

Can Remittances Spur Economic Growth and Development? Evidence from Latin American Countries (LACs)

Bichaka Fayissa*
Middle Tennessee State University
Christian Nsiah
Black Hills State University

Abstract

For the last five decades, there have been heated debates on the sources of economic growth in developing economies. The perceived factors of economic growth have ranged from surplus labor to investment in human and physical capital, transfer of technological change, overseas development assistance, flow of private capital, increasing returns from investment in new ideas and research and development. The impacts of the above listed traditional sources of economic growth have been well documented in literature. Researchers have also considered the importance of institutional factors such as the role of political freedom, political instability, voice and accountability on economic growth and development. Despite the increased size of remittances in the total international capital flows, however, the relationship between remittances and economic growth has not been adequately studied. This study explores the aggregate impact of remittances on the economic growth of 18 Latin American Countries within the conventional neoclassical growth framework using an unbalanced panel data spanning from 1980 to 2005. We find that remittances have a positive and significant effect on the growth of Latin American Countries where the financial systems are less developed by providing an alternative way to finance investment and helping overcome liquidity constraints.

Key Words: Workers' Remittances, Economic Growth, Panel Data, Arellano-Bond, Latin American Countries

JEL Classification: E21 F21, G22, J61, O16

* Corresponding author: Bichaka Fayissa, Department of Economics & Finance, Middle Tennessee State University, Murfreesboro, TN 37132, Tel. (615) 898-2385, Fax (615) 898-5596, Email: bfayissa@mtsu.edu

Can Remittances Spur Economic Growth and Development? Evidence from Latin American Countries (LACs)

I. Introduction

For more than half a century, there have been heated debates on the sources of economic growth of developing economies. The perceived sources of economic growth have ranged from surplus labor (Lewis, 1954; Myrdal, 1968; Harris-Todaro, 1970; Fields, 1980) to physical capital investment and technological change (Solow, 1956; Denison, 1967), foreign aid (Chenery and Strout, 1966; Papanek, 1973; Levy, 1987), foreign direct investment (de Mello, 1999), openness of the economy (investment in human capital (Schultz, 1980; Lucas, 1988), increasing returns from investment in new ideas and research and development (Romer, 1986; Lucas, 1988; Barro, 1991). Other researchers such as Owens (1987), Sen (1990), Easterly (2001), and Kaufmann, Kray, and Mastruzzi (2006) have also focused on the impact of institutional factors such as the role of political freedom, political instability, voice and accountability on economic growth and development.

While the above listed conventional sources of economic growth have received considerable attention in the empirical literature, it is rather surprising to find that the macroeconomic impact of remittances on economic growth has not been adequately investigated even though they represent a major part of international capital flows, surpassing foreign direct investment (FDI), export revenues, and foreign aid (Giuliano and Ruiz-Arranz, 2005). A recent World Bank (2006) study suggests that recorded remittances have grown faster than foreign direct investment, or official development assistance. Using data from the World Development Indicators, we estimate the impact of the inflows of remittances, official development assistance, foreign direct investment and the conventional sources on the GDP growth for the period from 1980 and 2005. As shown in Figure 1, we observe that remittances have far outstripped other sources of foreign money inflows between 1980 and 2005.

<<Insert Figure 1 here>>.

Consequently, recent financial flows into developing countries in the form of remittances are receiving increased attention because of their size and impact on the economies of recipient countries. According to Gupta, et al. (2007), estimated official remittances reached a total of \$188 billion in 2005 which is twice the amount of development assistance received by emerging economies. Informal and unreported remittances could even easily add another \$94 billion to the above figure. According to a World Bank study (2008) of Latin America, Latin America and the Caribbean received around \$50 billion in remittances in 2005. This represents about 70% of FDI and is almost 8 times more than official development assistance to the region. In terms of sheer volume, Mexico heads the pack in the region with over 25 billion, followed by Brazil (7.2 billion dollars), Colombia (4.8 billion), Guatemala (4.3 billion), El Salvador (3.8 billion), the Dominican Republic (3.1 billion), Peru (2.9 billion), Ecuador (2.8 billion), and Honduras (2.7 billion), according to the IDB (Grogg, 2009). However, as shown in Figure 2, on a per capita basis, El Salvador gets the most, followed by the Dominican Republic, Honduras, Guatemala, and Mexico rounding up the top five recipients in that order.

Top Recipients of Remittances in Latin American Countries

Mexico	\$25 billion
Brazil	7.2 billion
Colombia	4.8 billion
Guatemala	4.2 billion
El Salvador	3.8 billion
Dominican Republic	3.1 billion
Peru	2.9 billion
Ecuador	2.8 billion
Honduras	2.7 billion

Source: <http://ipsnews.net/news.asp?idnews=47032>

<<Insert Figure 2 here>>.

Despite the increasing importance of remittances in total international capital flows, the relationship between remittances and growth, especially in LACs, has not been adequately studied. This study explores the aggregate impact of remittances on the economic growth of 17 Latin American countries within the conventional neoclassical growth model, using panel data spanning from 1980 to 2005.¹

We also account for the traditional sources of economic growth using estimation methods that are based on simple fixed-effects and random-effects models which allow us to account for the heterogeneity of Latin American economies and the differences in the traditional sectors' contributions to their economic growth. The contribution of our work to the empirical literature is that we provide some evidence of the

¹ We planned to use data for all Latin and Caribbean countries, but our focus in this study is only Latin American countries.

extent to which aggregate capital flows into Latin American countries in the form of remittances can spur economic growth while accounting for the conventional sources of economic growth using standard growth theory. Our empirical results show that remittances have positive and statistically significant impact on both the current level of gross domestic product and the economic growth rate of Latin American countries as do investments in physical and human capital. Our findings also suggest that remittances play a role in the economic growth of Latin American economies by augmenting the dwindling external sources of capital in the form of foreign aid, foreign direct investment, and/or private investments to Latin America.

The rest of the paper is organized as follows. Section II provides a review of selected literature. In section III, we specify a conventional neoclassical growth model which incorporates remittances as one of the sources of growth. Section IV presents estimation results for both the fixed and random effects regressions accounting for both the country and time effects and the Arellano-Bond (2002) dynamic panel data estimates which account for both the dynamic nature of the data and endogeneity of some of the conventional growth sources. The last section summarizes the results, draws conclusions, and makes some policy recommendations for promoting remittances as a growth and development strategy.

II. A Review of Selected Literature

Few empirical studies have investigated the role of remittances in reducing poverty (Lucas and Stark, 1985; Adams, 1991; Rapoport and Docquier, 2003; Sander, 2004; Azam and Gubert, 2005; Adam, 2006) based on household survey data from various countries. The macroeconomic impacts of remittances may have been disregarded for at least two reasons. One theoretical strand suggests that workers' remittances are mainly used for consumption purposes and, hence, have minimal impact on investment. In other words, remittances are widely viewed as compensatory transfers between family members who lost skilled workers due to migration.

Nevertheless, Stahl and Arnold (1986) argue that the use of remittances for consumption may have a positive effect on growth because of their possible multiplier effect. Moreover, remittances respond to investment opportunities in the home country as much as to charitable or insurance motives. Many migrants invest their savings in small businesses, real estate or other assets in their own country because they know local markets better than in their host countries, or probably expecting to return in the future. In about two-thirds of developing countries, remittances are mostly profit-driven and increase when economic conditions improve back home. Such external monetary flows are particularly used for investment where the financial sector does not meet the credit needs of local entrepreneurs (Ruiz-Arranz, M., 2006). Thus, we cannot, *a priori*, predict the direction of the impact of remittances (REM_{it}) on the economic growth of Latin American economies based on the above discussions.

III. An Empirical Model of Economic Growth with Remittances

In the economic growth literature, researchers have been interested in the rate at which countries close the gap between their current positions and their desired long-run growth path. To determine the responsiveness of income growth rate to remittances and the traditional sources of economic growth such as investment in physical and human capital, an external source of capital represented by foreign aid, openness of the economy as measured by the ratio of the sum of imports and exports to the GDP, often proxied by terms of trade, foreign direct investment, the variation in the exchange rate, and a measure of an institutional factor often represented by the economic and political freedom index, we first specify a simple double log-linear Cobb-Douglass production function as:

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln REM_{it} + \beta_2 \ln ENR_{it} + \beta_3 \ln GCF_{it} + \beta_4 \ln AID_{it} + \beta_5 \ln OFI_{it} + \beta_6 \ln FDI_{it} + \beta_7 \ln TRA_{it} + \beta_8 \ln EFI_{it} + \beta_9 \ln EXR_{it} + \varepsilon_{it} \quad (1)$$

where $\ln GDP_{it}$ is the natural log of real GDP per capita and $\ln REM_{it}$ is log of remittances per capita in US\$; $\ln ENR_{it}$ is log of school enrollment, measured as tertiary enrollments as a percentage of gross. This variable is employed as measure of investment in human capital and is expected to have a positive effect on the economic growth of developing countries (Schultz, 1980; Romer 1986; Lucas, 1988; and Barro, 1990). $\ln GCF_{it}$ is the log of gross fixed capital formation as a percent of real GDP used as a proxy for investment in physical capital².

The next three variables are used to capture the impact of external sources of capital on economic growth. Proponents of aid argue that overseas capital flows are necessary for the economic growth of developing countries (Chenery and Strout, 1966; Papenek, 1973; Levy, 1987; and Islam, 1992; Fayissa and El-Kaissy, 1999). On the other hand, opponents of foreign aid argue that it has a negative effect on domestic savings and economic growth in less developed countries (see, Heller, 1975 and Boone, 1994). We cannot, therefore, a priori predict the impact official development assistance on economic growth. The log of foreign aid ($\ln AID_{it}$) denotes the sum of official development assistance. The log of other official flows ($\ln OFI_{it}$) is used to capture the impact of foreign portfolio investments and other foreign financial flows except foreign direct investment. The log of foreign direct investment ($\ln FDI_{it}$) used to capture the effect of external sources of capital on growth; $\ln TRAD_{it}$ is the log of openness to trade for each country under consideration, measured by the sum of exports and imports as the ratio of GDP (See, Table 1 for detailed definitions) to capture the impact of trade, or openness of the economy on economic growth.

$\ln EFI_{it}$ is log of a of economic freedom index. Owen (1987) and Sen (1999) argue that freedom (political, economic, social, transparency and security) is a necessary condition for economic growth and development. Thus, we use the log of economic freedom index ($\ln EFI_{it}$) to capture the effect of this institutional factor. Obtained from the Economic Freedom of the World project data, the EFI is designed to measure the consistency of a nation's institutions and policies with economic freedom. The EFI ranges

² Our specification in Eq(1) is based on the empirics in the new growth theory (Lucas, 1988; Barro, 1990; Benhabib and Spiegel, 1994; Grossman and Helpman, 1991; Barro and Sala-i-Martin, 1992b; Barro and Lee, 1994; and Temple, 1999).

from 1 to 10 with higher numbers denoting more freedom. Hence we expect the sign of the economic freedom index to be positive. Extent literature (Berg, et al., 2002; Edwards and Savastano, 2000; and Kandi et al., 2007) suggest that the impact of exchange rate fluctuations ($\ln EXR_{it}$) on economic growth is mixed, i.e., it may be expansionary or contractionary depending the level of economic development. To estimate the parameters corresponding to variables of interest from the data under consideration, we employ a panel data estimation, an empirical exposition of which is provided in equation (2) below.

$$Y_{it} = \lambda_i + \gamma_t + (X_{it})\varphi + \psi_{it} \quad (2)$$

where Y_{it} is the natural logarithm of real GDP per capita in country i at year t , and X_{it} is a vector of the explanatory variables (remittances, investment in physical and human capital, foreign aid, openness, foreign direct investment, economic freedom index, and exchange rate) for country $i = 1, 2, \dots, m$ and at time $t = 1, 2, \dots, T$, φ a scalar vector of parameters of β_1, \dots, β_7 ; ψ_{it} is a classical stochastic disturbance term with $E[\psi_{it}] = 0$ and $\text{var}[\psi_{it}] = \sigma_{\psi}^2$, λ_i and γ_t are country and time specific effects, respectively. Instead of *a priori* decision on the behavior of $\lambda_i + \gamma_t$ different types of assumptions are separately imposed on the model and the one that gives robust estimates is chosen.

If we assume the “country specific” effects to be constant across countries and the “time specific” effects are not present [i.e. $\lambda_i = \gamma_t$ and $\gamma_t = 0$], then model (2) is estimated by the Ordinary Least Squares (OLS) method, or restricted OLS method. The second estimation technique assumes that the country specific effects are constant, but not equal (i.e. $\lambda_i = \gamma_t$ and $\gamma_t = 0$ which yields a one-way fixed effects model). The third assumption is a situation where the country effects are not constants, but rather are disturbances; the time effects are not present [i.e. $\lambda_i = \gamma_t + w_i$ and $\gamma_t = 0$] where $E[w_i] = 0$ and $\text{var}[w_i] = \sigma_w^2$ and $\text{cov}[\psi_{it}, w_i] = 0$. In this case, model (2) is estimated by the generalized least squares (GLS) which yields random-effects model.

Given that some of the traditional factors that explain growth are either pre-determined, or endogenous, or both, and current period growth could depend on its values in the past, a dynamic variant of the fixed and random effects provided in Equation (2) above, known as the Arellano-Bond estimation (1991) is specified as follows:

$$\Delta Y_{it} = \alpha' \Delta Y_{it-1} + \beta' \Delta X_{it-1} + \gamma' Z_{it} + v_i + \varepsilon_{it} \quad (3)$$

Where ΔY_{it} is first difference of the natural log of per capita income growth in country i during time t ; ΔY_{it-1} is lagged difference of the dependent variable, ΔX_{it-1} is a vector of lagged level and differenced predetermined and endogenous variables, Z_{it} is a vector of exogenous variables, and α , β , and γ are parameters to be estimated. v_i and ε_{it} are assumed to be independent over all time periods in country i . The term v_i represents “country specific” effects which are independently and identically distributed over the countries while ε_{it} noise stochastic disturbance term and is also assumed to be independently distributed. We estimate the coefficients of the variables using the Arellano-Bond (1991) Generalized Method of Moments (GMM) estimator to evaluate the joint effects of remittances and the other explanatory variables on economic growth in Latin American countries while controlling for the potential bias due to the endogeneity of some of the regressors including the lagged dependent variable.

All data, except for the economic freedom index index (which is taken from the Fraser Institute’s Economic Freedom of the World Index), and the foreign financial flow data (which are taken from the UNCTAD Handbook of Statistics) are from the World Bank Development Indicators (WDI, 2006) CD. The definitions and descriptive statistics of each variable included in the model are provided in Tables 1 and 2, respectively.

<<Insert Table 1 here >>

IV. Empirical Results and Interpretations

Several versions of equation 2 are tested in order to obtain a model which yields robust results and best fits the data. Accordingly, column 1 of Table 2 presents the estimation results of fixed-effects model with bootstrap standard errors, whereas column 2 presents the estimation results for the random-effects model with bootstrap standard errors. Apart from the magnitude of the coefficients, the results reported in columns 1 and 2 are comparable.

A comparison of the consistent fixed-effects model with the efficient random-effects model using the Hausman specification test, rejects the fixed-effects estimates at $p < 0.05$ in favor of the random-effects estimates. We thus base the discussion of our findings on the more robust random-effects results reported in column 2 of Table 2. Broadly, the results reveal the expected relationship between the GDP per capita income (GDP_{it}) and the explanatory variables i.e., the variables representing the sources of growth have the expected signs according to the *a priori* predictions. All the coefficients represent elasticities since we estimated a double-logarithmic model.

<< *Insert Table 2 here* >>

The results from our model of choice indicate that remittance variable has a positive and statistically significant effect on the GDP per capita (at $p < .01$) of Latin American countries. Accordingly, we find that a 10 percent increase in the remittances of a typical Latin American economy would result in about 0.15 percent increase in the average per capita income. Similarly, a 10 percent increase in investment in human capital (ENR) as measured by the percent tertiary school enrollment increases GDP per capita by 1.04 percent, by far the second main variable which spurs economic growth. Consistent with the findings of Solow (1956), Barro (1990) and Temple (1999), we also find that investment in physical capital (GCF) as measured by the gross fixed capital formation as a percent of GDP has a positive and statistically

significant impact on the real per capita GDP i.e., we observe that a 10 percent increase in investment in the physical capital will lead to about 0.79 percent increase in the GDP per capita.

Our results also indicate that foreign aid (*AID*) has a negative effect on economic growth, confirming the position of the opponents of aid (Heller, 1975; Boone, 1994). We also find that other foreign financial flows (*OFI*) into the Latin American area also has a negative impact on economic growth. A measure of the openness of the economy (*TRA*) has the expected positive sign, but it does not have a significant impact on economic growth. We find a positive and significant relationship between the foreign direct investment (*FDI*) and the economic growth of our sample of Latin American countries.

On the other hand, the institutional variable (*EFI*) used to capture the effect of economic freedom shows that poor governance is an important bottleneck to the observed economic growth performances of Latin American economies. Consistent with arguments made by Sen (1990) and Owen (1987), our estimates indicate that a 10 percentage increase in economic freedom leads to about 2.48 percent increase in per capita income, by far the main variable which spurs economic growth.

While results based on the fixed and random effects models in which we simultaneously account for the heterogeneity and time to time fluctuations in the economic performance of Latin American economies are appealing, we note that some of the explanatory variables of growth are endogenous, thus confounding the results. For example, while *FDI* and investment in human capital (*ENR*) have often been credited for their role in the economic growth of a country, there is also ample evidence (Hansen and Rand, 2006; de Mello, 1999) that the level GDP and its growth rate have feedback effects on the amount of *FDI* a country receives and the rate of investment in human capital formation. Given that we are mainly interested in analyzing the effect of remittances on Latin American economic growth while accounting for the traditional growth explanatory factors that are either pre-determined (e.g., schooling) or endogenous (e.g., *FDI*), or both, we employ the Arellano-Bond dynamic panel General Method of

Moments (GMM) estimator to obtain robust estimates by using levels lagged one period to serve as instruments for the endogenous variables. The Arellano-Bond dynamic GMM estimates are reported in Table 3.

In our case, the Sargan test fails to reject the null hypothesis that the over-identifying restrictions are valid while the Arellano-Bond test rejects the null hypothesis of no-first autocorrelation in the differenced residuals AR(1), and accepts the null hypothesis of no second order autocorrelation in the differenced residuals. Consequently, the estimated coefficients reflect the true (efficient and unbiased) relationship between growth in Latin American per capita GDP and remittances (our variable of interests) and the traditional growth determinants that are either pre-determined, or endogenous, or both.

Based on the results from our model, we observe that the coefficients of the lagged values of GDP per capita (*PCI*) and changes in remittances (*REM*) have a significant and positive impact on the growth rate of Latin American GDP per capita. Accordingly, a 10 percent increase in remittances would lead to a 0.04 percent growth in the GDP per capita of Latin American economies. Accounting for the endogenous nature of the traditional growth explaining factors, we find that while foreign direct investment (*FDI*), official development assistance (*AID*) the terms of trade (*TRA*), and the institutional variable proxied by economic freedom index (*EFI*) were not significant, current investment in physical capital (*GCF*), and the lag of human capital (*SCH*), have significant growth enhancing roles.

V. Conclusion

The main goal of this study is to investigate the effect of remittances relative to the other external sources of capital such as foreign aid and foreign direct investment on the economic growth and development of Latin American countries. The results show that remittances do positively impact the economic growth of

Latin American countries. We have found that a 10 percent increase in remittances lead to a 0.15 percent increase in the GDP per capita income.

According to Gupta et al. (2007), remittances are neither a panacea nor a substitute for a sustained and domestically engineered development endeavor for curing the problems of “low-income countries”. Furthermore, large-scale migration can have a deleterious effect on domestic labor markets in specific sectors such as higher education, government services, science and technology, and the manufacturing and services, especially where those migrating to other countries are largely skilled workers who are difficult and expensive to replace. Migrant transfers in the form of remittances can ease the immediate budget constraints of families by bolstering crucial spending needs on food, health care, and schooling expenses for their children. Such an unharnessed market in money transfers is, not only a source of small scale saving, but it can also be expected to pave a way for the development of a formal financial sector which is essential for the economic growth and development of Latin American countries in line with King and Levine (1993) and Beck, et al. (2000), Giuliano and Ruiz-Arranz (2005), and Gupta, et al. (2007).

In addition, the results show that the conventional sources of growth such as investment in physical and human capital and the ability of households to have the wherewithal of spending on health, housing, nutrition, and other household items can enhance their productivity and spur their economic growth. A policy implication which may be drawn from this study is that Latin American countries can improve their economic growth performance, not only by investing on the traditional sources of growth such as investment in physical and human capital, trade, and foreign direct investment, but also by strategically harnessing the contribution of remittances by ensuring their efficient and reliable transfers and reducing the cost of transfers by improving their governance performance.

References

- Adams, Richard H., 1991, "The Effects of International Remittances on Poverty, Inequality, and Development in Egypt," IFPRI Research Report 86 (Washington, IFPRI)
- _____, 2006, "Remittances and Poverty in Ghana" World Bank Policy Research Paper 3838, (Washington: World Bank).
- Arellano, M. and S. Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58, 277-297.
- Barro, R.J., 1990, "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, 98: S103-25.
- Barro, R.J. and X. Sala-i-Martin, 1992, "Public Finance in Models of Economic Growth," *Review of Economic Studies*, 54: 646-61.
- Barro, R., 1991, "Economic Growth in Cross-Section of Countries," *Quarterly Journal of Economics*, 106(May): 407-443.
- Beck, T., R. Levine, and N. Loayza, 2000, "Finance and Sources of Economic Growth," *Journal Financial Economics*, 58: 263-300.
- Berg, Andrew, Eduardo Borensztein, and Paolo Mauro, 2002, "An Evaluation Monetary Regime Options for Latin America," *The North American Journal of Economics and Finance*, 13: 213-235.
- Blomstrom, Mangnus, Richard Lipsey, and Mario Zejan, *The Quarterly Journal of Economics*, 111(1): 269-276.
- Boone, Peter, 1994, "The Impact of Foreign Aid on Savings and Growth," Center Economic Performance, Working Paper, London School of Economics, No. 677, 1994.
- Calvo, Guillermo and Carmen Reinhart, 2002, "Fear Floating," *Quarterly Journal of Economics*, 117 (2): 379-408.
- Casseli, Francesco, Gerardo Esuivel, and Fernando Lefort, 1996, "Reopening the Convergence Debate: A New Look at Cross-country Growth empirics," *Journal of Economic Growth*, 1 (September): 363-389.
- Chenery, H. B. and A. Strout, 1966, "Foreign Assistance and Economic Development," *American Economic Review*, 56 (September): 679-733.
- de Mello, L. R., 1999, "Foreign Direct Investment-led Growth: Evidence from Time Series Panel Data," *Oxford Economic Papers*, 51 (1): 133-151.
- Denison, E. F., 1967, *Why Growth Rates Differ: Post-War Experience for Nine Western Countries*, Washington: DC.

- Easterly, William and Ross Levine, 1997, "Africa's Growth Tragedy: Policies and Ethnic Divisions," *The Quarterly Journal of Economics*, 112 (4): 1203- 1250.
- Edwards, Sebastian and Miguel A. Savastano, 2000, "Exchange Rates in Emerging Economies: What We Know? What Do We Need to Know in Economic Policy Reform? The Second Stage, ed by Anne Krueger, University of Chicago Press: 453-510.
- Fayissa, Bichaka and Mohammed El-Kaissy, 1999, "Foreign Aid and the Economic Growth of Developing countries (LDCs): Further Evidence" *Studies in Comparative International Development*, 34 (3), (September 1999): 37-50.
- Easterly, William, 2001, *The Elusive Quest for Growth*, The MIT Press, Cambridge, MA.
- Fields, G. S., 1980, *Poverty, Inequality, and Development*, Cambridge University Press, Cambridge, England.
- Garcia-Fuentes, Pablo A. and P. Lynn Kennedy, 2009, "Remittances and economic growth in Latin America and the Caribbean: The Impact of the human capital development," Southern Agricultural Economics Association, 2009 Annual Meeting, January 31-February 3, 2009, Atlanta, Georgia
- Giuliano, P. and M. Ruiz-Arranz, 2009, "Remittances, Financial Development, and Growth," *Journal of Development Economics*, 90 (1): 144-152
- Grogg, Patricia, 2009, "Latin America: Remittances Drop Will Hurt Poor," May 29, 2009, <http://ipsnews.net/news.asp?idnews=47032>
- Gupta, Sanjeev, Catherine Pattillo, and Smita Wagh, 2007, "Making Remittances Work for Africa," *Finance & Development*, 44, No. 2 (June, 2007): 1-9.
- Hansen, H. and J. Rand, 2006, "On the Causal Links between FDI and Growth in Developing Countries," <http://www.blackwell-synergy.com/doi/pdf/10.1111/j.1467-9701.2006.00756.x>
- Harris, J. R. M. Todaro, 1970, "Migration, Employment, and Development: A Two-Sector Analysis," *American Economic Review*, 60 (March):126-142.
- Ruiz-Arranz, M., 2006, "Boosting economic growth." Institute of Development Studies <http://www.id21.org/insights/insights60/art03.html>
- Islam, N. 1992, "Foreign Aid and Economic Growth: An Econometric Study of Bangladesh," *Applied Economics*, 24:541-544.
- Kandil, Magda, Harkan Berumert, and N. Nergiz Dincer, 2007, "The Effects of Exchange Rate Fluctuations on Economic Activity in Turkey," *Journal of Asian Economics*, 18 (2007):466-489.
- Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi, 2007, "Governance Matters VI: Governance Indicators for 1996-2006," (July 2007), World Bank Policy Research, Washington, DC.

- King, R. and R. Levine, 1993, "Finance, Entrepreneurship, and Growth," *Journal of Monetary Economics*, 32: 513-542.
- Levine, Roos, and David Renelt, 1992, "A Sensitivity Analysis of Cross-Country growth Regressions," *American Economic review*, 82, (September): 942-963.
- Levy, Victor, 1987, "Aid and economic growth in the sub- Saharan: Africa: The recent experience," *European Economic Review*, 32; 1777-1795.
- Lewis, A.W., 1954, "Economic Development with Unlimited Supplies of Labor," *Manchester School of Economic and Social Studies*, 22, (May): 139-191.
- Loser, Claudio Caitlin Lockwood, 2006, "The Macro-Economic Remittances in Latin America-Dutch Disease or Latin Cure? <http://www.g24.org/lose0906.pdf>
- Lucas, R.E, 1988, "On Mechanics of Economic Growth," *Journal of monetary Economics*, 22 (July):3-42.
- Myrdal, G. 1968, *Asian Drama: An Inquiry into the Poverty of Nations*, (New York: Twentieth Century Fund).
- Owens, E., 1987, *The Future of Freedom in the Developing World*, Pergamon Press.
- Papanek, Gustav, 1973, "Aid, Foreign Private Investment, Savings, and Growth in Less Developing Countries," *Journal of Political Economy*, 81:120-130.
- Rapoport, Hillel and Fredric Docquier, 2003, "The Economics of Migrants' Remittances," in *Handbook on the Economics of reciprocity, Giving, and Altruism*, Varet, Kolm, and Ythier Editors, North Holland.
- Romer, P., 1986, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, (October): 1002-1037.
- Schultz, T.W., 1980, "The Economics of Being Poor," *Journal of political Economy*, (August): 639-651.
- Sen A., 1999, *Development as Freedom*, Alfred Knopf Publisher (New York: NY).
- Solow, R., 1956, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, 70(February): 65-94.
- Stahl, Charles W. and Fred Arnold, 1986), "Overseas Workers' Remittances in Asian Development," *International Migration Review*, 20 (4): 899-925.
- Temple, J. R. W., 1999, "The New Growth Evidence," *Journal of Economic Literature*, 37 (March 1999):112-156.
- World Bank, 2006, *Global Economic Prospects: Economic Implications and Migration*: Washington, DC).
- World Bank, 2008, *Remittances and Development: Lessons from Latin America* edited by Pablo Fajnzylber and J. Humberto Lopez

Table 1: Data Description and Summary Statistics

Variable	Description	Mean	Std. Dev.	Min	Max
<i>GDPPC</i>	GDP per capita (constant 2000 US\$)	2847.83	1834.72	659.48	8212.90
<i>REM</i>	Per capita workers' remittances and compensation of employees, received (US\$)	40.65	64.40	0.00	413.02
<i>ENR</i>	Gross Tertiary School Enrollment rate(% gross)	22.67	10.69	7.86	63.86
<i>GCF</i>	Gross fixed capital formation (% of GDP)	18.96	4.29	6.51	33.32
<i>AID</i>	Official Development Assistance and Official Aid (Millions Current US \$)	193.00	191.00	3.00	1230.00
<i>OFI</i>	Foreign direct investment, net inflows (Millions \$)	1630.00	2680.00	4.04	13800.00
<i>FDI</i>	Other Foreign Financial Inflows (Millions Current \$)	1500.00	3870.00	1.20	30500.00
<i>TRA</i>	Trade as a Percent of GDP	57.21	32.65	11.55	198.77
<i>EFI</i>	Economic Freedom Index	5.67	1.16	2.30	7.80
<i>EXR</i>	Exchange Rate (Dollar per Local Currency)	626.75	2951.57	1.00	25000.00

Notes: All data are transformed into logs for our analysis. Data cover the years 1980 -2005

Table 2: Estimation Results for Random effects and Fixed-Effects Models

Variable	Description	Model 1	Model 2
Constant	Intercept	7.0989 *** (0.2634)	7.1423 *** (0.3005)
<i>REM</i>	Per capita workers' remittances and compensation of employees, received (US\$)	0.0167 *** (0.0061)	0.0148 ** (0.0065)
<i>ENR</i>	Gross Tertiary School Enrollment rate(% gross)	0.0772 *** (0.0248)	0.1039 *** (0.0272)
<i>GFC</i>	Gross fixed capital formation (% of GDP)	0.0865 *** (0.0314)	0.0792 ** (0.0350)
<i>AID</i>	Official Development Assistance and Official Aid (Millions Current US \$)	-0.0211 ** (0.0083)	-0.0297 *** (0.0092)
<i>OFI</i>	Other Foreign Financial Inflows (Millions Current \$)	-0.0327 *** (0.0097)	-0.0260 ** (0.0107)
<i>FDI</i>	Foreign direct investment, net inflows (Millions \$)	0.0299 *** (0.0059)	0.0344 *** (0.0064)
<i>TRA</i>	Trade as a Percent of GDP	0.0309 (0.0301)	0.0120 (0.0330)
<i>EFI</i>	Economic Freedom Index	0.2499 *** (0.0390)	0.2480 *** (0.0434)
<i>EXR</i>	Exchange Rate (Dollar per Local Currency)	-0.0133 (0.0090)	-0.0162 * (0.0094)
R-Square		0.5543	0.5458
Observations		339	339
Hausman			79.72 ***

Notes: Model 1 presents estimates for the fixed-effects model with bootstrap standard errors; Model 2 presents estimates for random effects with bootstrap standard errors. The standard Errors In Parenthesis; ***, **, and * indicate significance at $p < 0.01$, $p < 0.05$, and $p < 0.1$ levels, respectively. Number of observations = 339.

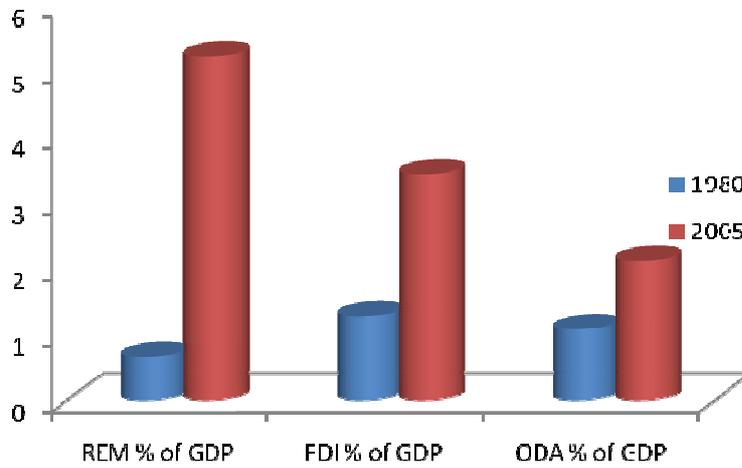
Table-3: Arellano-Bond Dynamic Panel-Data Estimation-Results

Variables	Coefficient Estimates (One-Step and One-Year Lag)	
GDP (LD)	0.8484	***
	(0.0295)	
REM (D(1))	0.0050	**
	(0.0024)	
ENR (D(1))	-0.0601	**
	(0.0300)	
ENR (LD)	0.0716	**
	(0.0318)	
GCF (D(1))	0.2072	***
	(0.0212)	
GCF (LD)	-0.2029	***
	(0.0207)	
AID (D(1))	-0.0081	
	(0.0054)	
AID (LD)	-0.0012	
	(0.0052)	
OFI (D(1))	0.0005	**
	(0.0124)	
OFI (LD)	-0.0023	
	(0.0111)	
FDI (D(1))	0.0032	
	(0.0022)	
FDI (LD)	-0.0019	
	(0.0021)	
TRA (D(1))	0.0107	
	(0.0117)	
EFI (D(1))	0.0765	***
	(0.0210)	
EXR (D(1))	-0.0005	
	(0.0007)	
Constant	3.2378	
	(1.9959)	
Number of Observations	349	
Number of Countries	18	
Wald Chi-Square	1932	***
Arellano-Bond Test of the null of No AR(1) Residual Errors	-2.03	***

Arellano-Bond test of the null of No AR(2) Residual Errors	1.39
Sargan Test of the Validity of the null of over-identifying Restrictions	36.61

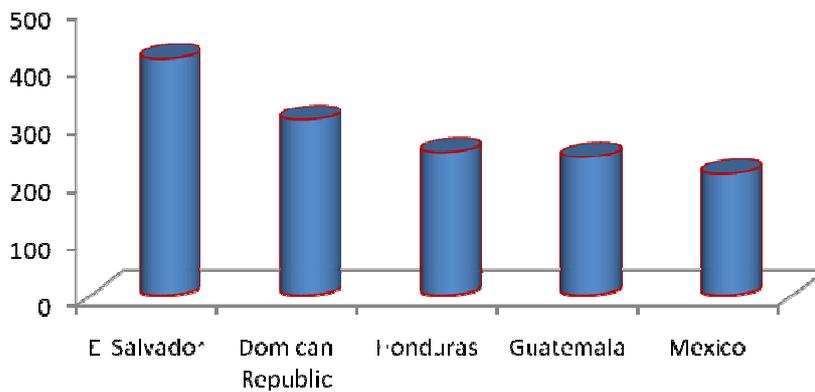
Notes: Standard Errors In Parenthesis; ***, **, and * indicate significance at $p < 0.01$, $p < 0.05$, and $p < 0.1$ levels, respectively. While the suffix D(1) after each variable denotes the number of times the specific variable was differenced. LD denotes the lagged difference. The variable ENR is treated as pre-Determined, while FDI, AID, OFI, and GCF are treated as endogenous variables.

Figure 1: International Capital Flows to Latin American Countries as a Percent of GDP



Source: World Development Indicators (2006)

Figure 2: Top 5 Per Capita Recipients of Remittances in Latin America



Source: World Development Report (2006)

**List of Countries
included in this
Study**

Argentina

Bolivia

Brazil

Chile

Colombia

Costa Rica

Dominican Republic

Ecuador

El Salvador

Guatemala

Honduras

Mexico

Nicaragua

Panama

Paraguay

Peru

Uruguay

Venezuela, RB
