indeed, one of the quickest ways to achieve assimilation in any area is through immersion, which is precisely what immigration by first-generation immigrants provides second-generation immigrants; this is evidenced by the fact future generations of immigrants assimilate almost completely within one generation regarding characteristics like criminal activity (second-generation immigrants assimilate to high native crime rates relative to first-generation immigrants), trust, and host country language acquisition. One could argue host country language acquisition and utilization is too absolute, with most immigrant descendants even forgetting the native country language within three generations (Caplan, 2019).

We find no reason to expect entrepreneurial tendencies to be subject to any less assimilation than something as culturally ingrained as language, and a wealth of literature uses similar lines of argumentation to make a case for cross-generational assimilating entrepreneurial tendencies among migrant families by viewing self-employment and participation in the labour market as means of socioeconomic assimilation (Light et al., 1994; Zhou, 2004; Portes and Shafer, 2007). Several scholars also highlight future generations of immigrants may display lower rates of entrepreneurship more indicative of natives because most immigrant self-employment results from low human capital, low language proficiency, and labour market restrictions that intentionally impact immigrants in a disproportionate way (Beaujot et al., 1994; Light and Gold, 2000; Valdez, 2006). Evidence described above shows second-generation immigrants suffer to a much smaller degree from the characteristics that lead to greater degrees of self-employment among immigrants, particularly necessity motivated self-employment.

However, we also qualify our second hypothesis. Literature provides empirical evidence and theoretical arguments that suggest inter-generational entrepreneurial assimilation among migrants, a view that has been termed the “assimilation approach,” but there is a variant of this approach to thinking about entrepreneurial assimilating tendencies among migrants known as the “segmented assimilation” variant (Chaudhary, 2014). This variant considers the possibility of “downward assimilation,” a concept that can be thought of as the opposite of assimilation; instead of assimilating into host country culture, there is a group of second-generation immigrants who assimilate further into their parents’ native culture, and this “downward assimilation” manifests itself through similar entrepreneurial tendencies across generations of immigrants (Haller et al., 2011).

Downward assimilation of this nature is often described in the literature as a negative outcome, as second-generation immigrants who downwardly assimilate experience adverse labour market outcomes and low levels of income, despite (or, rather, because of) continuing their parents’ entrepreneurial tendencies. Indeed, this is evidenced by some of the recorded predictors of downward assimilation, including low human capital, minority status, residing in an area with a particularly high concentration of immigrants, and a lack of opportunities for upward mobility because of the disadvantaged labour market status of parents (Portes and Zhou, 1993).

As such, though we predict second-generation immigrants to be generally less entrepreneurial than their parent generation at all stages of entrepreneurship, we also qualify this hypothesis by predicting the second-generation immigrants who do continue business into the established stage will be those who engage in entrepreneurship mostly

for necessity purposes. Necessity-motivated entrepreneurship is associated with adverse labour market outcomes (Block and Wagner, 2010), so we expect immigrants who downwardly assimilate and continue their parents' entrepreneurial tendencies to engage in entrepreneurship that is associated with low income, low skill level, and other adverse labour market outcomes. Further, if second-generation immigrants downwardly assimilate into parental entrepreneurial tendencies, and if parental entrepreneurial tendencies are largely driven by necessity-motivated entrepreneurship (as we predict above), we should also expect second-generation immigrants who downwardly assimilate to engage in necessity-motivated entrepreneurship. In short, we expect second-generation immigrants to shift away from their parents' entrepreneurial tendencies when they are able. In simpler words, we expect second-generation immigrants to "get out when the going is good." Those who continue the entrepreneurial behaviour of their parent generation and downwardly assimilate suffer worse outcomes.

Finally, our third hypothesis is that immigrants will be more intrapreneurial than natives. A concept originating in the management literature, intrapreneurship is defined as entrepreneurial behaviour by managers and employees *within* firms (Antoncic and Hirsch, 2003); much like Schumpeter (2011, p. 83) framed entrepreneurship as the "carrying out of new combinations" and a driver of economic growth, it is helpful to frame intrapreneurship as the "carrying out of new combinations" within firms, or departures from the status quo by managers and employees within firms. Intrapreneurship, like entrepreneurship, is also a driver of economic growth and development, which depend in large part on innovative behaviour within existing firms

(Antoncic and Antoncic, 2011). Although the average characteristics of intrapreneurs are likely different than those of more traditional entrepreneurs, particularly because intrapreneurship is much more likely in high-income countries (Bosma et al., 2011), we expect immigrants to be more entrepreneurial than natives generally for reasons described above. As such, we also expect relatively greater intrapreneurial tendencies among immigrants and inter-generational intrapreneurial assimilation among second-generation immigrants for the same reasons we expect to see the same *entrepreneurial* tendencies among first-generation immigrants and second-generation immigrants.

We further expound upon this hypothesis by predicting intrapreneurship among immigrants to be driven by low-skill or low-income immigrants. Prior literature identifies intrapreneurial individuals within firms as much more likely than average to have intentions of starting an independent business (Bosma et al., 2011), and the ability to start a business is limited by an individual's ability to raise capital (Bedi et al., Forthcoming). Therefore, we expect would-be intrapreneurial migrants with high incomes to instead engage in attempts to start their own businesses and relatively low-income immigrants to drive intrapreneurial differences between immigrants and natives.

Regarding our first hypothesis, we find evidence entrepreneurs at the early stage for both opportunity and necessity reasons are more likely to be first-generation migrants than non-immigrants. We also find entrepreneurs are more likely to be first-generation than second-generation immigrants at the early-stage, but this difference is driven primarily by differences in necessity-motivated entrepreneurship. Importantly, we identify lower income as an important mechanism driving higher necessity-motivated

entrepreneurial propensities among first-generation migrants, and we note early stage enterprises are slightly more likely to be started by second-generation immigrants with higher incomes than natives.

Regarding our second hypothesis, we provide evidence that second-generation immigrants become more like non-immigrants and less like their first-generation parents in terms of entrepreneurial propensities, and this is true regarding both opportunity motivated entrepreneurial rates and necessity motivated entrepreneurial rates. However, we also find evidence necessity-motivated entrepreneurs at the established stage are more likely to be second-generation immigrants than natives and first-generation immigrants. In other words, we find evidence that second-generation immigrants “get out” of entrepreneurial ventures “when the going is good.”

Regarding our third hypothesis, we document evidence of inter-generational assimilation among immigrants regarding intrapreneurial propensities, or likelihoods individuals will become managers within firms who promote innovative product development and marketing; as with normal measures of entrepreneurship, immigrants enjoy a higher intrapreneurial propensity than natives, with the intrapreneurial propensity of second-generation immigrants resting firmly between those of immigrants and natives. We also document evidence that differences in these intrapreneurial propensities are driven by low-income immigrants and second-generation immigrants.

The next section of the paper will provide descriptions of the data. In the fourth section, we introduce our empirical strategy and provide results and discussion. The fifth section concludes the study and provides implications and policy recommendations.

3. Data and Methodology

Data

The data used in this study is collected from the 2013 Global Entrepreneurship Monitor (GEM) Adult Population Survey. As a popular annual, cross-country, individual-level survey on entrepreneurial behaviours and intentions, GEM has been adopted in a broad entrepreneurship literature in the past two decades. In over 100 countries, GEM currently surveys a minimum per country sample of 2,000 working age adults at different income levels, which represents over three-fourths of the population in the world.

Generally, the framework of GEM categorizes and tracks entrepreneurship at different stages of maturity: future entrepreneurship, start-up/nascent entrepreneurship, early-stage entrepreneurship, and established entrepreneurship. At each stage, the administered questionnaires depict entrepreneurial characteristics in multiple dimensions, such as entrepreneurial motivations, job-creation, intrapreneurship, business angel tendencies, ownership structure, innovation, international orientation, demographics, etc. One of the more important questions in the GEM survey records individual motivations for starting a business, and this is where part of this paper's contribution can be found: opportunity-driven, or improvement-driven, entrepreneurs are entrepreneurs who start a business mainly to increase income or become independent, while necessity-driven entrepreneurs are those who start a business due to no other available option for work.

While GEM is not exclusively designed for immigration research, each year an additional set of questions on a different topic are surveyed on a subset of its complete pool. In 2013, the special topic conducted was on immigration and entrepreneurship

(Global Entrepreneurship Monitor 2013 Global Report). As such, the behaviours of immigrant entrepreneurs can be investigated with the intersection of the GEM main body questionnaires and the additional questions surveyed in 2013.

While this is the only cross-country immigration and entrepreneurship dataset available at the individual-level, we admit there are proportionally more immigrants in high income than low income countries in this data set; however, because of the inherent nature of immigration, one should expect this phenomenon in any immigration data set, as immigrants usually immigrate with the aim of increasing wealth (Hanson and Spilimbergo, 1999) — ergo, we should expect immigrants to immigrate from low-income countries to high-income countries. Our dataset also still represents a vast majority of the World’s population. Specifically, our data include a total of 116,135 surveyed individuals in 35 countries covered by the GEM 2013 immigration and entrepreneurship special topic survey, with 20 high income countries, 12 upper-middle income countries, and 3 lower-middle income countries, according to the World Bank country income classification of 2013. Refer to **Table 1** for a full list of the countries in the sample.

Empirical Methodology

As mentioned above, Peroni et al. (2016) investigate the immigration-entrepreneurship relation in a country-specific context (Luxemburg), and a few studies investigate the relation in a cross-country context (Li et al., 2015; Shami and Mickiewicz, 2017) using logit models and country-specific institutional variables. However, to perform a cross-country analysis based on individual-level data, the popular method dealing with binary outcome variables, the logit model, is not ideal. For example, in the current dataset of

2013 GEM immigrant entrepreneurship, apart from variations among individuals, country effects may also impact the entrepreneurial decisions and behaviours of individuals; hence, a multilevel (or “multidimensional”; “hierarchical”) model is more appropriate. The empirical framework employed in the current research is the Two-Level Logistic Regression (TLLR) with random country intercepts, to capture the effects of both individuals (level 1) and countries (level 2) on entrepreneurial outcomes (Bryan and Jenkins, 2015; Sommet and Morselli, 2017). The specifications of the TLLR model employed can be written as the following equation:

$$\ln \frac{P_{i,c}}{1 - P_{i,c}} = \beta_{0,c} + \beta_{1,c} * (Immigration_{i,c}, X'_{i,c}) + \varepsilon_{i,c}$$

$$\beta_{0,c} = \gamma_{0,0} + \gamma_{0,1}Z'_c + u_{0,c}$$

$$\beta_{1,c} = \gamma_{1,0} + u_{1,c}$$

$$i = 1, \dots, 24,599; c = 1, \dots, 35$$

where $P_{i,c}$ is the probability of a binary entrepreneurial outcome variable for person i in country c ; an example is the probability of an immigrant being an entrepreneur at the early-stage in the United States. We express our outcome variable as an odds ratio. Our binary immigration variable comes in three forms:

1. If a person is an immigrant (1) or a non-immigrant (0)
2. If a person is the descendant of at least one immigrant (1) or a first-generation immigrant (0)
3. If a person is a descendant of at least one immigrant (1) or a non-immigrant (0)

Table 1 List of All the Countries in the Sample

Country	Frequency in GEM Sample	Percentage in GEM sample	Overall percentage of foreign-born population in a country*
South Africa	3,450	2.97%	4.5%
Netherlands	3,005	2.59%	11.7%
Belgium	2,001	1.72%	10.4%
France	2,002	1.72%	11.6%
Spain	24,599	21.18%	13.8%
Hungary	2,000	1.72%	4.5%
Italy	2,052	1.77%	9.4%
Romania	2,021	1.74%	0.9%
United Kingdom	10,947	9.43%	12.4%
Sweden	2,506	2.16%	15.9%
Poland	2,000	1.72%	1.7%
Germany	5,996	5.16%	11.9%
Peru	2,075	1.79%	0.3%
Malaysia	1,982	1.71%	8.3%
Indonesia	1,746	1.50%	0.1%
Philippines	2,500	2.15%	0.2%
South Korea	2,000	1.72%	2.5%
China	3,625	3.12%	0.1%
Canada	3,286	2.83%	20.7%
Algeria	2,500	2.15%	0.7%
Nigeria	2,604	2.24%	0.7%
Botswana	2,204	1.90%	7.2%
Namibia	2,000	1.72%	2.2%
Portugal	2,003	1.72%	8.4%
Luxembourg	2,005	1.73%	43.3%
Ireland	2,002	1.72%	15.9%
Finland	2,005	1.73%	5.4%
Lithuania	2,000	1.72%	4.9%
Latvia	2,000	1.72%	13.8%
Croatia	2,000	1.72%	17.6%
Slovenia	2,002	1.72%	11.3%
Bosnia and Herzegovina	2,004	1.73%	0.6%
Czech Republic	5,009	4.31%	4.0%
Panama	2,004	1.73%	4.1%
Puerto Rico	2,000	1.72%	8.7%
Total	116,135	100%	-

$X'_{i,c}$ is the vector containing all the demographic characteristics at the individual level like gender, age, education, income class, whether a person is currently seeking a job, and whether he or she has a current full-time job. Built on the specifications of Peroni et al. (2016), $X'_{i,c}$ also includes other GEM individual-level characteristics relevant to entrepreneurial choices and behaviours, such as if a person has networks with other entrepreneurs, self-evaluation of his or her own entrepreneurial knowledge and skill, risk aversion, and an index for perceived cultural support for entrepreneurship (perception of social status of entrepreneurs, corruption, etc.) at the individual-level. Z'_c is the vector for country-level (level 2) characteristics. In this study, to identify the country-level effects on individual-level entrepreneurial decisions, Z'_c only includes a country dummy; a measure of income, logarithm of GDP per capita; and a measure for institutional quality. The data are collected from the World Development Indicators of the World Bank and the Economic Freedom of the World Index of the Fraser Institute, respectively. We do this to account for country-level institutional determinants of entrepreneurship, as institutions have been identified in prior literature as a driver of entrepreneurial behaviour (Baumol, 1990).

Due to the relatively small number of country-level observations ($c = 35$), our specifications are not able to accommodate more country-level variables; however, the LR tests indicate this specification is still superior to a regular one-level logistic regression, which does not allow for random country intercepts. In addition, $\beta_{0,c}$, $\beta_{1,c}$, and $\varepsilon_{i,c}$ refer to the (level 2) intercept of the dependent variable for country c , the slope for the (level 1) predictors in country c , and the unobserved (level 1) individual effects,

respectively. $\gamma_{0,0}$, $\gamma_{0,1}$, $\gamma_{1,0}$, $u_{0,c}$, and $u_{1,c}$ refer to the overall intercept, the slope of the country-level (level 2) predictors, the slope of the overall individual-level (level 1) predictors, and the unobserved (level 2) country effects, respectively. Refer to **Table 2** for details of the full list of the variables.

4. Results

The empirical results are presented by two entrepreneurial stages—early-stage entrepreneurship and established entrepreneurship. We further report the empirical results of intrapreneurship. In addition, three panels concerning comparisons of entrepreneurial activities among the three demographic groups of interest (first-generation immigrants, descendants of immigrants, and non-immigrants) are included in each of the tables. Finally, as a robustness check, we also tabulate the results that include an interaction term between income and entrepreneurship measures.

4.1 Early Stage Entrepreneurship

To begin, GEM defines total early-stage entrepreneurship (TEA) as enterprises that are less than three and a half years (42 months) old. Our results for this stage can be viewed in **Table 3**. As reported in column 1 of **Table 3**, entrepreneurs are more likely to be first generation immigrants than non-immigrants by about 39 percent (*Panel A*). Although potential entrepreneurial propensity significantly drops by about 32 percent, entrepreneurs are still more likely to be second-generation immigrants (*Panel B*) compared with non-immigrants by over 41 percent (*Panel C*). Divided by gender, the immigrant male early stage entrepreneurial rate (*Column 2*) is about 48 percent higher than the non-immigrant male early stage entrepreneurial rate, and the immigrant female

early stage entrepreneurial rate (*Column 3*) is over 30 percent higher than the non-immigrant female early stage entrepreneurial rate, suggesting a gender gap among immigrants exists in entrepreneurship at the early stage that is larger in magnitude than the gender gap existing among non-immigrants in entrepreneurship at the early stage.

The reason why immigrants are more entrepreneurial than non-immigrants, or more specifically why entrepreneurs are more likely to be immigrants than non-immigrants, can be partially explained by variation in motivation, as reported in columns 4 and 5. Although immigrants are more strongly motivated by both opportunity (*Column 4, Panel A*) and necessity (*Column 5, Panel A*) than non-immigrants, just as we predicted, the coefficient of the latter is much more significant and more than three times larger than that of the former in magnitude. This implies that a first-generation immigrant may be more entrepreneurial than a non-immigrant, but these differences are driven relatively more by necessity motivation than opportunity motivation.

Necessity motivation seems to be passed along to second-generation immigrants, as this motivation drives the stronger entrepreneurial activities of immigrants of both generations; however, necessity motivated entrepreneurs are less likely to be second generation immigrants than first-generation immigrants by about 45 percent (*Column 5, Panel B*). One interpretation could be that, born in the host country, the second-generation immigrants have improved their performance in the labour market and have been able to exit necessity motivated enterprises — this is exactly what our front-end theory predicts.

Table 2 Variables and Summary Statistics

Note: All variables are collected from and calculated based on the 2013 Global Entrepreneurship Monitor (GEM) Adult Population Survey, and its additional survey—Entrepreneurial Employee Activity (EEA).

Variable	Description	Num. of Obs.	Mean	S.D.
<i>Dependent variables</i> (with abbreviations used in the outputs in parenthesis)				
Expecting to start up a business (Start-up_expect)	Is a person alone or with others, expecting to start a new business, including any type of self-employment, within the next three years	111,986	0.174	0.379
Currently trying to start up a business (Start-up_now)	Is a person alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others	115,852	0.117	0.321
Nascent entrepreneur (Nascent)	If a person is currently involved in a new start-up (nascent) business for less than 3 months (independent or job) — either looking to increase income or sees good opportunity	116,135	0.137	0.344
Nascent entrepreneur, opportunity (Nascent_opp)	If a person is currently involved in starting a new business for less than 3 months, driven by opportunity motivation	116,135	0.040	0.196
Nascent entrepreneur, necessity (Nascent_nec)	If a person is currently involved in starting a new business for less than 3 months, driven by necessity motivation —no better job to choose	116,135	0.013	0.114
Job creation (Job_nascent)	If a nascent business currently creates at least one job or expects to create at least one job in 5 years, calculated based on “SU_JOB5Y” and “SU_JOB5Y”	5,256	0.838	0.369
Job creation, total early stage (Job_early)	If a business at the total early stage currently creates at least one job or expects to create at least one job in 5 years	116,135	0.071	0.257
Job creation, established stage (Job_estb)	If a business at the established stage currently creates at least one job or expects to create at least one job in 5 years	5,278	0.756	0.430
High job creation, nascent stage (High_job_nascent)	If a start-up/nascent business expects to create 19 jobs or more in 5 years, calculated based on “SU_JOB5Y” in the survey	115,135	0.959	0.199
High job creation, total early stage (High_job_early)	If a business at the total early stage expects to create 19 jobs or more in 5 years	116,135	0.008	0.087
High job creation, established stage (High_job_estab)	If a business at the established stage expects to create 19 jobs or more in 5 years	116,135	0.004	0.067
New technology adoption, nascent stage (New_tech_nascent)	If technologies or procedures required for the product or service of a nascent business is available less than 1 year new, calculated based on “SUNEWTEC” in the survey	7,589	0.215	0.411
New technology adoption, total early stage (New_tech_early)	If technologies or procedures required for the product or service of an early-stage business at the total early stage is available less than 1 year new	11,446	0.185	0.388
New technology adoption, established stage (New_tech_estb)	If technologies or procedures required for the product or service of an established business at the established stage is available less than 1 year new	8,627	0.066	0.248
New product or new market (New_product/mkt_early)	If product is new to all/most customers, and this product or service of an early-stage business is provided to a new market (few/no businesses offer the same product)	11,446	0.241	0.428
New product or new market (New_product/mkt_estb)	If product is new to all/most customers, and this product or service of an established business is provided to a new market (few/no businesses offer the same product)	7,570	0.166	0.372
International orientation (Int'l_nascent)	If more than 25% customers of a start-up/nascent business normally live outside of the country, calculated based on “SUEXPST” in the survey	10,705	0.140	0.348
International orientation (Int'l_early)	If more than 25% customers of a firm at the total early stage normally live outside of the country	8,432	0.035	0.184
International orientation (Int'l_estb)	If more than 25% customers of a firm at the established stage normally live outside of the country, calculated based on “EB_EXP4C” in the survey	116,135	0.033	0.178
Sole proprietorship (Sole-owner_nascent)	If a start-up/nascent business is sole proprietorship, calculated based on “SU_OWNER” in the survey	116,135	0.064	0.245
Sole proprietorship (Sole-owner_early)	If a business at the total early stage is sole proprietorship, calculated based on “SU_OWNER” in the survey	116,135	0.053	0.224
Sole proprietorship (Sole-owner_estb)	If a business at the established stage is sole proprietorship, calculated based on “SU_OWNER” in the survey	116,135	0.099	0.298

Total early-stage entrepreneurial activity (Early)	If a person is involved in entrepreneurial activity either at the nascent stage (activate in the past 12 months) or owner-manager of a new business (less than 3.5 years).	116,135	-0.978	1.080
Male TEA (Early_male)	% TEA initiated by male entrepreneurs because of opportunity motive	116,135	-0.923	1.059
Female TEA (Early_female)	% TEA initiated by female entrepreneurs because of opportunity motive	116,135	0.071	0.256
Opportunity TEA (Early_opp)	% TEA businesses initiated because of opportunity motive—not because of no other work options available	116,135	0.025	0.157
Necessity TEA (Early_nec)	% TEA initiated because of necessity motive—either no other work option or just maintaining their income.	116,135	0.074	0.262
Established business ownership (Estb)	If a person is involved in entrepreneurial activity as owner-manager of an established business (more than 3.5 years)	7,934	0.724	0.447
Opportunity EB (Estb_opp)	% of established businesses initiated because of opportunity motive—not because of no other work options available	7,934	0.276	0.447
Necessity EB (Estb_nec)	% of established businesses initiated because of necessity motive—not because of no other work options available	115,870	0.033	0.179
Potential intrapreneur, currently trying to start a business (Intrapreneur_potential)	If a person alone or with others, is currently trying to start a new business or a new venture for his/her employer as part of normal work, calculated based on “BJOBST” in the survey	115,779	0.053	0.223
Active intrapreneur in past three years (Intrapreneur_past)	If a person is active as an intrapreneur in past three years (base: employment population)	116,135	0.011	0.106
Active intrapreneur now (Intrapreneur_now)	If a person is active as an intrapreneur now (base: employment population)	111,986	0.174	0.379
Active and leading intrapreneur in past three years (Intrapreneur_lead_past)	If a person is active and leading as an intrapreneur in past three years (base: employment population)	115,852	0.117	0.321
Active and leading intrapreneur now (Intrapreneur_lead_now)	If a person is active and leading as an intrapreneur now (base: employment population)	116,135	0.137	0.344
Control Variables				
Institutional quality at country level	Economic Freedom of the World Index (EFW), summary index	35	7.406	0.530
GDP per capita at country level	Log GDP per capita, constant 2017 international dollars	35	10.258	0.608
Gender	Gender of the respondents	116,135	1.517	0.450
Age	Age range for respondents recoded	116,112	4.169	1.425
Education	United Nations harmonized educational attainment	114,723	3.319	1.330
Household Income	Log household income of respondents	90,972	7.370	3.130
Seeking employment	If a person is currently looking for a job, regardless of if he/she has a job or is an entrepreneur.	115,751	1.876	0.330
Employed	If a person is currently employed by others in full-time work, regardless of if he/she is an entrepreneur at the same time.	115,816	1.611	0.488
Entrepreneurial networking	If a person knows someone personally who started a business in the past 2 years	114,974	0.343	0.475
Entrepreneurial skill	If a person believes that he/she has the knowledge, skill and experience required to start a new business	113,083	0.473	0.499
Entrepreneurial risk averse	Would fear of failure prevent a person from starting a business, controls for the differences between risk averse, neutral and acceptant preferences	112,101	0.429	0.495
Entrepreneurial Opportunity Perception	If a person perceives good opportunities to start a business in the country where he/she lives, which also includes the considerations on factors like enforcing property rights and protection of freedom.	99,046	0.328	0.469
Cultural support index for entrepreneurship	Individual’s view on the social status of entrepreneurs, if it is a good career choice and how does corruption affect his/her answer to these questions in a country	116,135	1.067	1.764

Despite a lower entrepreneurial propensity than first generation immigrants, entrepreneurs are still more likely to be second-generation immigrants than non-immigrants, driven by both motivations (32.2 percent higher for opportunity motivation and 36.5 percent higher for necessity motivation, respectively (*Columns 4 and 5, Panel C*)). Thus, we see assimilation across generations of immigrants regarding entrepreneurial propensities, and cross-generational decreases in entrepreneurial tendencies among immigrants are primarily driven by a decreased likelihood of necessity-driven entrepreneurial ventures being run by second-generation immigrants. This could suggest that while entrepreneurship seems to be passed along to second-generation immigrants, entrepreneurial traits are not passed along completely, and second-generation immigrants start behaving more like their non-immigrant peers. Increased income mobility among the descendants of immigrants can explain the fact second-generation immigrants tend to be relatively less motivated by necessity than their parents (Abramitzky et al., 2020), and these results sit well with assimilation explanations of cross-generational entrepreneurial tendencies among migrants and their families (Light et al., 1994; Zhou, 2004; Portes and Shafer, 2007).

Columns 6 through 10 continue to investigate five additional dimensions of entrepreneurial measures between immigrants, their descendants, and non-immigrants. As Column 6 suggests, like the early-stage entrepreneurial measures analysed in the previous columns, both immigrant enterprises and enterprises of their descendant generation are more likely to hire than native entrepreneurs, by over 50 percent (*Column 6, Panel A*) and over 60 percent, respectively (*Column 6, Panel C*). What is more,

second-generation immigrant entrepreneurs have an over 53 percent greater likelihood to either adopt new technologies compared with non-immigrants entrepreneurs (*Column 7, Panel C*) or to introduce new products compared with the first-generation immigrant entrepreneurs (*Column 8, Panel B*), which reflects clear inter-generational movement toward innovation. Additionally, the first-generation immigrant entrepreneurs have stronger connections to international customers and markets compared with both their descendants (*Column 9, Panel B*) and non-immigrants (*Column 9, Panel A*).

Finally, immigrants of both generations consistently lack a business partner—although the likelihood decreases significantly for the second-generation immigrant entrepreneurs by about 38 percent (*Column 10, Panel B*), they are still about 25 percent more likely than non-immigrants to be sole proprietors (*Column 10, Panel C*). This could be another reflection of immigrant entrepreneurs’ disadvantage compared with non-immigrants and a further indication that entrepreneurial differences between immigrants and natives are driven in large part by necessity motivations. Indeed, Hurst and Pugsley (2010) find businesses run by sole proprietorships are characterized by less innovation and scale up at a lower rate than businesses owned by multiple individuals. The authors conclude sole proprietorships to contribute less to economic growth than other businesses.

Overall, at the total early entrepreneurial stage, we find significant differences among immigrants, non-immigrants, and second-generation immigrants in terms of entrepreneurial intentions, motivations, and behaviors. Specifically, we find first-generation immigrants to be more entrepreneurial than non-immigrants, and we find these differences to be primarily driven by necessity motivation. We also find second-generation

Table 3 Entrepreneurship at the Total Early Stage

	1	2	3	4	5	6	7	8	9	10
Panel A Immigrants compared with non-immigrants										
<i>Dependent Variables</i>	Early	Early_male	Early_femal e	Early_opp	Early_nec	Job_early	New_tech _early	New_product/mkt_ear ly	Int'l_early	Sole- owner_early
Immigrants	0.393*** (0.085)	0.480*** (0.110)	0.302** (0.135)	0.217** (0.099)	0.708*** (0.146)	0.529*** (0.094)	0.076 (0.209)	-0.454*** (0.173)	0.451** (0.187)	0.305*** (0.106)
Constant	-2.639** (1.163)	-3.497*** (1.136)	-2.315* (1.334)	-4.327*** (1.149)	-0.210 (1.428)	-3.045** (1.240)	1.654 (1.964)	-3.571*** (1.342)	-6.615*** (2.495)	-2.405** (1.098)
Random effects at the country level	0.178*** (0.044)	0.162*** (0.042)	0.219*** (0.057)	0.169*** (0.043)	0.236*** (0.066)	0.200*** (0.050)	0.459*** (0.122)	0.199*** (0.056)	0.752*** (0.212)	0.151*** (0.039)
Log likelihood (LL)	-20053.434	-11199.800	-8836.356	-16270.535	-8492.231	-16703.713	-3725.366	-4497.994	-2841.025	-15418.711
LL, comparison model	-20620.322	-11467.443	-9122.393	-16711.851	-8626.487	-17184.574	-4096.832	-4615.646	-3028.643	-15798.709
LR test vs. log model, prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Success	1,740	864	876	1,740	1,740	1,740	218	218	201	1,740
Failure	69,927	34,838	35,089	69,927	69,927	69,927	8,275	8,275	7,818	69,927
Number of obs.	71667	35702	35965	71667	71667	71667	8493	8493	8019	71667
Number of countries	35	35	35	35	35	35	35	35	35	35
Panel B Second-generation immigrants compared with the first-generation immigrants										
Descendants of Immigrants	-0.317*** (0.123)	-0.366** (0.154)	-0.236 (0.203)	-0.169 (0.137)	-0.449** (0.217)	-0.469*** (0.138)	0.027 (0.299)	0.536** (0.242)	-0.557** (0.278)	-0.381** (0.155)
Constant	-1.017 (1.783)	-1.778 (1.943)	-0.421 (2.158)	-2.889* (1.656)	2.962 (1.906)	-1.145 (1.996)	1.132 (2.768)	-2.573 (2.317)	-2.815 (2.391)	-0.566 (1.623)
Random effects at the country level	0.116 (0.073)	0.101 (0.077)	0.090 (0.087)	0.062 (0.052)	0.000 (0.000)	0.146 (0.091)	0.075 (0.160)	0.044 (0.081)	0.000 (0.000)	0.043 (0.045)
Log likelihood (LL)	-1024.952	-615.400	-409.315	-841.564	-398.432	-846.716	-175.585	-240.107	-190.240	-703.470
LL, comparison model	-1033.999	-619.235	-410.748	-844.126	-398.432	-855.093	-175.761	-240.341	-190.240	-704.549
LR test vs. log model, prob.	0.000	0.003	0.045	0.012	.	0.000	0.276	0.247	.	0.071
Success	1,745	891	854	1,745	1,745	1,745	198	198	187	1,745
Failure	1,740	864	876	1,740	1,740	1,740	218	218	201	1,740
Number of obs.	3485	1755	1730	3485	3485	3485	416	416	388	3485
Number of countries	17	17	17	17	17	17	15	15	15	17
Panel C Second-generation immigrants compared with non-immigrants										
Descendants of Immigrants	0.411*** (0.061)	0.411*** (0.077)	0.370*** (0.089)	0.322*** (0.065)	0.365*** (0.095)	0.615*** (0.065)	0.536*** (0.107)	-0.028 (0.106)	0.112 (0.172)	0.246*** (0.067)
Constant	-1.441 (1.188)	-2.337** (1.146)	-1.095 (1.364)	-3.433*** (1.195)	0.971 (1.416)	-1.240 (1.306)	3.287 (2.127)	-3.460** (1.370)	-6.450** (2.550)	-1.543 (1.124)
Random effects at the country level	0.180*** (0.046)	0.156*** (0.042)	0.217*** (0.058)	0.178*** (0.046)	0.217*** (0.061)	0.217*** (0.056)	0.534*** (0.146)	0.195*** (0.055)	0.753*** (0.217)	0.151*** (0.039)
Log likelihood (LL)	-19504.428	-10867.561	-8619.733	-15835.852	-8261.682	-16209.370	-3616.982	-4380.743	-2725.263	-15039.738
LL, comparison model	-19992.581	-11076.020	-8884.704	-16233.134	-8376.422	-16621.102	-3961.307	-4495.720	-2895.743	-15389.434
LR test vs. log model, prob.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Success	24,476	11,921	12,555	24,476	24,476	24,476	2,507	2,507	2,398	24,476
Failure	45,463	22,921	22,542	45,463	45,463	45,463	5,769	5,769	5,421	45,463
Number of obs.	69939	34842	35097	69939	69939	69939	8,276	8,276	7819	69939
Number of countries	35	35	35	35	35	35	35	35	35	35

entrepreneurial outcomes at this stage to fall well in between those of their first-generation parents and non-immigrants – in other words, second-generation immigrants are becoming less like their first-generation parents and more like non-immigrants.

4.2 Established Entrepreneurship

Table 4 continues the investigation of immigration and entrepreneurship for businesses at the next maturity level - the “established business stage,” defined by GEM as enterprises that have survived longer than three and a half years (42 months). In distinct contrast to all the previous stages, differences in the overall entrepreneurial rate driven by both types of motivations between immigrants and non-immigrants (*Panel A*) and between the descendants of immigrants and their parent-generation (*Panel B*) largely disappear at the established stage.

The only two significant contrasts that remain at the established stage are immigrant entrepreneurs have a persistent and much higher likelihood of both utilizing new technology (*Column 5, Panel A*), suggesting more innovative behavior among immigrants compared to natives, and connecting to international customers (*Column 7, Panel A*) compared to non-immigrants and their descendants. Indeed, immigrant entrepreneurs are more than twice as likely to connect to international customers than native entrepreneurs at the established stage compared with differences between natives and first-generation immigrants in international orientation at the early stage (*Column 9, Panel A of Table 2*). Nevertheless, second-generation migrants also “beat” their parent generation snappily in terms of providing new products to new markets (*Column 6, Panel B*) by over 128 percent. Part of this result is also likely data-driven; if non-immigrants and immigrants had similar

entrepreneurial rates, immigrants, by their nature of being more recent, would have a higher rate of “newer” entrepreneurship and lower rates of more established entrepreneurship. Unfortunately, the data at our disposal does not allow for us to control for the time an immigrant has resided in the host country.

What should we make of this statistically insignificant difference between first-generation entrepreneurship and non-immigrant entrepreneurship at the established stage given we lack data on immigrants’ length of stay in the host country? Does this indicate first-generation immigrants are less able to nurture their businesses to maturity than non-immigrants? Many have taken this result to mean as much (Peroni et al., 2016). However, as mentioned above, a large part of this result may be data driven; in other words, this data omits an essential variable, making the assertion that first-generation immigrants are less able to nurture their businesses to maturity problematic. If immigrants and non-immigrants had the same entrepreneurial propensities, logic follows those immigrants would be more entrepreneurial at the early stage less entrepreneurial in the established stage, simply because immigrants systematically live in the host country a shorter amount of time than non-immigrants. Indeed, taking this simple fact into consideration, no statistically significant difference in established entrepreneurship rates between immigrants and non-immigrants coupled with a higher rate of early-stage entrepreneurship among immigrants indicates our estimates of the differences between established entrepreneurship rates between immigrants and non-immigrants are biased downward.

This downward bias seems more likely given the fact we record coefficients suggesting immigrants are more entrepreneurial at the established stage than natives when

motivated by opportunity and less entrepreneurial at the established stage than natives when motivated by necessity; these coefficients are simply insignificant. If we are correct, our results could very well indicate immigrants are more entrepreneurial at the established stage than non-immigrants when motivated by opportunity and less entrepreneurial at the established stage than non-immigrants when motivated by necessity. Julian Simon once wrote, “Not only does a correlation not ‘prove’ causation, as the popular slogan has it, but no other scientific procedure - not even a lengthy series of experiments - can ‘prove’ causation, either. Rather, the best one can do is to build a stronger and stronger case for the influence of one variable upon another, using data and theory together. On the other hand, even a simple correlation can under some circumstances strongly suggest causation in a fashion contrary to the slogan” (Simon, 1989 pp. 327). The correlation we find between being an immigrant and engaging in established entrepreneurship seems to be a perfect example of a circumstance in which “a simple correlation can...strongly suggest causation in a fashion contrary to the slogan,” especially when we use “data and theory together” to recognize the omitted variable representing duration of stay in the host country likely biases our estimates of first-generation immigrants’ entrepreneurial propensities at the established stage compared to non-immigrants’ downwards.

Having said that, we see a distinct change in cross-generational entrepreneurial patterns among second-generation immigrants when we move our analysis from the early stage to the established stage. There are two distinctions that draw our attention. On the one hand, the descendants of immigrants have a considerably smaller established-stage entrepreneurial rate than their non-immigrant counterparts (Column 1, Panel C), and this

is specifically driven by a weaker opportunity motivation (Column 2, Panel C) but stronger necessity motivation (Column 3, Panel C) among entrepreneurs who are second-generation immigrants. This finding suggests second-generation immigrants are mostly involved in business ownership because of an “inheritance effect,” or because of established businesses inherited from parents.

The overall findings that descendants of immigrants are more entrepreneurial at the early stage than non-immigrants but less entrepreneurial at the established stage than immigrants, coupled with the findings first-generation immigrants are more entrepreneurial than non-immigrants at the early stage and similarly entrepreneurial to non-immigrants at the established stage, suggest the descendants of immigrants are more likely than non-immigrants and first-generation immigrants to “give up on” or sell a business before it reaches the established stage. Those who do not “give up on” a business before reaching the established stage seem to stay in business in large part because of necessity reasons.

In other words, because first-generation immigrants are more constrained, in terms of capital, than second-generation migrants and more entrepreneurial for necessity reasons, it seems reasonable to assume first-generation immigrants are also less likely than second-generation immigrants to sell a poorly performing business, because first-generation immigrants have fewer outside options for income than second-generation immigrants due to both decreased capital constraints (Abramitzky et al., 2020) and labor market restrictions that specifically affect immigrants (Wang and Lofstrom, 2020). In addition, this finding could be interpreted as demonstrating how the disadvantaged status of immigrants in the labor market is persistent at least in part until the second generation, at least for some

immigrants. It seems second-generation immigrants who can find work outside self-employment take advantage of the opportunity, while immigrants who inherit entrepreneurial propensities from their parent generation are “forced” to continue self-employment in that these second-generation immigrants continue business ventures for necessity purposes or because they see no other better options for work. It seems second-generation immigrants, when able, “get out when the going is good.” This finding reconciles well the assimilation perspective of second-generation entrepreneurship with its segmented assimilation variant (Chaudhary, 2014). It seems there are two broad groups of second-generation immigrants – those who “get out when the going is good” and the rest who stay because “the going is not good.”

On the other hand, the established enterprises owned and managed by descendants of immigrants seem to have taken advantage of their knowledge of and connections to the international market, very likely including the home countries of their parents. Although international orientation is not as great among second-generation immigrants than it is among first-generation immigrants (Column 7, Panel B), it is strong enough to be statistically significantly greater than the international orientation of non-immigrants (Column 7, Panel C), which further suggests an “inheritance effect” may exist. Recall that there is no significant difference between enterprises run by second-generation immigrants and those run by natives at the total early stage in terms of international orientation (see Column 9, Panel C of **Table 2**), which suggests there exists an “assimilation effect” as well - it seems second-generation immigrant owned businesses display strong levels of international orientation at the established stage but not at the early stage. However, while

second-generation immigrants seem to inherit substantial international connections, descendants of immigrants also have more business partners than non-immigrants. Taken together, we interpret these findings to suggest the descendants of immigrants are involved in business ownership mostly because of inherited, necessity motivated businesses, and the descendants of immigrants seem to generally exit self-employment when new opportunity arises. Those who stay seem to stay because of necessity-motivated reasons. In simpler words, second-generation immigrants seem to “get out when the going is good.”

4.3 Intrapreneurship

Adding to the findings from the previous three tables, **Table 5** provides answers to an additional important component to entrepreneurship—intrapreneurship, or innovative activity led by managers within firms. These outcomes are especially important, as the importance of intrapreneurship for economic growth and development has been widely recognized (Hisrich, 1990; Antoncic & Hisrich, 2001; Antoncic & Hisrich, 2003). It is not just the owners of businesses who drive economic development, but their innovative managers as well. Consistent with being more entrepreneurial, potential intrapreneurs are also 50 percent more likely to be immigrants compared with both non-immigrants (Column 1, Panel A) and their descendants (Column 1, Panel B). In addition, second-generation immigrants are more intrapreneurial than the natives by over 90 percent (Column 1, Panel C). Again, intrapreneurial rates of immigrants are higher than natives, with those of second-generation immigrants resting between. Moreover, while no significant difference can be found between the two generations of immigrants and between non-immigrants and first-generation immigrants in terms of intrapreneurship either in the past three years (Column

Table 4 Entrepreneurship at the Established Stage

	1	2	3	4	5	6	7	8
Panel A Immigrants compared with non-immigrants								
<i>Dependent Variables</i>	Estab	Estab_opp	Estab_nec	Job_estab	New_tech_estb	New_product/mkt_estb	Int'l_estb	Sole-owner_estb
Immigrants	-0.085 (0.113)	0.088 (0.270)	-0.088 (0.270)	-0.039 (0.129)	0.892** (0.455)	-0.434 (0.367)	1.122*** (0.367)	-0.006 (0.128)
Constant	-11.195*** (1.696)	-3.018 (1.914)	3.018 (1.914)	-11.670*** (1.632)	6.906** (3.021)	-0.556 (1.577)	-8.022*** (2.951)	-9.737*** (1.748)
Random effects at the country level	0.381*** (0.096)	0.383*** (0.112)	0.383*** (0.112)	0.345*** (0.089)	0.829*** (0.271)	0.210*** (0.069)	0.568*** (0.213)	0.399*** (0.102)
Log likelihood (LL)	-15670.316	-2975.024	-2975.024	-12467.139	-1251.916	-1974.564	-793.363	-12539.577
LL, comparison model	-16342.343	-3079.241	-3079.241	-12848.417	-1421.794	-2023.640	-818.311	-13117.350
LR test vs. log model, prob.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Success	1,740	95	95	1,740	103	103	100	1,740
Failure	69,927	5,297	5,297	69,927	5,609	5,609	5,508	69,927
Number of obs.	71667	5392	5392	71667	5712	5712	5608	71667
Number of countries	35	35	35	35	35	35	35	35
Panel B Second-generation immigrants compared with the first-generation immigrants								
Descendants of Immigrants	0.094 (0.157)	-0.658* (0.361)	0.658* (0.361)	0.165 (0.173)	-2.540* (1.312)	1.286*** (0.474)	-1.874** (0.761)	0.063 (0.178)
Constant	-16.964*** (2.565)	-4.732 (4.193)	4.732 (4.193)	-15.534*** (2.496)	17.554* (10.046)	4.506 (5.980)	-4.787 (8.255)	-16.517*** (3.348)
Random effects at the country level	0.156 (0.110)	0.000 (0.000)	0.000 (0.000)	0.109 (0.084)	0.000 (0.000)	0.644 (0.587)	0.000 (0.000)	0.323 (0.209)
Log likelihood (LL)	-646.407	-112.338	-112.338	-547.730	-21.829	-91.822	-38.778	-523.686
LL, comparison model	-652.476	-112.338	-112.338	-551.711	-21.829	-94.383	-38.778	-535.864
LR test vs. log model, prob.	0.000	.	.	0.002	.	0.012	.	0.000
Success	1745	122	122	1745	135	137	98	1745
Failure	1740	95	95	1740	101	103	133	1740
Number of obs.	3485	217	217	3485	236	240	231	3485
Number of countries	17	13	13	17	13	13	13	17
Panel C Second-generation immigrants compared with non-immigrants								
Descendants of Immigrants	-1.111*** (0.096)	-0.461*** (0.169)	0.461*** (0.169)	-0.534*** (0.098)	0.200 (0.365)	0.142 (0.172)	0.575** (0.281)	-1.145*** (0.107)
Constant	-14.425*** (2.304)	-4.585** (1.980)	4.585** (1.980)	-13.289*** (1.869)	8.317** (3.473)	-0.163 (1.664)	-6.250** (2.909)	-13.049*** (2.282)
Random effects at the country level	0.711*** (0.182)	0.367*** (0.107)	0.367*** (0.107)	0.450*** (0.117)	0.934*** (0.318)	0.207*** (0.070)	0.414** (0.182)	0.687*** (0.179)
Log likelihood (LL)	-15292.155	-2923.101	-2923.101	-12207.114	-1225.953	-1945.293	-760.066	-12227.789
LL, comparison model	-16033.662	-3019.400	-3019.400	-12604.681	-1399.325	-1989.122	-772.329	-12858.750
LR test vs. log model, prob.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Success	24,476	1,478	1,478	24,476	1,583	1,583	1,558	24,476
Failure	45,463	3,819	3,819	45,463	4,026	4,026	3,950	45,463
Number of obs.	69939	5297	5297	69939	5609	5609	5508	69939
Number of countries	35	35	35	35	35	35	35	35

2) or currently (Column 3), the descendant generation of immigrants do significantly outperform non-immigrants as intrapreneurs with an active leading role by about 34 Percent (Column 4, Panel C). This may suggest a previously uncaptured improvement of status for second-generation immigrants in the labor market, both in terms of greater economic opportunity in the form of inter-generational mobility and in terms of being able to avoid labor market restrictions tailored to immigrants. More importantly, these findings reinforce our prior results on early-stage entrepreneurship (and established stage entrepreneurship to an extent) in that both imply cross-generational assimilating tendencies among immigrants regarding entrepreneurial tendencies. It seems there are cross-generational assimilating tendencies within immigrant families regarding both entrepreneurship and intrapreneurship. This finding becomes even more important once it is recognized growth and development depend in large part on entrepreneurship within existing firms, or intrapreneurship (Antoncic and Antoncic, 2011).

These findings suggest immigrants and their descendants contribute to entrepreneurship in their host countries more than their non-immigrant counterparts, especially at the early stage. Indeed, the fact that there is no significant difference at the established stage between non-immigrants and first-generation immigrants at least suggests immigrants are more entrepreneurial than natives at even this stage, because first-generation immigrants, by definition, have been in their host countries less time on average than natives. Although immigrants display higher rates of necessity-driven motivation and their businesses do not scale up, there is evidence of “entrepreneurial assimilation” and

Table 5 Business Angel and Intrapreneurship

	1	2	3	4	5
<i>Panel A Immigrants compared with non-immigrants</i>					
<i>Dependent Variables</i>	Intrapreneur_potential	Intrapreneur_past	Intrapreneur_now	Intrapreneur_lead_past	Intrapreneur_lead_now
Immigrants	0.501*** (0.106)	-0.059 (0.207)	0.086 (0.222)	0.203 (0.248)	0.414 (0.254)
Constant	-0.276 (2.177)	-9.979*** (2.366)	-9.525*** (2.014)	-11.928*** (1.915)	-11.648*** (1.791)
Random effects at the country level	0.600*** (0.162)	0.372*** (0.127)	0.251*** (0.089)	0.195** (0.079)	0.154** (0.067)
Log likelihood (LL)	-14598.595	-6170.537	-5025.122	-3450.821	-2970.829
LL, comparison model	-15321.169	-6399.846	-5137.279	-3487.624	-2992.810
LR test vs. log model, prob.	0.000	0.000	0.000	0.000	0.000
Success	1,740	195	195	195	195
Failure	69,927	15,027	15,045	15,027	15,045
Number of obs.	71667	15222	15240	15222	15240
Number of countries	35	19	19	19	19
<i>Panel B Second-generation immigrants compared with the first-generation immigrants</i>					
Descendants of Immigrants	-0.472*** (0.149)	0.115 (0.264)	-0.084 (0.285)	0.068 (0.302)	-0.205 (0.317)
Constant	-1.010 (2.686)	-12.455*** (4.504)	-10.066* (5.900)	-8.566** (4.007)	-8.101* (4.493)
Random effects at the country level	0.314* (0.176)	0.116 (0.313)	0.321 (0.468)	0.000 (0.000)	0.000 (0.000)
Log likelihood (LL)	-772.527	-232.477	-199.067	-169.812	-151.659
LL, comparison model	-788.325	-232.381	-199.393	-169.812	-151.659
LR test vs. log model, prob.	0.000	1.000	0.209	.	.
Success	1,745	350	350	350	350
Failure	1,740	195	195	195	195
Number of obs.	3485	545	545	545	545
Number of countries	17	8	8	8	8
<i>Panel C Second-generation immigrants compared with non-immigrants</i>					
Descendants of Immigrants	0.912*** (0.069)	0.098 (0.134)	0.105 (0.143)	0.336** (0.148)	0.266* (0.155)
Constant	2.330 (2.310)	-9.504*** (2.371)	-8.995*** (2.044)	-10.535*** (1.939)	-10.536*** (1.856)
Random effects at the country level	0.671*** (0.181)	0.350*** (0.124)	0.233*** (0.086)	0.175** (0.072)	0.142** (0.063)
Log likelihood (LL)	-13697.823	-6102.918	-4964.383	-3392.084	-2915.109
LL, comparison model	-14284.205	-6273.580	-5056.958	-3427.442	-2936.468
LR test vs. log model, prob.	0.000	0.000	0.000	0.000	0.000
Success	24,426	5,340	5,345	5,340	5,345
Failure	45,363	9,690	9,703	9,690	9,703
Number of obs.	69789	15030	15048	15030	15048
Number of countries	35	19	19	19	19

inter-generational mobility: specifically, second-generation immigrants seem to exit necessity-motivated enterprises when able or “get out when the going is good.”

4.4 Robustness Check: Interacting Immigrant Status with Income

As we have observed, empirical evidence suggests greater entrepreneurial tendencies among immigrants and their later generations compared to natives. The question remains is: Do our findings hold for all immigrants, including the poorer and lower-skilled, or only high-skilled immigrants? Perhaps more importantly: what are the mechanisms behind this relationship? We have identified two mechanisms in our front-end theory that could be driving our results: income and labor market restrictions. As a robustness check, in **Table 6** we test one of these mechanisms by further including interactions of income and the three forms of immigration dummies used in our previous specifications. We do not do the same for labor market restrictions, as our current data does not include country-specific laws directly restricting immigrants and their descendants in the labor market, but only a variable that measures broad institutional quality. To save space, we only retest and tabulate the coefficients of immigration dummies and the interaction terms of income with immigration dummies.

Panel A reports the comparisons between immigrants and non-immigrants at all business maturity stages, as aforementioned. Overall, except for a few minor exceptions, most of the immigrant dummy variable coefficients are consistent with coefficients in the previous tables, both in terms of the sign of the coefficients and statistical significance. In addition, we record quite a few negative and significant coefficients for the interaction terms at the early stage and some negative and weakly significant interaction coefficients

for the intrapreneurship specifications. These negative coefficients suggest that entrepreneurial behaviors at the early stage and intrapreneurial behaviors both negatively depend on household income, with one exception – introducing a new product to market or introducing a product to a new market positively depends on being an immigrant and having a higher income! In other words, it is the relatively lower-skilled and more impoverished immigrants that are more entrepreneurial than non-immigrants for necessity reasons, and high-skilled immigrants engage in more innovative behavior typically associated with opportunity motivated entrepreneurship, exactly as our front-end theory predicts!

Further, for the established stage businesses, we captured two significant but relatively small interaction coefficients at the five percent significance level (Column 1 & Column 4) that further lend credence to our front-end hypotheses; these coefficients suggest that at the established stage, there are more high-skilled and higher-income immigrant entrepreneurs in our sample. Further, we find second-generation immigrant entrepreneurs with a higher income are less likely than their parent generation to engage in entrepreneurship, particularly opportunity motivated entrepreneurship. Thus, it seems we have identified differences in income as a mechanism driving differences in entrepreneurial tendencies between immigrants and non-immigrants; as immigrant entrepreneurs receive more income, they are less entrepreneurial for necessity reasons at the early stage and are more entrepreneurial at the established stage. Further, as shown in Panel B, as second-generation immigrants receive more income, they are less entrepreneurial generally. These

results directly represent the phenomenon of “getting out” of business “when the going is good.”

Finally, in Panel C, the results comparing second-generation immigrants and the non-immigrants at all entrepreneurship stages are quite similar to those in Panel A — while we observe a positive and barely statistically significant coefficient for the interaction term focusing on early stage entrepreneurship, we see a negative and significant coefficient for the interaction terms focusing on intrapreneurship and a positive interaction coefficient for the interaction term focusing on the established stage. Thus, it seems second-generation immigrants are overall more entrepreneurial than natives at the early stage and less intrapreneurial as they receive more income but more entrepreneurial than natives at the established stage, particularly concerning opportunity motivated entrepreneurship, when they have more income. This finding lends credence to our front-end theory (Bosma et al., 2011; Bedi et al., Forthcoming). Again, we find income to be a primary driver of differences in entrepreneurial propensities among first-generation immigrants, second-generation immigrants, and non-immigrants. Particularly, the second-generation immigrants who do engage in established stage opportunity driven entrepreneurship are those immigrants who are high income individuals, which is again exactly what our front-end theory predicts.

These last findings in particular call to question suggestions to prioritize high-skilled immigration (Lofstrom, 2019; Borjas, 1995) — though we find low-income, low-skilled immigrants to be more likely to engage in less innovative forms of necessity motivated entrepreneurship, we see clear inter-generational improvements in just one

generation that suggest upward mobility and continued innovative and entrepreneurial contributions in the form of intrapreneurship and opportunity motivated established stage entrepreneurship on the part of second-generation migrants, particularly those who enjoy a higher income. These finding also do not rule out the possibility current immigration restrictions are inefficiently forcing immigrants into necessity motivated self-employment when these migrants would be making more productive contributions elsewhere.

5. Conclusions and Implications

This paper investigates the propensities of first- and second-generation immigrants to engage in entrepreneurial behavior relative to non-immigrants. The basic question this paper asks is: to what extent do immigrants exhibit different propensities of engaging in entrepreneurial behavior in the form of business creation? We find overall positive associations, with a few important caveats. What are the implications of these findings?

First, these results largely vindicate our previous hypotheses.

Our first hypothesis, that immigrants are more entrepreneurial generally, but particularly at the early stage, than non-immigrants, is largely corroborated by these results. For example, we find entrepreneurs are more likely to be immigrants than non-immigrants at the early stage, particularly because of necessity motivated reasons. However, we also find no statistically significant differences between the propensities to engage in entrepreneurial activity at the established stage between first-generation immigrants and non-immigrants. More importantly, we find these effects even after controlling for a host of country-level and individual-level determinants of entrepreneurship, including broad measures of host country institutional structures. Our results suggest immigrants are just

Table 6 Including Interactions of Immigrants and Incomes at All Business Stages

	1	2	3	4	5	6	7	8	9	10
<i>Panel A Immigrants compared with non-immigrants</i>										
<i>Early Stage</i>	Total_TEA	Male	Female	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner
immigrant	0.622***	0.851***	0.355	0.248	1.358***	0.827***	0.086	-1.317***	1.098**	0.511**
	(0.196)	(0.262)	(0.300)	(0.242)	(0.306)	(0.217)	(0.491)	(0.449)	(0.430)	(0.243)
limmi_inc	-0.032	-0.050	-0.008	-0.004	-0.108**	-0.041	-0.001	0.113**	-0.087	-0.029
	(0.025)	(0.032)	(0.041)	(0.030)	(0.048)	(0.028)	(0.060)	(0.052)	(0.053)	(0.032)
<i>Established Stage</i>	Total_EB	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner		
immigrant	-0.637**	0.690	-0.690	-0.727*	0.632	-1.396	1.507	-0.556		
	(0.310)	(0.745)	(0.745)	(0.385)	(1.247)	(1.306)	(1.046)	(0.350)		
limmi_inc	0.071**	-0.076	0.076	0.085**	0.033	0.109	-0.046	0.072*		
	(0.036)	(0.086)	(0.086)	(0.043)	(0.144)	(0.137)	(0.118)	(0.041)		
<i>Intrapreneurship</i>	Potential	Past	Now	Lead_past	Lead_now					
immigrant	0.894***	0.247	0.651	1.701**	1.634*					
	(0.244)	(0.766)	(0.810)	(0.846)	(0.917)					
limmi_inc	-0.053*	-0.034	-0.063	-0.166*	-0.133					
	(0.031)	(0.083)	(0.088)	(0.093)	(0.099)					
<i>Panel B Second-generation immigrants compared with the first-generation immigrants</i>										
<i>Early Stage</i>	Total_TEA	Male	Female	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner
immigrant	-0.141	-0.326	0.242	0.479	-1.115**	-0.263	-0.168	1.459**	-0.290	-0.229
	(0.307)	(0.401)	(0.479)	(0.352)	(0.502)	(0.346)	(0.772)	(0.631)	(0.706)	(0.381)
limmi_inc	-0.023	-0.005	-0.067	-0.084**	0.102	-0.027	0.025	-0.119	-0.036	-0.021
	(0.038)	(0.048)	(0.061)	(0.042)	(0.069)	(0.042)	(0.093)	(0.075)	(0.087)	(0.047)
<i>Established Stage</i>	Total_EB	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner		
immigrant	-0.030	-2.240**	2.240**	0.373	.	2.794*	.	0.089		
	(0.450)	(1.063)	(1.063)	(0.523)	.	(1.551)	.	(0.497)		
limmi_inc	0.015	0.192	-0.192	-0.025	.	-0.171	.	-0.003		
	(0.051)	(0.120)	(0.120)	(0.058)	.	(0.163)	.	(0.057)		
<i>Intrapreneurship</i>	Potential	Past	Now	Lead_past	Lead_now					
immigrant	-0.796**	-0.140	-0.381	-1.157	-1.276					
	(0.394)	(0.979)	(1.084)	(1.159)	(1.340)					
limmi_inc	0.042	0.028	0.033	0.136	0.113					
	(0.047)	(0.105)	(0.116)	(0.124)	(0.141)					
<i>Panel C Second-generation immigrants compared with non-immigrants</i>										
<i>Early Stage</i>	Total_TEA	Male	Female	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner
immigrant	0.278***	0.311**	0.260*	0.221**	0.270*	0.578***	0.477**	-0.172	0.238	0.178*
	(0.094)	(0.124)	(0.140)	(0.106)	(0.147)	(0.103)	(0.190)	(0.184)	(0.264)	(0.107)
limmi_inc	0.018*	0.013	0.015	0.013	0.014	0.005	0.008	0.019	-0.016	0.009
	(0.010)	(0.013)	(0.015)	(0.011)	(0.016)	(0.011)	(0.022)	(0.020)	(0.025)	(0.011)
<i>Established Stage</i>	Total_EB	Opportunity	Necessity	Job creation	New tech	New product/market	International	Sole-owner		
immigrant	-2.097***	-0.708***	0.708***	-1.425***	0.445	0.473	0.540	-2.004***		
	(0.136)	(0.270)	(0.270)	(0.153)	(0.521)	(0.340)	(0.611)	(0.152)		
limmi_inc	0.129***	0.030	-0.030	0.111***	-0.031	-0.038	0.004	0.115***		
	(0.012)	(0.026)	(0.026)	(0.014)	(0.047)	(0.034)	(0.059)	(0.014)		
<i>Intrapreneurship</i>	Potential	Past	Now	Lead_past	Lead_now					
limmi_inc	0.967***	0.435**	0.220	1.039***	0.787**					
	(0.109)	(0.216)	(0.249)	(0.323)	(0.363)					
limmi_~1_inc	-0.007	-0.038**	-0.013	-0.075**	-0.055					
	(0.012)	(0.019)	(0.022)	(0.031)	(0.035)					

more entrepreneurial than natives, lending partial validity to explanations of immigrant entrepreneurship focusing on positive self-selection and the inherent risk involved in both migration and entrepreneurship or positive effects of cultural experience on profit recognition (Vandor and Franke, 2016). Moreover, we identify and empirically test a key mechanism to explain differences in entrepreneurial motivation between immigrants and natives: differences in income.

Further, we find evidence for our second hypothesis, that second-generation immigrants become more like non-immigrants and less like their first-generation parents. They become less like their first-generation parents and more like non-immigrants in that they are less entrepreneurial than their parents and more entrepreneurial than natives generally, particularly when we analyze necessity motivated early stage entrepreneurship. We also find evidence of segmented assimilation: second-generation immigrants who are more entrepreneurial than first-generation immigrants and the native born at the established stage are more entrepreneurial mostly because of necessity motivation. We again identify differences in income as a key driver of differences in established stage entrepreneurial tendencies among first-generation immigrants, second-generation immigrants, and natives.

Finally, we find evidence for our last hypothesis, that first-generation immigrants will be more intrapreneurial than natives and that second-generation intrapreneurial rates will fall squarely between those of first-generation immigrants and natives. We also find evidence in support of findings by Bosma et al. (2011) and Bedi et al. (Forthcoming); namely, we see immigrants and second-generation immigrants with higher incomes less to

be less intrapreneurial; we imagine this is because the higher incomes enjoyed by these overall more entrepreneurial individuals allow them the capital to begin their own ventures.

What are the implications of these findings? First, these results call to question suggestions to prioritize high-skilled immigration (Lofstrom, 2019; Borjas, 1995). Not only are immigrants more entrepreneurial generally than natives, in terms of both opportunity and necessity motivation, but while first-generation immigrant entrepreneurship is characterized by higher levels of less innovative, necessity-driven entrepreneurship than the native-born, their second-generation descendants already begin to become more like native-born workers. We also see clear inter-generational improvements in just one generation that suggest upward mobility and continued innovative and entrepreneurial contributions in the form of intrapreneurship and opportunity motivated established stage entrepreneurship on the part of second-generation migrants, particularly those who enjoy a higher income.

Further, immigrants display no less propensity to engage in established stage entrepreneurship than natives despite being in the host countries less time on average. A fruitful avenue for future research would involve measuring the duration of stay of immigrants in the host country at the individual level. If, after controlling for duration of stay in the host country, results changed to suggest the higher entrepreneurial rate among immigrants at the established stage compared to non-immigrants were significant, our theory would be further vindicated. Finally, our findings, though they identify differences in income as a key mechanism explaining our results, do not rule out the possibility current immigration restrictions are inefficiently forcing immigrants into necessity motivated self-

employment when these migrants could be making more productive contributions elsewhere. Indeed, it is especially theoretically reasonable to expect labor market restrictions that disproportionately impact migrants and their families to stifle the entrepreneurial assimilation process among generations of migrants and even exacerbate whatever downward assimilation is already occurring. This theoretical possibility provides a particularly fruitful avenue for future research. Further, these results could also very well be driven by the fact opportunity-driven entrepreneurs are simply more likely to be successful and enjoy a higher income than necessity-driven entrepreneurs.

These findings and the preceding analysis suggest immigration can greatly increase the welfare of immigrants and their descendants not only through entrepreneurial and intrapreneurial behaviors, but also by contributing elsewhere to the labor market rather than working in necessity motivated enterprises.

These findings also suggest there are inter-generational assimilating tendencies leading to innovative gains from even low-skilled migration. As early as the second generation, there is evidence the descendants of immigrants become more akin to natives as regards entrepreneurial propensity. This suggests long-term benefits from even poorer, low-skilled immigrants in the form of inter-generational mobility leading to higher likelihoods of engaging in innovative opportunity motivated behavior and by offering future generations a way to exit necessity motivated enterprises.

It is also important to recognize while these enterprises may be necessity motivated relative to other opportunities in the host country, necessity motivated entrepreneurship in wealthier host countries almost assuredly provides more opportunity for immigrants and

their family than necessity motivated entrepreneurship in home countries, especially when we consider vast wage differentials between rich and poor countries (Caplan, 2019).

Instead of lobbying for a higher prioritization of high-skilled immigration, immigration could be used as a tool for long-term economic mobility, especially if immigration restrictions are pushing immigrants into less efficient necessity-based entrepreneurship (Wang & Lofstrom, 2020). These results at least suggest such an orientation towards immigration would not only be great for immigrants and their descendants but could also be good for the non-immigrants with whom these immigrants and their descendants interact.

Brain Gains: On the Relationship Between Remittances and Entrepreneurship

1. Introduction

Remittances are defined as a transfer of money between two parties, often intended as a gift. In the immigration context, remittances are monetary transfers sent across borders to friends or family by migrants who have left their home nation. While these transfers have been occurring for centuries, better data collection and an increased focus on the economics of migration and remittances have made it easier for researchers to study the economic consequences of remittances. As such, this study asks: do remittances promote entrepreneurship in the receiving countries? We hypothesize that remittances alleviate capital constraints, stimulating entrepreneurial ventures.

Recently, the role of remittances has received attention throughout political discourse, in part because of Donald Trump's idea of building a border wall at Mexico's expense by invoking the Patriot Act to cut off or tax remittances to Mexico (Niquette, 2018). However, the topic of remittances is nothing new to the academic profession, and a vast array of research has been undertaken to investigate the effects of remittances (Abdih, et al., 2012; Adams & Klobodu, 2016; Aggarwal, et al., 2011; Amuedo-Dorantes & Pozo, 2004; Berdiev, et al., 2013; Bugamelli & Paterno, 2009).

This is for good reason. Migrant worker remittances are one of the largest sources of external finance for developing nations, even sometimes exceeding other prominent forms of financial flows, including foreign aid and foreign direct investment (Meyer & Shera, 2017). The World Bank (2019) estimates north of \$689 billion of officially recorded remittance flows transferred worldwide in 2018, \$528 billion of which were sent to individuals and families in the developing world. These figures represent a growth of 7.8% compared to 2017. Thus, any policy effecting the flow of remittances would have widespread implications as remittances are becoming more important. For example, overseas remittances now constitute one of Bitcoin's most profitable uses, totaling \$600 billion in crypto transfers (Shobhit, 2018).

Research on this topic spans the fields of both macro- and microeconomics. Macro models of a small open economy study the effects remittances have on the overall composition of the labor force and employment dynamics over the business cycle. Micro-level decisions are also studied, including not only the motives for sending remittances, but also the impact remittances have on individual and household level decisions regarding consumption, investment, and participation in the labor force (Shapiro & Mandelman, 2016). Prior empirical research on the relation between remittances and entrepreneurship is mixed (Shapiro & Mandelman, 2016; Liu, et al., 2010; Vasco, 2013; Reyes, et al., 2013).

The purpose of our research is to delve into a relatively less explored area, the impact of remittances on home-country entrepreneurial decisions. Specifically, our research question is: to what degree do remittances have a cross-country impact on entrepreneurial ventures in the receiving nations? In doing so, we bring together two

different, but related, strands of literature. The first strand consists of research on the New Economics of Labor Migration, which treats the household as the decision-making unit, as opposed to standard neoclassical theory that treats migration as solely an individual decision (Stark & Levhari, 1982; Stark & Bloom, 1985). The second strand of literature focuses on encouraging entrepreneurship as a way to promote growth and development (Lanjouw, 1999; de Soto, 1987).

By providing access to capital, we hypothesize that remittances increase entrepreneurial activity. If the main barrier to starting or expanding a business is capital, remittances can alleviate the capital constraint, providing the necessary financing. We further hypothesize that remittances will increase early-stage entrepreneurship more so than established businesses. Lastly, we contend that remittances will promote opportunity driven entrepreneurship.

We find a positive, statistically significant association between remittances and various measures of entrepreneurship, including early-stage and opportunity-driven entrepreneurship. For example, a one standard deviation increase in remittances promotes total early-stage entrepreneurship rates by about 5.2 percentage points, which is 65% of its standard deviation. Additional tests suggest that entrepreneurs who benefit the most from remittances have the following characteristics: 1) a female entrepreneur driven by profit and opportunity and 2) a middle-income individual with secondary education who starts an individually owned business.

Our results stand in contrast to studies using single-country data that find remittances do not lead to increases in entrepreneurial activity (Vasco, 2013). We believe

the difference in results is most likely driven by differences in context. This study is the first to tackle this specific question comprehensively using updated cross-country data, which permits controlling for confounding institutional and cultural factors that affect entrepreneurship. This partly explains differences in our findings compared to previous work since culture and institutional quality vary far more in cross-country samples than single-country samples. In addition, our empirical methodology minimizes concerns regarding endogeneity, providing support that the channel of causation runs from remittances to entrepreneurship.

The rest of the paper is organized as follows: Section 2 highlights related literature; Section 3 details our theoretical underpinnings and hypotheses. Section 4 includes our data and methodology. Section 5 provides empirical results; Section 6 presents a robustness check controlling for cultural perceptions of entrepreneurial opportunities, and Section 7 includes conclusions, implications, and policy recommendations.

2. Related Literature

Remittances and the New Economics of Migration

Economics research on remittances spans topics in both macro- and microeconomics. When tackling the subject from the macro-perspective, scholars traditionally concentrate on aggregate determinants of remittance transfers or on the effects of remittances on variables such as the real exchange rate or foreign exchange reserves. For example, El-Sakka and McNabb use data from Egypt to study the macroeconomic determinants of the volume and flow of remittances sent to individuals living there (1999). Indeed, the authors find that macroeconomic conditions, such as higher domestic inflation rates, are positively

linked to remittance flows. They also discover that Egypt's policy of pegging interest rates in order to keep the costs of government borrowing low results in abnormal interest rates, often falling below zero. Coupled with the fact that Egypt pegs its exchange rate, the authors find evidence these abnormal interest rates lead emigrants to remit money through black market channels or to simply divert the money elsewhere.

Other research on the macroeconomics of remittances cast doubt on whether remittances can have a positive effect on the exchange and interest rates of receiving countries. Real interest rates of receiving nations were found to increase in the face of higher remittance rates, making developing countries less competitive on the world stage (Amuedo-Dorantes & Pozo, 2004). Further studies examine the relation between remittances and business cycles. For example, Frankel (2011) provides evidence for the "smoothing" hypothesis, which predicts more remittances sent to home nations experiencing an economic slump.

Prior research also focuses on the "why" behind remittance payments. This is an important question to ask, especially considering remittance payments are a voluntary transfer. There are several theories as to the primary motivation behind remittance payments, and this is where the relevance of the New Economics of Labor Migration (NELM) becomes especially important. In the context of NELM, migrants not only remit with the aim of supporting relatives left behind (altruistic motivation) but also for the purpose of obtaining self-benefit (self-interest). In this respect, remittances act not only as a means toward mutual benefit, but also serve as an insurance mechanism (Vasco, 2013).

Furthermore, Poirine (1995) theorizes that job training and education can be viewed as forms of loans to be paid back, with interest, in the form of remittances. In the author's analysis of several islands in the South Pacific, Poirine points out that payments to non-immigrant families do not decrease over time, as one may expect if remittances were based on purely altruistic motives. Poirine also pushes back against the theory of remittances as family insurance policies, as remittances are not usually used to purchase capital goods, but to supplement consumption.

If the theory of remittances as implicit loan agreements is correct, concerns over a "brain drain," or an exodus of high-skilled immigrants from developing to developed countries, are less warranted. According to this concern, migration represents a loss to developing countries, as it is a loss of human capital. However, migration and resulting remittances are also a way for families in institutionally poor environments to "export" some of their human capital to more institutionally secure, and profitable, environments. Because poor institutions cause poverty and a lack of entrepreneurship (Autio & Fu, 2015), migration and the resulting remittances are a way to subvert these negative incentives in home countries by allowing access to countries with better incentives and institutional environments that promote entrepreneurship. Remittances are simply the returns on those investments.

Instead of a "brain drain," we may very well be looking at a "brain gain" (Easterly & Nyarko, 2008). Thus, any policy decreasing the flow of remittances to developing home countries, such as taxing remittances, would affect the returns to these investments in human capital. In turn, decisions to migrate as well as decisions to invest in human capital

in institutionally poor environments will also be negatively affected, potentially altering the trajectory of development and entrepreneurship in the home country.

Of course, none of this means that any theory on remittance motivation can be rejected a priori. Motivation surely depends on historical, institutional, and cultural context in any given scenario (Boettke, et al., 2015). Institutions comprise an important facet of this analysis, and a substantial amount of research connects remittances and political institutions. In a study on the effect of remittances on support for democracy in Africa, Konte (2016) examines if sub-Saharan African nations respond to greater remittance payments by being less or more likely to support democracy. Konte's findings indicate the chances of favoring more democracy in the presence of remittances depends on individual rankings of concerns about living situations. Individuals who value rule of law, rights, and freedom were more likely to not favor democracy any less in the presence of remittances. Those with concerns to improve their economic situation were more likely to be less favorable of democracy in the presence of remittances. Konte classifies these individuals as belonging to the "remittance curse" class.

Additional works find conflicting evidence on the connection between remittances and the quality of democratic institutions. For example, Williams (2017) shows that remittances to countries in sub-Saharan Africa incentivize citizens to hold their governments more accountable; thus, democratic institutions are strengthened. On the other hand, other research maintains that remittances can have the opposite effect, incentivizing corruption in the same way natural resource rents incentivize corruption

within governments (Abdih, et al., 2012). Berdiev, et al., also find that corruption is increasing with remittance payments, especially among non-OECD nations (2013).

Research on the connection between growth and remittances is more tenuous. For example, Konte (2014) reports that remittances either insignificantly relate to growth or they have a slight negative effect. However, remittances can support economic growth in countries located in sub-Saharan Africa, supporting the idea of a “Brain Gain” association with remittance payments. Rao and Hassan (2011) find that remittances can positively affect short and medium growth, but may not in the long run.

Additional work shows that remittances have a poverty-alleviating effect in sub-Saharan African nations. The mechanism identified is a relaxation of the budget constraint for many poor households (Gupta, et al., 2009), a mechanism our study identifies theoretically as a driver of the association between remittances and entrepreneurial outcomes. Supporting this mechanism is work by Giuliano and Ruiz-Arranz (2009) who show that remittances frequently substitute for standard capital flows, in particular when there is a shortage of credit in capital markets (Giuliano & Ruiz-Arranz, 2009). Related, remittance payments are associated with greater bank deposits and bank receipts across the developing world (Aggarwal, et al., 2011).

Remittances and Entrepreneurship

Like remittances, entrepreneurship is a widely studied topic, and this is for good reason. Since Joseph Shumpeter’s (2011, p. 83) seminal piece identified entrepreneurship as a driver of economic growth and positioned the entrepreneur as the individual in society responsible for the “carrying out of new combinations,” or “creative destruction,”

academics from across disciplines have studied determinants of entrepreneurship. Because of entrepreneurship's integral connection to growth and development, determinants of entrepreneurial activity receive close attention. Bradley and McMullen (2012) argue that capital is not enough to encourage development; entrepreneurship and innovation are also necessary. Entrepreneurship enables poor people to create income, providing a potential tool for redressing poverty and alleviating income inequality, especially in an environment with poor institutional quality and few promising employment opportunities (Bruton, et al., 2013; Tebaldi & Ramesh, 2010).

Baumol (1996) points out that Schumpeter's definition of the entrepreneur overlooks the possibility of wealth redistribution (or destruction) in the entrepreneurial "carrying out of new combinations". The surrounding institutional environment inherently influences entrepreneurs. Existing comparative entrepreneurship research studies a range of economic and legal institutions that effect entrepreneurship. These include: labor market flexibility (Kannianinen & Vesala, 2005), entry regulations (Djankov, et al., 2002), taxation (Gentry & Hubbard, 2000; Johnson, et al., 1998), property rights regimes (Autio & Acs, 2010; Estrin, et al., 2013), bankruptcy law (Lee, et al., 2011), the overall quality of economic and political institutions (McMullen et al., 2008; Autio & Fu, 2015; Boudreaux & Nikolaev, 2017; Bjørnskov & Foss, 2013), and social attitudes (Autio & Wennberg, 2010).

Finally, and specific to our current research, several studies analyze the possible connection between migration, remittances, and entrepreneurship, but without consensus as to the sign of this association. A growing body of evidence argues for the existence of a

link between emigration and returnee entrepreneurship, or entrepreneurship undertaken by migrants after they eventually return to their home countries. For example, Liu et al. (2010) find that firms founded by returnee entrepreneurs exhibit more innovative behavior than their locally founded counterparts and that returnee firms have an indirect spill-over effect on non-returnee firms. Kenny et al. (2013) find that while returnee entrepreneurs were not critical in the formation of information and communications technology (ICT) industries in Taiwan, Mainland China, and India, these returnee entrepreneurs played active roles in the secondary development of these industries. Wang et al. (2011) find Chinese returnee entrepreneurs benefit their home economy when they return with venture capital, experience working with multi-national corporations, and experience at top universities. Finally, remittances are also found to serve as a way to finance microenterprises and encourage self-employment in times of economic downturn and high unemployment, which can bolster household income (Shapiro & Mandelman, 2016). Like Easterly and Nyarko (2008), these studies show worries of a “brain drain” associated with immigration may be unwarranted. Indeed, returnee entrepreneurs offer their home countries a “brain gain,” at least in terms of secondary development of industry (Kenny, et al., 2013).

Other literature based on the New Economics of Labor Migration (NELM) described above (Stark & Bloom, 1985; Taylor, 1999) highlights the theoretical and empirical associations between migration, remittances, and entrepreneurship. These papers theorize migration to be driven by market failures in home countries and highlight a number of relevant single-country and single-village studies on the role of remittances. Remittances are crucial to overcome capital market imperfections by relaxing migrant

households' credit constraints and providing recipient economies with the necessary capital to engage in entrepreneurial ventures. These authors also claim that remittances are linked to agricultural asset accumulation and other investment goods such as education, housing, and healthcare as well as a greater ability to afford imports of complementary inputs in the production of exportable goods. Collectively, these works indicate that not only do remittances lead to high levels of entrepreneurship directly through the relaxation of credit constraints, but also indirectly through increased demand and spill-over effects.

In other country-specific empirical studies, Reyes et al. (2013) examine how migrants and their remittances affect entrepreneurship by studying overseas workers (OFWs) from the Philippines. They find that recipients frequently use remittances for consumption before using them for entrepreneurial endeavors. However, if the recipients receive their remittances from OFWs with higher levels of human capital in the form of education, then remittances are more likely to positively associate with entrepreneurial investment. Their results indicate "OFWs with members who are professionals or technicians are likely to have higher income from entrepreneurial activity" (Reyes, et al., 2013, p. 8). The authors recommend policies that could contribute to increased savings by recipients, which could help cover consumption needs and lead to more investment in entrepreneurial ventures.

However, in other work using Ecuador as a case study, it is shown that neither migration nor remittances have any effect on the odds of a household owning a rural business. Instead, education, credit, and infrastructure are positively correlated with the probability of owning a rural enterprise. The author finds remittances are often not enough

to help individuals start their own enterprises, because barriers like poor infrastructure stand in the way (Vasco, 2013).

Finally, Zheng and Musteen (2018) utilize cross-country data to document a positive relation between remittances received and necessity-driven entrepreneurship, or entrepreneurship undertaken because no other viable options for income are available. At the same time, these authors document a negative relation between remittances received and opportunity-driven entrepreneurship, or entrepreneurship undertaken because of a perceived profit opportunity. However, unlike our current study, this paper does not control for institutional factors.

Indeed, the previous seemingly contradictory results across studies are driven by cross-country differences in institutional and cultural context. While remittances can have some positive impact on entrepreneurship, this impact can be negated partially or entirely by institutional barriers like poor infrastructure in Ecuador (Vasco, 2013) or few viable investment opportunities in the Philippines (Reyes, et al., 2013).

To avoid the issue of confounding institutional and cultural factors and to better isolate the impact of remittances on entrepreneurship, we utilize a broad cross-country sample. While this strategy decreases the relative number of observations in developing nations and increases the relative number of observations in mature markets, it provides greater external validity than the aforementioned explorations of the impacts of remittances on entrepreneurship. The addition of developed economies should also not be a large issue as we are able to isolate remittances received from remittances sent.

3. Theory

We build from prior studies to hypothesize that, in general, remittances will increase entrepreneurial activity in receiving countries by providing access to capital. If the main barrier to starting or expanding a business is capital, remittances can alleviate the capital constraint, providing the necessary financing (Stark & Bloom, 1985; Taylor, 1999; Gupta, et al., 2009). Self-employed entrepreneurs and small businesses, particularly those operating in developing countries, tend to lack formal access to external capital and bank credit; thus, it becomes important for entrepreneurs to have informal access to credit, largely from friends and family. Quang, et al., (2019) identify three sources of family social capital - family duties, family trust, and family support – and show that these sources of social capital provided by familial ties, both in the home and the host country, contribute to entrepreneurial immigrants' opportunity creation in a number of ways. Thus, we expect that remittances will increase entrepreneurship.

Furthermore, we anticipate that remittances will impact specific types of entrepreneurship. For example, we hypothesize a stronger association between remittances and early-stage entrepreneurship, defined as recently starting a business. If an entrepreneur is capitally constrained, he or she will not be able to start a new entrepreneurial venture unless outside funding is available. Alternatively, an entrepreneur who owns an established business will be less affected by remittances since she or he presumably already has access to capital.

Early-stage entrepreneurship mainly measures self-employment and small business activity. This may be a poor measure of Schumpeterian entrepreneurship, and a better

measure would be billionaire rates (Henrekson & Sanandaji, 2014); however, self-employment may be a second-best option for individuals in nations with institutional environments too poor to encourage such investment and production, and these individuals constitute a large portion of those receiving remittances (World Bank, 2019). For individuals living within nations with more sophisticated and better institutional environments, capital constraints do not represent as much of a barrier to investment, making remittances and diaspora investment less effective for those receiving remittances.

We also expect that remittances will promote opportunity driven entrepreneurship, and they are less likely to promote business ventures that are out of necessity. Some individuals open a business and continue operating because no other employment opportunities are available. For these entrepreneurs, remittances provide the additional income source, thus decreasing the need to open a business out of necessity. An entrepreneur pursuing an economic opportunity is more likely to use remittance income as an investment in a business rather than simply to increase consumption. This is an important distinction to make as Ingemar et al. (2016) find evidence that necessity motivated self-employed entrepreneurs show relatively low intrinsic work motivation, less preference for independence, and lower scores on personality traits typically associated with entrepreneurship compared to their “non-necessity” motivated counterparts.

4. Data and Methodology

Built on prior literature, our research empirically explores the cross-country remittances-entrepreneurship relation in remittance receiving countries. This is in contrast to other studies that have used country-specific evidence to make a case for or against a relation

between remittances and entrepreneurship (Vasco, 2013; Reyes, et al., 2013) or simple cross-country remittances-entrepreneurship associations (Zheng & Musteen, 2018). To our knowledge, we are the first to tackle this specific topic comprehensively using updated cross-country data. Not only do we estimate the effects remittances have on different stages of entrepreneurship, but our use of GMM models helps us estimate lagged, dynamic effects of remittances on entrepreneurial activity.

Currently, the most influential cross-country entrepreneurship data employed in empirical business and economics research is the Global Entrepreneurship Monitor (GEM) (Bosma & Kelley, 2019). According to statistics on GEM usage, there are 774 papers published in 375 academic journals that are based on the GEM data, covering a wide range of topics in entrepreneurship, marketing, management, economics, political science, sociology and psychology (Frederick & Bygrave, 2004; Ace & Varga, 2005; Hessels & van Stel, 2011; Gielnik, et al., 2018). For example, GEM data appear frequently among journals including, but not limited to, *Small Business Economics*, *International Entrepreneurship and Management Journal*, and *International Journal of Entrepreneurship and Small Business*. Up to this point, there is only one paper testing the cross-country relation between remittances and early-stage entrepreneurial activities with data from 2001 to 2009 (Zheng & Musteen, 2018). Our current research intends to extend our understanding of the remittances-entrepreneurship relation with updated data and more robust methodology, including testing the associations between remittances and various entrepreneurship measures at different stages.

For two decades, the GEM Adult Population Survey (APS) has tracked evidence of entrepreneurial activities in over one hundred economies, including high-, middle-, and low-income countries. Annually, over 200,000 individuals are interviewed, and their responses are aggregated at the national level. The GEM-APS dataset covers a wide spectrum of entrepreneurial activity, entrepreneurship at different stages, with different motivations and attitudes, and depending on different socioeconomic factors of the entrepreneurs (age, gender, education, income). For instance, the “female opportunity-driven total early-stage entrepreneurial activity rate” measures the percentage of 18-64-year-old female individuals in a country that either own or manage a new business for less than 42 months. Our entrepreneurship measures are collected from the national level GEM-APS dataset between 2004 and 2015.

Given that the cross-country remittances data at the individual level are not available, our main independent variable of interest is country level aggregation of share of remittances received as percentage of GDP, which is collected from World Bank’s World Development Indicators (WDI). WDI is the main choice of data for cross-country level research, including the remittances literature. Many empirical papers use our same measure of remittances collected from WDI (Gupta, et al., 2009; Aggarwal, et al., 2011; Imai, et al., 2014; Shapiro & Mandelman, 2016). Personal remittances are the sum of personal transfers and compensation of employees, as defined in the sixth edition of the IMF’s Balance of Payments Manual (2009). This measure of remittances allows us to focus on remittances *received* in each country, as a percentage of GDP, and avoids confounding remittances received and remittances sent.

Although better data collection has made it easier for modern researchers to study remittances relative to their past counterparts, it is important to note that remittances are difficult to accurately measure. For example, remittances do not include small transfers sent via money transfer operators, post offices, mobile phones, or informal transfers (IMF, 2009). Instead, the World Bank (Bank, 2019) measures remittances based on “compensation of employees” and “personal transfers.” “Compensation of employees” measures the salaries of temporary migrant workers, residents of the country who work for embassies, residents of the country who work for international organizations, and residents of the country who work for foreign companies. “Personal transfers” include all transfers in cash or in kind made or received by residents of the home country to or from individuals in the host country. World Bank data on these personal transfers and compensation of employees are utilized to measure remittances, specifically remittances received as a percentage of GDP for each country.

For cross-country level research, it is common to divide variables by GDP, in order to adjust for size of the economy. This includes but is not limited to the remittances literature including, Gupta, et al. (2008), Giuliano and Ruiz-Arranz (2009), Aggarwal, et al. (2011), Adams and Klobodu (2016), Shapiro and Mandelman (2016), etc.

Table 7 includes summary statistics and descriptions of all the variables. Included in **Table 8** are pairwise comparisons, including correlations of remittances and entrepreneurship measures. As shown, there exists a positive correlation between remittances received and the vast majority of the measures of entrepreneurship in our sample.

Due to concerns of potentially unobservable country heterogeneity, omitted variables, and endogeneity, it can be argued that either remittances induce entrepreneurship or entrepreneurship motivates sending remittances (Vasco, 2013; Poirine, 1995). Without a valid and efficient instrumental variable for remittances, this paper relies on estimator with a dynamic panel to identify causality—the Blundell and Bond (1998) system generalized method of moments (henceforth, GMM). For samples with “small T, large N” panels and non-strictly exogenous independent variables (Roodman, 2009), GMM is the best method to address endogeneity. It does so by employing lags of the dependent variable as its own instruments, starting from the second lag. This methodology is common in cross-country studies including research on remittances (Acosta, et al., 2008; Catrinescu, et al., 2009; Giuliano & Ruiz-Arranz, 2009; Aggarwal, et al., 2011; Imai, et al., 2014; Adams & Klobodu, 2016). Thus, we avoid concerns of reverse causality by studying the effects of remittances received in the past on entrepreneurial decisions in the future.

Our GMM specifications can be written with the following equation:

$$Entre_{it} = \beta_0 + \beta_1 Entre_{it-1} + \beta_2 Remit_{it-1} + \beta_3' Z_{it-1} + \beta_4 \theta_i + \varepsilon_{it} \quad (1)$$

Where i and t represent country and year, respectively. $Entre_{it}$ and $Entre_{it-1}$ take the form of multiple entrepreneurial activity measures from the GEM-APS dataset in year t and $t - 1$, respectively; $Remit_{it-1}$ is the share of remittances received in a country i as the percentage of its GDP in year $t - 1$; Z_{it-1} is a vector of four control variables; θ_i is the time-fixed effects dummies, and ε_{it} is the random error term.

Note that to match with the entrepreneurial measures on the LHS, all RHS

Table 7: Variables Description, Summary Statistics and Correlation

Variable	Description	Source	# Obs.	Mean	S.D.
Remittances	Personal remittances received as percentage of GDP, measured in current USD	World Bank-World Development Indicators (WDI) 2019	390	1.352	2.368
Log GDP per capita	GDP per capita (log.), constant 2011 PPP international dollars	WDI 2019	390	10.865	0.632
GDP growth rate	GDP growth rate, annual percentage	WDI 2019	390	2.400	3.826
Institutions	Economic Freedom of the World Index (EFW), summary index	Fraser Institute 2018	345	7.137	0.663
Labour force participation rate	Labour force participation rate, total (% of total population ages 15+); International Labour Organisation (ILO) Estimate	WDI 2019	390	70.569	7.706
Pre-entrepreneurial rate	% 18-64 pop. who is currently trying to start a new business	Global Entrepreneurship Monitor (GEM) 2018/2019 Global Report	390	12.403	9.929
Start-up/Nascent-stage entrepreneurship	% 18-64 pop. who is currently involved in a new start-up (nascent) business for less than 1 year (independent or as a job)	GEM 2018/2019	390	14.489	10.434
Total early-stage entrepreneurial activity (TEA)	% 18-64 pop. who are either a nascent entrepreneur (less than 3 months) or owner-manager of a new business (less than 3.5 years)	GEM 2018/2019	390	11.026	7.201
Established business ownership (EB)	% 18-64 pop. are owner-manager of an established business (more than 3.5 years)	GEM 2018/2019	390	7.796	4.889
Opportunity TEA	% TEA not because of no other work option or just maintaining their income	GEM 2018/2019	390	7.823	4.997
Male opportunity TEA	% male TEA not because of no other work option or just maintaining their income	GEM 2018/2019	390	9.693	5.518
Female opportunity TEA	% female TEA not because of no other work option or just maintaining their income	GEM 2018/2019	390	5.970	4.775
Necessity TEA	% TEA due to no other work option or just maintaining their income	GEM 2018/2019	390	2.807	2.596
Male necessity TEA	% 18-64 male TEA and necessity motive	GEM 2018/2019	390	3.039	2.508
Female necessity TEA	% 18-64 female TEA and necessity motive	GEM 2018/2019	390	2.554	2.881
TEA jobs	% 18-64 pop. who are involved in TEA expecting to create jobs in 5 years	GEM 2018/2019	390	8.019	5.625
TEA with some secondary degree	% 18-64 pop. involved in TEA with some secondary degree	GEM 2018/2019	384	8.426	7.255
TEA with secondary degree	% 18-64 pop. involved in TEA with secondary degree	GEM 2018/2019	388	10.521	7.530

Table 8: Correlations of Remittances with Lags up to Five Years

	Remittances	Remittances _{<i>t-1</i>}	Remittances _{<i>t-2</i>}	Remittances _{<i>t-3</i>}	Remittances _{<i>t-4</i>}	Remittances _{<i>t-5</i>}
Start-up/Nascent-stage entrepreneurship	0.173	0.182	0.172	0.177	0.170	0.175
Trying to start a new business	0.193	0.203	0.192	0.195	0.186	0.189
Total early-stage entrepreneurial activity (TEA)	0.174	0.191	0.179	0.171	0.163	0.156
Opportunity TEA	0.115	0.134	0.124	0.120	0.108	0.104
Male opportunity TEA	0.115	0.129	0.122	0.120	0.107	0.104
Female opportunity TEA	0.115	0.137	0.122	0.116	0.106	0.100
Necessity TEA	0.254	0.264	0.252	0.237	0.236	0.223
Male necessity TEA	0.277	0.280	0.268	0.254	0.252	0.236
Female necessity TEA	0.220	0.236	0.224	0.210	0.209	0.199
TEA jobs	-0.041	-0.038	0.146	0.144	0.136	0.132
Established business ownership (EB)	0.098	0.113	0.090	0.059	0.049	0.037
TEA with some secondary degree	0.169	0.187	0.173	0.155	0.151	0.147
TEA with secondary degree	0.200	0.214	0.202	0.204	0.197	0.192
TEA with post-secondary degree	0.167	0.183	0.186	0.186	0.174	0.172
TEA in lowest 33 percentile income	0.168	0.180	0.175	0.161	0.163	0.165
TEA in middle 33 percentile income	0.156	0.168	0.159	0.141	0.143	0.143
TEA in highest 33 percentile income	0.149	0.159	0.155	0.150	0.134	0.136

variables including the entrepreneurial activity measures are lagged for one year. This is done for four reasons. The first is to partially address reverse causality running from entrepreneurship to remittances. The second is to allow time for the family members of immigrant workers to invest their remittances received in the family businesses. The third reason is due to the constraint of our limited sample. Last, although lagging the RHS for one term could be arbitrary, this is the conventional treatment in studies including remittances with panel data (Catrinescu, et al., 2009; Imai, et al., 2014; Adams & Klobodu, 2016).

To show this is the case for the current data, in **Table 8**, we present the correlations of the lagged remittances from year one up to the fifth year and each of the entrepreneurship measures. It suggests that using deeper lags does not make a significant difference, as all correlation coefficients are similar regardless of number of lags.

Therefore, we use the standard approach and lag remittances for one year.

The four control variables in vector Z_{it-1} include GDP per capita, GDP growth, economic institutions, and labour force participation rate. GDP per capita captures income differences in year $t - 1$ when the remittances were received. We include GDP growth, controlling for the possible business cycles effects on entrepreneurial activities. We also include a measure for the economically active proportion of the population – the labor force participation rate in a recipient country. Data for all three controls are collected from World Development Indicators (2019).

To control for the quality of economic institutions, we include economic freedom measured by the Economic Freedom of the World Index (Fraser Institute, 2018). The

economic freedom index is measured from 0-10, with a higher score indicating more economic freedom. We do so because institutions are the “rules of the game,” which affect incentives to engage in entrepreneurial activities (North, 1991; Boettke & Coyne, 2003). For example, secure property rights and contract enforcement are important predictors of wealth-enhancing entrepreneurship (Sobel, 2008). Thus, in order for an entrepreneur to utilize remittances for an entrepreneurial venture, some minimal level of economic freedom may be necessary. Further, Catrinescu, et al., (2009) argue that recent contradictory findings concerning the association between remittances and entrepreneurship are due in large part to omitting a control for institutional quality. We avoid this bias by including economic freedom as a measure of institutional quality.

The GEM-APS survey covers countries in different income groups, although proportionally there are more high- and middle-income countries in the current sample. For example, Malawi is the economy with the lowest income in the sample, with GDP per capita of about \$2,600 in 2011 international dollars. Countries in our sample with the highest income include Norway and the United States. One third of our sample is comprised of developing countries. In total, our dataset includes 567 observations from 2004-2015 and up to 99 countries. Recall that GMM specifications employ lags of the dependent variables as instruments, thus reducing the actual number of observations utilized to about 390 observations across 67 countries. Refer to **Table 9** for the list of all the countries in the sample.

5. Empirical Results

Table 10 reports results using entrepreneurship at four different stages. The first three measures of entrepreneurship are the pre-entrepreneurship stage (currently trying to start a new business), nascent-stage entrepreneurship (businesses at the start-up stage with less than one year of operation), and total early-stage entrepreneurship (TEA), which combines both the former two stages. As hypothesized, remittances are positively and significantly related to all three forms of early entrepreneurial activity (columns 1-3). Specifically, using the results in column 3, a one standard deviation increase in remittances promotes total early-stage entrepreneurship rates by about 5.2 percentage points, which is 65% of its standard deviation.

Column (4) measures entrepreneurship using established business ownership rates. Remittances are positive but insignificantly associated with established ownership rates. As suggested above, if remittances are used as capital to finance an entrepreneurial venture, established entrepreneurs may not be as capitally constrained as earlier stage entrepreneurs, limiting the effect of remittances on entrepreneurial activity. However, it is still possible that remittances helped some of those established businesses when they were at their early stages. Established businesses are those founded for longer than 42 months (three and one-half years), while we only lag remittances for one year in the current specifications. We address this by allowing for three more lags, and indeed, we observe that remittances received four years ago significantly affect established business ownership rates. The coefficient for remittances is smaller in relation to established

Table 9: List of All the Countries in the Sample

Argentina	Cameroon	Croatia	Latvia	Romania	Dominican Republic	Nigeria
Australia	Colombia	Hungary	Mexico	Slovakia	Algeria	Pakistan
Belgium	Germany	Indonesia	Malaysia	Slovenia	France	Russian Federation
Brazil	Ecuador	India	Netherlands	Sweden	Ghana	Trinidad and Tobago
Barbados	Spain	Ireland	Norway	Thailand	Iceland	Turkey
Botswana	Estonia	Iran	Panama	Tunisia	Jamaica	Uganda
Canada	Finland	Israel	Peru	Uruguay	Japan	Zambia
Switzerland	United Kingdom	Italy	Philippines	United States	Lithuania	
Chile	Greece	Korea, Rep.	Poland	South Africa	Malawi	
China	Guatemala	Luxembourg	Portugal	Denmark	Namibia	

Table 10: Remittances and Entrepreneurial Activities at Different Stages

Dependent Variables:	Trying to start a new business/Pre-entrepreneurship stage (1)	Start-up/Nascent-stage entrepreneurship (2)	Total early-stage entrepreneurship (3)	Established business ownership (4)
Remittances $t-1$	2.037*** (0.623)	1.824** (0.752)	1.476** (0.718)	0.790 (0.812)
Trying to start a new business $t-1$	0.636*** (0.224)			
Start-up/Nascent-stage entrepreneurship $t-1$		0.381 (0.280)		
Total early-stage entrepreneurship $t-1$			0.481 (0.299)	
Established business ownership $t-1$				0.988*** (0.265)
Log GDP Per Capita $t-1$	0.545 (5.261)	-4.537 (6.788)	-3.159 (3.092)	2.271 (2.533)
GDP Growth Rate $t-1$	0.497 (0.441)	0.401 (0.557)	0.080 (0.389)	0.354 (0.278)
Institutions $t-1$	-4.389 (3.609)	-2.711 (4.394)	-1.204 (2.376)	-0.126 (2.485)
Labor Force Participation Rate $t-1$	0.351 (0.263)	0.295 (0.296)	0.318 (0.239)	0.075 (0.127)
Constant	2.410 (56.641)	55.394 (69.560)	24.374 (35.464)	-31.121 (27.217)
Observations	390	390	390	390
Auto-corr p-value	0.474	0.811	0.511	0.382
Hansen-J p-value	0.601	0.356	0.109	0.246

businesses (1.033) compared to coefficient for remittances associated with TEA (1.476), which supports our priors—remittances play a more significant role on entrepreneurship at the early stage than the established stage.

Comparing across the results, the findings suggest that remittances promote early stage and established entrepreneurship, but early stage entrepreneurs benefit more.

Overall, **Table 10** describes what remittances sent from overseas can do and what they cannot do. Remittances can finance an attempt to start a business, an individually owned start-up, or total early stage entrepreneurship. However, remittances do appear to matter significantly less for those businesses already established.

While showing the positive remittances-early stage entrepreneurship association is an important discovery, it also triggers the following question: are all early-stage entrepreneurial ventures the same? To answer this question and to further interpret the findings from **Table 10**, we disentangle total early-stage entrepreneurship (TEA) by its motivations: opportunity driven versus necessity driven. The former refers to an entrepreneur who is driven by a perceived profit opportunity, whereas the latter refers to the opposite case. Necessity driven entrepreneurship is when an entrepreneur is involved in a business due to no better choice for work (Zheng & Musteen, 2018). Economic incentives matter for the outcomes of entrepreneurial activities. Subsequently, remittances may be used differently by opportunity driven and necessity driven entrepreneurs. Results by entrepreneurial motivation can be seen below in **Table 11**. As suggested by the first three columns in **Table 11**, remittances encourage early-stage opportunity driven entrepreneurship. According to column (1), a one standard deviation

increase in remittances increases opportunity TEA by 60% of its standard deviation. As shown in columns (2)-(3), remittances are significantly utilized by both male and female opportunity driven entrepreneurs.

Remittances, however, are irrelevant for necessity-driven TEAs, as shown in columns (4)-(6). In addition, column (7) indicates that remittances do not affect the likelihood of business expansion, measured by expected job creation. Collectively, the results in **Table 11** can be interpreted as remittances provide financial capital to those individuals who are seeking better business opportunities. Remittances offer a way for such entrepreneurs to afford entrepreneurial ventures. However, remittances do not increase necessity driven entrepreneurship because remittances may be alleviating some of the necessity or income constraint.

Table 12 further explores if remittances potentially affect entrepreneurs at the early stage with different socioeconomic status. Tests in this table focus on two additional factors, education and income. Comparing across education levels, columns (1)-(3) report that remittances positively and significantly influence entrepreneurs with secondary and post-secondary degrees, a finding partially consistent with Sadeghi, et al., (2019), Piispanen, et al., (2018), and Elenurm and Heil (2015). For example, a one standard deviation increase in remittances increases early-stage entrepreneurs with secondary degrees by almost one standard deviation. This suggests that higher educated entrepreneurs are more likely to use remittances to finance an entrepreneurial venture.

Columns (4)-(6) compare entrepreneurs by income. As shown, remittances

Table 11: Remittances and Total Early Stage Entrepreneurial Activities by Motivation

Dependent Variables	Opportunity TEA (1)	Male opportunity TEA (2)	Female opportunity TEA (3)	Necessity TEA (4)	Male necessity TEA (5)	Female necessity TEA (6)	TEA jobs (7)
Remittances $t-1$	0.949*** (0.296)	1.179** (0.531)	0.697** (0.354)	0.402 (0.433)	0.161 (0.445)	0.288 (0.292)	0.648 (0.493)
Opportunity TEA $t-1$	0.608* (0.320)						
Male opportunity TEA $t-1$		0.339 (0.283)					
Female opportunity TEA $t-1$			0.855*** (0.284)				
Necessity TEA $t-1$				0.243 (0.252)			
Male necessity TEA $t-1$					-0.041 (0.198)		
Female necessity TEA $t-1$						0.509 (0.443)	
TEA jobs $t-1$							0.570** (0.277)
Log GDP Per Capita $t-1$	-0.688 (2.577)	-1.621 (3.226)	0.281 (2.568)	-2.093 (1.521)	-2.440* (1.463)	-1.655 (1.805)	-3.524* (2.056)
GDP Growth Rate $t-1$	0.164 (0.308)	0.129 (0.354)	0.207 (0.236)	-0.046 (0.138)	0.121 (0.125)	-0.128 (0.151)	-0.169 (0.340)
Institutions $t-1$	-0.785 (1.767)	-0.611 (2.515)	-1.028 (1.246)	-1.312 (1.462)	-0.565 (1.889)	-0.827 (1.152)	0.257 (1.788)
Labor Force Participation Rate $t-1$	0.197 (0.160)	0.255 (0.241)	0.181 (0.122)	0.050 (0.091)	0.024 (0.155)	0.067 (0.091)	0.221* (0.127)
Constant	0.460 (26.694)	8.698 (39.458)	-9.318 (22.473)	30.394* (16.299)	31.590* (16.775)	20.281 (18.310)	24.404 (21.105)
Observations	390	390	390	390	390	390	390
Auto-corr p-value	0.228	0.545	0.197	0.602	0.815	0.875	0.893
Hansen-J p-value	0.097	0.187	0.264	0.173	0.158	0.181	0.519

Table 12: Remittances and Total Early Stage Entrepreneurial Activities by Demographics

Dependent Variables	TEA with some secondary degree	TEA with secondary degree	TEA with post-secondary degree	TEA in lowest 33 PCTL income group	TEA in middle 33 PCTL income group	TEA in highest 33 PCTL income group
	(1)	(2)	(3)	(4)	(5)	(6)
Remittances $t-1$	0.833 (0.644)	2.178** (1.109)	1.234* (0.663)	1.418* (0.794)	1.651** (0.804)	-0.484 (1.478)
Some Secondary Education $t-1$	0.768*** (0.274)					
Secondary Education $t-1$		0.598 (0.390)				
Post-Secondary Education $t-1$			0.512 (0.532)			
Graduate experience $t-1$						
Lowest 33 PCTL Income $t-1$				0.350 (0.414)		
Middle 33 PCTL Income $t-1$					0.269 (0.477)	
Highest 33 PCTL Income $t-1$						0.684*** (0.233)
Log GDP Per Capita $t-1$	-2.736 (3.780)	-1.569 (4.308)	-6.649 (8.459)	-3.639 (4.328)	-5.883 (5.114)	-0.509 (5.250)
GDP Growth Rate $t-1$	-0.037 (0.444)	0.430 (0.396)	-0.287 (0.783)	-0.622 (0.502)	0.076 (0.463)	0.292 (0.701)
Institutions $t-1$	0.954 (2.706)	-0.449 (3.253)	1.539 (7.197)	-2.029 (4.264)	-1.210 (3.345)	-3.737 (3.645)
Labor Force Participation Rate $t-1$	0.034 (0.310)	0.278 (0.272)	0.360 (0.433)	0.024 (0.387)	0.245 (0.244)	-0.091 (0.277)
Constant	21.364 (42.997)	0.761 (44.402)	41.079 (74.606)	58.480 (36.353)	61.915 (50.487)	43.829 (46.602)
Observations	376	381	370	357	379	370
Auto-corr p-value	0.933	0.278	0.427	0.182	0.516	0.104
Hansen-J p-value	0.401	0.214	0.064	0.301	0.279	0.036

positively and significantly affect early-stage entrepreneurs in the lowest and middle-income groups, especially the latter group. Remittances do not significantly influence higher income entrepreneurs, which is not surprising if remittances are providing income to capitally constrained entrepreneurs. Overall, results from this table suggest that remittances are more strongly associated with entrepreneurs from the middle-income group or those with a secondary degree education.

6. Cultural Robustness Check

Our results differentiate two types of entrepreneurial motivations - necessity driven and opportunity driven entrepreneurship. While the literature has unanimity on the definition of the former, there are arguments about what the latter specifically entails. Specifically, literature has identified the importance of cultural foundations of entrepreneurship (Lee & Peterson, 2000), focusing on how people with different cultural backgrounds may identify and respond differently to a similar opportunity (Dana, 1996). For example, highly individualistic cultures with low uncertainty avoidance promote entrepreneurial potential (Mueller & Thomas, 2001). Informal institutions and social norms also matter for entrepreneurship (Williamson, 2013).

Thus, cultural factors could play a role in determining cross-country opportunity-driven entrepreneurial decisions. To address this possibility, this section adds a cultural control to our main specifications—perceptions of good opportunities, collected from GEM. Answers to this question do not rely on if a respondent is an entrepreneur or their motivations, but merely reflect the average subjective judgement of the entrepreneurial environment in a country. This inclusion broadly controls for cross-country perception

differences relevant for entrepreneurship. For example, cultural perception is positively correlated with the belief that entrepreneurship is a good career choice (0.44) and the level of social status of entrepreneurs (0.42).

As Dana (1996) highlights, individuals in different cultural contexts react to similar opportunities differently. Thus, we expect remittances to affect entrepreneurship differently across different cultural contexts. In other words, an entrepreneurial opportunity may not matter as much as the perception of an opportunity. Given our prior findings that remittances strongly associate with early-stage and opportunity driven entrepreneurship, we expect that once we control for cultural perception, the effect of remittances may be diminished. For example, if a remittance receiving entrepreneur has a negative perception of opportunities, remittances may not impact the decision to start a business or take advantage of an opportunity. Furthermore, a more optimistic outlook could increase the size of influence of remittances on entrepreneurship.

Table 13 reproduces estimations from Tables 2 and 3 but now includes the cultural perception variable. As expected, the magnitudes of all the coefficients of remittances are smaller, compared to our previous estimations. This reflects the argument that perceived opportunity affects the willingness to utilize remittances in entrepreneurial decisions.

The coefficient for remittances is positive and significant, promoting TEA (column (1)). However, remittances no longer significantly affect overall opportunity-driven TEA (column (2)). We believe this is intuitive since we are now controlling for perceptions of opportunities. If an entrepreneurial opportunity is not perceived as such, an

Table 13: Cultural Robustness Check

Dependent Variables	Total early-stage entrepreneurship (1)	Opportunity TEA (2)	Male opportunity TEA (3)	Female opportunity TEA (4)	Necessity TEA (5)	Male necessity TEA (6)	Female necessity TEA (7)
Remittances $t-1$	1.431** (0.716)	0.928 (0.602)	0.886 (1.046)	0.948** (0.416)	0.533 (0.404)	0.272 (0.513)	0.609 (0.463)
Opportunity TEA $t-1$	-0.037 (0.318)						
Male opportunity TEA $t-1$		-0.002 (0.402)					
Female opportunity TEA $t-1$			-0.284 (0.377)				
Necessity TEA $t-1$				0.460 (0.379)			
Male necessity TEA $t-1$					0.030 (0.207)		
Female necessity TEA $t-1$						-0.083 (0.195)	
TEA jobs $t-1$							0.168 (0.290)
Log GDP Per Capita $t-1$	-6.790** (2.844)	-4.040 (2.846)	-3.844 (3.154)	-2.320 (2.838)	-2.294* (1.324)	-2.474 (1.578)	-1.853 (1.550)
GDP Growth Rate $t-1$	-0.169 (0.323)	-0.190 (0.258)	-0.176 (0.279)	-0.050 (0.273)	-0.063 (0.125)	0.147 (0.139)	-0.140 (0.150)
Institutions $t-1$	-1.108 (2.711)	0.503 (2.109)	-0.574 (2.708)	-0.107 (1.603)	-1.514 (1.546)	-0.539 (1.954)	-1.677 (1.364)
Labor Force Participation Rate $t-1$	0.354 (0.259)	0.350* (0.197)	0.504* (0.291)	0.234 (0.151)	0.060 (0.094)	0.035 (0.162)	0.092 (0.100)
Cultural Control $t-1$	0.217* (0.123)	0.158 (0.106)	0.223* (0.120)	0.069 (0.083)	0.046 (0.036)	0.004 (0.027)	0.067* (0.041)
Constant	58.699** (29.320)	16.869 (23.975)	14.097 (36.680)	8.742 (21.368)	32.041*** (12.159)	30.880* (18.151)	24.789* (13.844)
Observations	390	390	390	390	390	390	390
Auto-corr p-value	0.449	0.607	0.341	0.345	0.326	0.934	0.782
Hansen-J p-value	0.316	0.187	0.297	0.131	0.328	0.169	0.513

individual is less likely to take on an entrepreneurial activity, even if capital via remittances is available.

As shown in columns (3) and (4), this result appears to be driven by the insignificant role remittances have on male opportunity-TEA; remittances still promote female opportunity-TEA. This finding indicates that female perceptions may vary less than male cultural perceptions; hence, controlling for culture only decreases the effect of remittances for male entrepreneurs. In addition, differences in the results across gender could indicate that females are more capital constrained than male entrepreneurs are. Regardless of cultural perception, once capital is available, females engage in opportunity-driven entrepreneurial activities. Our results provide support to this interpretation as the culture control variable is significant only in the male entrepreneurship specification. Thus, remittances appear to relax the budget constraints of females more so than males, and this affect is not altered by perceived opportunities. Lastly, we show in columns (5)-(7) remittances are still irrelevant to necessity-driven TEAs, which makes sense as necessity driven entrepreneurship should not be culturally sensitive. Across all specifications, the culture control variable is significant in 3 of 7 specifications (at 10% level).

Overall, results in **Table 13** largely confirm our previous findings. Indeed, this result vindicates, albeit in a very different context, the notion that “cultural constraints affect the individual’s response to opportunity” (Dana, 1996, p. 65). As suggested in the literature, culture matters for responses to entrepreneurial opportunities, and entrepreneurship is indeed a culturally relevant concept. Our data support this argument.

In un-tabulated analysis, we find a positive and significant association between remittances and the perception of opportunity. This suggests that remittances affect the way entrepreneurs perceive opportunities. In addition to alleviating capital constraints, this simple association indicates that the positive impact of remittances on entrepreneurship may also act through a cultural perceptions channel. Although diving deeper into this explanation is beyond the scope of the current research, it lends additional intuition to explain why remittances affect opportunity driven entrepreneurship.

7. Conclusions, Implications, and Policy Recommendations

Collectively, our results support our first hypothesis that remittances promote entrepreneurship. We find statistically significant, positive relations between various types of entrepreneurship and remittances. Importantly, we do not find any negative, statistically significant associations between entrepreneurship and remittances. In addition, remittances do not equally affect all types of entrepreneurs. Remittances significantly influence early-stage entrepreneurship and opportunity driven entrepreneurship, supporting our second and third hypotheses. Remittances do not appear to influence job creation or necessity driven entrepreneurs. This finding stands in contrast to those single-country studies that find remittances to not lead to increases in entrepreneurial activity (Vasco, 2013), as well as a former cross-country study on the effects of remittances on entrepreneurship (Zheng & Musteen, 2018).

After controlling for cultural perceptions of opportunity, remittances continue to promote total early stage entrepreneurship and female opportunity driven

entrepreneurship. This finding suggests that remittances may increase the entrepreneurial propensity of women relative to men.

While we are unable to directly test the mechanism of a relaxed budget constraint because of data limitations, the idea that remittances affect entrepreneurship primarily by affecting early-stage, opportunity-driven entrepreneurship supports our theoretical priors. We also note that remittances are positively correlated with cultural perception of good opportunities, suggesting cultural perceptions are an additional channel through which remittances impact entrepreneurship. Future lines of research with access to richer datasets could serve to clear murky waters by directly testing these possible transmission mechanisms.

Our findings have several policy implications. First, our results indicate that fears of a “brain drain” may be unwarranted. Instead, migration may embody a “brain gain” for countries, especially if migration represents an implicit loan agreement in which investments in human capital are paid back through remittances (Poirine, 1995). If so, migration does not represent an exploitation of the developing world, but a way to improve a family’s situation, even if that improvement is marginal. Migration of high-skilled human capital from developing countries should not be discouraged, but encouraged, precisely because it encourages the development of highly skilled human capital in institutionally poor environments where such development would provide few returns without the prospect of migration (Easterly & Nyarko, 2008).

Second, our findings also provide important implications for policymakers analyzing various forms of transfers from wealthy to poor nations. Historically,

developed nations have focused on boosting economic growth in the developing world by sending vast amounts of bi-lateral and multi-lateral foreign aid. This aid is provided by governments with poor results (Easterly, 2003). Various reasons are cited for this, including the fact that aid is often misappropriated by corrupt governments as well as the epistemic problems associated with jump-starting an economy through centrally provided aid programs (Easterly, 2014). Remittances avoid both problems because they are sent directly to those whom they are intended to aid. In fact, with the advent of crypto currency (Shobhit, 2018), these problems are further mitigated by remittances. Instead of encouraging foreign aid that is often channeled through corrupt governments, the transfer of remittances should be a focus for those who would like to see marginal improvements for the families of immigrants who stay behind. Citizens will then be able to use their local knowledge to engage in entrepreneurial activity.

Lastly, our findings imply that since remittances have a positive impact on opportunity-driven entrepreneurship, they should be encouraged (or at least not discouraged) if the end-goal is to promote entrepreneurial activity in developing markets and elsewhere. In addition, if entrepreneurship is an activity that most people believe should be encouraged, migrants fleeing institutionally poor environments in order to better their lives in more institutionally secure environments should not be seen as a negative, as it currently seems to be by many American voters. Perhaps taxing remittances in order to build a wall to keep these individuals out is not the most appropriate policy. Instead, these goals may be better served by allowing migrants the

freedom to attempt to boost entrepreneurial propensity in the home country in the ways they know best and by utilizing their specific, local knowledge.

Reception to Perception: On How Remittances Affect Cultural and Social Attitudes

1. Introduction

Can remittances, defined as a transfer of money between two parties often intended as a gift, affect cultural attitudes? While these transfers have occurred for centuries, increased focus on the economics of immigration and remittances coupled with better contemporary data collection have made it easier to study the impacts of remittances on important economic outcomes. To this end, this paper asks: do remittances sent by immigrants to their families affect cultural and social attitudes in receiving nations? Because remittances represent a growth in income or wealth, I hypothesise remittances to marginally lead to more pro-market, pro-entrepreneurship attitudes. To my knowledge, I am the first to tackle this specific topic using updated, cross-country data and considering lagged, dynamic effects.

The topic of remittances is nothing foreign to academia, and there is no shortage of research attempts to uncover the impacts of remittances on important economic, cultural, and political outcomes (Abdih et al., 2012; Adams and Klobodu, 2016; Aggarwal et al., 2011; Amuedo-Dorantes and Pozo, 2004; Berdiev et al., 2013; Bugamelli and Paterno, 2009).

This interest in remittances is not surprising either. Immigrant remittances constitute one of the largest sources of external financing for developing nations, often

surpassing other well-known forms of financial flow, like foreign direct investment and multi-lateral and bi-lateral foreign aid (Meyer and Shera, 2017). The World Bank (2019) estimates over \$689 billion worth of officially recorded remittances were transferred throughout the World in 2018, \$528 billion of which were sent to those residing in developing nations. Further, these numbers represent an increase of 7.8% compared to remittance flows in 2017. As such, any policies affecting the relative ease of sending remittances would have widespread implications, and these implications are becoming increasingly important as remittance flows throughout the World exhibit growth. To illustrate, overseas remittances comprise one of Bitcoin's most profitable uses, totalling \$600 billion in crypto transfers (Shobhit, 2018).

Like remittances, the topics of culture, attitudes, and beliefs have received wide academic attention (Hochschild, 1981; Inglehart, 1990; Piketty, 1998), and the importance of cultural attitudes and beliefs has subsequently been recognised. A stark example of this importance is presented by Alesina et al. (2001), who point out 60% of those in the United States, compared to 26% of those in Europe, believe poor people to be lazy, while welfare spending in the United States in 1995 was 16% of GDP compared to an average of 25% for European nations. Beliefs and attitudes clearly influence economic and political outcomes.

Research on the determinants and effects of cultural attitudes has also spanned the fields of both macro- and microeconomics. At the macro level, economists like North (1981) and Putnam (1995) emphasise the role of private constraints on behaviour arising from emergent customs, norms, and culture, especially the role of social capital, a

concept including social networks and ties, shared values and beliefs, and norms of reciprocity. Williamson (2009) and Williamson and Kerekes (2011) build on this research and provide evidence showing informal institutions, including cultural attitudes and beliefs, are more important in securing property rights and promoting good economic outcomes than formal institutions like constitutional rules and legislation.

At the micro level, Di Tella et al. (2007) use a natural experiment in Argentina to find random allocation of property rights in Buenos Aires led to squatters demonstrating more individualistic and materialistic beliefs. Caplan (2007) also studies the determinants of beliefs by utilising the Survey of Americans and Economists on the Economy (SAEE) to study systematic differences in beliefs between the average U.S. citizen and the average U.S. economist. He finds variables like education, income growth, job security, and being male cause individuals to think more like economists. Research on how remittances affect the formation of beliefs is limited mostly to research on social remittances, or the transfer of ideas, behaviours, social capital, and identities (Levitt, 1998; Levitt and Lamba-Nieves, 2011; Boccagni and Decimo, 2013; Lacroix et al., 2016).

As a form of income growth (Caplan, 2007) and as a bundle of property rights (Di Tella et al., 2007), I hypothesise remittances to lead to an increase in the proportion of individuals in the receiving country who hold relatively pro-market beliefs or who think more like economists.

I find a negative, statistically significant association between remittances as a proportion of GDP and the proportion of the population in the receiving nation who

answer, “Yes,” to the statement: “In my country, most people would prefer that everyone had a similar standard of living.” I also provide evidence remittances lead to more pro-entrepreneurship attitudes as well as more positive media exposure of new entrepreneurs.

My results lend partial credence to the theories of, and evidence presented by, Caplan (2007) and Di Tella et al. (2007). Remittances represent a form of income growth and the reception of a bundle of property rights, and fewer concerns over equality, more pro-entrepreneurship attitudes, and more positive media exposure of new entrepreneurs represent a more pro-market attitude as well as an attitude more closely resembling the average economist.

The rest of the paper is organised as follows: section II provides a literature review; Section III highlights the data and methodology used in this study; Section IV details results; Section V provides a robustness check, and Section VI concludes the study and provides implications.

2. Literature Review and Theory

Culture, Beliefs, and Attitudes

Research on the importance and determinants of cultural attitudes and beliefs has also been subject to a fair amount of study. Economists like North (1981) and Putnam (1995) emphasise the role of private constraints on behaviour arising from emergent customs, norms, and culture, especially the role of social capital, a concept including social networks and ties, shared values and beliefs, and norms of reciprocity. Since then, a litany of researchers have studied links between beliefs and economic institutions (Hochschild, 1981; Inglehart, 1990; Piketty, 1998; Alesina et al., 2001; Knack and

Keefer, 1997; Fukuyama, 1999; Carden et al., 2009). For example, Acemoglu and Johnson (2005) have attempted to unbundle the effects of public and private constraints on behaviour and find while private constraints impact forms of financial intermediation and regulation, public constraints matter more for growth, credit, and investment.

On the other hand, Williamson (2009) and Williamson and Kerekes (2011) build on this research and provide evidence showing informal institutions, including cultural attitudes and beliefs, are more important in securing property rights and promoting good economic outcomes than formal institutions like constitutional rules and legislation, and several other researchers have studied private, informal alternatives; including culture, beliefs, customs, and norms; to public enforcement mechanisms in several different contexts including the Medieval Merchant (Benson, 1989a), Gypsy law (Leeson, 2013), trading with bandits and thieves (Leeson, 2007b), and pirate law (Leeson, 2008; Leeson, 2009).

Others have studied the effects reception of private property has on the formation of beliefs and attitudes. Namely, Di Tella et al. (2007), use a natural experiment in Argentina to find random allocation of property rights in Buenos Aires led to squatters demonstrating more individualistic and materialistic beliefs. The authors also found private property acquisition to be related to social capital accumulation. At the same time, education is associated positively with the preceding values of individualism and materialism, and the authors find the acquisition of property rights has the equivalent effect on cultural attitudes of 4.4 additional years of education.

Related, Caplan (2007) studies the determinants of beliefs by utilising the Survey of Americans and Economists on the Economy (SAEE) to study systematic differences in beliefs between the average U.S. citizen and the average economist. He finds not only large systematic differences in beliefs between the average U.S. citizen and the average economist, but also that variables like education, income growth, job security, and being male cause individuals to think more like economists. Specifically, the average U.S. citizen is more anti-market, more anti-foreign, more concerned with the conservation of labour, and more pessimistic than the average economist. Caplan highlights the importance of these systematic differences in beliefs and the ability of systematically biased beliefs to lead to wildly inefficient political outcomes; indeed, Caplan blames the brunt of political failure and inefficient policy on these systematically biased beliefs among voters.

Remittances and Cultural Attitudes

More related to this study, Piteli et al. (2019) note remittances have different effects in different countries, and these different effects can be tied to different cultural attitudes across countries. More specifically, the economic effects of remittances are exacerbated in countries where masculinity and power distance are considered more important, whereas the effects of remittances are mitigated in countries where uncertainty avoidance and individualism are highly valued. Similarly, Silverstein and Wencheng (2020) document how remittance transfers made by Chinese grandparents for the benefit of their grandchildren are impacted by patrilineal culture.

Similarly, Bedi et al. (Forthcoming) find remittances to be positively associated with entrepreneurship motivated by opportunity and an attempt to better one's circumstances. However, the authors also find the magnitude of this positive relationship is mitigated when controlling for cultural attitudes in the receiving country, a finding that corroborates the positive relationship found by Mickiewicz and Kaasa (2020) between self-employment and cultural values like creativity and security. This suggests two channels through which remittances may impact entrepreneurial behaviour positively: directly, through increasing available capital, and indirectly, by leading to more positive attitudes regarding entrepreneurship.

These positive attitudes regarding entrepreneurship are important, as they help individuals determine career decisions, including full-time and part-time self-employment decisions, through mechanisms like social support and social sanction (Autio et al., 2000; Stenholm et al., 2013; Block et al., 2019). Indeed, the relationship between culture and entrepreneurship can manifest itself in unique ways – Herrmann-Pillath et al. (2019) document how ritual acts as an entrepreneurial medium in China by launching emotional energy, and Swail et al. (2014) document a positive relationship between the skills students believe they develop when watching depictions of entrepreneurs in popular media, a phenomenon they dub “entre-tainment,” and entrepreneurial intentions. The authors further find this relationship is stronger the more social legitimacy is attached to “entre-tainment.”

Research on a specific impact of remittances on beliefs and attitudes is limited. In a study on the effects of remittances on support for democracy in Africa, Konte (2016)

researches whether individuals in sub-Saharan Africa respond to greater remittance payments by being more or less likely to support democracy. Konte's findings show the association between favouring more democracy and remittances depends on individual rankings of worries over living situations. People who value rule of law, freedom, and rights were more likely to not lose support for democracy in the presence of remittances. Those concerned with improving their economic situation were more likely to lose support for democracy in the presence of remittances. Konte classifies these individuals as belonging to the "remittance curse" class. Along the same vein, Flores (2005) highlights the interplay between financial remittances and political intentions and how remittances impact political participation in the receiving nations.

Similarly, Levitt (1998) highlights the fact remittances do not only consist of money and in-kind goods – remittances can also take the form of ideas, behaviours, social capital, and identities. These more abstract forms of remittances are known as social remittances, and social remittances can promote several positive outcomes in the home nations, including community organisation methods and business skills. Later studies have built on and expanded upon this idea of social remittances (Levitt and Lamba-Nieves, 2011; Boccagni and Decimo, 2013; Lacroix et al, 2016), especially focusing on impacts of remittances on social capital (Markley, 2011). Further, Evansluong et al. (2019) differentiate between three sources of family social capital - family duties, family trust, and family support – and show that these sources of social capital provided by familial ties, diffused between home and host country, contribute to entrepreneurial immigrants' opportunity creation. Finally, Connell (2010) notes that cultural hybridity

brought about by migration has mitigated many effects of any “brain drains” caused by selective migration.

This paper contributes to the preceding literature and theory by studying the impacts of remittances at the cross-country level using survey data concerning cultural attitudes and beliefs concerning entrepreneurship. This paper also contributes to the preceding literature by estimating lagged, dynamic effects of remittances on cultural attitudes and beliefs. To my knowledge, I am the first to tackle this specific topic using updated, cross-country data and consider lagged, dynamic effects.

I build on prior theory to hypothesise that, on average, the reception of remittances will lead to an accumulation of more market-oriented, pro-entrepreneurship beliefs. Theoretically this could happen for similar reasons the acquisition of property rights leads to more market-oriented beliefs – both may affect the incentives associated with self-manipulation of beliefs. This could also happen if the accumulation of remittances, representing a growth in income similar to the acquisition of property, lowers the relative gains of collective action by granting a family the ability to survive more independently (Di Tella et al., 2007).

I also hypothesise remittances, representing a growth in income, to cause individuals to think more like economists and entrepreneurs and hold more market-oriented beliefs for similar reasons Caplan (2007) offers regarding the effects of income growth on beliefs. It could be that income growth causes one to self-interestedly hold more market-oriented beliefs, especially regarding equality. In other words, those with upward mobility find less of a disconnect between beliefs and reality when holding pro-

market beliefs. An alternative, and not necessarily competing, theory is a correlation between personal and social optimism or between personal feelings of success and beliefs individual success is largely due to skill and hard work. While this paper does not focus on individual beliefs because of data limitations, it does estimate effects of remittances on social attitudes.

3. Data and Methodology

This research explores the relationship between cultural attitudes and remittances. While other works have studied this topic before, this paper contributes to the literature by studying the impacts of remittances at the cross-country level using survey data concerning cultural attitudes and beliefs concerning entrepreneurship. This paper also contributes to the preceding literature by estimating lagged, dynamic effects of remittances on cultural attitudes and beliefs. To my knowledge, I am the first to tackle this specific topic using updated, cross-country data and consider lagged, dynamic effects.

The most current, influential cross-country entrepreneurship data utilized in empirical business, management, entrepreneurship, and economics research is the Global Entrepreneurship Monitor (GEM) (Bosma and Kelley, 2019). According to statistics on the use of GEM, there are 774 papers published in 375 academic journals that are based on GEM data, covering a wide array of topics in entrepreneurship, management, marketing, economics, political science, psychology, and sociology (Frederick and Bygrave, 2004; Ace and Varga, 2005; Hessels and van Stel, 2011; Gielnik et al., 2018). For example, GEM data appear often in journals including, but not limited to, *Small*

Business Economics, International Entrepreneurship and Management Journal, and International Journal of Entrepreneurship and Small Business. To my knowledge, this is the first attempt to test the effects of remittances on cultural attitudes and beliefs using GEM data. Indeed, systematic cross-country studies on the impacts of remittances on cultural attitudes are rare, with Konte's (2016) study on the impacts of remittances on attitudes concerning democracy being the only one besides this attempt, at least to this author's knowledge.

For two decades, the GEM Adult Population Survey (APS) has tracked evidence of entrepreneurial activities in over one hundred economies, including high-, middle-, and low-income countries. Annually, over 200,000 individuals are interviewed, and their responses are aggregated at the national level. While the GEM-APS dataset focuses on a wide array of entrepreneurial activity; differentiating between entrepreneurship at different stages, with different motivations and attitudes, and depending on different socioeconomic factors (age, gender, education, income); the survey also collects data on attitudes and beliefs concerning entrepreneurship. For example, a variable proxying for social attitudes concerning equality measures the percent of respondents in a given country in a given year who answer, "Yes," to the statement, "In my country, most people would prefer that everyone had a similar standard of living." These measures are collected from the national level GEM-APS dataset between 2004 and 2015.

Given that the cross-country remittances data at the individual level are unavailable, my main independent variable of interest is a country level aggregation of share of remittances received as a percentage of GDP, collected from World Bank's

World Development Indicators (WDI). WDI is the first choice of data for a great deal of cross-country level research, including work on remittances. Many papers utilize my same measure of remittances collected from WDI (Gupta et al., 2009; Aggarwal et al., 2011; Imai et al., 2014; Shapiro and Mandelman, 2016). Personal remittances are the sum of personal transfers and compensation of employees, as defined in the sixth edition of the IMF's Balance of Payments Manual (2009). This measure of remittances allows me to focus on remittances *received* in each country, as a percentage of GDP, and avoids clumping together remittances received with remittances sent.

Although better data collection has made it easier for modern researchers to study remittances relative to the past, it is important to note remittances are difficult to accurately measure. To illustrate, remittances do not include small transfers sent via money transfer operators, mobile phones, post offices, or informal transfers (IMF, 2009). Instead, the World Bank (Bank, 2019) measures remittances based on “compensation of employees” and “personal transfers.” “Compensation of employees” refers to the salaries of temporary migrant workers, residents of the country who work for embassies, residents of the country who work for international organizations, and residents of the country who work for foreign companies. “Personal transfers” measure all transfers in cash or in kind made or received by residents of the home country to or from individuals in the host country. World Bank data on these personal transfers and compensation of employees are utilized to measure remittances, specifically remittances received as a percentage of GDP for each country.

For cross-country level research, it is common to divide variables by GDP, to adjust for size of the economy. This includes but is not limited to the remittances literature including, Gupta et al. (2009), Giuliano and Ruiz-Arranz (2009), Aggarwal et al. (2011), Adams and Klobodu (2016), Shapiro and Mandelman (2016), etc. Because of concerns of potentially unobservable country heterogeneity, omitted variables, and endogeneity, it can be argued that either remittances affect attitudes and beliefs concerning entrepreneurship or attitudes and beliefs can motivate sending remittances (Vasco, 2013; Poirine, 1995). Without a valid and efficient instrumental variable for remittances, this paper relies on estimators with a dynamic panel to identify causality—the Blundell and Bond (1998) system generalized method of moments (henceforth, GMM). For samples with “small T, large N” panels and non-strictly exogenous independent variables (Roodman, 2009), GMM is the best method to address endogeneity. It does so by employing lags of the dependent variable as its own instruments, starting from the second lag. This methodology is common in cross-country studies including research on remittances (Acosta et al., 2008; Catrinescu et al., 2009; Giuliano and Ruiz-Arranz, 2009; Aggarwal et al., 2011; Imai et al., 2014; Adams and Klobodu, 2016). Thus, I avoid concerns of reverse causality by studying the effects of remittances received in the past on entrepreneurial beliefs and attitudes in the future.

My GMM specifications can be written with the following equation:

$$Cul_{it} = \beta_0 + \beta_1 Cul_{it-1} + \beta_2 Remit_{it-1} + \beta_3' Z_{it-1} + \beta_4 \theta_i + \varepsilon_{it} \quad (1)$$

Where i and t represent country and year, respectively. Cul_{it} and Cul_{it-1} take the form of multiple cultural and social beliefs and attitudes measures from the GEM-APS dataset

in year t and $t - 1$, respectively; $Remit_{it-1}$ is the share of remittances received in a country i as the percentage of its GDP in year $t - 1$; Z_{it-1} is a vector of four control variables; θ_i is the time-fixed effects dummies, and ε_{it} is the random error term.

Note that to match with the cultural beliefs and attitudes measures on the LHS, all RHS variables including the cultural beliefs and attitudes measures are lagged for one year. This is done for four reasons. The first is to partially address reverse causality running from cultural beliefs and attitudes to remittances. The second is to allow time for the family members of immigrant workers to reform beliefs and attitudes after remittances have been received. The third reason is due to the constraint of my limited sample. Last, although lagging the RHS for one term could be arbitrary, this is the conventional treatment in studies including remittances with panel data (Catrinescu et al., 2009; Imai et al., 2014; Adams and Klobodu, 2016). Further, remittances represent a one-time growth in income, and under the preceding theory and literature review, it is income growth and not income levels that matter for the formation of beliefs. Thus, we should expect the effects of this specific type of income growth, remittances, to show themselves one term after the reception of those remittances and not much longer after. A one-time growth in income is expected to alter beliefs in the preceding theory, but unless that growth is repeated, the effects should diminish rather quickly.

The four control variables in vector Z_{it-1} include GDP per capita; GDP growth; economic institutions; and labour force participation rate; following the work of Bedi, et al. (Forthcoming), who make use of this same dataset to measure the effects of remittances on entrepreneurial outcomes. GDP per capita captures income differences in

year $t - 1$ when the remittances were received. I include GDP growth to control for possible business cycle effects on cultural attitudes and perceptions. I also include a measure for the economically active proportion of the population – the labor force participation rate in a recipient country – in order to disentangle the effects labor markets and remittances may have on cultural attitudes concerning entrepreneurship. Data for all three controls are collected from World Development Indicators (2019).

To control for the quality of economic institutions, I include economic freedom measured by the Economic Freedom of the World Index (Fraser Institute, 2018). The economic freedom index is measured from 0-10, with a higher score indicating more economic freedom. I do so because institutions are the “rules of the game,” and these rules can interact with more informal institutions, including cultural attitudes and beliefs (Williamson, 2009). For example, cultural attitudes have been shown to be more important than and influential to formal institutions (Williamson and Kerekes, 2011). Thus, to unbundle effects associated with institutional environments on cultural attitudes from effects associated with remittances on cultural attitudes, I control for institutions.

The GEM-APS survey covers countries in different income groups, although proportionally there are more high- and middle-income countries in the current sample. For example, Malawi is the economy with the lowest income in the sample, with GDP per capita of about \$2,600 in 2011 international dollars. Countries in my sample with the highest income include Norway and the United States. One third of my sample is composed of developing countries. Summary statistics for all variables can be found in **Table 14**, and a list of all countries in my sample can be found in **Table 15**.

Table 14: Summary Statistics

Variable:	Obs.	Mean	Std. Dev.	Min	Max
Perceptions of Equality	578	63.348	12.908	17.590	96.797
Knowing a New Entrepreneur	631	40.023	12.121	13.967	85.123
Self-Appraisal of Entrepreneurial Talent	631	50.110	15.555	8.652	89.479
Perceptions of Opportunity	631	40.738	16.609	2.851	85.540
Fear of Failure	631	37.078	9.860	11.822	72.347
Entrepreneurship is Good	593	64.745	14.052	16.732	96.155
Entrepreneurship is Respectable	596	69.807	10.642	31.471	100
Media Portrayal of Entrepreneurs	592	61.652	30.611	19.224	717.722
Remittances	2,069	4.780	6.854	0.000	49.290
Log GDP Per Capita	1,914	9.991	1.127	7.356	12.342
GDP Growth Rate	2,051	4.046	4.370	28.096	34.5
Institutions	1,251	6.824	0.899	3.146	9.047
Labour Force Participation Rate	1,914	67.274	10.698	33.821	90.34
Percent Secondary Education	1,748	53.788	32.889	3.493	153.805

Table 15: List of All the Countries in the Sample

Argentina	Cameroon	Croatia	Latvia	Romania	Dominican Republic	Nigeria
Australia	Colombia	Hungary	Mexico	Slovakia	Algeria	Pakistan
Belgium	Germany	Indonesia	Malaysia	Slovenia	France	Russian Federation
Brasil	Ecuador	India	Netherlands	Sweden	Ghana	Trinidad and Tobago
Barbados	Spain	Ireland	Norway	Thailand	Iceland	Turkey
Botswana	Estonia	Iran	Panama	Tunisia	Jamaica	Uganda
Canada	Finland	Israel	Peru	Uruguay	Japan	Zambia
Switzerland	United Kingdom	Italy	Philippines	United States	Lithuania	
Chile	Greece	Korea, Rep.	Poland	South Africa	Malawi	
China	Guatemala	Luxembourg	Portugal	Denmark	Namibia	

4. Results

I now turn to an analysis of my results. To begin, I examine my results when I use social perceptions on the importance of equality as my dependent variable, the results of which can be found in **Table 16**. This variable measures the percent of respondents who answered, “Yes,” to the statement, “In my country, most people would prefer that everyone had a similar standard of living.” According to theory presented above, we should expect a negative association between remittances as a percent of GDP and the cultural variable measuring social preferences for equality, because concerns over equality represent a less market-oriented and economist-oriented attitude (Caplan, 2007). Indeed, this is exactly the type of association I find, statistically significant within the 5% level of significance. Specifically, a one percentage point increase in remittances as a share of GDP is associated with a 1.28 percentage point decrease in the share of the population answering, “Yes,” to the statement, “In my country, most people would prefer that everyone had a similar standard of living.”

Next, I analyze my results using the variable representing personal acquaintance with entrepreneurs as my dependent variable of interest, the results of which can be found in **Table 2**. This variable represents the proportion of respondents in a given year in a given country who answer, “Yes,” to the question, “Do you know someone personally who started a business in the past 2 years?” Unlike the variable measuring social perceptions of equality, one should expect a positive association between remittances and the proportion of respondents who personally know an entrepreneur, especially considering research that finds positive associations between remittances and

Table 16: Remittances and Cultural Attitudes

Dependent Variables:	Perceptions of Equality	Knowing a New Entrepreneur	Self-Appraisal of Entrepreneurial Talent	Perceptions of Opportunity	Fear of Failure	Entrepreneurship is Good	Entrepreneurship is Respectable	Media Portrayal of Entrepreneurs
Remittances _{t-1}	-1.280** (-0.592)	0.976 (-1.098)	1.515 (-0.998)	1.879 (-1.337)	0.663 (-2.137)	1.406 (-1.313)	0.445 (-0.519)	1.392* (-0.807)
Log GDP	-2.767	-10.800**	4.314	2.755	2.967	-4.468	1.305	-0.927
Per Capita _{t-1}	(-4.198)	(-4.296)	(-4.949)	(-5.166)	(-4.762)	(-5.25)	(-3.886)	(-4.03)
GDP	0.102	0.459	0.435	1.186**	0.012	0.684	0.161	0.094
Growth	(-0.305)	(-0.34)	(-0.47)	(-0.565)	(-0.572)	(-0.522)	(-0.471)	(-0.465)
Rate _{t-1}								
EFW _{t-1}	5.316 (-5.181)	-3.253 (-4.531)	-7.064 (-4.744)	-1.608 (-5.869)	0.299 (-5.329)	0.576 (-3.842)	-0.27 (-3.864)	-3.678 (-3.113)
Labour	-0.15	-0.128	0.579**	0.036	0.355	-0.227	-0.186	-0.272
Force	(-0.418)	(-0.316)	(-0.285)	(-0.384)	(-0.305)	(-0.245)	(-0.259)	(-0.212)
Participation _{t-1}								
Constant	30.532 (-30.92)	182.531*** (-67.444)	-40.391 (-62.315)	-7.524 (-51.425)	-44.158 (-54.941)	95.352 (-62.863)	20.563 (-43.878)	64.088 (-53.076)
Observation	367	415	415	415	415	376	378	377

entrepreneurship in the receiving country (Bedi et al., Forthcoming). Again, my findings support previous theory and empirical evidence, showing a positive, but statistically insignificant, relationship between remittances and the percent of people who know an individual who recently started a business. While my variable measuring remittances does not show significance, there is a negative, statistically significant relationship between the percent of people who know someone who has recently started a business and GDP per capita. This result is in line with evidence presented by La Porta and Schliefer (2014), who find sole proprietorships and independent entrepreneurial ventures are less common in developed countries than in developing countries.

I now turn to a discussion of my results using the variable measuring self-appraisal of entrepreneurial talent as my dependent variable of interest, the results of which can be found in **Table 16**. This variable is a proxy for self-evaluation of entrepreneurial skills, measuring the percent of respondents who answer, “Yes,” to the question, “Do you have the knowledge, skill and experience required to start a new business?” Like the variable measuring personal acquaintance with entrepreneurs, we should expect a positive relationship between remittances and self-evaluation of entrepreneurial talent and potential (Bedi et al., Forthcoming), and this is exactly the relationship I find, with statistical significance just beyond the 10% level. Further, I find the percent of respondents who actively participate in the labor force is related positively to self-evaluations of entrepreneurial talent, significant within the 5% level, suggesting human capital in general and/or positive business cycle fluctuations to be an important determinant of individuals’ overall self-evaluation of entrepreneurial talent.

Next, I report results utilizing my variable representing perceptions of entrepreneurial opportunity as my dependent variable of interest, the results of which can be found in **Table 16**. This variable reports the percent of respondents who answer, “Yes,” to the question, “In the next six months, will there be good opportunities for starting a business in the area where you live?” Again, I expect a positive association between this variable and remittances as a percent of GDP, and again, this is what I find, though significance is only at the 16% level. Further, the GDP growth rate is positively related to social perception of entrepreneurial opportunity within the 5% level of significance. Both these results support the idea that social optimism and personal optimism are correlated – if one lives in an area where life seems to be getting better, she is more likely to be optimistic about opportunities in the near future (Caplan, 2007).

I continue my analysis by examining the association between the variable measuring fear of failure and remittances as a percent of GDP, the results of which can be found in **Table 16**. This variable measures the percent of respondents who answer, “Yes,” to the question, “Would fear of failure prevent you from starting a business?” Like the variable measuring social perceptions of equality, I expect a negative association between remittances and fear of failure for similar reasons I reported positive correlations between remittances and feelings of optimism. However, I find a positive correlation, suggesting remittances increase the percent of respondents answering, “Yes,” to the question, “Would fear of failure prevent you from starting a business?” However, the coefficient for this variable is not significant at all, and it can be argued the question,

“Would fear of failure prevent you from starting a business?” is overly ambiguous because of its hypothetical phrasing.

Next, I analyze relations between the dependent variables measuring social perceptions on the desirability of becoming an entrepreneur and my independent variable of interest, remittances as a percent of GDP, the results of which can be found in **Table 16**. One variable measures the percent of respondents responding, “Yes,” to the statement, “In my country, most people consider starting a new business a desirable career choice,” and the other variable measures the percent of respondents answering, “Yes,” to the statement, “In my country, those successful at starting a new business have a high level of status and respect.” Because remittances represent a growth in income, and because a growth in income is found to be associated with more market-oriented attitudes (Caplan, 2007), I expect a positive association between remittances as a percent of GDP and these two dependent variables of interest. I again find the expected sign, but the association is insignificant.

Finally, I examine my last dependent variable of interest, a measure of the percent of respondents answering, “Yes,” to the statement, “In my country, you will often see stories in the public media about successful new businesses,” the results of which can be found in **Table 16**. Again, because remittances have been found to be associated with increased levels of entrepreneurship (Bedi et al., Forthcoming), I expect a positive association between the variable measuring positive media attention to entrepreneurs and remittances as a percent of GDP. Not only do I find a positive link, but this link is statistically significant within the 10% level of significance. A one percentage point

increase in remittances as a percent of GDP is associated with a 1.39 percentage point increase in the share of respondents answering, “Yes,” to the statement, “In my country, you will often see stories in the public media about successful new businesses.” While this statement measures a different aspect of culture than the preceding survey statements and questions, focusing on media exposure of entrepreneurs instead of cultural attitudes and beliefs about entrepreneurship, media still represent an important facet of cultural dissemination (Cooke et al, 2008), and these results coupled with results from Swail et al. (2014) suggest entrepreneurship may be stimulated in receiving nations by remittances through media attention to entrepreneurs.

5. Education Robustness Check

The prior results lend credence to the idea that remittances marginally lead to more pro-market and pro-entrepreneurial social attitudes and perceptions. Prior research has found education to also lead to more market oriented cultural attitudes. Thus, to consider the previous results robust, it seems prudent to also control for education. This is exactly what I do in the following analysis, the results of which can be found in **Table 17. I** obtain my variable measuring education from GEM, which collects data on the percent of respondents with a secondary degree, averaged for the years 1971-1995. To economize on space, I focus only on results that changed substantially in significance. These variables include the variables measuring social perceptions of equality, social perceptions on the desirability of becoming an entrepreneur, and positive media portrayal of entrepreneurs. All results maintain the same sign after controlling for education.

Table 17: Education Robustness Check

Dependent Variables:	Perceptions of Equality	Knowing a New Entrepreneur	Self-Appraisal of Entrepreneurial Talent	Perceptions of Opportunity	Fear of Failure	Entrepreneurship is Good	Entrepreneurship is Respectable	Media Portrayal of Entrepreneurs
Remitt _{t-1}	-1.394* (-0.778)	0.817 (-1.17)	2.043 (-1.653)	0.945 (-1.654)	0.258 (-1.632)	1.903* (-1.146)	0.579 (-0.573)	1.621** (-0.669)
Percent Secondary Education _{t-1}	0.191 (-0.212)	-0.537 (-0.385)	-0.396 (-0.244)	-0.521 (-0.406)	0.106 (-0.175)	-0.201 (-0.282)	-0.281 (-0.256)	-0.15 (-0.318)
Log GDP Per Capita _{t-1}	-8.22 (-7.476)	1.309 (-10.627)	8.574 (-6.296)	14.827 (-11.382)	-0.506 (-6.853)	-0.801 (-7.417)	10.795 (-10.9)	2.219 (-8.281)
GDP Growth Rate _{t-1}	0.113 (-0.283)	0.327 (-0.382)	0.046 (-0.513)	1.108*** (-0.404)	0.109 (-0.415)	0.589 (-0.415)	0.213 (-0.483)	-0.05 (-0.421)
EFW _{t-1}	6.592 (-4.753)	-3.872 (-6.251)	-8.448* (-4.928)	-2.111 (-5.508)	1.652 (-4.966)	-0.416 (-3.72)	-4.099 (-5.317)	-4.248 (-3.702)
Labor Force Participation _{t-1}	-0.245 (-0.35)	-0.11 (-0.521)	0.187 (-0.27)	0.368 (-0.545)	0.209 (-0.271)	-0.118 (-0.313)	-0.006 (-0.39)	-0.178 (-0.268)
Constant	69.653 (-57.314)	103.367 (-101.197)	-3.328 (-82.806)	-112.991 (-122.717)	-12.226 (-58.034)	78.077 (-79.459)	-23.949 (-86.139)	41.433 (-77.153)
Observations	334	380	380	380	380	343	345	344

To begin, the effect of remittances on my variable measuring social perceptions of equality increases slightly in magnitude. Specifically, after controlling for education, a one percentage point increase in remittances as a share of GDP leads to a 1.39 percentage point decrease in the share of respondents answering, “Yes,” to the question, “In my country, most people would prefer that everyone had a similar standard of living.” However, the statistical significance of this variable decreases slightly to within the 10% level of significance.

I next turn to the effects of remittances on social attitudes concerning the desirability of becoming an entrepreneur. After controlling for education, the effect of remittances on social perceptions on the desirability of becoming an entrepreneur becomes significant – a one percentage point increase in remittances as a share of GDP now leads to a 1.9 percentage point increase in the share of respondents answering, “Yes,” to the question, “In my country, most people consider starting a new business a desirable career choice,” and this relationship is significant within the 10% level of significance.

Finally, I concentrate on the effects of remittances on positive media portrayal of entrepreneurs after controlling for education. Now, I estimate a one percentage point increase in the share of remittances as a percent of GDP to lead to an increase of 1.62 percentage points in the share of respondents answering, “Yes,” to the question, “In my country, you will often see stories in the public media about successful new businesses.” Further, this relationship becomes more significant after controlling for education, reaching the 5% level of significance.

What should we make of these results? Overall, while all of the results were not statistically significant, none of the results contradicted prior theory and empirical evidence on the determinants of cultural beliefs, and the one relationship that did not make intuitive sense, the positive relationship between fear of failure and remittances, was highly statistically insignificant, and the survey question representing that dependent variable was more ambiguous than the other survey questions measuring social beliefs and attitudes concerning entrepreneurship because of hypothetical phrasing. Further, there were statistically significant relationships between remittances received as a percent of GDP and feelings about equality as well as between remittances received and depictions of successful entrepreneurs in the media. Further, after controlling for education, remittances still have the predicted effects on social perceptions of equality and positive media portrayal of entrepreneurs, and remittances becomes statistically significantly associated with social perceptions concerning the desirability of becoming an entrepreneur. Thus, remittances seem to influence social perceptions independent GDP growth and education, two variables found most important for the formation of beliefs in the literature (Di Tella et al., 2007; Caplan, 2007).

6. Conclusions, Implications, and Further Research

I study the effects of remittances on social attitudes and beliefs concerning entrepreneurship. I find remittances cause social perceptions in receiving nations to err towards caring less about equality, towards finding entrepreneurship a more desirable career choice, and towards being exposed more to successful entrepreneurs through

media. More importantly, I find no evidence counter to prior research on the determinants of cultural attitudes and beliefs.

One implication of these findings is that remittances, like the reception of property rights, can lead to more market-oriented and pro-entrepreneurial attitudes associated with successful economic outcomes (Di Tella et al, 2007). Like individualism and materialism, placing less importance on equality represents a rise in informal institutions that serve to help protect property rights (Williamson and Kerekes, 2011).

These findings also corroborate evidence provided by Caplan (2007) showing growth in income to be correlated with thinking like an economist. While direct questions about feelings of equality are not available from SAEE evidence presented by Caplan, certain questions about the desirability of wage gaps between business owners and employees and tendencies of non-economists toward anti-market biases serve as decent proxies for feelings towards equality. My partial replication of these results makes sense too: remittances represent a direct increase, or growth, in income.

Not only are property rights acquisition, income growth, and remittances positively associated with market-oriented attitudes, but so is education. Di Tella, et al. (2007), emphasize the acquisition of property rights has the equivalent effect on cultural attitudes of 4.4 additional years of education, and Caplan (2007) shows income growth is the second biggest determinant of thinking like an economist, in terms of magnitude, and education is the biggest determinant of thinking like an economist. This evidence provides strong indication the reception of remittances can behave like education in

transforming informal cultural institutions, a novel implication considering the difficulty of institutional transfer (Seidler, 2014).

If this is the case, there are strong implications for development economics. Remittances are a major substitute for other prominent forms of development aid like bi-lateral and multi-lateral foreign aid, which is often found to lead to corruption in developing nations (Easterly, 2014). If remittances behave like education in terms of altering cultural attitudes and beliefs more conducive to economic growth, remittances represent more than a foreign aid mechanism that is able to bypass the corruptive effects of foreign aid channeled through corrupt government and poor institutions (Dutta et al, 2013; Bedi et al., Forthcoming) – remittances may actually be a way to *enhance* currently poor institutions. This becomes even more important considering GDP growth is correlated with cultural attitudes that promote economic development (Caplan, 2007). This implies cultural attitudes not conducive to growth inhibit growth, which would lead to a situation where cultural attitudes transform in a way even less conducive to growth, leading to a poverty trap. My research suggests remittances may marginally improve such poverty traps by encouraging social attitudes more conducive to economic growth, even promoting virtuous circles of growth and entrepreneurship in the most optimistic of estimations.

However, the current attempt represents a first step in uncovering the systematic effects of remittances on specific cultural attitudes at the cross-country level. Future attempts would do well to take advantage of natural experiments, potential instrumental

variables, and richer datasets with not only a greater variety of questions, but also more finely tuned questions.

Still, this paper provides limited evidence in support of the idea remittances should not be thought of as merely monetary or in-kind transfers. It seems more abstract goods are remitted by immigrants, including market-oriented and entrepreneur-friendly attitudes and beliefs.

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Biography

Joshua K. Bedi was born in Jackson, MS to Kanwar Bedi and Tammy Bedi. He attended Mississippi State University as an undergraduate, earning his Bachelor of Business Administration in Business Economics and his Bachelor of Arts in German in 2017. He then went on to pursue his Doctor of Philosophy in Economics at George Mason University, earning his Master of Arts in Economics in 2019. After finishing his Doctor of Philosophy, he will begin a position as a post-doc in entrepreneurship under the Mærsk McKinney Møller Endowed Chair in Entrepreneurship with Dr. José Mata at Copenhagen Business School.