Spring 2013

Remittances and Economic Development

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REMITTANCES AND ECONOMIC DEVELOPMENT

By

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Bachelor of Arts, Southern Illinois University, 2011

A Research Paper

Submitted in Partial Fulfillment of the Requirements for the

Masters of Arts in Economics.

Department of Economics

in the Graduate School

Southern Illinois University Carbondale

May 2013

RESEARCH PAPER APPROVAL

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Approved by:

Richard Grabowski, Research Advisor

Graduate School

Southern Illinois University Carbondale

April 11th 2013

AN ABSTRACT OF THE RESEARCH PAPER OF

Timothy M David for the Master of Arts degree in Economics

TITLE: REMITTANCES AND ECONOMIC DEVELOPMENT

MAJOR PROFESSOR: Dr. Richard Grabowski

The amount of remittances flowing into developing countries has increased significantly since 1970. More recently remittances have outpaced direct aid flows to developing countries. Remittances can provide a very useful source of cash flow to developing countries, by providing a source of income that households can use more resources on consumption and investment purposes. This can perhaps help proxy for foreign direct investment in these countries and lead to higher economic growth and better economic development outcomes in the long run. In this paper I will be doing a cross country regression analysis looking at remittances effect on long run economic development.

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CHAPTER 1 – INTRODUCTION

Remittances, or cash transfers sent from workers aboard to family members or friends back to their country of origin, are an important source of income flows to developing countries. In 2004 remittances were 125 billion dollars, which greatly exceed flows of aid into these same countries[1]. The amount of reported remittances has risen greatly since the 1970s. While reported remittance flows are not greater than foreign direct investment, they have become a large and increasing amount of income flowing into developing countries. For this research paper I will be looking primarily at how inflows of remittances affect economic development. I will also be looking at real GDP per capita and real GDP per capita growth in these countries and how it is affected by inflows of remittances or other investments.

Investment can be very important part of economic development. In order for developing countries to grow and modernize they need capital, particularly income. Generally the conclusion reached by economists about why certain developing countries have not been more successful is a lack of capital and investment in order to increase productivity. In order to invest in capital and resources you need to first have income in order to invest. Two major sources of investment inflow into developing countries are primarily foreign direct investment (FDI) and foreign aid. However both can have potential problems. With both FDI and foreign aid, countries or people may have found it difficult to give aid to developing countries with corrupt or oppressive governments. A potential difference between remittances vs. FDI and Aid is that remittances are primarily sent to households rather than with aid often given to governments. The large rise in remittances since the 1970s also does point to the importance of understanding the potential positive effects that remittances can have on economic development.

[1] Giuliano and Ruiz-Arranz (2009)

Past work on remittances looks primarily at both at the effect of remittances on economic growth and also what other variables can lead to a larger amount of remittances. The effects of remittances on growth have been look at in Giuliano and Ruiz-Arranz (2009). The authors looked at remittances effect directly on real GDP per capita growth alongside other control variables. They find a positive effect of remittances on growth. They use a sample of a 100 countries of years 1975 to 2002. Guiliano and Ruiz-Arranz also break the sample down and look at the effect of remittances on different countries based on financial development and found that remittances effect tended to be positive in for less financially developed countries and negative for more financially developed countries. Some papers have found a different relationship between remittances and growth. In Chami, Fullenkamp, Jahjah (2005) they found a negative correlation between remittances and GDP growth. Remittances are unlike profit driven capital flows in that they are countercyclical. Therefore remittances flows are higher for countries that are doing worse, as people leave the country to move elsewhere in order to find better sources of income.

Other papers have looked at other effects remittances may have on a developing economy other than GDP growth. In Aggarwal, Demirgüç-Kunt, and Pería (2011) they look at remittances effect on financial development. In the paper they look at 109 countries over years 1975-2007. The authors find a positive and significant relationship between remittances and financial development in developing countries. So not only do remittances have potential effect on growth but also on other aspects of the economy. If having a more developed financial sector is important for growth then the presence of large amount of reported remittances flowing through the financial sector could have a positive impact. So remittances could therefore affect growth indirectly through other variables.

Some papers have looked at what other variables could have an effect on remittances, two examples being policies in the nation that workers migrate to and also transaction costs. In Amuedo-Dorantes and Mazzolari (2010) look at how 1986 Immigration Reform and Control Act (IRCA) affected the remittances behavior of Mexican immigrants to the United States. Primarily they found that this lowered the amount of money and probability of sending money home for Mexican immigrants to the United States. Also Freund and Spatafora (2008) looked at transaction costs and their effects on remittance flows between countries. They found a negative relationship between remittance flows and transaction costs and exchange rate restrictions.

CHAPTER 2 – DATA

For this project I will be looking at a long run panel data analysis of remittances and others variables effects on both gross domestic product (GDP) and the growth rate of GDP. I will do the regression on 71 different countries over a 51 year period. The countries are all low and middle income countries; I will classify the countries using Word Bank development indicators groups for low, lower middle, and middle income countries. I will be looking at the time period between 1960 and 2011. All of the data come from the World Bank development indicator database and also all data used are annual data. There are, however, large amounts of missing data primarily for the first 10 years of the data set, so in order to make up for that I included a large number of countries and ran estimates using the whole data set using annual data rather than breaking it up into longer intervals.

To measure economic development and growth, I used both GDP per capita and GDP per capita growth. GDP per capita is measure in current United States dollars, and GDP per capita is measured in annual percentage. For foreign direct investment (FDI), I had two different measures, both in current US dollars and percentage of GDP. Controls including such things as inflation, population growth, imports, foreign aid, and government spending. For inflation, it is measured both in consumer prices and GDP deflator. Population growth is measured in annual percentage growth rate. Imports and government spending are taken as a percentage of GDP. Foreign aid is in current United States dollars. Also in an attempt to account further account for inequality I used World Bank indicators such as income share of GDP of top 10% income earners and the GINI index.

For remittances, the Workers' remittances receipts variable in World Bank Economic Indicators in constant United States dollars are used. This is somewhat limited as is discussed in

the remittance literature due to large amounts of informal remittances that are not sent through the formal financial channels. Direct cash transfers of remittances sent this way are therefore not recorded in the official World Bank data. This means the real amount of remittances is therefore much higher than is what is reported. This is a problem with remittance data, which cannot be solved with the data I have access to.

For the first few sets of regressions the dependent variable is GDP per capita regressed on FDI, foreign aid, and remittances. Here the hypothesis for remittances is that they should have a positive effect on overall economic growth and development. For control variables, I need to control for things such as inflation, population growth, and imports. Inflation and population are common economic controls in most of the remittance literature. I also want to control for openness of the economy by looking at trade flows into the economy. FDI, foreign aid and remittances are all a source of potential investment funds for a country and are also included.

CHAPTER 3 – ESTIMATION

In order to look are remittances effect on growth; I am going to look at a cross sectional panel data for years 1960 to 2011. There will be 71 different countries included in the analysis. I tried to use similar countries as where used in the literature however in the data set that I used I was only able to get enough data for 71 of the countries. A full list of countries can be seen in the appendix b.

The regression equations that I analyzed were estimated using ordinary least squares regression, and uses all 51 years of data in order to get as much observations as possible and in order to get powerful results as possible. The first initial equation estimated is as follows:

(1) $GDP_{i,t} = \beta_0 + \beta_1 GDP_{i,t-1} + \beta_2 Rem_{i,t} + \beta_3 FDI_{i,t} + \beta_4 X_{i,t} + \varepsilon_{i,t}$

Here the dependent variable is GDP per capita. On the left I used lagged GDP per capita, remittances and FDI. $X_{i,t}$ is a matrix of controls variables including inflation, imports as percentage of GDP, population growth and net foreign aid. Remittances, FDI and foreign aid are all trying to capture the effect of an inflow of investment into a country and its overall effect on GDP and growth. Inflation, population growth and imports are just control variables below are the results for the first equation:

TABLE 1
Dependent Variable: GDP
Method: Panel Least Squares
Periods included: 43
Cross-sections included: 66
Total panel (unbalanced) observations: 1370

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	131.8831	49.85413	2.645380	0.0083
GDP(-1)	1.037646	0.005602	185.2268	0.0000
REMITTANCES	8.62E-10	3.79E-09	0.227552	0.8200
FDI	2.84E-09	1.48E-09	1.916795	0.0555
INFLATION	0.002112	0.033042	0.063912	0.9490
IMPORTS	0.485020	0.669374	0.724586	0.4688
POP	-51.41608	13.98818	-3.675680	0.0002
NETAID	-7.24E-09	3.09E-08	-0.234597	0.8146

R-squared	0.973305	Mean dependent var	2627.932
Adjusted R-squared	0.973168	S.D. dependent var	2946.056
S.E. of regression	482.5816	Akaike info criterion	15.20200
Sum squared resid	3.17E+08	Schwarz criterion	15.23250
Log likelihood	-10405.37	Hannan-Quinn criter.	15.21341
F-statistic	7094.060	Durbin-Watson stat	1.826003
Prob(F-statistic)	0.000000		

Here the results are somewhat expected. Both FDI and remittances have a positive effect on GDP. Remittance is not significant however FDI is significant at the 10% level. Lagged GDP and population growth coefficients are also significant. I tried the first equation also with using FDI as a percentage of GDP, similar results can be seen here:

TABLE 2

Dependent Variable: GDP
Method: Panel Least Squares
Date: 04/11/13 Time: 02:01
Sample: 1 3763
Periods included: 41
Cross-sections included: 66
Total panel (unbalanced) observations: 1510

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	136.9321	45.66906	2.998356	0.0028
GDP(-1)	1.038711	0.005557	186.9223	0.0000
REMITTANCES	2.68E-09	3.53E-09	0.757896	0.4486
FDIPERCENT	9.154581	3.754233	2.438469	0.0149
IMPORTS	-0.437453	0.652702	-0.670218	0.5028
POP	-46.39755	12.91807	-3.591678	0.0003
NETAID	-6.56E-09	2.91E-08	-0.225261	0.8218

R-squared	0.973898	Mean dependent var	2453.688
Adjusted R-squared	0.973794	S.D. dependent var	2890.699
S.E. of regression	467.9584	Akaike info criterion	15.13926
Sum squared resid	3.29E+08	Schwarz criterion	15.16392
Log likelihood	-11423.14	Hannan-Quinn criter.	15.14845
F-statistic	9346.360	Durbin-Watson stat	1.782617
Prob(F-statistic)	0.000000		

Similar results can also be seen when using GDP per capita growth as the dependent variable instead of just GDP per capita:

TABLE 3

Dependent Variable: GDPGROWTH
Method: Panel Least Squares
Cross-sections included: 66
Total panel (unbalanced) observations: 1358

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.744415	0.417679	6.570635	0.0000
GDP(-1)	-0.000187	4.70E-05	-3.970769	0.0001
REMITTANCES	3.78E-11	3.16E-11	1.196335	0.2318
FDI	5.96E-11	1.24E-11	4.814822	0.0000
INFLATION	-0.000719	0.000276	-2.605759	0.0093
IMPORTS	0.025104	0.005592	4.488961	0.0000
POP	-0.932797	0.117324	-7.950592	0.0000
NETAID	1.11E-09	2.58E-10	4.314586	0.0000

R-squared	0.115814	Mean dependent var	2.268332
Adjusted R-squared	0.111230	S.D. dependent var	4.273160
S.E. of regression	4.028505	Akaike info criterion	5.630541
Sum squared resid	21908.95	Schwarz criterion	5.661256
Log likelihood	-3815.138	Hannan-Quinn criter.	5.642041
F-statistic	25.26122	Durbin-Watson stat	1.301836
Prob(F-statistic)	0.000000		

Here all the coefficients are significant at the 10,5 and 1 percent levels except remittances which still insignificant. However the sign of remittances coefficient is still positive. One interesting thing here is that the lagged GDP per capita coefficient is negative here, implying that higher GDP in previous years leads to lower growth next year. Having a negative coefficient on lagged GDP here also implies convergence.

Intuitively lower income countries may have fewer opportunities domestically for workers looking for work to support their families, so therefore they may be more likely to go aboard a send back remittances. In order to deal with this potential endogeneity problem I created a dummy variable for low income countries and added into the regression for a second equation as well as government spending. Government spending is added as an additional control.

(2) $GDP_{i,t} =$

$$\beta_0 + \beta_1 GDP_{i,t-1} + \beta_2 Rem_{i,t} + \beta_3 FDI_{i,t} + \beta_4 lower\ income +$$

$$\beta_5 government\ spending + \beta_6 X_{i,t} + \varepsilon_{i,t}$$

The results for the regression are as follows:

TABLE 4
Dependent Variable: GDP
Method: Panel Least Squares
Cross-sections included: 65
Total panel (unbalanced) observations: 1353

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	110.3755	52.58452	2.099012	0.0360
GDP(-1)	1.055695	0.005443	193.9421	0.0000
REMITTANCES	-2.48E-10	3.50E-09	-0.070832	0.9435
FDI	2.47E-09	1.36E-09	1.810460	0.0704
GOVSPENDING	-2.295211	2.868286	-0.800203	0.4237
IMPORTS	0.328006	0.689416	0.475773	0.6343
INFLATION	0.002660	0.030290	0.087802	0.9300
LOWINCOME	14.57060	38.88808	0.374680	0.7080
NETAID	9.99E-09	2.87E-08	0.347671	0.7281
POP	-42.06533	13.35348	-3.150141	0.0017

R-squared	0.977239	Mean dependent var	2623.435
Adjusted R-squared	0.977086	S.D. dependent var	2919.683
S.E. of regression	441.9603	Akaike info criterion	15.02768
Sum squared resid	2.62E+08	Schwarz criterion	15.06619
Log likelihood	-10156.23	Hannan-Quinn criter.	15.04210
F-statistic	6406.778	Durbin-Watson stat	1.501206
Prob(F-statistic)	0.000000		

Here results are different for previous regressions with remittance coefficient changing sign but still insignificant.

Two potential problems could be leading to the insignificant coefficients to be that the remittance data is underestimating the effect of remittances. This would be due to the data not accurately capturing total remittances due to informal remittances not being part of the remittance data. The other reason is that remittance data may have a nonlinear relationship with GDP per capita or GDP growth. It is possible that remittances have a diminishing rate of return. So in order to test less, I add remittance^2 to the regression in addition to the other variables:

TABLE 5
Dependent Variable: GDP
Cross-sections included: 66
Total panel (unbalanced) observations: 1370

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	127.5836	50.30572	2.536165	0.0113
GDP(-1)	1.037549	0.005605	185.1026	0.0000
FDI	2.66E-09	1.51E-09	1.762937	0.0781
REMITTANCES	5.30E-09	7.84E-09	0.676341	0.4989
REMITTANCES^2	-1.34E-19	2.06E-19	-0.646936	0.5178
IMPORTS	0.530303	0.673166	0.787774	0.4310
INFLATION	0.002523	0.033056	0.076317	0.9392
NETAID	-8.72E-09	3.10E-08	-0.281824	0.7781
POP	-51.43603	13.99120	-3.676312	0.0002

R-squared	0.973313	Mean dependent var	2627.932
Adjusted R-squared	0.973156	S.D. dependent var	2946.056
S.E. of regression	482.6847	Akaike info criterion	15.20315
Sum squared resid	3.17E+08	Schwarz criterion	15.23746
Log likelihood	-10405.16	Hannan-Quinn criter.	15.21599
F-statistic	6204.705	Durbin-Watson stat	1.826263
Prob(F-statistic)	0.000000		

Here the regression confirms that the remittances have a positive but diminishing rate of return to GDP per capita. However both terms for remittances are still insignificant.

Next I am going to look at whether or not income inequality can also potentially have an effect on economic growth and output. In order to measure income inequality I used two different statistics. First is the Gini coefficient and the other is the income share of top 10% of the population. The results of those two regressions are below:

TABLE 6

Dependent Variable: GDP
Method: Panel Least Squares
Cross-sections included: 56
Total panel (unbalanced) observations: 372

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	275.5779	185.7673	1.483458	0.1388
GDP(-1)	1.084170	0.013891	78.04629	0.0000
REMITTANCES	4.94E-09	9.75E-09	0.506964	0.6125
FDI	-2.28E-09	3.92E-09	-0.581815	0.5611
INFLATION	0.107370	0.133054	0.806966	0.4202
IMPORTS	1.924178	1.401392	1.373048	0.1706
POP	-32.53128	34.48858	-0.943248	0.3462
NETAID	4.13E-08	6.87E-08	0.600918	0.5483
GINI	-7.257024	3.269275	-2.219766	0.0271

R-squared	0.964624	Mean dependent var	3141.204
Adjusted R-squared	0.963844	S.D. dependent var	2676.026
S.E. of regression	508.8359	Akaike info criterion	15.32602
Sum squared resid	93985771	Schwarz criterion	15.42084
Log likelihood	-2841.641	Hannan-Quinn criter.	15.36368
F-statistic	1237.278	Durbin-Watson stat	2.294797
Prob(F-statistic)	0.000000		

TABLE 7

Dependent Variable: GDP
Method: Panel Least Squares
Cross-sections included: 56
Total panel (unbalanced) observations: 374

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	108.6050	160.7026	0.675813	0.4996
GDP(-1)	1.084291	0.013899	78.01076	0.0000
REMITTANCES	5.86E-09	9.78E-09	0.599354	0.5493
FDI	-3.05E-09	3.90E-09	-0.782441	0.4345
INFLATION	0.089683	0.133078	0.673915	0.5008
IMPORTS	2.079854	1.397018	1.488781	0.1374
POP	-43.76290	34.03557	-1.285799	0.1993
NETAID	7.75E-08	6.51E-08	1.190598	0.2346
SHARETOP10	-4.677489	3.372069	-1.387127	0.1662

R-squared	0.964356	Mean dependent var	3133.841
Adjusted R-squared	0.963575	S.D. dependent var	2671.609
S.E. of regression	509.8878	Akaike info criterion	15.33003
Sum squared resid	94894717	Schwarz criterion	15.42446
Log likelihood	-2857.715	Hannan-Quinn criter.	15.36752
F-statistic	1234.391	Durbin-Watson stat	2.288467
Prob(F-statistic)	0.000000		

Here adding in the income inequality variables does overall change the regression, with both remittance coefficients being negative. However both the GINI coefficient and the income share

of top 10 percent of the population are both negative. Only the GINI coefficient is significant however. Implying higher levels of income inequality leads to lower GDP outcomes. The same relationships are also present when you change the dependent variable to GDP growth.

CHAPTER 4 – NONLINEAR RELATIONSHIP

There still could potentially a nonlinear relationship between remittances and growth. As the amount of remittances increases the potential return for the investment could be lower. In order to look at this nonlinear relationship I took logs of all variables which are measured in current US dollars. Results for the regression without foreign aid are as follows:

TABLE 8
Dependent Variable: LOGGDP
Method: Panel Least Squares
Cross-sections included: 62
Total panel (unbalanced) observations: 1187

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.070123	0.053948	-1.299820	0.1939
LOGGDP(-1)	0.984437	0.004340	226.8206	0.0000
LOGFDI	0.008988	0.002173	4.135634	0.0000
LOGREM	0.001028	0.001675	0.613650	0.5396
LOGPOP	-0.012832	0.005261	-2.439236	0.0149
LOGINFLATION	-0.001921	0.003097	-0.620310	0.5352
LOGTRADE	0.017368	0.007704	2.254465	0.0243

R-squared	0.987826	Mean dependent var	7.319498
Adjusted R-squared	0.987764	S.D. dependent var	1.097649
S.E. of regression	0.121419	Akaike info criterion	-1.373266
Sum squared resid	17.39611	Schwarz criterion	-1.343313
Log likelihood	822.0335	Hannan-Quinn criter.	-1.361977
F-statistic	15957.70	Durbin-Watson stat	1.665543
Prob(F-statistic)	0.000000		

Here once again the sign of the various coefficients such as lagged GDP, population growth and remittances are the same before. However once again the effect of remittances on GDP per capita is insignificant. The same exercise was also done with GDP growth as the dependent variable:

TABLE 9
Dependent Variable: GDPGROWTH
Method: Panel Least Squares
Cross-sections included: 62
Total panel (unbalanced) observations: 1173

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.283305	1.682059	-3.140975	0.0017
LOGGDP(-1)	-0.897858	0.134421	-6.679448	0.0000
LOGFDI	0.653107	0.067318	9.701866	0.0000
LOGREM	-0.048834	0.052088	-0.937526	0.3487
LOGPOP	-0.793905	0.164980	-4.812116	0.0000
LOGINFLATION	-0.201814	0.097406	-2.071880	0.0385
LOGTRADE	0.944252	0.239928	3.935560	0.0001

R-squared	0.110155	Mean dependent var	2.427399
Adjusted R-squared	0.105576	S.D. dependent var	3.970877
S.E. of regression	3.755417	Akaike info criterion	5.490225
Sum squared resid	16444.28	Schwarz criterion	5.520465
Log likelihood	-3213.017	Hannan-Quinn criter.	5.501629
F-statistic	24.05682	Durbin-Watson stat	1.278338
Prob(F-statistic)	0.000000		

Here the coefficients are similar to the previous GDP growth regressions, however in this case coefficient on remittances is negative, but still insignificant.

Next I included log of foreign aid as part of the regression equation. Results are as follows:

TABLE 10
Dependent Variable: LOGGDP
Method: Panel Least Squares
Cross-sections included: 61
Total panel (unbalanced) observations: 1114

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.168281	0.083054	2.026153	0.0430
LOGGDP(-1)	0.971915	0.005758	168.8083	0.0000
LOGFDI	0.011917	0.002489	4.788145	0.0000
LOGREM	0.003810	0.001922	1.982643	0.0477
LOGPOP	-0.012169	0.005580	-2.180953	0.0294
LOGINFLATION	-0.001063	0.003208	-0.331360	0.7404
LOGTRADE	0.014846	0.008016	1.851984	0.0643
LOGAID	-0.013383	0.003626	-3.691019	0.0002

R-squared	0.986718	Mean dependent var	7.243113
Adjusted R-squared	0.986634	S.D. dependent var	1.060916
S.E. of regression	0.122655	Akaike info criterion	-1.351733
Sum squared resid	16.63884	Schwarz criterion	-1.315714
Log likelihood	760.9154	Hannan-Quinn criter.	-1.338115
F-statistic	11737.73	Durbin-Watson stat	1.682837
Prob(F-statistic)	0.000000		

Here once again the sign of the coefficients are largely the same. High GDP last period leads to higher GDP in the next period. Both FDI and remittances are positive and significant on their effect of GDP. Population and inflation both have negative effects on GDP. Here inflation is insignificant and so the import variable (trade). While both FDI and Remittances are significant and positive, however the coefficient on FDI is higher implying that FDI has a greater effect on overall output than remittances inflows

CHAPTER 5 – RESULTS

In all the regressions done, most of the coefficients for remittances were found to be insignificant. However, in all but one regression the coefficient was positive. This positive coefficient lines up with economic intuition that higher levels of inflows of remittances into countries will act as a potential source of investment and help raise economic growth. Economic intuition for FDI also leads one to believe there is a positive relationship between FDI and GDP as well as growth. Higher levels of foreign investment in a country can be used to raise output. This was found to be the case in almost all the regressions. Also in these same regressions the coefficient on FDI was larger than on remittances. This implies that FDI has a greater overall effect on growth than remittances. However, keep in mind we know with remittances that the remittance data has a large amount of informal activity, which is not included in the total remittances reported. It is not clear how the lack of data on informal remittances would change the outcome of the results of the paper.

While the relationship between remittances and growth and GDP is not significant in all but the last regression, there does seem to be a positive relationship between remittances and GDP. However looking at the GDP growth equations the R^2, the adjusted R^2 and F statistic are much lower than when just GDP per capita is used as the dependent variable. So therefore the equations seem to not be accurate predictors of GDP growth. In order to look at remittances effect on GDP growth I would probably have to change the estimation process and include others variables. The most significant predicator of GDP in all the equations seems to be lagged GDP, which makes sense from an economic perspective. Over the long run during normal times, countries with higher GDP in one year will likely see high GDP next year. GDP is persistent overtime.

In order to expand upon this paper I would first have to relook at the remittance data in order to try to more accurately reflect the amount of actual remittances that are present in these economies. In order to do that I would have to get some more accurate measure of how much informal remittances there are, but also trend of remittances overtime. One can assume from formal remittances reported, that the amount of informal remittances that countries have received probably has trended up overtime as well. Also one potential situation that could occur is that agents could be substituting between formal and informal remittances. One would have to look at case studies or probably survey data to try to figure out more about trends of remittances overtime and their effect on growth. Another thing one could do to expand on this paper is try to increase the data set. Most of papers on remittances use 100 or so countries rather than the 71 used in this paper. Hopefully by expanding the data set it would lead to more significant coefficients.

Since remittances can be difficult to get proper data on then one could try to instrument for them, however finding a good and accurate instrument can be difficult. Chami, Fullenkamp, Jahjah (2005) did find that remittances tend to more countercyclical. So as the domestic economies of these countries are struggling, the workers go elsewhere in order to look for work, and then send a proportion of the income back home to their families. This would suggest that remittances are a form of consumption smoothing then. I am not sure what would make a good instrument for remittances. I did look at running remittances as the dependent variable and using GDP, GINI index and others. Here I assumed that countries with lower opportunities for workers would likely lead to a larger amount of remittances as more workers go abroad to search for work.

CHAPTER 6 – CONCLUSION

The amount of remittances flowing into lower income countries has increased greatly over the last few decades. The large influx of money back to families and relatives in the home countries could lead higher level of consumption and investment. As the amount of remittances has gone up considerably overtime the importance of understanding its effects of economic growth and outcomes is very important.

In this research paper I looked at the overall macroeconomic effects of remittances on GDP per capita and growth using a panel set of 71 low and middle income countries from years 1960 to 2011. Overall the results were mixed, while remittances did seem to have a positive effect on both economic growth and GDP the coefficients where primarily insignificant. Foreign direct investment also tended to have a positive effect on growth and in most cases a greater magnitude of effect on GDP and growth. In order to get a better grasp between the relationship between remittances and economic development more research is needed. One of main obstacles is trying to look at informal remittances and their effect on economic development.

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APPENDICES

Descriptive Statistics:

	GDP	GDPGROWTH	REMITTANCES	FDI	NETAID
Mean	2605.714	2.268332	1.28E+09	2.08E+09	3.45E+08
Median	1422.506	2.468817	1.48E+08	1.42E+08	1.82E+08
Maximum	21049.49	21.79444	5.30E+10	1.86E+11	4.44E+09
Minimum	120.9355	-19.08331	15803.28	-9.42E+09	-6.72E+08
Std. Dev.	2935.695	4.273160	3.76E+09	9.65E+09	4.78E+08
Skewness	2.035793	-0.337438	7.677243	11.08078	2.734532
Kurtosis	7.621503	5.285208	81.45831	161.5498	13.61215
Jarque-Bera	2146.551	321.2593	361650.5	1450183.	8064.726
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	3538560.	3080.394	1.74E+12	2.82E+12	4.69E+11
Sum Sq. Dev.	1.17E+10	24778.68	1.92E+22	1.26E+23	3.10E+20
Observations	1358	1358	1358	1358	1358

	INFLATION	IMPORTS	POP
Mean	35.37960	40.71017	1.685593
Median	7.280437	36.72463	1.796202
Maximum	11749.64	132.0264	11.18066
Minimum	-7.796642	5.461268	-3.820174
Std. Dev.	398.2639	21.59859	1.087644
Skewness	24.11119	0.935782	-0.017476
Kurtosis	645.2895	3.631851	7.618906
Jarque-Bera	23474233	220.7873	1207.235
Probability	0.000000	0.000000	0.000000
Sum	48045.49	55284.42	2289.036
Sum Sq. Dev.	2.15E+08	633039.3	1605.291
Observations	1358	1358	1358

List of countries:

Argentina
Barbados
Benin
Bolivia
Botswana
Brazil
Cameroon
Chile
China
Colombia
Costa Rica
Croatia
Dominica
Mauritius
Mexico
Mozambique
Nepal
Nicaragua
Niger
Pakistan
Panama
Paraguay
Peru
Philippines
Poland
Romania

Dominican Republic
Ecuador
Egypt, Arab Rep.
El Salvador
Eritrea
Estonia
Ethiopia
Guatemala
Guyana
Haiti
Honduras
Hungary
India
Indonesia
Iran, Islamic Rep.
Jamaica
Jordan
Kenya
Malawi
Malaysia
Mali
Malta
Mauritania
Russian Federation
Samoa
Senegal
Seychelles
Sierra Leone
Slovak Republic
Slovenia
Sri Lanka
St. Kitts and Nevis
St. Lucia
Sudan
Swaziland
Syrian Arab Republic
Thailand
Togo
Tonga
Trinidad and Tobago
Tunisia
Turkey
Uruguay
Venezuela, RB
Zimbabwe

List of low Income Countries:

Benin
Eritrea
Ethiopia
Haiti
Kenya
Malawi
Mali
Mauritania
Nepal
Niger
Sierra
Leone
Togo
Zimbabwe

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Research Paper Title:

Remittances and Economic Development

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