Brain Gains: A Cross-Country Study on the Relationship Between Remittances and Entrepreneurship

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Abstract

This paper asks: do remittances promote entrepreneurship? Remittances have become one of the largest forms of cross-country financial inflows, even exceeding other prominent forms of financial flows, including foreign aid and foreign direct investment (Meyer & Shera, 2017). By directly providing relief, remittances are an important income and capital source for family members of immigrant workers in home countries. We hypothesise and empirically document a positive link between remittances and entrepreneurship rates across countries. Our results suggest that remittances promote early-stage business development, particularly for opportunity-seeking entrepreneurs. In addition, we find that female opportunity driven entrepreneurs and entrepreneurs with a secondary education and from a middle-class background benefit more from remittances.

Keywords: Remittances, Entrepreneurship, Development, Immigration, Financial Inflows, Brain Drain, Brain Gain, Early-Stage Entrepreneurship, Opportunity-Driven Entrepreneurship, Diaspora Investment

JEL Codes: F24, L26, O1

I. 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 hypothesise 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, totalling $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 labour 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 in regards to consumption, investment, and participation in the labour 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 Labour 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 hypothesise 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 hypothesise 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 minimises concerns regarding endogeneity, providing support that the channel of causation runs from remittances to entrepreneurship.

The rest of the paper is organised as follows: Section II highlights related literature; Section III details our theoretical underpinnings and hypotheses. Section IV includes our data and methodology. Section V provides empirical results; Section VI presents a robustness check controlling for cultural perceptions of entrepreneurial opportunities, and Section VII includes conclusions, implications, and policy recommendations.

I. 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 Labour 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) theorises 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 favouring 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 favour democracy any less in the presence of remittances. Those with concerns to improve their economic situation were more likely to be less favourable 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 incentivise 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, incentivising corruption in the same way natural resource rents incentivise 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: labour 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 analyse 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 behaviour 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 Labour Migration (NELM) described above (Stark & Bloom, 1985; Taylor, 1999) highlights the theoretical and empirical associations between migration, remittances, and entrepreneurship. These papers theorise 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 health-care 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 endeavours. 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) utilise 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 utilise 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.

II. Theory

We build from prior studies to hypothesise 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 hypothesise 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 presumedly 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.

IV. 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*.[1] 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.

[1] Counted based on GEM's publication statistics by December 13, 2019.

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[2].

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

[2] Survey questions conducted between 1999-2003 do not match with more recent survey data; thus, we focus on questions from 2004-2015.

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 organisations, 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 utilised 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 1 includes summary statistics and descriptions of all the variables. Included in Appendix 1 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 estimators with a dynamic panel to identify causality—the Blundell and Bond (1998) system generalised 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.[3] 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:

$$Entre_{it} = \beta_0 + \beta_1 Entre_{it-1} + \beta_2 Remit_{it-1} + \beta_3{}' Z_{it-1} + \beta_4 \theta_{\mathrm{i}} + \varepsilon_{it} \qquad (1)$$

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 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

[3] Valid GMM estimators rely on satisfying two assumptions─ the second-order correlation test (identification of serial correlation issues with the error terms) and the Hansen-J test (restriction for overidentification issues with the instruments).

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 Appendix 1, 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 labour 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 utilise 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 utilised to about 390 observations across 67 countries[4]. Table 1 reports the summary statistics for all the variables in the sample.

V. Empirical results

Table 2 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 hypothesised, 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

[4] Refer to Appendix 2 for the list of all the countries in the sample.

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. Remittances coefficient is smaller in relation to established businesses (1.033) compared to remittances coefficient on TEA (1.476), which supports our priors—remittances play a more significant role on entrepreneurship at the early stage than the established stage.[5]

Comparing across the results, the findings suggest that remittances promote early stage and established entrepreneurship, but early stage entrepreneurs benefit more. Overall, Table 2 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 2, 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

[5] Output for this is not tabulated but available upon request.

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.

As suggested by the first three columns in Table 3, 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 utilised 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 3 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 4 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.[6] 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

[6] Remittances do not show significant differences among entrepreneurs in different age groups; hence, the output is not tabulated to save space.

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 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.

VI. 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 5 reproduces estimations from Tables 2 and 3 but now includes the cultural perception variable. As expected, the magnitude of all the coefficients of remittances are smaller, compared to our previous estimations. This reflects the argument that perceived opportunity affects the willingness to utilise 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 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 5 largely confirm those in Tables 2 and 3. 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.

VII. 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 policy-makers analysing 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 channelled 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 utilising their specific, local knowledge.

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Appendix 1: Correlations of Remittances with Lags up to Five Years and Various Entrepreneurship Measures

	Remittances	Remittances$_{t-1}$	Remittances$_{t-2}$	Remittances$_{t-3}$	Remittances$_{t-4}$	Remittances$_{t-5}$
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

Appendix 2: 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 1: Variables Description, Summary Statistics and Correlation

Notes: The number of observations reported here is based on GMM output in column (3) of Table 1—with total early-stage entrepreneurship as the dependent variable.

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

TEA with post-secondary degree	% 18-64 pop. involved in TEA with post- secondary degree	GEM 2018/2019	379	12.697	8.279
TEA in lowest 33 percentile income	% 18-64 pop. involved in TEA from lowest 33 percentile income household	GEM 2018/2019	371	6.748	6.463
TEA in middle 33 percentile income	% 18-64 pop. involved in TEA from middle 33 percentile income household	GEM 2018/2019	386	8.388	7.391
TEA in highest 33 percentile income	% 18-64 pop. involved in TEA from highest 33 percentile income household	GEM 2018/2019	378	10.366	7.762
Predict opportunity	% 18-64 pop. answered YES to the question “Will there be good opportunities for starting a business in where you live in the next six months”	GEM 2018/2019	390	39.431	16.624
Fear of failure	% 18-64 pop. answered YES to the question “Would fear of failure would prevent you from starting a business?”	GEM 2018/2019	390	37.919	9.898
Good career	% 18-64 pop. agreed on the statement “Most people consider starting a new business a desirable career choice.”	GEM 2018/2019	365	63.107	13.649
Social status	% 18-64 pop. agreed on the statement “Those successful at starting a new business have a high level of status and respect.”	GEM 2018/2019	366	69.191	10.379
Media coverage	% 18-64 pop. agreed on the statement “Stories in the public media about successful new businesses are often seen.”	GEM 2018/2019	365	59.228	14.440

Table 2: Remittances and Entrepreneurial Activities at Different Stages

Notes: This table uses GMM estimation. GMM method is Blundell–Bond system generalised method of moments. All dependent variables interpret as "percent of 18-64 years old interviewees answer yes" to the question and all lagged for one year. All models include a set of time fixed effects. Refer to Table-1 for details of all variables. Robust standard errors are reported in parentheses, with *** p<0.01, ** p<0.05, * p<0.1.

Dependent Variables:	Trying to start a new business/Pre-entrepreneurship stage	Start-up/Nascent-stage entrepreneurship	Total early-stage entrepreneurship	Established business ownership
	(1)	(2)	(3)	(4)
Remittances $_{t-1}$	2.037***	1.824**	1.476**	0.790
	(0.623)	(0.752)	(0.718)	(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	-4.537	-3.159	2.271
	(5.261)	(6.788)	(3.092)	(2.533)
GDP Growth Rate $_{t-1}$	0.497	0.401	0.080	0.354
	(0.441)	(0.557)	(0.389)	(0.278)
Institutions $_{t-1}$	-4.389	-2.711	-1.204	-0.126
	(3.609)	(4.394)	(2.376)	(2.485)
Labor Force Participation Rate $_{t-1}$	0.351	0.295	0.318	0.075
	(0.263)	(0.296)	(0.239)	(0.127)
Constant	2.410	55.394	24.374	-31.121
	(56.641)	(69.560)	(35.464)	(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

Table 3: Remittances and Total Early-Stage Entrepreneurial Activities by Motivation

Notes: This table uses GMM estimation. GMM method is Blundell–Bond system generalised method of moments. TEA refers to Total Early-Stage Entrepreneurial Activity Rate. All dependent variables interpret as "percent of 18-64 years old interviewees answer yes" to the question and all lagged for one year. All models include a set of time fixed effects. Refer to Table-1 for details of all variables. Robust standard errors are reported in parentheses, with *** p<0.01, ** p<0.05, * p<0.1.

Dependent Variables	Opportunity TEA	Male opportunity TEA	Female opportunity TEA	Necessity TEA	Male necessity TEA	Female necessity TEA	TEA jobs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Remittances $_{t-1}$	0.949***	1.179**	0.697**	0.402	0.161	0.288	0.648
	(0.296)	(0.531)	(0.354)	(0.433)	(0.445)	(0.292)	(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	-1.621	0.281	-2.093	-2.440*	-1.655	-3.524*
	(2.577)	(3.226)	(2.568)	(1.521)	(1.463)	(1.805)	(2.056)
GDP Growth Rate $_{t-1}$	0.164	0.129	0.207	-0.046	0.121	-0.128	-0.169
	(0.308)	(0.354)	(0.236)	(0.138)	(0.125)	(0.151)	(0.340)
Institutions $_{t-1}$	-0.785	-0.611	-1.028	-1.312	-0.565	-0.827	0.257
	(1.767)	(2.515)	(1.246)	(1.462)	(1.889)	(1.152)	(1.788)
Labor Force Participation Rate $_{t-1}$	0.197	0.255	0.181	0.050	0.024	0.067	0.221*
	(0.160)	(0.241)	(0.122)	(0.091)	(0.155)	(0.091)	(0.127)
Constant	0.460	8.698	-9.318	30.394*	31.590*	20.281	24.404
	(26.694)	(39.458)	(22.473)	(16.299)	(16.775)	(18.310)	(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 4: Remittances and Total Early-stage Entrepreneurial Activities by Education and Income Groups

Notes: This table uses GMM estimation. GMM method is Blundell–Bond system generalised method of moments. TEA refers to Total Early-Stage Entrepreneurial Activity Rate. All dependent variables interpret as "percent of 18-64 years old interviewees answer yes" to the question and all lagged for one year. All models include a set of time fixed effects. Refer to Table-1 for details of all variables. Robust standard errors are reported in parentheses, with *** p<0.01, ** p<0.05, * p<0.1.

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	2.178**	1.234*	1.418*	1.651**	-0.484
	(0.644)	(1.109)	(0.663)	(0.794)	(0.804)	(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	-1.569	-6.649	-3.639	-5.883	-0.509
	(3.780)	(4.308)	(8.459)	(4.328)	(5.114)	(5.250)
GDP Growth Rate $_{t-1}$	-0.037	0.430	-0.287	-0.622	0.076	0.292
	(0.444)	(0.396)	(0.783)	(0.502)	(0.463)	(0.701)
Institutions $_{t-1}$	0.954	-0.449	1.539	-2.029	-1.210	-3.737
	(2.706)	(3.253)	(7.197)	(4.264)	(3.345)	(3.645)
Labor Force Participation Rate $_{t-1}$	0.034	0.278	0.360	0.024	0.245	-0.091
	(0.310)	(0.272)	(0.433)	(0.387)	(0.244)	(0.277)
Constant	21.364	0.761	41.079	58.480	61.915	43.829
	(42.997)	(44.402)	(74.606)	(36.353)	(50.487)	(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

Table 5: Robustness Check—Remittances and Total Early-Stage Entrepreneurial Activities by Motivation

Notes: This table uses GMM estimation. GMM method is Blundell–Bond system generalised method of moments. TEA refers to Total Early-Stage Entrepreneurial Activity Rate. All dependent variables interpret as "percent of 18-64 years old interviewees answer yes" to the question and all lagged for one year. All models include a set of time fixed effects. Refer to Table-1 for details of all variables. Robust standard errors are reported in parentheses, with *** p<0.01, ** p<0.05, * p<0.1.

Dependent Variables	Total early-stage entrepreneurship	Opportunity TEA	Male opportunity TEA	Female opportunity TEA	Necessity TEA	Male necessity TEA	Female necessity TEA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Remittances $_{t-1}$	1.431**	0.928	0.886	0.948**	0.533	0.272	0.609
	(0.716)	(0.602)	(1.046)	(0.416)	(0.404)	(0.513)	(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**	-4.040	-3.844	-2.320	-2.294*	-2.474	-1.853
	(2.844)	(2.846)	(3.154)	(2.838)	(1.324)	(1.578)	(1.550)
GDP Growth Rate $_{t-1}$	-0.169	-0.190	-0.176	-0.050	-0.063	0.147	-0.140
	(0.323)	(0.258)	(0.279)	(0.273)	(0.125)	(0.139)	(0.150)
Institutions $_{t-1}$	-1.108	0.503	-0.574	-0.107	-1.514	-0.539	-1.677
	(2.711)	(2.109)	(2.708)	(1.603)	(1.546)	(1.954)	(1.364)
Labor Force Participation Rate $_{t-1}$	0.354	0.350*	0.504*	0.234	0.060	0.035	0.092
	(0.259)	(0.197)	(0.291)	(0.151)	(0.094)	(0.162)	(0.100)
Cultural Control $_{t-1}$	0.217*	0.158	0.223*	0.069	0.046	0.004	0.067*
	(0.123)	(0.106)	(0.120)	(0.083)	(0.036)	(0.027)	(0.041)
Constant	58.699**	16.869	14.097	8.742	32.041***	30.880*	24.789*
	(29.320)	(23.975)	(36.680)	(21.368)	(12.159)	(18.151)	(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