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Remittances, institutions and economic growth: a closer look at some proxies for institutions

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Abstract

This paper re-examines the relationship between remittances and economic growth by giving a closer look at the role of institutions. Using data on 55 developing countries over the period 1991 – 2011 and estimates from empirical models that take care of the heterogeneity among countries as well as the potential endogeneity of remittances and other control variables, we find the link between remittances and growth to be fragile. We also document that the impact of institutions on the relationship between remittances and growth depends on how institutions are measured. We highlight some points related to certain aspects of institutions that are believed to have impact on remittances and measurement issues surrounding both remittances and institutions.

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1. Introduction

An aspect of migration that has recently attracted the attention of both academicians and policy makers is the role of migrants' remittances. According to the World Bank (2014), worldwide remittances are expected to have reached an estimated $582 billion in 2014 of which, flows to developing countries represent about $435 billion. These figures only capture remittances sent through formal channels and flows through informal channels are believed to be considerable. In 2013, remittances were three times bigger than official development assistance (ODA) and, for many developing countries, bigger than foreign direct investment (World Bank, 2014). Remittances are also credited for being more resilient in the face of economic and political turbulences than other forms of capital/financial flows to developing countries (Bettin *et al*, 2014). The potential impacts of remittances on the recipient economies may take various forms spanning from income distribution/inequality (Koechlin and Leon, 2007) and poverty(Adams and page, 2005, Acosta *et al*, 2008) to crime (Vargas-Silva, 2009), brain drain (Faini, 2007) and other socio-economic dimensions. This paper focuses on the growth impact of remittances by giving a closer look at institutions. We argue that the impact of institutions on the relationship between remittances and growth depends on how institutions are actually measured or defined.

As far as the impact of remittances on economic growth is concerned, the literature, both theoretical and empirical, is mixed. Although methodological issues including the design of instrumentation may partly explain some of the differences in the empirical literature, the mechanics/channels through which remittances may affect growth are a good place to start where, at least, four channels have been identified. First, if an increase in remittances translates into an increase in investment, then we expect remittances to affect growth positively. Singh *et al* (2011) document that such an impact is larger in countries at lower level of financial development. According to Barajas *et al* (2009), the mechanism through which remittances affect investment goes beyond just providing additional resources. They argue that remittances can serve as collateral and also affect macroeconomic stability. They, however, point out that the above effects may not be materialized if the marginal propensity to consume is high or/and if remittances are perceived to be permanent. On the other hand, Singh *et al* (2011) argue that even in places where the marginal propensity to consume is high, remittances can foster investment by reducing output growth volatility. For example, Combes and Ebeke (2011), using a System-GMM approach, find that remittances significantly reduce consumption instability. On the other hand, Chami et al (2005) show that remittances, unlike foreign direct investment, are compensatory transfers and hence should have a negative impact on economic growth.

Second, remittances are believed to affect total factor productivity through their impact on the efficiency of domestic investment (Barajas et al, 2009). Third, remittances may affect the labor market through their impact on recipients' labor force participation decision or labor supply; a moral hazard idea first formalized by Chami et al (2005). Finally, remittances may result in currency appreciation and hence can lead to a "Dutch Disease" effect. Amuedo-Dorantes and Pozo (2004) provide evidence of such an effect for Latin American countries. More recently, Rao and Hassan (2011) document other indirect channels including education and human capital formation through which remittances may affect growth positively. On the other hand, Abdih *et al* (2012) demonstrate how remittances can adversely affect economic growth by weakening the quality of institutions. Some of the major issues surrounding the empirical literature on remittances and growth include the heterogeneity among countries and

the potential endogeneity of remittances and other control variables (Faini, 2007). Given the mixed nature of the empirical results pertaining to the direct impact of remittances on growth[1], some have started to ask if remittances promote growth under certain conditions. Giuliano and Ruiz-Arraz (2009), for example, provide evidence that remittances help growth only in countries with low level of financial development. They argue that remittances provide alternative finances in the face of liquidity constraints. Ruiz *et al* (2009) document that the positive relationship between remittances and growth disappears when non-linearity in the remittance variable is taken into account. Recently, Imai *et al* (2014) argue that although remittances affect growth positively, their volatility can be a source of output shock. Feeny *et al* (2014) provide evidence of a positive relationship between remittances and growth in small island developing countries although the average effect when all developing countries are pooled together is not significant.

Our work is closely related to Catrinescu *et al* (2009) who look at institutions and policies as important conditionality variables that affect the impact of remittances on growth.[2] They contribute to the literature by introducing institutions which they identify as an important omitted variable in a dynamic panel data framework that accounts for endogeneity. There is a large body of evidence that shows a strong relationship between institutions and economic growth (see for example, Rodrik *et al*, 2004). The question is whether institutions, which are believed to have impact on growth, also make remittances more effective. Ratha (2003) argues that better institutions may help turn remittances into higher rates of investment or/and make investment more efficient. In light of this, Ali and Alpaslan (2013), using panel vector correction method, document a two way relationship between remittances and investment. On the other hand, institutions may also affect the extent of migration which in turn affects remittances (Holzmann and Munz, 2004).

We extend the work of Catrinescu et al (2009) by asking if different proxies of institutions have different impacts on the relationship between remittances and growth. We do so by employing a System Generalized Methods of Moments (S-GMM) approach that reduces the weak instrument problem using four-year average data to account for business cycle effects. Our paper contributes to the empirical literature by making use of different proxies in a framework that takes into account issues of heterogeneity, endogeneity and weak instruments. We also note the fragility of the remittance coefficient and identify an important and potential source of variation in the existing literature pertaining to the significance of remittances. We document that the impact of institutions on the relationship between remittances and growth depends on which proxies for institutions are used.

In section 2, we present our empirical model and describe the data used. Section 3 presents our results and discussion. The last section concludes by highlighting our major findings.

2. Data and the Empirical Model

2.1 Data

We compiled data from 55 countries spanning the years 1991- 2011. We use non-overlapping four year averages and our data set is strongly balanced. A descriptive statistics of the key

[1] Appendix A summarizes more details on some of the major contributions.

[2] In the context of the relationship between remittances and growth, the role of institutions can be seen as a mechanism that can explain both factor accumulation and productivity, the proximate determinates of growth.

variables is given in table 1 and the variable descriptions with data sources are provided in appendix C. At the outset, we would like to note that the quality of data on remittances is generally poor; especially, in the Pre -2004 period.[3] Moreover, Clemens and McKenzie (2014) point out that the large increases in the size of remittances over the years may be illusionary in the sense that the recent hike in the volume of remittances may simply reflect changes in measurement.[4]

Table 1. Summary statistics

Variable	Mean	SD	Min.	Max.	Obs.
Growth	1.86	3.53	-15.46	12.69	330
Remittance/GDP	3.65	4.66	0.004	21.68	306
Investment./ GDP	20.67	5.63	5.84	44.50	318
Aid/ GDP	6.06	8.00	-0.04	52.72	326
M2/GDP	40.17	25.21	7.26	172.9	326
Pop.	1.77	1.14	-2.15	5.49	330
Govt./GDP	13.33	5.16	3.82	33.47	318
Trade	67.99	34.00	13.08	242.79	323
inflation	45.03	251.41	-3.20	2989.22	310
lnschool	4.55	.32	3.23	5.20	313
ICRG composite	61.53	9.85	15.09	80.53	322
Law and Order	2.99	1.06	0.28	6	322
corruption	2.41	0.89	0	5	329
Bureaucratic Quality	1.62	0.84	0	3.5	329
Accountability	3.60	1.28	0.51	6	322

Note: Variable description and sources of data are given in appendix B.

2.2 **Empirical Model**

To investigate the relationship between remittances and growth, we adopt a variant of the model used by Aisen and Veiga (2013). Before interaction terms are introduced, the model for economic growth can be given as follows:

[3] Catrinescu et al (2009) say "….the quality of data on remittances is extremely poor. It is well known that large quantities of remittances are transmitted through "informal" channels such as "hawala" service providers, public transportation providers, or through friends and family and are not recorded in the balance of payments of many countries"p.83.

[4] Clemens and McKenzie (2014) estimate about 79% of the growth in remittances received by developing countries during the 1990 to 2010 period just reflects changes in measurement.

$$\ln Y_{it} - \ln Y_{i,t-1} = \alpha \ln Y_{i,t-1} + \alpha_1 REMIT_{it} + \beta' \mathbf{X}_{it} + \gamma' \mathbf{I}_{it} + \eta i + \gamma t + \varepsilon_{it} \quad (1)$$
$$i=1,2,\ldots,N \qquad t=1,2,\ldots,T$$

where Y stands for real GDP per capita, REMIT stands for remittances expressed as a percentage of GDP, **X** represents a vector of control variables commonly used in the literature[5] , **I** represents a vector of variables that proxy institutions, ηi and γt are country and time specific effects respectively and ε_{it} is the error term. Population growth and investment are included in line with traditional theory and the importance of institutions has been emphasized in the literature as in Acemoglu *et al* (2001). Institutions, by providing the rules of the game, affect how people interact and, hence, shape how a society functions (Vieira *et al*, 2012). We include lagged real GDP per capita to capture the notion of convergence.

We are interested in testing if the direct impact of remittances (captured by α_1) is significant. According to the reviewed literature, the sign of the remittance variable can be positive or negative depending on which factors are dominant in our sample. If growth enhancing factors like higher accumulation /efficiency of investment are dominant, we expect a positive sign. On the other hand, if factors like exchange rate appreciation (and hence the Dutch disease effect) are more dominant the sign can be negative. Moreover, both altruistic behavior (which implies the counter-cyclicality of remittances where more remittances are sent at times of difficulty) and self- driven motives (investment/inheritance) which are typically pro-cyclical play important roles.[6] We are also interested in the interaction term between remittances and institutions to see if remittances work better under certain institutional conditions.

3. Results

Estimating equation (1) using OLS may lead to serious problems which include omitted variable bias as country specific effects are ignored which may be correlated with the independent variables (Vieira et al, 2012). The lagged dependent variable is also endogenous to the fixed effects (ηi) which may lead to a dynamic panel bias (Aisen and Veiga, 2013). Although our conclusions are based on the System-GMM results, we first present our baseline results using fixed effects estimations which capture the potential heterogeneity among countries and the results are presented in table 2. [7]

Looking at our variable of interest (remittances), except for one instance (column 3), the coefficient seems to be consistently insignificant. This is particularly true as long as investment is included in the covariate set[8]. The sensitivity of the remittance variable to the inclusion/exclusion of the investment variable is documented in Giuliano and Ruiz-Arranz (2009). According to Catrinescu et al (2009), the inconsistent results with regard to the

[5] The control set includes investment (% of GDP), Foreign Direct Investment (FDI) (% of GDP), a measure of financial development, M2 (% of GDP), government expenditure (% of GDP), population growth (Pop), Inflation, openness (Trade) and schooling (School). ln refers to the logarithm of the variable. The control set reflects the commonly used broad categories in the literature. Besides institutions, these include geography, integration (openness) and policy variables (inflation, share of government in GDP). While i indexes country, t indexes time.

[6] See the graph in appendix B which reflects the possible cancelling out of theses opposing effects.

[7] The choice of Fixed Effects over Random Effects is based on the standard Hausman Test.

[8] If the investment variable is dropped from the control set, the remittance coefficient sometimes shows significance (results not reported here for brevity).

remittances coefficient estimates could be due to endogeneity problems related to both the subjective institutional proxies and remittance estimations.

Table 2: Remittances, institutions and growth (Fixed Effects)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP	-0.319	0.238	0.095	0.149	0.043	-0.024
	(0.478)	(0.504)	(0.419)	(0.446)	(0.439)	(0.460)
Remittances	0.464	0.242	-0.204**	0.383	0.107	-0.146
	(0.357)	(0.243)	(0.095)	(0.241)	(0.218)	(0.229)
Investment	0.180**	0.168**	0.178**	0.171**	0.202**	0.182**
	(0.060)	(0.058)	(0.055)	(0.061)	(0.055)	(0.057)
FDI	0.240**	0.352**	0.302**	0.358**	0.276**	0.289**
	(0.083)	(0.106)	(0.088)	(0.121)	(0.092)	(0.092)
M2	-0.061**	-0.057**	-0.055**	-0.074**	-0.063**	0.060**
	(0.019)	(0.025)	(0.018)	(0.023)	(0.021)	(0.019)
Pop.	-1.439**	-1.115**	-0.958**	-1.161**	-1.366**	-1.003**
	(0.491)	(0.499)	(0.441)	(0.460)	(0.462)	(0.421)
Govt.	-0.146**	-0.156*	-0.143**	-0.143	-0.146**	-0.133*
	(0.074)	(0.090)	(0.071)	(0.097)	(0.072)	(0.074)
Trade	0.009	0.032	0.019	0.034	0.013	0.018
	(0.018)	(0.024)	(0.019)	(0.024)	(0.019)	(0.019)
Inflation	-0.002**	-0.003***	-0.003**	-0.003***	-0.003***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
School	0.011	0.002	0.005	0.001	0.007	0.004
	(0.019)	(0.019)	(0.017)	(0.019)	(0.018)	(0.019)
ICRG Composite	0.091**					
	(0. 030)					
corruption		0.688				-0.311
		(0.681)				(0.213)
Law and Order			0.383*			0.311*
			(0.216)			(0.186)
Bureaucratic Quality				0.787		0.091
				(0.686)		(0.471)
Accountability					0.052	0.088
					(0.216)	(0.243)
Remittance * ICRG	-0.006					
	(0.006)					
Remittance * corruption		-0.046				0.049
		(0.076)				(0.052)
Remittance * law &order			0.109**			0.107**
			(0.031)			(0.045)
Remittance * bureaucratic quality				-0.148		-0.021
				(0.107)		(0.079)
Remit * accountability					-0.004	-0.001
					(0.051)	(0.044)
N	264	266	264	266	264	264
R^2	0.34	0.31	0.33	0.32	0.57	0.36

Note: The dependent variable is the growth of real GDP per capita. Robust SEs (clustered) are in parentheses. Columns (1) –(5) differ in the institutional measure used. (6) includes all the dimensions together (except ICRG composite). *** *p <0.01, ** p< 0.05, *p<0.10*.

Table 2 also shows that the traditional growth determinants, investment and population, are found to be robustly significant with signs in line with theory. FDI also turns out to be consistently significant with the expected sign. Of the proxies of institutions used in this study, only the composite International Country Risk Guide (ICRG) index and the law and order component are found to have a direct impact on economic growth. An important finding here relates to the remittance-institution interaction term. We find that the significance of the remittance-institution interaction term depends on how institutions are measured. The interaction term turns out to be significant only when the law and order dimension is used. In order to avoid the possibility of a certain proxy capturing the effects of the other proxies[9], we include all the proxies together. The results, given in column (6), show that the major findings remain intact.

Although the fixed effects estimation controls for heterogeneity, in order to produce consistent estimates, the right side variables need to be strictly exogenous. In this regard, instrumental variable (IV) approaches can be useful as long as reasonable instruments are employed. However, finding reliable instruments may be difficult. As noted by Giuliano and Ruiz-Arranz (2009), some of the instruments used in earlier works such as distance from the country of origin cannot be used in panel framework since they don't vary overtime. Moreover, many of the right side variables can be potentially endogenous. In this light, we use a system-GMM approach, developed by Arellano and Bover (1995) and Blundell and Bond (1998), to take care of the potential endogeneity of the right side variables including remittances. In general, system-GMM takes into account the time dimension of the data, country specific effects, the issue of lagged dependent variable (and possible correlations with the error term) and the potential endogeneity in the right side variables (Vieira et al, 2012). We choose the system-GMM approach over difference GMM since the later may suffer from the problem of weak instruments in the presence of persistent regressors (Vieira et al, 2012).[10] According to Aisen and Veiga (2013), the difference-GMM has a statistical problem in a sense that lagged levels of the right side variables are weak instruments for first differences if the series are persistent overtime. Moreover, the difference estimator eliminates the relationship that we would conceptually like to see. That is, the relationship between the growth of real GDP per capita and the right side variables including remittances (Levin et al, 2000 and Aisen and Veiga, 2013). Owing to our short time dimension, Combes et al (2014) also suggest the use of system-GMM.

Table 3 shows that the coefficient of remittances never attains significance although the sign is consistently negative.[11] Looking at the proxies of institutions, while the ICRG composite index and the law and order dimension again turn out to be significant, implying a direct impact on growth, the only time the remittance – institution interaction term attains significance is when law and order is used. This supports our argument that the role of institutions in the remittance – growth nexus depends on which proxies of institutions are used. Most of the results for the other control variables are qualitatively similar to those obtained using the fixed effects method. The consistency of the GMM estimator is checked using tests for over-identifying restrictions and second-order serial correlation in the error term. Table 3 presents the estimation results using the system GMM procedure. Our results are also robust to the inclusion of regional and income dummies.

[9] ICRG is a composite index and hence used separately in the regressions.

[10] We collapses the instruments following Roodman(2009b).

[11] In Feeny et al (2014), all the coefficients of the remittance variable in the GMM estimation are negative when all developing countries are considered together.

Table 3: Remittances, institutions and growth (S- GMM)

Variables	(1)	(2)	(2)	(4)	(5)	(6)
Initial GDP	-0.079*	0.103	0.025	0.066	0.042	0.007
	(0.047)	(0.127)	(0.141)	(0.107)	(0.106)	(0.099)
Remittances	0.373	-0.393	0.203	-0.174	-0.296	-0.497
	(0.460)	(0.346)	(0.365)	(0.411)	(0.447)	(0.646)
Investment	0.186***	0.163*	0.160*	0.179***	0.087**	0.193**
	(0.050)	(0.099)	(0.097)	(0.091)	(0.034)	(0.094)
FDI	0.196**	0.247**	0.247**	0.296**	0.122**	0.240**
	(0.077)	(0.100)	(0.100)	(0.147)	(0.050)	(0.112)
M2	0.005	-0.084**	-0.084**	-0.085**	0.003	-0.070**
	(0.011)	(0.029)	(0.029)	(0.029)	(0.008)	(0.030)
Pop.	-1.550***	-0.676***	-0.676***	-1.469**	-1.367**	-1.430**
	(0.257)	(0.182)	(0.182)	(0.601)	(0.516)	(0.477)
Govt.	-0.109*	-0.282**	-0.267**	-0.250**	-0.274	-0.294
	(0.063)	(0.139)	(0.082)	(0.113)	(0.081)	(0.087)
Trade	-0.016*	0.044	0.019	0.022	0.012	0.007
	(0.009)	(0.033)	(0.026)	(0.030)	(0.023)	(0.024)
Inflation	0.001	0.001	0.001	0.001	0.002**	0.001
	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)	(0.001)
School	-0.016	0.027	-0.003	0.017	0.007	0.017
	(0.015)	(0.019)	(0.017)	(0.020)	(0.020)	(0.017)
ICRG Composite	0.122**					
	(0. 035)					
corruption		0.198				-1.064
		(1.011)				(0.375)
Law and Order			0.983*			0.134*
			(0.519)			(0.072)
Bureaucratic Quality				1.102		0.302
				(0.984)		(0.525)
Accountability					0.344	0.301
					(0.374)	(0.385)
Remittance * ICRG	-0.005					
	(0.007)					
Remittance * corruption		0.097				0.126
		(0.121)				(0.073)
Remittance * law &order			0.051*			0.031**
			(0.030)			(0.015)
Remit * bureaucratic quality				0.049		-0.019
				(0.176)		(0.086)
Remit * accountability					0.053	0.048
					(0.092)	(0.083)
AR(2) (*p*-value)	0.232	0.141	0.235	0.102	0.275	0.253
Hansen (*p*-value)	0.187	0.115	0.287	0.112	0.416	0.328

Note: The dependent variable is the growth of real GDP per capita. SEs are in parentheses. Columns (1) –(5) differ in the institutional measure used. (6) includes all the dimensions together (except ICRG composite). The Hansen test shows the validity of the instruments and there is no problem of second order autocorrelation as implied by the AR(2) values. *** *p <0.01, ** p< 0.05, *p<0.10*.

Given our results, although a detailed analysis would be beyond the scope of this paper, we highlight three questions in relation to institutions and the proxies used in the paper: 1) which types of institutions affect growth? 2) which aspects of institutions are expected to affect remittances? and 3) do the proxies used in the paper capture those aspects of institutions?

Regarding the first question, Rodrik *et al* (2004) identify four types of economic institutions that can influence growth. First, those related to the protection of property rights, corruption, contract enforcement, and, in general, the rule of law which are collectively put together as "Market Creating Institutions." Second, we have aspects of institutions that deal with market failures in general and are put together under the category "Market-regulating institutions". Market-stabilizing institutions, the third group, basically deal with macroeconomic stability. And, the fourth group, "Market-legitimizing institutions, deal with conflict resolutions and redistribution. To the above list, Perkins et al (2013) add political institutions that define the extent of political participation by the public and how society is governed in general.

Against this background, we ask if some aspects of governance/institutions are likely to affect remittances more than others, our second question. Given that remittances are expected to affect growth through both accumulation (investment) and productivity, at least theoretically, we expect a role played by the various components since we expect improvements in those many dimensions help to improve the investment climate in general. For example, remitters are likely to commit long term investment where property rights are secured or/and the rule of law is enforced or/and corruption is limited. However, the relative importance of these dimensions may be different depending on country specific conditions. Haggard and Tiede (2011), using a cluster analysis, argue that developing countries reveal different rule of law syndromes. For example, for a significant group of countries, they identify "law and order", to be the most important challenge which affects the volatility of growth. This is somehow in line with our results since the interaction term in this study is significant only when law and order is used as proxy.

The third question then is whether those proxies used in the paper capture the different aspects of institutions which are expected to affect remittances. Concerning this question, we would like to mention a concern with regard to the measurements/proxies of institutional quality used in this paper. We use data from the Political Risk Services (PRS) since they provide the longest data series for a large number of countries on different aspects of institutions. The political risk assessments (the ICRG and their components), however, are constructed on the basis of subjective analysis. Therefore, they reflect perceptions rather than formal aspects of institutional settings (Catrinescu et al, 2009). Although Galeser et al (2004) argue for limiting the use of legal institutions based on objective measures, Haggard and Tiede (2011) point out that subjective measures may capture the gap between de jure and de facto institutions. They also point out that subjective measures may reflect informal institutions. Earlier, Moers (1999) also justify the use of such subjective measures in the context of growth models.

4. Conclusion

Although there is a vast literature on the relationship between remittances and growth in recent decades, the literature that links institutions to remittances and growth is scant. This paper contributes to this line of literature. The closest work is by Catrinescu et al (2009) who introduced institutions by arguing that their non-inclusion may lead to omitted variable bias. We extend their paper by asking if different proxies of institutions have different impacts on the relationship between remittances and growth. We do so by employing a System Generalized Methods of Moments (S-GMM) approach that reduces the weak instrument problem using four-year average data to account for business cycle effects. We document that the link between remittances and growth is fragile. For example, in line with Giuliano and Ruiz-Arranz (2009), we note the sensitivity of the remittance variable to the inclusion/exclusion of the investment variable.

Our major finding is that the impact of institutions on the relationship between remittances and growth depends on how institutions are measured/proxied. Specifically, we document that the remittance-institution interaction term to be significant only when the law and order dimension is used. We note that the significance of the rule of law dimension is in line with Haggard and Tiede (2011) who identify "law and order", as the most important challenge for a significant number of countries in affecting the volatility of growth. Although a detailed explanation as to why some measures of institutions tend to be more conducive than others in affecting the remittances – growth relationship is beyond the scope of the paper, we highlight some ideas in connection to the role institutions may play in affecting the remittances-growth nexus and measurement issues surrounding both remittances and growth. We identify a careful and detailed analysis of these interrelated questions as a potential area for future research.

References

Abdih, Y, R. Chami, J.Dagher and P. Montiel (2012), "Remittances and Institutions: Are Remittances a Curse?", World Development **40**, 657-666.

Acemoglu, D, S. Johnson and J.A. Robinson (2001) "The colonial origins of comparative development: an empirical investigation" *American Economic Review* **91**, 1369–1401.

Acosta, P, C. Calderón, P. Fajnzylber, and H. Lopez (2008). "What is the impact of international remittances on poverty and inequality in Latin America?" World Development, **36**, 89–114.

Adams, H.R and J. Page (2005) "Do international migration and remittances reduce poverty in developing countries?" *World Development* **33**, 1645-69.

Aisen, A and J. Veiga (2013) "How does political instability affect economic growth?" *European Journal of Political Economy* **29**, 151- 167.

Ali, A. and B. Alpaslan (2013), "Do Migrant Remittances Complement Domestic Investment? New Evidence from Panel Cointegration", Economics Discussion Paper Series EDP-1308, The University of Manchester.

Amuedo-Dorantes, C. and S. Pozo (2004), "Workers' remittances and the real ex- change rate: a paradox of gifts," World Development **32**, 1407–1417.

Arellano, M and O. Boover (1995) "Another look at the instrumental variables estimation of error components models" *Journal of Econometrics* **68**, 29-51.

Barajas, A, C. Chami, R. Fullenkamp, M. Gapen and P. Montiel (2009) "Do Workers' Remittances Promote Economic Growth?" *IMF Working Paper* 09/153.

Bettin, G., A. F. Presbitero and N. Spatafora (2014), Remittances and Vulnerability in Developing Countries, *IMF Working Paper*, WP/14/13

Blundell, R and S.R. Bond (1998) "Initial conditions and moment restrictions in dynamic panel data models" *Journal of Econometrics* **87**, 115-43.

Catrinescu, N, M. Leon-Ledesma, M.Piracha and B. Quillin (2009) "Remittances, institutions and economic growth" *World Development* **37**, 81-92.

Chami, R, C. Fullenkamp and S. Jahjah (2005) "Are immigrant remittances flows a source of capital for development?" *IMF Staff Papers* **52**, 55 – 81.

Clemens, M. and D. McKenzie (2014) "Why Don't Remittances Appear to Affect Growth?" The World Bank, Policy Research Working Paper, 6856.

Combes, J. and C. Ebeke (2011), "Remittances and Household Consumption Instability in Developing Countries." *World Development* **39**, 1076-1089.

Combes, J, C. Ebeke, S. Etoundi and T. Yogo (2014), "Are Remittances and Foreign Aid a Hedge Against Food Price Shocks in Developing Countries?" World Development **54**, 81–98

Faini, R.(2007) "Remittances and the brain drain" *The World Bank Economic Review* **21,** 177-91.

Feeny, S, S. Iamsiraroj and M. McGillivary (2014), " Remittances and Growth: Larger Impacts in Smaller Countries?" The Journal of Developing Studies **50**, 1055-1066.

Glaeser, E, R. LaPorta, F. Lopez-de-Silanes and A. Shleifer (2004), "Do Institutions Cause Grwth?" Journal of Economic Growth, **9**, 271-303.

Guiliano, P and M. Ruiz-Arranz (2009) "Remittances, Financial Development, and Growth" *Journal of Development Economics* **90**, 144-52.

Haggard and Tiede (2011), "The Rule of Law and Economic Growth: Where are We?", World Development **39**, 673-685.

Holzmann, R. and R. Munz(2004), "Challenges and opportunities of international migration for the EU, its member states, neighboring countries, and regions : a Policy Note," Social Protection Discussion Papers 30160, The World Bank.

Imai, K.S., R. Gaiha, A. Ali and N. Kaicker (2014), "Remittances, growth and poverty: New Evidence from Asian Countries", Journal of Policy Modeling **36**, 524 – 538.

Koechlin, V and G. Leon (2007) "International remittances and income inequality: an empirical investigation" *Journal of Economic Policy Reform* **10**, 123-41.

Levine, R., N. Loaza and T. Beck(2000), "Financial Intermediation and Growth: Causality and Causes", Journal of Monetary Economics **46**, 31-77.

Moers, L. (1999), "How important are institutions for growth in transition countries?", Mimeo, University of Amsterdam.

Perkins, D.H., S.Radelet, D.L. Lindauer and S.A. Block (2013), "Economics of Development", W.W. Norton & Company, Inc.

Rao, B.H and G.M. Hassan (2011) "A panel data analysis of the growth effects of remittances" *Economic Modelling* **28**, 701-709.

Ratha, D. (2003), "Workers' Remittances: An Important and Stable Source of External Development Finance", mimeo, The World Bank.

Rodrik, D, A. Subramanian and F. Trebbi (2004), "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development", *Journal of Economic Growth* **9**, 131-165.

Roodman, D. (2009a) "How to do xtabond2: An Introduction to Difference and System GMM in Stata" The Stata Journal **9**, 86-136.

Roodman, D. (2009b) "A Note on the Theme of Too many Instruments" Oxford Bulletin of Economics and Statistics **71**, 35-158.

Ruiz, I, E. Shukralla and C. Vargas-Silva (2009) "Remittances, institutions and growth: a semi-parametric study" *International Economic Journal* **23**, 111-119.

Singh, R, M. Jan, K. Haacker, Kyung woo Lee, and Maëlan Le Goff (2011), "Determinants and macroeconomic impact of remittances in Sub-Saharan Africa," Journal of African Economies **20,** 312–340.

Vargas-Silva, C. (2009) "Crime and remittance transfers" *Eastern Economic Journal* **35**, 232–247.

Vieira, F., MacDonald, R. and Damasceno, A. (2012) The role of institutions in cross- section income and panel growth models: a deeper investigation on the weakness and proliferation of instruments, *Journal of Comparative Economics*, **40**, 127 – 140.

World Bank (2014) "Migration and Development Brief 23", Migration and Remittances Unit, The World Bank.

Appendix A: Summary of some major contributions on remittances and growth

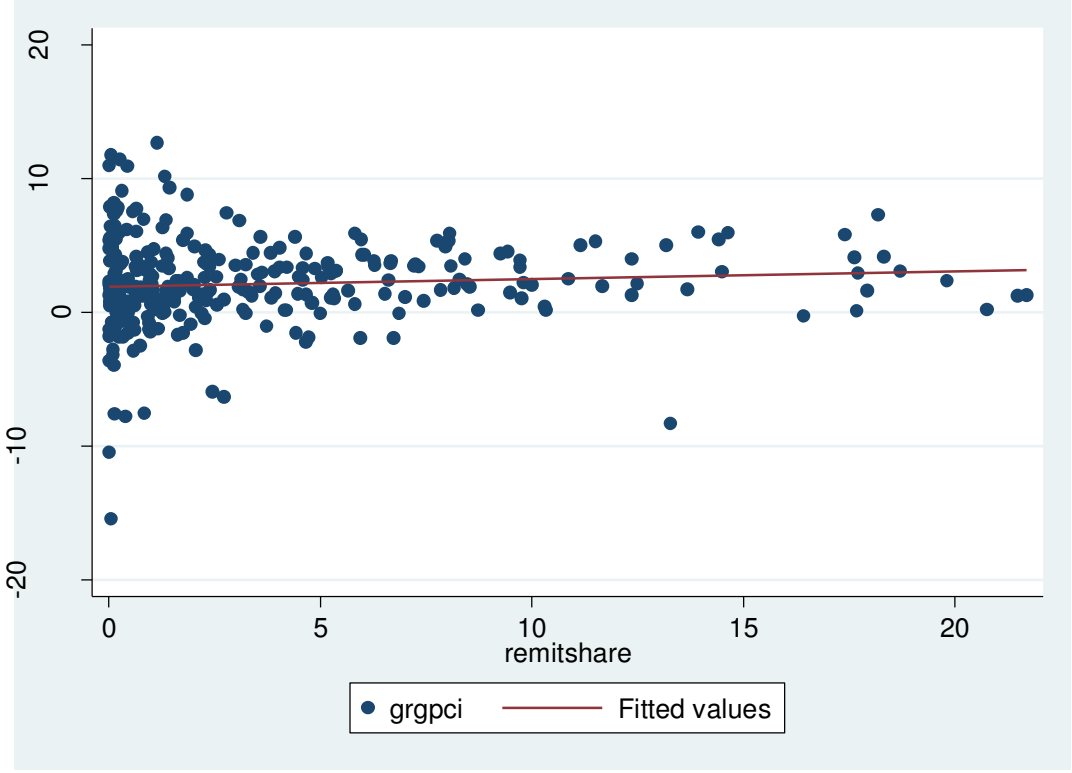
Author (s),Year	(a) Sample Coverage (b)Time Period	Methodology(a) Instruments Used(b)	Dependent Variable (LHS)	Main Variable of Interest (RHS)	Key Finding(s) /Conclusions
Chami *et al* (2005)	(a)113 countries (b)1970-1998	OLS, Panel Fixed Effects	Logarithm (log) of real GDP per capita, GDP per capita growth	Workers' remittances/GDP, Change in the log of remittances to GDP ratio	Remittances are negatively correlated with GDP growth, implying their compensatory nature.
Barajas *et al* (2009)	(a) 84 countries (b) 1970 -2004	(a)OLS IV/ Fixed Effects IV (b) ratio of remittances to GDP of all other recipient countries reflective of global transaction costs.	Per-capita GDP growth	-Worker remittances -Square of worker remittances - Interaction of remittances with M2/GDP	No robust significant impact of remittances on growth (majority of estimated coefficients are negative)
Catrinescu *et al* (2009)	(a)162 countries (b) 1970-2003	(a)OLS, Anderson-Hsiao IV (AH_IV) and Generalized Method of Moments (GMM) (difference) (b) internal instruments (in GMM), in AH_IV lagged growth of GDP per capita is instrumented by its lagged level in t-2.	Log. GDP per capita growth.	Log. of the remittance to GDP ratio	Remittances affect growth in those countries with better institutions (based on dynamic panel estimations).
Giuliano and Ruiz-Arranz (2009)	(a)73 developing countries (b)1975-2002	OLS, System GMM	Growth of real per capita GDP	Ratio of remittances to GDP.	Remittances positively affect growth in those countries where the financial sector is less developed by providing alternative finances and deal with liquidity constraints.
Rao and Hassan (2011)	(a) 40 countries with remittance to GDP ratio of 1% or more (only China with 0.9%) (b)1970-2006	(a) Fixed Effects and System GMM (b) internal instruments They also use a multiple of GDP, GDP per capita and GDP growth rate of OECD countries with remittances to GDP of year 2007 in their sample.	Log of output per worker to identify the channels (1^{st} step) The four channels identified (investment rate, volatility to output, development of financial sector and the exchange rate (2^{nd} step)	The possible channels through remittances affect growth (1st stage) Remittances (2^{nd} Stage)	No direct impact of remittances on growth but significant indirect impacts through the four channels.

Appendix A (Cont'd)

Author(s) (Year)	Sample Coverage(a) Time Period (b)	(a)Methodology (b)Instruments Used	Dependent Variable (LHS)	Main Variable of Interest (RHS)	Key Finding(s) /Conclusions
Imai *et al* (2014)	(a)24 Asian and Pacific economies (b)1980-2009	(a)FE-2SLS; RE-2SLS GMM generated VAR used in the volatility estimations. (b) In the growth regressions they use remittances' own lag and income gap between each recipient country and the U.S. as instruments. lagged agricultural growth per worker is used as an instrument for poverty regressions	GDP per capita growth rate (growth estimations). Poverty head counts.	Remittances as a share of GDP.	Remittances are generally beneficial to growth and poverty reduction. However, their volatility is harmful to growth.

Note: We mostly focus on the growth regressions of these papers. For example, Giuliano and Ruiz-Arranz (2009) also conducted investment regressions)

Appendix B: Scatter plot of the share of remittances and growth of real GDP per capita



Appendix C: List of Countries

Albania	Costa Rica	Guinea-Bissau	Malawi	Panama	Togo
Argentina	Dominican Rep.	Guyana	Mali	Paraguay	Trinidad and Tobago
Armenia	Ecuador	Honduras	Mexico	Peru	Togo
Bangladesh	Egypt	India	Moldova	Philippines	Tunisia
Bolivia	El Salvador	Indonesia	Morocco	Romania	Turkey
Brazil	Ethiopia	Jordan	Namibia	Senegal	Yemen, Rep.
Burkina Faso	Gabon	Kenya	Nicaragua	Sierra Leone	
Cameroon	Ghana	Latvia	Niger	Sri Lanka	
China	Guatemala	Lithuania	Nigeria	Sudan	

Appendix D: Variable descriptions and sources

Variables	Descriptions	Sources
Remittances	Sum of workers' remittances, compensation of employees, and migrants' transfers (expressed in US$)	WDI
Real GDP per capita	Real GDP per capita in 2000 constant US$	WDI
Initial GDP	Initial GDP at the beginning of the sample period	WDI
POP	Population growth	WDI
Investment	Gross Fixed Capital Formation (% of GDP)	WDI
Govt.	Government Expenditure (% of GDP)	WDI
Inflation	CPI inflation	WDI
M2	Money and quasi-money (M2) in US$ (as % of GDP)	WDI
FDI	Foreign Direct Investment as % of GDP	WDI
Trade openness	(Imports + Exports)/GDP	WDI
School	Primary school enrolment	WDI
Aid	Official Development Assistance (% of GDP)	WDI
ICRG Composite	ICRG Composite Political Risk Indicator: Its components include government stability, socioeconomic conditions, investment profile, internal conflict external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucratic quality.	ICRG (The PRS Group)
Corruption Index	Defined as ' a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process'	ICRG (The PRS Group)
Law and Order	'The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law'	ICRG (The PRS Group)
Accountability	Measures the responsiveness government is to its people, 'on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one.'	ICRG (The PRS Group)
Bureaucratic Quality	' high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services.'	ICRG (The PRS Group)

WDI = World Development Indicators, World Bank, Definitions for institutional variables are from the PRS Group available at http://www.prsgroup.com.