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THE EFFECT OF ECONOMIC FREEDOM ON WORKERS' REMITTANCES TO LABOR SENDING COUNTRIES

CAPSTONE PAPER

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Abstract

I test the determinants of workers' remittances, with a focus on how economic freedom in the labor sending country affects the level of remittance inflows the country receives. I use an unbalanced panel data set between years 2000 and 2006. I find a positive and statistically significant relationship between economic freedom and the percentage of GDP from remittances. I show that the effect of economic freedom is dependent upon the level of economic development in the labor sending country (measured by real GDP per capita); as GDP per capita increases, the marginal effect of economic freedom on remittances decreases steadily.

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INTRODUCTION AND LITERATURE REVIEW

Since living in the Philippines, a nation that received \$21.3 billion, 10.7 % of its GDP, in remittance inflows in 2010, I have been intrigued and interested in workers' remittances (World Bank 2011). I witnessed households who were able to use remittances as an important tool to climb out of poverty by investing remittances in human and capital stocks. I witnessed households that were solely dependent upon remittances, without these inflows they would have been completely destitute. I found myself questioning what macroeconomic factors lead to more, or less, remittance inflows for a country; particularly does the size of the government, existence of property rights, access to capital, the ability to trade and the amount of regulation a country imposes affect the amount of remittances inflows received. In other words does the level of *economic freedom* a country has affect its amount of remittance inflows?

Remittances, transfers of money by foreign workers to his or her home country, are increasing in size and importance each year and constitute a significant inflow of money to countries, particularly developing countries, throughout the world. In 2009 worldwide remittance inflows reached \$416 billion, an increase from \$101 billion in 1995 (World Bank 2011). For many developing countries remittances exceed international aid. For example, remittances in Tajikistan were \$1 billion in 2006; international aid was \$240 million in that same year (World Bank 2011). In 2006 worldwide aid from donor nations reached \$104 billion and foreign direct investment reached \$167 billion. Worldwide remittances in 2006 was \$318 billion, more than aid from donor nations and foreign direct investment combined (World Bank 2011). As remittances continue to increase in importance and size the key macroeconomic determinants that affect remittances become increasingly important for administrations to consider. In particular the amount of economic freedom within a country, which is affected greatly by administration policy choices, needs to be considered.

Remittance theoretical literature is heavily based upon Lucas and Stark (1985). Lucas and Stark propose three primary theoretical models regarding the motivations of remitting

behavior by individuals. The first theoretical model assumes that individuals remit money for altruistic reasons. Under this model the remitting individual derives utility from the consumption and associated well being of the recipient(s). As Lucas and Stark write, “Certainly the most obvious motive for remitting is pure altruism—the care of a migrant for those left behind. Indeed, this appears to be the single notion underlying much of the remittance Literature” (Lucas and Stark 1985, 902). Under a model of pure altruism remittances should be positively correlated with the remitter’s own income (Niimi, Pham and Reilly 2008). This is clear in the case of developing countries where a unit of remittances can increase consumption and well-being relatively more than in developed countries due to a larger purchasing power. Economic difficulty or natural disasters in the home country can be an important motivator for workers to send remittances (Lucas and Stark 1985). Remittances sent home to ease the economic shock from such disasters are thought to be altruistic. In their micro study El-Sakka and McNabb showed that remittances to Egypt increased with lower levels of income and higher levels of inflation within the labor sending country (El-Sakka and McNabb 1999). Equally migrants with families in Botswana that experienced natural disasters sent more remittances home than those outside the regions where natural disasters occurred (Lucas and Stark 1985).

Remittances can also be modeled as pure self-interest—an investment. Under this model the remitter will remit money to invest in the labor sending country with the intention to see a financial return. Lucas and Stark (1985) define three different structures of self interested motivations. The first is to invest in assets within the sending country. The second is investment by the migrant to prepare for a return to the labor sending country. Remittances would be sent to acquire assets such as land. Lucas and Stark (1988) define the third type of self interested remittance motivation as a willingness to inherit, with a positive relationship between the amount of assets in the family of origin within the sending country (potential inheritance) and the level of remittances.

The third theoretical motivation to remit theorizes that the family functions as a form of financial intermediary or bank. The family gives loans for the benefit of the family. Lucas and Stark (1985), Stark and Lucas (1988), and Agrawal and Horowitz (2002) suggest that

the family functions as a lending institution to the immigrant to invest in their human capital, travel costs or other expenses associated with the act of migration. Once migration occurs the emigrant then remits money to repay the loan. The family can then take the money and reinvest it in other members of the household.

In the latter two models, self interest and family as a financial intermediary, altruism continues to play an important role as an enforcing mechanism. It ensures the migrant, and the family members, will uphold their end of the contract – whether it is to repay a loan for education to the household or to manage assets or capital of the remitter (Stark and Lucas 1988). In these models more macro-economic factors, like interest rates, labor force participation and real exchange rates have impacts on the level of international remittances that a country receives (El-Sakka and McNabb 1999).

Empirical research has focused on determinants such as skill level (education), labor force participation rate, domestic inflation rate, domestic interest rate and exchange rates. Studies focused on the macro-economic determinants of remittances focus on a single country (El-Sakka and McNabb 1999)¹ (Argawal and Horowitz 2002)² or on a small cross sectional sample of countries (Faini 1994)³. Faiani (1994) and El-Sakka and McNabb (1999) each found exchange rate differences and domestic interest rate differences to be a significant determinant of remittance inflows. El-Sakka and McNabb (1999) and Faiani (1994) based their research on a single country (Egypt) and on five Mediterranean countries respectively. These papers concluded that both interest and exchange rates

¹ El-Sakka and McNabb (1999) used annual data from 1967-91 for cash remittances to Egypt and annual data from 1974-91 for imports financed from remittance sources, the authors tested the determinants of remittances to Egypt finding a statistically significant positive relationship with inflation, and a statistically significant negative relationship with the difference of domestic and foreign interest rates (domestic minus foreign) and the difference of official exchange rates and black market exchange rates (domestic minus black market).

² Argawal and Horowitz (2002) used a cross sectional data set using a household survey collected by the Guyana Bureau of Statistics between 1992 and 1993. In addition to testing the determinants of remittances they also ran a probit model on the decision to remit. They found statistically significant determinants of remittances to be the presence of other migrants in the household (negative), household size (negative), household per-capita income (negative) and the age of the household head (negative)

³ Faini (1994) used a cross-sectional data set comprised of Mediterranean countries (Morocco, Portugal, Tunisia, Turkey and Yugoslavia) between 1977 and 1989. Faini, using Seemingly unrelated regression framework tested the determinants of remittances, finding statistically significant positive relationships with the interest rate differential (host country interest rate minus home country interest rate minus expected devaluation), the real exchange rate and a statistically significant negative relationship with the home country's income.

differences need to be competitive to support remittance inflows to the labor-sending countries. Inflation is an additional macroeconomic factor that may act as a key determinant to remittance inflows to labor sending countries. El-Sakka and McNabb (1999) find that domestic inflation is associated with higher levels of remittances. They propose that this may be to allow migrants' families to maintain consumption levels, thus demonstrating altruism. It also could be theoretically argued that if a negative relationship between domestic inflation and remittances may provide evidence that remittances are investments and not altruistic. Adams (2008) used a more complete cross sectional data set of 76 low and middle income countries. Adams (2008)⁴ found that "all of the coefficients measuring real interest rates at home are positively and significantly related to the level of per capita remittances received by a country. In this study, countries with more competitive real interest rates receive more per capita remittances" (R. H. Adams 2008, 100). A higher level of domestic interest rate (in the labor sending country) is also associated with high level of remittance inflows, representing that migrants are motivated by investment returns at home (El-Sakka and McNabb 1999).

The level of skilled labor being exported by sending countries is widely considered a key determinant of remittance inflows. Surprisingly Adams (2008) found a negative correlation between the proportion of skilled labor exported by countries and the level of the country's remittance inflows. He proposes that this result could represent that higher skilled workers are less likely to return to their country of origin and are more likely to bring family members with them, making them less concerned with their home country.

Adams (2008) found that "the level of poverty in the labor-sending country does not have a positive impact on the amount of remittances received by a country" (R. H. Adams

⁴ Adams (2008) used a cross country data set comprised of 76 low and middle income countries using data from 1995 to 2001. Adams (2008) collected and merged the data between the 6 years to create a more complete cross country data set due to the unavailability of data. The statistically significant determinants of remittances on the low-skilled population were: the percent of low-skilled migrants from labor sending country (positive), percent of population under 14 in labor sending country (positive), per capita GDP in labor sending country (positive), real interest rate in labor sending country (positive). Other control variables for the determinants of remittances on the low skilled population where: stock of total migrants from the labor sending country, poverty headcount in labor sending country, poverty gap in labor-sending country, cost to remit \$200 to labor sending country, exchange rate in labor sending country, war in labor sending country. Using the same instruments Adams (2008) tested the determinants on a high skilled migrant populations, the statistically significant determinants were Poverty headcount (negative), percent of population under 14 years, per capital GDP (positive), real interest rate (positive).

2008, 99). El-Sakka and McNabb (1999) find that “the level of real domestic income, in contrast, does appear to influence the flow of remittance earnings“ (El-Sakka and McNabb 1999, 1497). Income is classically measured using GDP from the labor sending country (Faini 1994) (Lucas and Stark 1985). Adams (2008) chooses to “clarify the impact of income on the determination of remittances” by using GDP per capita income from the labor sending country and finds GDP per capita and the level of remittances, regardless of the skill level of migrants, to be positively correlated – a finding that conflicts with the theory of altruism.

Using GDP growth as the dependent variable Chami, Fullenkamp and Jahjah (2005) test if remittances function in the same manner as FDI. They suggest that remittances cause shirking of work, which would be represented by lower levels of labor force participation. Chami, Fullenkamp and Jahjah (2005)⁵ found a negative relationship between remittance inflows and GDP growth, where as they found a positive relationship between labor force participation rate and other capital flows such as FDI. Chami, Fullenkamp and Jahjah (2005) argue “remittances do not appear to be intended to serve as capital for economic development, but as compensation for poor economic performance” (Chami, Fullenkamp and Jahjah 2005, 77).

Global locality has been addressed in a number of empirical studies with the use of regional dummy variables. Some regions are more reliant upon remittances than others, in particular Latin America, Asia and Africa. For example, remittances have increased twenty fold since 1980 to Latin America, and the region receives more foreign remittances than any other region of the world, US\$40 billion in 2004 (Acosta, et al. 2006).

Economic theory says economic freedom “affects incentives, productive effort, and the effectiveness of resource use” (Strum and Haan 2001, 839). When this is applied to the self-interest theory for remitting money we expect to see a positive relationship between remittances and economic freedom in the labor sending country. The relationship between workers’ remittances and economic freedom has not been empirically tested within the literature. Empirically the literature has examined the relationship between economic

⁵ Chami, Fullenkamp and Jahjah (2005) do not test the determinants of remittances, but instead if remittances function the same as other sources of capital, therefore their dependent variable is GDP growth rate.

freedom and other factors such as economic growth (Strum and Haan 2001), economic development (Assane and Grammy 2003), and corruption (Billger and Goel 2009). The meaning of economic freedom can be vague. Gwartney and Lawerson (2003) quantify the characteristics in each country that measure the different components of economic freedom – and then aggregate them into an index. There is an overall economic freedom index (EFI) and an individual index for each of the five areas of economic freedom that Gwartnery and Lawerson (2003) measure. The key components of economic freedom are voluntary exchange, personal choice, freedom to compete, and the protection of property and persons (Gwartney and Lawson 2003). The empirical literature supports that an increase in economic freedom leads to greater material prosperity in the adapting countries (Stoup 2007).

DATA

I use a panel data set across 82 countries from year 2000 to year 2006⁶. Workers remittance inflows were collected from World Bank' Migration and Remittances Factbook (2008). The data originate from the International Monetary Fund's Balance of Payments Statistics Yearbook. Remittance inflows are measured by each labor sending country; these measures include only data on official international remittance inflows⁷. Therefore the *actual* level of remittances will be much higher than what is recorded by the IMF and the World Bank. Workers' remittances are standardized by each countries current GDP (for the appropriate year). The dependent variable modeled in the empirical section can then be interpreted as the percentage of GDP from remittance inflows.

The independent variable of interest is economic freedom⁸. An index published by the Fraser institute annually within the Economic Freedom of the World: Annual Report. This index is comprised of 42 indicators that are used to generate a country level measure across five key areas; the size of government (expenditures, taxes and enterprise), legal structure and security of property rights, access to sound money, freedom to trade

⁶ See appendix B for list of countries

⁷ The data provided are in current value and does not include remittances transferred through unofficial, or black-market, channels.

⁸ See appendix A for full summary statistics and appendix E for detailed data description.

internationally, and regulation of credit, labor and business. It can be thought of as a quality measure of a country's institutional and policy environment (Gwartney and Lawson 2003). The index measures are available semi-regularly from 1980 through 2007; in 2000 they became available on an annual basis. The highest ranking in 2007 was Hong Kong with a rating of 8.97 out of 10, in the same year the United States had a rating of 8.06. The global average across the six years focused on within this paper is 6.58. The Economic freedom index, in addition to providing an overall measure of economic freedom, provides individual measures across the five key areas previously mentioned, also on a scale of one to ten⁹.

Real gross domestic product per capita within the labor sending country, a key macroeconomic control used throughout the literature, has had mixed empirical results. In this paper I use real GDP per capita, measured in year 2000 values, collected from the Penn World Tables. The average real GDP per capita from the sample used in this study is \$12,687; with a large amount of variation within the sample – a standard deviation of \$44,452. Africa has the lowest average GDP per capita across the specific regions, at \$2,864, yet it also has the lowest level of remittances at 0.7% of GDP. This, in conjunction with the highest deposit rate across regions, 9.26%, does little to support altruistic or self-interested remittance theories.

Due to the unavailability of data I am not able to calculate the exchange rate difference with the black market; however this variable is included within the individual area 4 of the economic freedom index. Also included in the economic freedom index is real inflation rate (economic freedom area 3) and real interest rate (economic freedom area 5). Studies focusing on a single country (El-Sakka and McNabb 1999) or a small region (Faini 1994) have found these variables to be key controls.

The level of human capital available to the labor sending country has been a key determinant across the literature. In this study I use the percentage of secondary school age children enrolled in secondary school as a proxy for the countries' focus and commitment to human capital development. The average across the data is 67% of school

⁹ Area 1 – Size of government, Area 2 – Legal structure and security of property rights, Area 3 – Access to sound money, Area 4 – Freedom to exchange with foreigners, Area 5 – Regulation of credit, labor and business

aged children enrolled in secondary school; the minimum of is 4% and maximum is 99%. This measure is collected from the World Bank data bank.

Families will be dependent upon remittances if they have a low labor force participation rate – regardless if this unemployment is, or is not, by choice. In some cases migrants may be sending money home, allowing family members to purchase a reduction of their labor supply, as proposed by Chami, Fullenkamp and Jahjah (2005). Migrants may also be sending money to family members that are willing, but unable, to find employment in the labor sending country. Labor force participation rate is collected by from the World Bank data bank.

The level of communication between immigrants and their families within the labor sending country may have an impact on the level of remittances sent back to the country. Theoretically this would support both altruistic and self motivated motivations to remit. A migrant able to regularly communicate with his family may be better able to gauge when and if they require financial assistance. Where as an individual focused on personal investment can stay more informed regarding investment possibilities. I have chosen to control for both the number of cell phone and internet users per one hundred people within the labor sending countries. Lastly I follow Adams (2008) and control for the stock of migrants abroad using country population, with data found from Penn World Tables.

EMPIRICAL APPROACH

I estimate remittances as a percentage of GDP ($WR_{i,t}$) as a function of economic freedom, ($EF_{i,t}$) and a vector of demographic ($X_{i,t}$) and communication variables ($C_{i,t}$)¹⁰ discussed in the data section.

$$WR_{i,t} = f(EF_{i,t}, X_{i,t}, C_{i,t})$$

For economic freedom (as well as its five area components) I hypothesize a positive relationship with the dependent variable. These variables, and their effect, have not yet

¹⁰ The estimation and analysis will be conducted using STATA 11.0.

been tested within the literature, therefore hypothesizing the magnitude of the coefficients is not realistic. Theoretically it is reasonable to assume the positive results will be significant.

The literature has shown a significant negative relationship between workers' remittances and real GDP (or real GDP per capita) within micro studies, however macro studies have shown this relationship to be positive. I further test the relationship of economic freedom and real GDP per capita ($GDP_{i,t}$) on workers' remittances by interacting the two variables. This effect of economic freedom on workers' remittances conditional upon real GDP per capita (the country's level of economic development).

By using country and time fixed effects estimation I control for individual country and time related unobservable variables. There are several variables, including country specific public policy, institutional and historical factors that will affect the level of remittances a labor sending country receives. Therefore if OLS is used to estimate the above model the results would be biased. These factors can be accounted for with country fixed effects (see model below), where D_i is a dummy variable that takes the value of one for country i and zero for all other countries (regardless of time) and α is a fixed-effect controlling for the unobservable differences between countries. D_t is a dummy variable that takes the value of one for time t and 0 for all other times (regardless of country) and ϕ is a fixed-effect controlling for unobservable differences across times. I correct for autocorrelation of order 1 (AR1)¹¹ and heteroskedasticity. I estimate the country and time fixed effects model using feasible GLS to correct for each.

$$WR_{i,t} = \alpha_1 + \beta_1 EF_{i,t} + B_2 GDP_{i,t} + B_3 (EF_{i,t} * GDP_{i,t}) + \delta_1 X_{i,t} + \delta_2 C_{i,t} + \sum_{i=2}^n \alpha_i D_i + \sum_{i=2}^n \phi_i D_t + \varepsilon_{i,t}$$

I then estimate the effect of each of the five individual area of economic freedom on workers' remittances, where $areaEF_i$ represents the i^{th} area of economic freedom (see below).

$$WR_{i,t} = \alpha_1 + \beta_1 areaEF_{i,t} + B_2 GDP_{i,t} + B_3 (areaEF_{i,t} * GDP_{i,t}) + \delta_1 X_{i,t} + \delta_2 C_{i,t} + \sum_{i=2}^n \alpha_i D_i + \sum_{i=2}^n \phi_i D_t + \varepsilon_{i,t}$$

¹¹ A test of Autocorrelation of order 1 resulted in a strong rejection of the null hypothesis of no autocorrelation of order 1

EMPIRICAL RESULTS AND ANALYSIS

ECONOMIC FREEDOM INDEX (EFI)

Specification 1 (Table 1 – Column 1) shows workers' remittances as a percentage of GDP regressed onto the overall level of economic freedom (EFI) while controlling for country and time fixed effects. In this specification no demographic or communication variables are controlled for, however it is worth noting that many of the components that the EFI is built upon are macro-economic determinants of remittances within the remittance literature (inflation rate, real interest rate, official and black market exchange rate difference). Within specification 1 there is a statistically significant positive effect of EFI on workers' remittances as a percentage of GDP.

Specification 2 (Table 1 – Column 1) shows a statistically significant positive effect of EFI on workers' remittances as a percentage of GDP holds while controlling for key demographic variables. The economic effect of EFI increases slightly, from .13% in specification 2, to .14%,. The signs, and statistical significance, of the other demographic control variables align with the previous literature on the economic determinants of remittances. Real GDP per capita has a statistically significant and negative relationship, suggesting a level of altruism within the sample. A reduction in income levels within the labor sending country will result in a migrant remitting money home to relatives and loved ones to smooth their consumption levels. The effect of labor force participation rate is statistically significant and negative, suggesting similar altruistic motives as real GDP per capita. As a migrant's family members are unable (or unwilling) to participate within the labor force the migrant will remit money home to smooth their income and consumption levels. The percentage of school aged children enrolled in secondary education, controlling for the level of human capital available to a country, is positive but not statistically significant. This suggests that as a country places more emphasis on human capital there will be a positive effect on remittances as a percentage of GDP. In specification 3 and 4 the

statistically significance of the human capital measure increases. Interestingly the relationship of population, a measure of the available stock of migrants, is the opposite of what was found in other studies (Adams 2008). This relationship, as well as its statistical significance, holds across all three specifications (as well as the later tests on the individual areas of economic freedom). This may be the result of countries with smaller populations having economies that are more dependent upon workers' remittances.

The interaction between EFI and real GDP per capita allows the examination of the effect of EFI on workers' remittances conditional on the level of economic development within each country¹². When this interaction term is introduced in model (column 3), the signs and significance levels of the other control variables (with the exception of the significance of the human capital measure) remain the same. The joint significance of EFI, real GDP per capita and their interaction is statistically significant at a 1% level¹³ allowing for further analysis of these variables.

Specification 4 introduces a measure of communication, the number of internet users per 100 people. This measure will theoretically be positive regardless of if the intentions to remit are self interest or altruistic. If a person is altruistic they will be more likely to remit if they have a greater opportunity to remain in communication with family members or loved ones. Equally a person is more likely to remit for self interest (investment) reasons if they are more likely to oversee those investments via regular lines of communication. This introduction of this variable, as well as its squared term, suggests that the level of communication a migrant has with their home country does have a positive, but diminishing, level of effect on remittances as a percentage of GDP. With the introduction of this variable into the model the signs and significance levels of all other variables in the model remain unchanged. Equally the joint significance of the variables of interest, the three beta coefficients (EFI, real GDP per capita and their interaction), is statistically significant at 1% level.

¹² $\beta_1 + B_3(GDP_{i,t})$

¹³ Prob > Chi² = 0.0001

Using the results from the final specification (column 4) we can then tell a level effect story. This should be viewed cautiously because it is difficult to define what a one unit increase in EFI means. For example we can look at the Philippines in the year 2000. The country had EFI of 6.96 with a real GDP per capita of \$3,965. A one unit increase in EFI would then result in an increase of remittances as a percentage of GDP by 0.18 percent (or \$579,826,990). This represents a 9.3% increase in remittances as a percentage of GDP. A more informative analysis of the effect of EFI on workers' remittances as a % of GDP conditional on the level of economic development within a country is obtained by a marginal effect graph (see Graph 1).

Table 1: Dependent Variable = % of GDP from workers' remittances
(Estimated with Generalized Least Squares, country and time fixed effects¹⁴)

Independent Variables	Specifications			
	(1)	(2)	(3)	(4)
<i>Economic Freedom</i>	.00129 (.00043)**	.00140 (.00038)***	.00355 (.00067)***	.00217 (.00066)***
<i>Real GDP per capita (Year 2005 \$US Ten thousands)</i>	--	-.00538 (.00092)***	.00490 (.00255)*	.00179 (.00214)
<i>Interaction between real GDP per capita and Economic Freedom</i>	--	--	-.00135 (.00028)***	-.00097 (.00024)***
<i>Internet users per 100 people</i>	--	--	--	.00020 (.00003)***
<i>Internet users squared</i>	--	--	--	-2.14e-06 (2.52e-e07)***
<i>Labor Force participation rate</i>	--	-.00026 (.00009)**	-.00024 (.00008)**	-.00035 (.00010)***
<i>% of school aged children enrolled in secondary education</i>	--	.00005 (.00003)	.00010 (.00003)**	.00007 (.00003)**
<i>Population (in Millions)</i>	--	-1.50e-07 (4.18e-08)***	-1.91e-07 (-4.89e08)***	-1.62e-07 (4.23e-08)***
<i>Constant</i>	.06180 (.00373)***	.07513 (.00666)***	.05615 (.00643)***	.07433 (.00776)***
n=467				*=90% **=95% ***=99% levels of confidence

¹⁴ Based on panel data between the period of 2000-2006 for 82 countries collected from the World Bank, World Penn Tables, The Frasier Institute and the IMF. There are 81 country-specific intercept dummy variables and five time –specific intercept dummy variables in the models whose estimates are not reported. Robust standard errors reported in parenthesis.

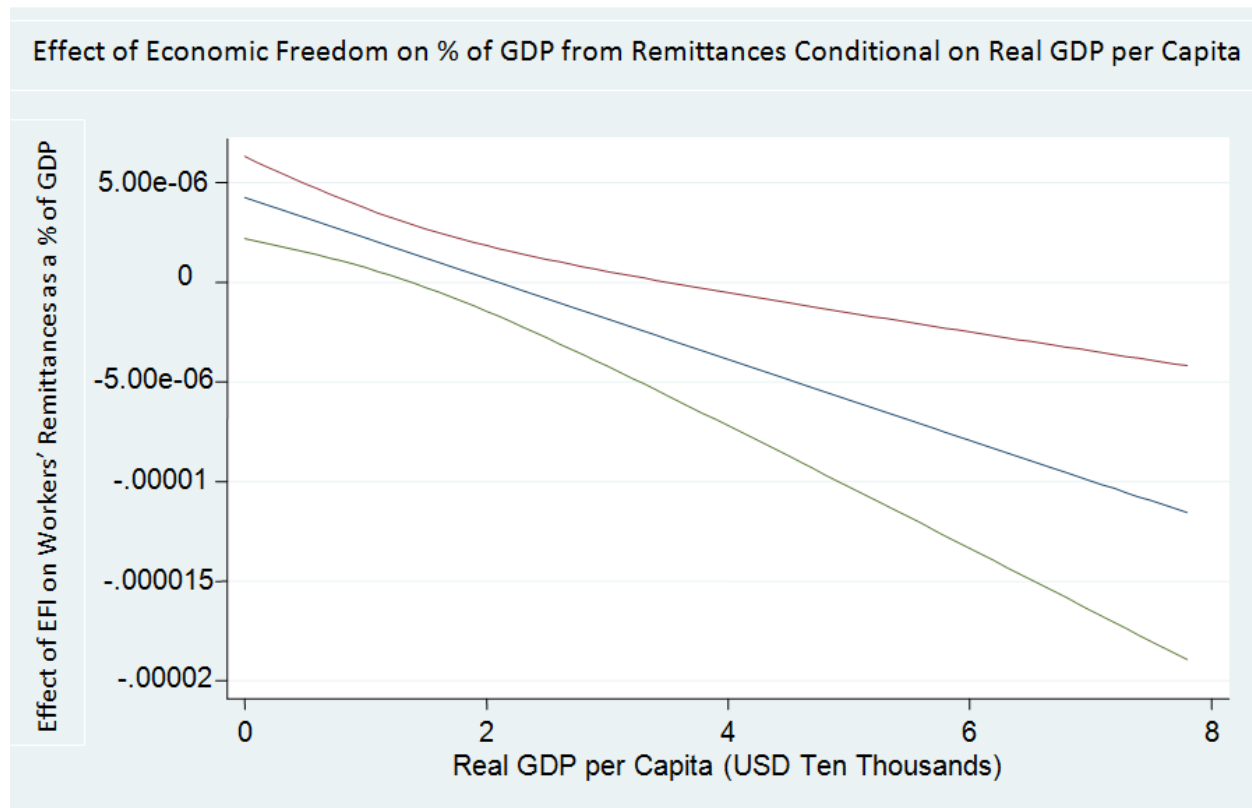
Figure 1¹⁵ shows the effect of EFI on workers' remittances as a percentage of GDP conditional upon the countries real GDP per capita. Graph 1 shows all countries that have a real GDP per capita below \$20,000 the effect of an increase in EFI will have a positive effect on remittances as a percentage of GDP. Equally for all countries that have a level of economic development greater than \$20,000 real GDP per capita the effect of an increase in EFI will result in a negative effect on remittances as a percentage of GDP. Becoming more economically free has a greater effect on workers' remittances for developing countries than it does for countries that are economically developed (or further along the path of economic development).

The interaction of EFI and real GDP per capita allows for the comparison of countries of similar levels of economic development. In 2003 Venezuela and Mexico each had a real GDP per capita near \$10,000. Venezuela had an EFI of 3.99 with .065% of GDP from remittances, where Mexico had an EFI of 6.27 with 1.69% of its GDP from remittances. It is then possible to determine that 21.3% of the difference in workers' remittances between the two countries is explained by their difference in economic freedom¹⁶.

¹⁵ For graphical purposes workers' remittance as a percentage of GDP is divided by 10,000 for graph 1 and the five marginal effect graphs found in Appendix F.

¹⁶ $0.00217 - .0097(1) = .0012$
 $[(.0012)(6.27-3.99)] / (.0169 - .00065) = 21.3\%$

Graph 1:



Twenty-two countries within the sample had a real GDP per capita greater than \$20,000 (for the last year sampled), while the remainder, sixty countries, had a real GDP per capita of less than \$20,000. Those with a real GDP per capita of less than \$20,000, on average, had economies that were much more reliant upon remittances. Countries that are still developing economically are much more reliant on remittances as a percentage of GDP than more economically developed countries. The average workers' remittances as a percentage of GDP for countries with less than \$20,000 real GDP per capita was 1.6 percent, while the average workers' remittances as a percentage of GDP for countries with more than \$20,000 real GDP per capita was only .59 percent.

AREAS OF ECONOMIC FREEDOM

The final specification (Table 1 column 4) can then be applied to each of the five areas of economic freedom (see Table 2). In each of the five models within table 2 the i^{th} area of economic freedom represents that particular area of EFI, this is then interacted with real GDP per capita for a particular country at a particular time. Under each of the five models the area of economic freedom, real GDP per capita and the interaction of these two variables remain jointly significant at a once percent level.

Marginal effect graphs similar to Graph 1 can then be drawn to illustrate the effect of an increase of economic freedom within each of the five areas of the EFI and their effect on workers' remittances as a percentage of GDP conditional on the level of economic development¹⁷. This allows further insight into the particular channels of economic freedom that have the greatest, or least, effect on workers' remittances.

¹⁷ See Appendix F for EFI Area 1-5 marginal effect graphs.

Table 2: Dependent Variable = % of GDP from workers' remittances
(Estimated with Generalized Least Squares, country fixed effects¹⁸)

<i>i</i> th Area of Economic freedom →	Models				
	(1)	(2)	(3)	(4)	(5)
The <i>i</i> th Area of Economic Freedom	-0.00019 (.00022)	.000039 (.00028)	.00101 (.00022)***	-.00026 (.00029)	.00203 (.00033)***
Real GDP per capita (Year 2005 \$US thousands)	-.00388 (00120)***	-.00568 (.00115)***	-.00213 (.00200)	-.00568 (.00115)***	.00113 (.00145)
(Real GDP per capita) x (<i>i</i> th area of Economic Freedom)	-.00020 (.00010) *	-.00003 (.00011)	-.00038 (.00200)*	.00044 (.00013)***	-.00080 (.00016)***
Internet users per 100 people	.00020 (.00004)***	.00019 (.00003)***	.00018 (.00003)***	.00016 (.00003)***	.00016 (.00003)***
Internet users squared	-2.37e-06 (2.59e-07)***	-2.28e-06 (2.80e-07)***	-1.97e-06 (2.74e-07)***	-1.98e-06 (2.69e-07)***	-1.94e-06 (2.70e-07)***
Labor Force participation rate	.00042 (.00009)***	-.00039 (.00010)***	-.00017 (.00009) *	-.00039 (.00090)***	-.00048 (.00010)***
% of school aged children enrolled in secondary education	.00004 (.00003)	.00002 (.00003)	.00005 (.00003)	.00001 (.00003)	.00002 (.00003)
Population (in Millions)	-1.67e-07 (3.83e-08)***	-1.31e-07 (4.17e-08)**	-1.23e-07 (3.26e-08)***	-3.26e-07 (4.17e-08)***	-1.76e-07 (3.89e-08)***
Constant	.09713 (.00695)***	.09288 (.00725)***	.07103 (.00641)***	.09688 (.00708)***	.08874 (.00811)***
Joint Significance of <i>i</i> th Area of EFI, Real GDP per Capita and their interaction	P > Chi ² = 0.000	P > Chi ² = 0.000	P > Chi ² = 0.000	P > Chi ² = 0.000	P > Chi ² = 0.000
n=467	*=90% **=95% ***=99% levels of confidence				

Areas 2, 3, and 5 of the EFI (legal structure and security of property rights, access to sound money and regulation of credit, labor and business, respectively) each have similar results as overall EFI. In each of these three areas the effect of increasing economic freedom within the area has a positive effect on workers' remittances as a percentage of GDP for countries with a real GDP per capita of \$20,000 or less. For developed nations, those with a real GDP per capita greater than \$20,000, the effect of increasing economic freedom within each of these three areas has a negative effect on the amount of remittances, as a percentage of GDP, the country receives.

¹⁸ Based on panel data between the period of 2000-2006 for 82 countries collected from the World Bank, World Penn Tables, The Frasier Institute and the IMF. There are 81 country-specific intercept dummy variables and five time-specific intercept dummy variables in the models whose estimates are not reported. Robust standard errors reported in parenthesis.

The increase of economic freedom of Area 1, the size of government, is the one area that has a negative effect on workers' remittances as a percentage of GDP for nearly all countries within the sample. Here the positive effect of decreasing the size of government (an increase in economic freedom) only has a positive effect for countries that have a real GDP per capita less than \$1,000. A decrease in the size of government results in negative effects on workers' remittances as a percentage of GDP for all countries with a real GDP per capita over \$1000. In the sample for this study only 16 observations¹⁹ had a real GDP per capita of \$1000 or less, with the remaining 449 observations having a level of economic development above \$1000 real GDP per capita.

An increase in the economic freedom of Area 4, the freedom to trade internationally, has a negative effect on countries with a real GDP per capita of less than \$10,000 real GDP per capita, 54% of the sample. The effect of increasing the freedom to trade internationally does not have a positive effect on workers' remittances as a percentage of GDP until a country exceeds a real GDP per capita of \$10,000. This may be a reflection of international investors, in this case migrants who are unwilling to invest in a country (remit money) until there is a basic level of infrastructure within the country. This infrastructure, whether physical or financial, may not be present in countries that are at the lowest levels of economic development – those below \$10,000 real GDP per capita levels.

¹⁹ 4 countries (Guinea-Bissau 2000; Madagascar 2000, 2001, 2002, 2003, 2004, 2005, 2006; Malawi 2001; Niger 2000, 2001, 2002, 2003, 2004, 2005, 2006; Togo 2000).

CONCLUDING COMMENTS

This study provides evidence to suggest that an increase in Economic Freedom, in particular the legal structure and security of property rights, the access to sound money and the regulation of credit, labor and business, has a positive effect on workers' remittances as a percentage of GDP for developing countries. There is also evidence to suggest that decreasing the size of government has a negative effect on workers' remittances for all but the most impoverished countries.

Increasing a countries ability to trade internationally has a negative effect on workers' remittances for countries at the lowest end of the economic development ladder; those below \$10,000 real GDP per Capita. This marginal, negative, effect becomes smaller (absolute value) as countries approach an economic development level of \$10,000 real GDP per capita. Remittances inflows increase as the freedom to trade internationally increases for countries exceeding the economic development level of \$10,000 real GDP per capita.

Developing countries are much more dependent upon remittances than countries with higher levels of economic development. For many developing countries workers' remittances represent a significant financial inflow for their economy. These same countries have lower levels of economic freedom than their developed counterparts. I show that increasing the level of economic freedom in developing countries will have a positive effect on the remittance inflows received within those countries.

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APPENDICES

APPENDIX A: SUMMARY STATISTICS

Variable	Observations ²⁰	Mean	Minimum	Maximum
Worker Remittances as a % of GDP	467	0.013 (.175)	.000	.096
Economic Freedom ²¹	467	6.69 (.869)	3.99	8.920
Real GDP per Capita (Year 2005, US\$)	467	14,960 (13,611)	658	74,366
Cell Phone Use (per 100 people)	467	40.99 (36.670)	0	150.86
Internet Use (per 100 people)	467	21.700 (23.522)	0.07	87.57
Population (In thousands)	467	31,938 (53,558)	248	298,442
Labor Force Participation Rate	467	62.356 (8.700)	47.4	87
% School Enrollment (Secondary)	467	68.342 (24.704)	4.06	99.76
Latin American	467	.208	0	1
Africa	467	0.201	0	1
Asia	467	0.112	0	1

²⁰ 467 observations from 82 countries across 7 years (2000-2006). For a list of countries see Appendix B.

²¹ See Appendix C for summary statistics on Economic Freedom Areas 1 - 5

APPENDIX B: COUNTRIES (AND OBSERVED YEARS) INCLUDED IN DATA SAMPLE

Asia (including Central and Southeast Asia)

AUSTRALIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
BANGLADESH (2000, 2001, 2002, 2003, 2004, 2005, 2006)
HONG KONG (2001, 2002, 2003, 2004, 2005, 2006)
INDONESIA (2000, 2003, 2004, 2005, 2006)
JAPAN (2000, 2001, 2002, 2003, 2004, 2005, 2006)
MALAYSIA (2000, 2001, 2002, 2003, 2004, 2005)
MONGOLIA (2004, 2005, 2006)
NEW ZEALAND (2002)
PAKISTAN (2001, 2002, 2004, 2005, 2006)
PHILIPPINES (2001, 2002, 2003, 2004, 2005, 2006)

Latin America

BELIZE (2000, 2002, 2004, 2005, 2006)
BOLIVIA (2001, 2002, 2003, 2004, 2006)
BRAZIL (2000, 2001, 2002, 2003, 2004, 2005)
COLOMBIA (2000, 2001, 2002, 2004, 2005, 2006)
DOMINICAN REPUBLIC (2000, 2001, 2002, 2003, 2004, 2005, 2006)
ECUADOR (2000, 2001, 2002, 2003, 2004, 2005, 2006)
EL SALVADOR (2000, 2002, 2003, 2005, 2006)
GUATEMALA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
JAMAICA (2000, 2001, 2002, 2003, 2004, 2005)
MEXICO (2000, 2001, 2002, 2003, 2004, 2005, 2006)
NICARAGUA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
PANAMA (2000, 2001, 2002, 2004, 2005, 2006)
PARAGUAY (2005, 2006)
PERU (2000, 2001, 2002, 2003, 2004, 2005, 2006)
TRINIDAD AND TOBAGO (2000, 2001, 2002, 2003, 2004, 2005)
URUGUAY (2006)
VENEZUELA (2000, 2001, 2002, 2003, 2004, 2005, 2006)

Africa

ALGERIA (2002, 2003, 2004)
BENIN (2000, 2001)
BOTSWANA (2000, 2001, 2002, 2003, 2004, 2005)
COTE D'IVOIRE (2000, 2001, 2002)
EGYPT (2001, 2002)
GHANA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
GUINEA-BISSAU (2000)
KENYA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
MADAGASCAR (2000, 2001, 2002, 2003, 2004, 2005, 2006)
MALAWI (2000, 2001, 2002, 2003, 2004, 2005, 2006)
MOROCCO (2000, 2002, 2003)
MOZAMBIQUE (2004, 2005, 2006)
NAMIBIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
NIGER (2001, 2002, 2003, 2004, 2005, 2006)

NIGERIA (2003, 2004, 2005, 2006)
SENEGAL (2004, 2005, 2006)
SOUTH AFRICA (2000, 2005, 2006)
SYRIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
TOGO (2000)
TUNISIA (2000, 2001, 2002, 2003, 2006)
UGANDA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
ZAMBIA (2004, 2005)

Other

ALBANIA (2000, 2001, 2002, 2003, 2004)
ARMENIA (2004, 2005, 2006)
AZERBAIJAN (2005, 2006)
BELGIUM (2002, 2003, 2004, 2005, 2006)
BULGARIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
CROATIA (2000, 2001, 2002, 2003, 2005, 2006)
CYPRUS (2000, 2001, 2002, 2003, 2004, 2005, 2006)
DENMARK (2000, 2002, 2003, 2004, 2005, 2006)
ESTONIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
FIJI (2000, 2001, 2002, 2003, 2004, 2005, 2006)
FINLAND (2000, 2001, 2002, 2003, 2004, 2005, 2006)
FRANCE (2000, 2001, 2002, 2003, 2004, 2005, 2006)
GEORGIA (2005, 2006)
GREECE (2000, 2001, 2003, 2004, 2005, 2006)
HUNGARY (2000, 2001, 2002, 2003, 2004, 2005, 2006)
ICELAND (2000, 2001, 2002, 2003, 2004, 2005, 2006)
IRELAND (2000, 2001, 2002, 2003, 2004, 2005, 2006)
ISRAEL (2000, 2001, 2002, 2003, 2004, 2005, 2006)
ITALY (2000, 2002, 2003, 2004, 2005, 2006)
JORDAN (2002, 2003, 2004, 2005, 2006)
LITHUANIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
LUXEMBOURG (2000, 2001, 2002, 2003, 2004, 2005, 2006)
MACEDONIA (2005)
MALTA (2001, 2002, 2003, 2004, 2005)
NETHERLANDS (2000, 2001, 2002, 2003, 2004, 2005, 2006)
NORWAY (2000, 2001, 2002, 2003, 2004, 2005)
OMAN (2000, 2001, 2002, 2003, 2004, 2005, 2006)
POLAND (2000, 2001, 2002, 2003, 2004, 2005, 2006)
PORTUGAL (2000, 2001, 2002, 2003, 2005, 2006)
ROMANIA (2000, 2001, 2002, 2003, 2004, 2005, 2006)
SLOVENIA (2000, 2002, 2003, 2004, 2005, 2006)
SPAIN (2000, 2001, 2002, 2003, 2004, 2005, 2006)
SWEDEN (2000, 2002, 2003, 2004, 2005, 2006)
SWITZERLAND (2000, 2001, 2002, 2003, 2004, 2005, 2006)
TURKEY (2005, 2006)
UKRAINE (2000, 2001, 2002, 2003, 2004, 2005, 2006)
UNITED KINGDOM (2000, 2001, 2002, 2003, 2004, 2005, 2006)
UNITED STATES (2000, 2001, 2002, 2003, 2004, 2005, 2006)

APPENDIX C: AREAS OF ECONOMIC FREEDOM SUMMARY STATISTICS

Variable	Observations	Mean	Minimum	Maximum
Economic Freedom - Area 1 (Size of Government)	467	6.17 (1.50)	2.56	9.32
Economic Freedom - Area 2 (Legal Structure and Security of Property Rights)	467	5.86 (2.03)	1.43	9.62
Economic Freedom - Area 3 (Access to Sound Money)	467	8.20 (1.52)	2.24	9.84
Economic Freedom - Area 4 (Freedom to trade internationally)	467	7.02 (0.96)	3.71	9.75
Economic Freedom - Area 5 (Regulation of Credit, Labor, and Business)	467	6.18 (1.06)	1.49	8.90

SIMPLE CORRELATION MATRIX OF THE AREAS OF ECONOMIC FREEDOM

	Area 1	Area 2	Area3	Area 4	Area 5
Area 1	1.0000				
Area 2	-0.4127	1.0000			
Area 3	-0.0433	0.5022	1.0000		
Area 4	-0.1303	0.5372	0.5337	1.0000	
Area 5	0.0272	0.6095	0.4506	0.4938	1.0000

APPENDIX D: REGIONAL SUMMARY STATISTICS

AFRICA

Variable	Observations ²²	Mean	Minimum	Maximum
Worker Remittances as a % of GDP	95	0.007 (0.008)	0.000	0.037
Economic Freedom ²³	95	6.001 (0.717)	4.49	7.18
Real GDP per Capita (Year 2005, US\$)	95	3,079 (2,561)	658	9,979
Cell Phone Use (per 100 people)	95	6.899 (10.914)	0	83.69
Internet Use (per 100 people)	95	2.106 (2.057)	.110	7.91
Population (In thousands)	95	23,608 (27,204)	1,279	140,398
Labor Force Participation Rate	95	68.634 (12.247)	47.80	87
% School Enrollment (Secondary)	95	34.450 (20.074)	4.06	71.63

²² 21 African countries across 7 years (2000-2006). For a list of countries see Appendix B.

²³ See Appendix C for summary statistics on Economic Freedom Areas 1 - 5

ASIA

Variable	Observations²⁴	Mean	Minimum	Maximum
Worker Remittances as a % of GDP	53	0.009 (0.011)	0.000	0.037
Economic Freedom ²⁵	53	6.894 (0.982)	5.42	8.92
Real GDP per Capita (Year 2005, US\$)	53	15,877 (12,739)	1,792	40,593
Cell Phone Use (per 100 people)	53	42.430 (38.363)	.200	137.73
Internet Use (per 100 people)	53	27.409 (25.237)	.07	68.52
Population (In thousands)	53	73,099 (2,825)	2,825	231,820
Labor Force Participation Rate	53	63.977 (5.310)	51.1	72.6
% School Enrollment (Secondary)	53	67.060 (22.334)	19.53	99.76

²⁴ 10 Asian countries across 7 years (2000-2006). For a list of countries see Appendix B.

²⁵ See Appendix C for summary statistics on Economic Freedom Areas 1 - 5

LATIN AMERICA

Variable	Observations²⁶	Mean	Minimum	Maximum
Worker Remittances as a % of GDP	98	0.023 (.023)	0.000	0.092
Economic Freedom ²⁷	98	6.42 (0.781)	3.99	7.43
Real GDP per Capita (Year 2005, US\$)	98	7,528 (3,623)	2,008	21,403
Cell Phone Use (per 100 people)	98	23.155 (19.299)	1.45	74.76
Internet Use (per 100 people)	98	8.938 (7.813)	0.71	46.49
Population (In thousands)	98	29,083 (47,238)	248	188,993
Labor Force Participation Rate	98	63.721 (3.474)	56.6	71.50
% School Enrollment (Secondary)	98	58.692 (12.808)	26.88	80.26

²⁶ 17 Latin American countries across 7 years (2000-2006). For a list of countries see Appendix B.

²⁷ See Appendix C for summary statistics on Economic Freedom Areas 1 - 5

APPENDIX E: VARIABLE DEFINITIONS

Workers' Remittances

Workers' remittances and compensation of employees consists of current transfers by migrant workers as well as wages and salaries earned by nonresident workers. These data are the sum of three items defined in the fifth edition of the IMF's Balance of Payments Manual; workers' remittances, compensation of employees, and migrants' transfers. (The World Bank 2011).

Economic Freedom Index

This is an averaged index across all “five” areas of economic freedom (described below).

Economic Freedom Area 1

Size of government. This consists of; government expenditures, taxes and enterprises - measured by government consumption spending as a percentage of total consumption, government enterprises, transfers and subsidies as a percentage of GDP and investment as a percentage of GDP and the top marginal tax rate including the income threshold to which it applies (Berggren 2003).

Economic Freedom Area 2

Legal structure and security of property rights. This consists of; judicial independence and impartial courts, lack of military interference in the political process and rule of law, protection of intellectual property rights and integrity within the legal system (Berggren 2003).

Economic Freedom Area 3

Access to sound money. This consists of; the recent inflation rate, the standard inflation variability in the past five years, average annual growth of the money supply for the previous five years minus the average annual growth of real GDP for the past ten years and the freedom of individuals to own foreign currency bank accounts either domestically or abroad (Berggren 2003).

Economic Freedom Area 4

Regulatory trade barriers. This consists of; hidden import barriers (barriers other than public tariffs and quotas), the cost to import goods, the difference between the official exchange rate and the black market exchange rate and international capital market controls (such as the availability of domestic citizens to obtain foreign capital or the availability of foreign citizens to obtain domestic capital and the presence of barriers that limit citizens to engage in exchange with foreigners) (Berggren 2003).

Economic Freedom Area 5

Regulation of credit, labor and business. This consists of; credit market regulations (ownership of banks, domestic banks competition with foreign banks, the percentage of credit extended to the private sector, avoidance of interest rate controls that may lead to real interest rates), labor market regulations (the impact of the minimum wage on wages, hiring and firing practices within the private sector, the share of labor force whose wages are determined through collective bargaining, unemployment benefits and their effect on the incentives to works) and business regulation (the ability of businesses to set their own prices, administrative procedures acting as an obstacle to new business generation, time spent by private sector management dealing with government bureaucracy, ease of starting a new business) (Berggren 2003).

School enrollment, secondary (% of secondary school age children)

“Net enrollment ratio is the ratio of children of official school age based on the International Standard Classification of Education 1997 who are enrolled in school to the population of the corresponding official school age. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers.

Source: United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics” (The World Bank 2011).

Fixed broadband Internet subscribers (per 100 people)

“Fixed broadband Internet subscribers are the number of broadband subscribers with a digital subscriber line, cable modem, or other high-speed technology.

Source: International Telecommunication Union, World Telecommunication/ICT Development Report and database, and World Bank estimates” (The World Bank 2011).

Labor participation rate, total (% of total population ages 15+)

“Labor force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labor for the production of goods and services during a specified period.

Source: International Labour Organization, Key Indicators of the Labour Market database” (The World Bank 2011).

Population (in thousands)

Population is from the World Bank World Development Indicators 2009, and United Nations Development Centre sources prior to 1960 (Heston, Summers and Aten 2009)

Real Gross Domestic Product per Capita, current price

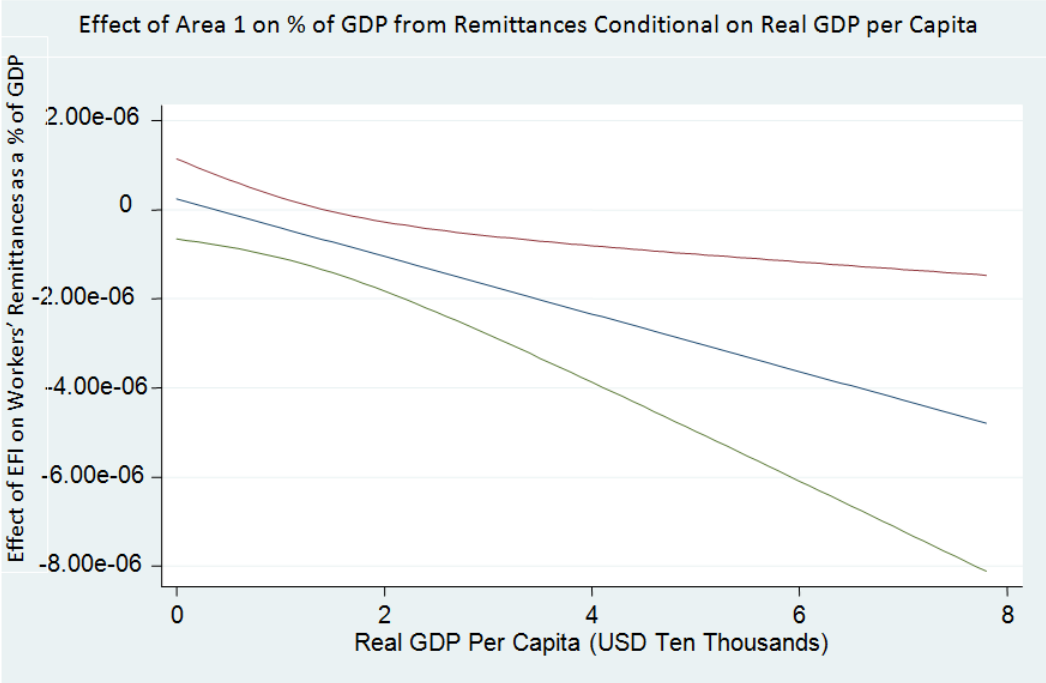
Real Gross Domestic product per capita, current price, is obtained by adding up consumption, investment, government and exports, and subtracting imports in any given year. The given year components are obtained by extrapolating the 2005 values in international dollars from the Geary aggregation using national growth rates” (Heston, Summers and Aten 2009)

Real GDP per capita (Constant Price)

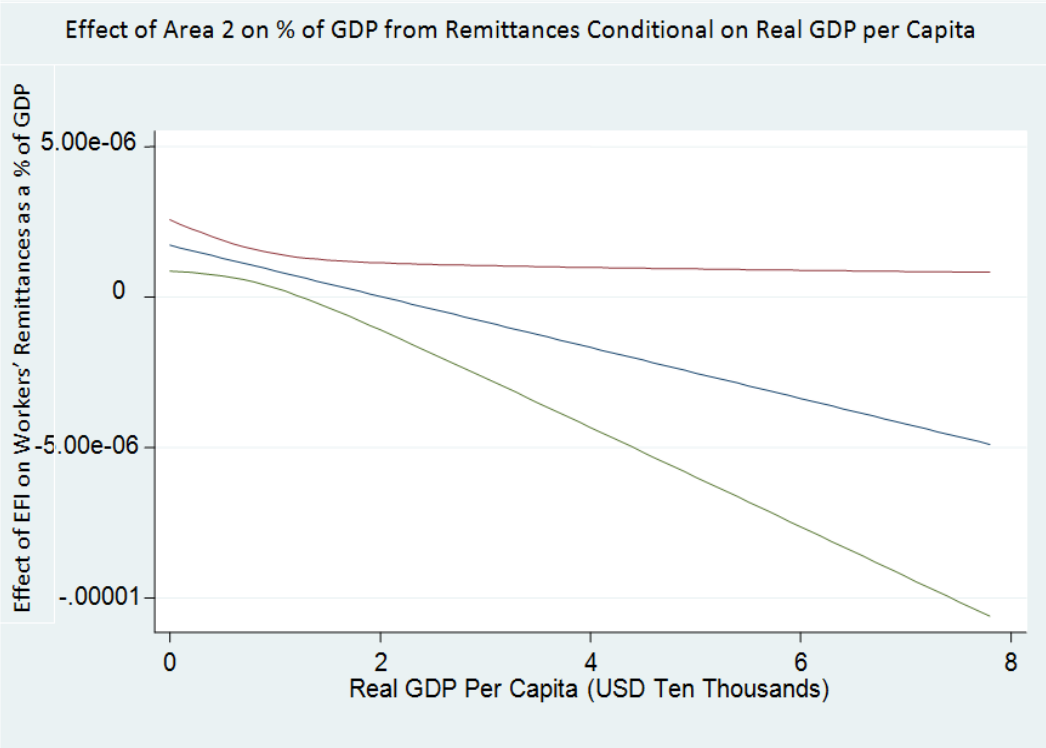
RGDPL is obtained by adding up consumption, investment, government and exports, and subtracting imports in any given year. The given year components are obtained by extrapolating the 2005 values in international dollars from the Geary aggregation using national growth rates. (Heston, Summers and Aten 2009)

APPENDIX F: INDIVIDUAL EFI AREA MARGINAL EFFECT GRAPHS

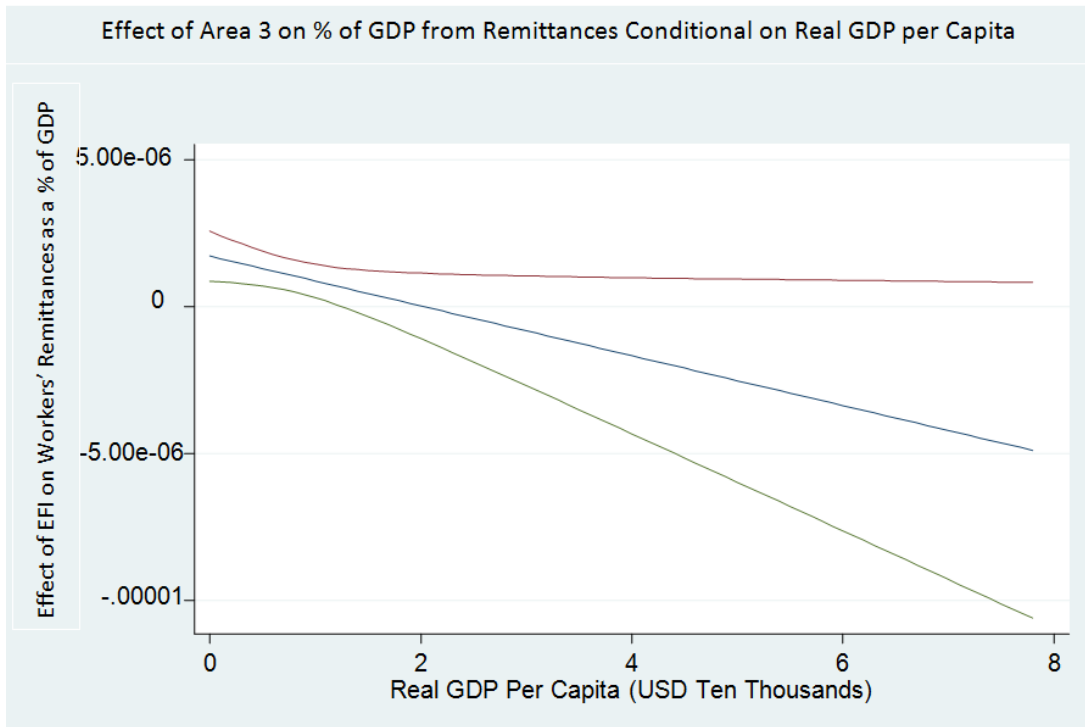
AREA 1: SIZE OF GOVERNMENT



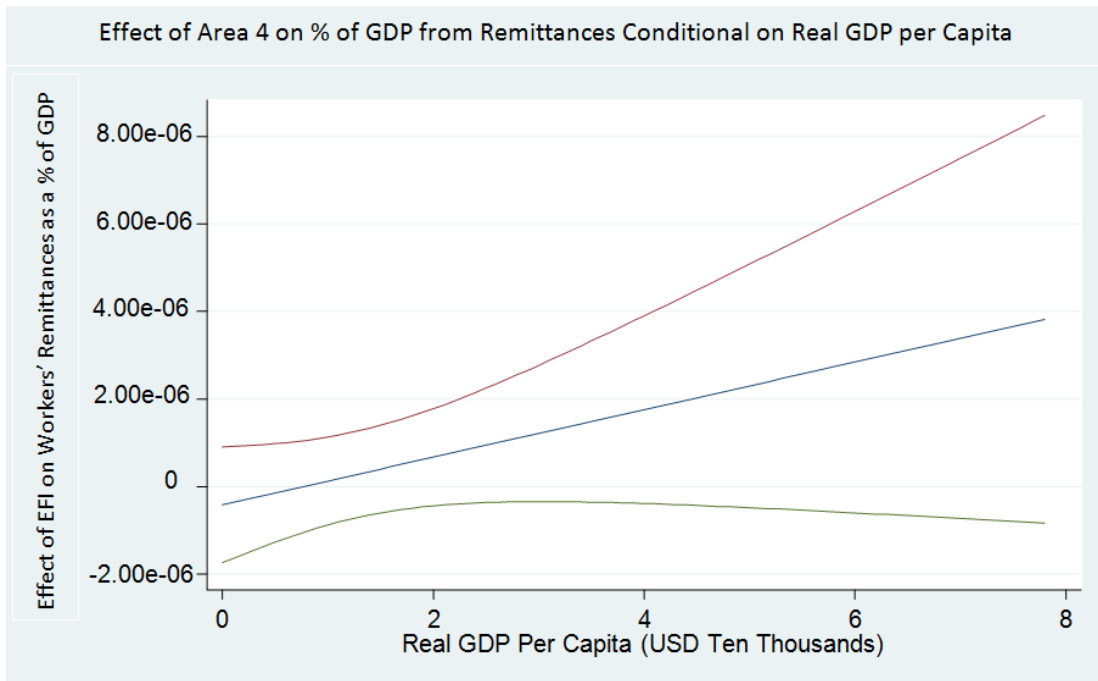
AREA 2: LEGAL STRUCTURE AND SECURITY OF PROPERTY RIGHTS



AREA 3: ACCESS TO SOUND MONEY



AREA 4: FREEDOM TO TRADE INTERNATIONALLY



AREA 5: REGULATION OF CREDIT, LABOR AND BUSINESS

