With a little help from my friends

A study on remittances' impact on economic growth

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Abstract

Received remittances around the world has experienced a large increase during the last decades. This study investigates the effect that remittances have on economic growth, by using annual panel data from 81 countries from the last four decades. In the paper we divide our data into seven different periods to observe the long-term relationship through regression analysis. Our results indicate that remittances have a significant positive effect on the economic growth in the period in which it is received, but the study do not provide any support for economic growth caused by remittances in the previous period.

Keywords: *Remittances, Economic Growth, Panel Data, Development*

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1.   Introduction

The remittances of migrants consist of the funds citizens abroad send back to their source country, as well as the compensation received by employees who work abroad (World Bank, n.d). Many of the recipients of remittances are among the poorest in the world, which can make the increased income extremely important, when it comes to providing necessities and hindering poverty in the receiving country.
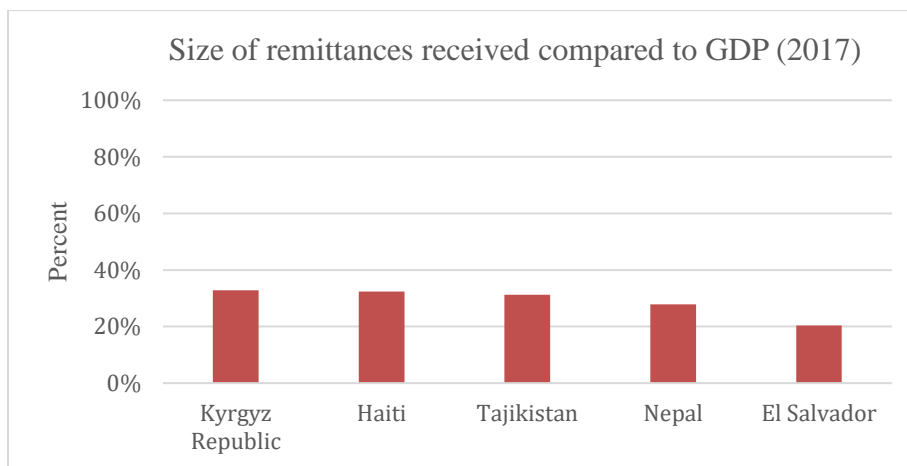
Remittances is a global phenomenon that has been the subject of several studies the last decades, one of the main reasons being the increased size of remitted capital across the world. In 2017, the total amount of remittances received by all countries consisted of $580 billion, in comparison, the total amount of official development assistance received only reached $163 billion (World Bank, n.d). Graph one demonstrated below, shows the average level of remittances sent to developing countries, compared to their GDP. Among the countries in the lowest income group, the remitted capital has increased from around 1,5 percent to 6 since the beginning of the 1980s.

Graph 1, Source: World Bank, Personal Remittances Received
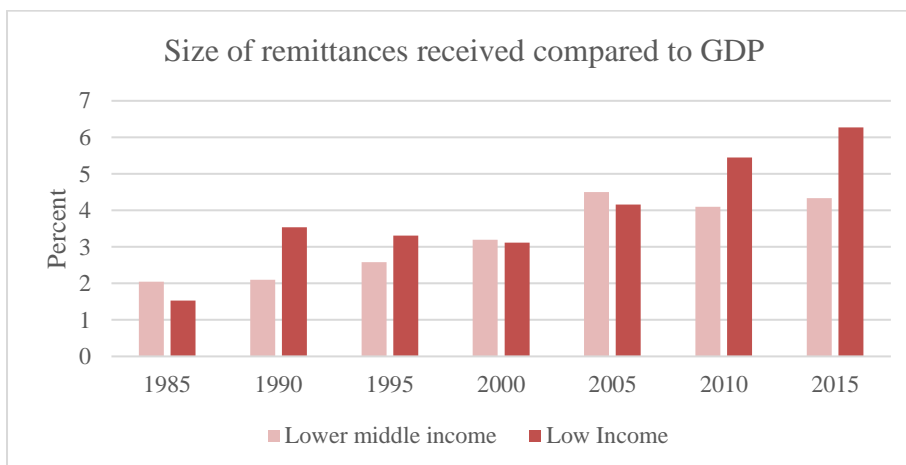
Different countries within the two income groups also differ widely in how much remittances they receive. In graph two, we display the nations with the highest inflows of remittances during 2017, as compared to their GDP. For Kyrgyz Republic, Haiti and Tajikistan the remittances reach up to over 30 percent of the nation's GDP. A quick glance at the graph concludes that the countries are not confined to a single region. Instead, they are spread across several continents, showcasing the fact that remittances are a global phenomenon.

One of the first thoughts about the impact of remittances could be its short-run poverty reducing effect. While this could be one of the reasons remittances are sent, we will in this paper focus on the effect that remittances sent to households have on the long-term economic growth. Our dataset used to analyse the effects consist of remittances received during the last four decades by 81 countries. While we investigate the direct causes that remittances could have on the economic growth, we will also discuss the effects we suspect that remittances could have on other important factors thought to influence economic growth.

Previous studies about remittances and economic growth has mainly been focused on specific regions or countries. With our study consisting of panel data from countries classified as *low income* and *lower middle income* from all around the world, we hope to broaden the view of how remittances effect long-term economic growth in the developing part of the world.

The structure of this paper is as follow: Section two will introduce a background on how remittances can be thought to impact its recipients, as well as a review of previous research on remittances and its impact on economic growth. Section three will introduce a theoretical framework of how we can describe economic growth through several factors which remittances could affect. Section four presents the methodology, where we describe the data and the construction of our regression model. Section five presents a summary of the results we have discovered, as well as analysing and discussing our findings from the view of our previous introduced theories. Section six will conclude our paper and discuss what future research could be done to further broaden the understanding of remittances' impact on growth.

2.   Background

In this section we will present a background on the features of remittances as well as previous studies done on the subject.

2.1.1 Remittances and ODA

Remittances have a lot of similarities to the official development assistance (ODA) received by developing nations. While the ODA sent by developed nations and organisations provide capital and aid meant to finance necessities such as clean drinking water, education and improvement of infrastructure, remittances are mainly sent from relatives and friends living abroad. Yiew et al. (2018) finds a 'U-shaped' connection between official development assistance and economic growth, showing short-run negative effects and long-run positive impact, while suggesting that overdependence on ODA could lead to negative overall impact.

The main difference between remittances compared to aid, is that there generally is no expectation or demand connected to the transaction. While there might be strict regulations and controls on how ODA is to be used, remittances can be considered as an increase of income, leaving the recipients to decide for themselves on how to spend the money.

2.1.2 Health, Economic growth and Remittances

Health is a factor which has been shown to have a positive impact on economic growth (Bloom et al. 2001). While there are several ways to measure the health status of the individuals residing in a country, the life expectancy can be considered as a good indicator of health status (Barro, 1996).

While remittances are not usually marked for spending in certain areas as official development assistance can be, the provision of remittances have been linked to some expenditure on health-related goods and services. Research has shown several positive health-related effects in remittances-receiving households. Among them are lower infant mortality (Ratha, 2013), decreased risk of underweight in rural parts of Indonesia (Lu, 2012) and significant additional health expenditures in Ecuador (Ponce et al. 2011). The value of providing access to preventive and emergency health care can be considered to have a positive effect on life expectancy which in turn can affect the economic growth.

2.1.3 Human Capital, Economic Growth and Remittances

A longer life expectancy will increase the labour stock of the country and provide a greater accumulation of human capital. Individuals who expect to live longer will have a higher return to schooling and therefore increased incentive to complete their education. Accumulated human capital is labour enhancing, increasing the productivity and output of labour, all of which will contribute to the economic growth. Several researchers have studied remittances and its link to human capital. A study of schooling decisions in El Salvador (Cox, et al. 2003) finds that remittances have a significant effect on the decision of staying in school. According to a study of eight countries in a middle-income group, remittances have a significant positive effect on the development of higher education (Arif, et al. 2019). Valatheeswaran et al. (2018) also find a significant positive effect on private school enrolment in India.

Even though several factors of remittances are thought to contribute to human capital, the positive effects of remittances could be decreased by a share of the labour force residing outside of the country. An increase of human capital in the country raises the question of who will chose to migrate. Depending on whether the migrating workforce has a relatively high education, the results could vary. If there is a low rate of return for highly educated workers in the country, there could be a positive selection where the increased human capital caused by education is not used in the remittances-receiving country. This could cause a brain drain, negating the remittances effect due to the high productivity workers departing from the domestic labour market (Roberts, 2004).

One case where this has been observed is presented by Bredtmann et al. (2019). In their paper on economic growth in sub-Saharan Africa, they discover that the individuals who choose to migrate are generally positively selected. This indicates that the educated share of the population could chose to leave the country to achieve higher wages and living conditions abroad.

2.1.4 Poverty, Economic Growth and Remittances

Global economic growth has led to improvements of the everyday life for a large share of the world's population. However, a part of the global population still lives in poverty (World Bank, 2018). Remittances in its simplest form raise the income of the receiving families and can be viewed as poverty-reducing. One study has observed that a 10-percent increase in

remittances per capita will lead to a decline, on average, of 4.7 percent in poverty headcount (Peković, 2017). There is also evidence that the remittance inflow in Pakistan has led to decreased poverty, indicating that remittances could contribute to the economic growth indirectly by acting as a poverty-reducing instrument (Qayyum, et al. 2008).

One theory of why the poverty persists, suggest that it could be attributed to the existence of "poverty traps", hindering economic growth. The theory of the poverty traps suggests that to escape poverty, individuals needs enough income to be able to accumulate human and physical capital. (Chen, 2019). Remittances could in these cases lift the liquidity constraints on households allowing them to climb out of poverty.

2.1.5 Physical Capital, Economic Growth and Remittances.

As shown earlier, remittances could have effects on the investment in education, leading to a higher human capital accumulation. There could also be an effect on the physical capital formation, if the receiver chooses to invest the income received. The investment in productivity enhancing factors can be viewed as increasing the total output, promoting economic growth. Different mechanisms of the source country could be thought to affect this rate of investment. Countries in the low- and middle-income group generally have less developed financial institutions and infrastructure, which can affect both the rate of return of investments and the incentive to avoid consumption.

The choice to invest in physical capital can depend on how easy it is to raise external capital for the households and companies. In countries with non-existing financial resources, remittances received could be the only capital available for investing, this could increase the dependence on remitted capital. The empirical study by Bjuggren et al. (2008) find that "*the use of remittances for investment depends on the institutional quality and the depth of financial intermediation*" and conclude that the financial and social institutions play an important role when considering whether to invest or consume remittances. Thus, the use of remittances for investment could negatively depend on the rate of development of the institutions in the country. The reason for this finding could be that, as the financial markets develop, investors can gather capital through the formal institutions and not rely on remittances. This could indicate that weak institutions could increase the amount of remittances used for investments. Catrinescu et al. (2006) however suggest that developed

institutions can increase the amount of remittance invested as well as the efficiency of the investments made.

2.2 Previous Research on Remittances and Economic Growth

Several previous studies have focused on remittances and its impact on economic growth, but no consensus has been reached on the subject. Some studies have found support for a positive effect, while others have found none, and that there might even be negative effects related to remittances.

Some of the positive findings are described by Jongwanich (2007). In her paper she finds that remittances seemed to have a positive but marginal impact on economic growth. The study shows that an increase in disposable income lead to improvement of domestic investment and human capital. Moreover, her paper stresses the direct connection between remittances and the reduction of poverty, as the people receiving remittance often are among the poorest in the country. Meyer et al. (2017) also find support for economic growth stemming from remittances sent to high-receiving countries in Europe. Guiliano et al. (2009) find that remittances can increase the growth of countries with weak financial institutions as they provide means to finance investment of households suffering from financial restraints.

Support for the theory that remittances may not only be positive has been found by Cosimano et al. (2008). The study finds little evidence that remittances increase economic growth, and that it might even have had a negative effect on it. This suggests that remittances are not intended for investment but rather for consumption and spent on necessities not related to economic growth. It might help decrease poverty, but not contribute to the productivity. Chami et al. (2018) discuss the "remittance trap", suggesting that the massive influx of remittances can cause domestic stagnation partly due to a reduced labour force as the reservation wage rises, but also by the increased consumption. When the remittances increase, the massive inflow of foreign currency to the country can lead to appreciation of the domestic currency. This can reduce the competitiveness of domestic corporations which are dependent on exports, giving rise to the phenomenon called the Dutch disease (Acosta et al, 2009). Rajan et al. (2011) also finds that this worsened competitiveness leads to a decreased manufacturing. As countries get more dependent of the cash flow provided by remittances, they also submit themselves to macroeconomic risks. Signs of the Dutch disease has been found in Pakistan, where the appreciation of the real exchange rate has affected the export

sector (Makhlouf et al. 2013). Rodrik (2008) argues that an overvaluation of the exchange rate is correlated with several different macroeconomic factors which limit growth, and that the undervaluation of the real exchange rate instead can boost the economic growth for developing countries.

2.3 Remittances and Consumption

Previous research and the theory of economic growth presented above give us an idea of how remittances could cause growth if the income is diverted from consumption. The results found from previous research is inconclusive, something which could be caused by not being able to observe all the effects that remittances have on the different channels.

In the previous sections we have discussed several ways that remittances could lead to growth through investment in human capital, physical capital, health and by reducing poverty. Consumption could also be thought of as increasing the short-term growth by stimulating the economy. The evidence from previous research however suggests that there might be macroeconomic risks contained within.

3.   Theoretical model

To study the effect of remittances on economic growth we will use a theoretical model. In the growth model of technology transfer and trade, presented in this section, a key factor to raising a country's *steady state* and the long-term economic growth is through investments.

3.1 Growth Model with Technology Transfer and Trade

In our paper we will use the model of technological transfer and trade to capture the characteristics of developing countries. The model is presented in Jones (2013) and the production function of the model is displayed in equation 1:

$$Y = K^a (hL)^{1-a} \left(1 + \frac{m}{d}\right)^{1-a} \qquad (1)$$

In the production function we view the output as a function of capital (K), labour (L), the labour-augmenting factor human capital (h) and the term for the quantity of traded goods relative to the quantity of domestic goods $\left(\frac{m}{d}\right)$. Capital and labour is as usual represented by the labour force and capital stock in the country. The capital accumulation

function is given by equation 2:

$$\dot{K} = S_K Y - \delta K \qquad (2)$$

The accumulation of investments is viewed as a fraction of GDP minus the depreciation of capital already in place. Capital in this sense is thought of as physical capital which needs replacing and maintenance, which is portrayed by the depreciation term. The growth of labour is given by the labour stock which grows at the same rate as the population:

$$\frac{\dot{L}}{L} = n \qquad (3)$$

Human capital in this model is determined by equation 4:

$$\dot{h} = \mu e^{\psi u} A^{\gamma} h^{1-\gamma} \qquad (4)$$

The equation for the human capital accumulation is given by four different factors. Openness of the country (μ), Exogenously given technological frontier of the world (A), accumulated human capital (h) and education term $e^{\psi u}$. The education term is interpreted as returns from schooling, where u is the average years of schooling in the country and ψ is the quality of the education. Inclusion of μ allows for an interpretation where we can account for the spill-over effects of imported knowledge and technology, depending on how open a country is to the surrounding world. Nations who are more open will have a greater output as they can take advantage of more and more of the frontier technology.

A key assumption of the model is that the output will depend on a nation's ability to adapt and use the world technology. The growth model with technological transfer and trade is a well suited for describing economic growth in developing countries. In it, we assume that the technological growth is given by research and technological progress made in advanced countries, since the developing countries most likely will not have an advanced research and development sector. The steady state for the model is derived and showed in equation 5:

$$y(t) = \left(\frac{S_K}{n+g+\delta}\right)^{\frac{a}{1-a}} \left(\frac{\mu}{g} e^{\psi u}\right)^{\frac{1}{\gamma}} \left(1 + \frac{m}{h}\right) A(t) \qquad (5)$$

As we discussed earlier, the drive for growth in the model is decided by the exogenous world technology. The steady state level will depend heavily on the nation's human capital which is described in the second term. A higher rate of openness and returns to education will increase the nation's steady state. By taking the logs and the derivatives of the production function we can solve for the growth rate of Y. We conclude that the growth rate of the output is ultimately given by the percentual change of the human capital:

$$\frac{\dot{h}}{h} = \mu e^{\psi u} \left(\frac{A}{h}\right)^{\gamma} \qquad (6)$$

From this model we can then conclude that it is possible to increase the short-term growth rate by increasing education, openness, investment and international trade. Long-term growth rate will be pinned down by the technological frontier, as the fraction will decrease the growth rate when *h* grows over time.

The model we are using to analyse the effect that remittances could have on economic growth fits well with our dataset. It focuses on the assumption that the countries analysed will not be part of the frontier research which drives the long-term growth, but instead focus on how well they can adapt to the technology.

4.   Methodology

In this section we will present our data and our empirical model. The specification of the dataset was made with the theoretical model above in mind. With guidance from Meyer et al.'s (2017) study made on remittances, we then construct our empirical model.

4.1. Specification of Data

The purpose of this paper is to investigate the impact of remittances on economic growth. To do so we have used a dataset from World Bank's database *World development indicators (n.d),* consisting of panel data. We have chosen to specify our data to consist of the countries classified as *"low income"* and *"low middle income"* by the World Bank. The reason for this, as discussed before, is that we want to focus on recipient countries with less developed economies. Countries with missing data were dropped leaving us with 73 (71 in regression 3) countries from all around the world, which can be found in the appendix 8.1. Data on remittances have not been collected for long time, which put a constraint on the timeframe for

this study. The database provides data on remittances since the beginning of the 80's and therefore have we chosen to use data from 1983 to 2017 covering 35 years. This sample was then divided into seven different time periods, each consisting of five years. By doing do, we hope to observe the long-term relationship of remittances and growth. The average value of each time period was used in the regression.

Table 1 consists of a description of our data. The choice of independent variables was made based on the previous research and the theoretical model presented earlier. To measure the investments made within a country, we have chosen to use gross capital formation as percentage of GDP. It consists of the outlays made to maintain the level of fixed assets of the economy and the net changes in the level of inventories. According to our theoretical model, investments increases the short-term growth rate. This is also supported by most researchers, Sala-i-Martin (1997) being one of them. Thus, we assume that *inv* will have a positive and significant effect on growth.

Table 1

VARIABLES	
gro	GDP per capita growth, annual and in percent
inv	Gross capital formation as percentage of GDP
gdp_{t-1}	Natural logarithm of initial GDP per capita
tra	Trade as percentage of GDP
oda	Net official development assistance received as percentage of GNI
enr	School enrolment in secondary school as share of total population
rem	Personal remittances received as percentage of GDP

Initial GDP is thought to have a negative relationship with the long-term growth rate (Barro, 1996). This relationship can be explained by the theory of conditional convergence, which states that countries who are far below their steady state are to experience a more rapid economic growth rate compared to countries closer to their steady state (Barro et al. 1992). Hence, we expect gdp_{t-1} to have a significant negative impact on growth.

In order to incorporate our theoretical model better into the study, we wanted to have a variable for openness in the regression. The variable tra is the sum of exported and imported goods as a percentage of GDP, measuring the size of trade with the rest of the world. Trade is considered to increase GDP according to our theoretical model and therefore, we expect that *tra* will have a positive effect on growth in this regression.

Net Official Development Assistant (ODA) consist of loans and aid aimed to promote economic development and welfare in developing countries and territories. According to Yiew et. al (2018) an overdependence on ODA might cause negative impacts on growth. However, ODA provided to improve infrastructure and the education system is thought to improve growth. Thus, it is hard to determine on beforehand how it will affect growth.

Sala-i-Martin (1997) found, that the share of children in education has a positive impact on growth in the long run. We therefore decided to use enrolment in secondary school as share of the population as our measurement of human capital. Since we believe that our results will be closely related to previous studies, we assume that enr will have a positive impact on growth. As measure for remittances we have chosen personal remittances received as percentage of GDP. It consists of the money received by households from abroad, and income of short-term workers who reside in the country but who are employed outside of it.

4.2 Specification of Empiric Model

When constructing our model, we used Meyer et al.'s (2017) model as a base with some modifications to fit our dataset. Taking into consideration the effects of enrolment and ODA may take time before they are detected, we have included lagged variables to acknowledge that there might be a connection between previous periods and the growth in the present one. The reasoning behind this choice, is that ODA consists of programs funded by foreign governments to improve the development of the recipient country. Such programs could for example be to build schools or improve the infrastructure. The impact of the programs on growth will hence be noticed when the school is built or when the infrastructure has been improved. For enrolment it is reasonable to assume that students enrolled in secondary school do not contribute to the production of goods i.e. they do not contribute to growth. However, when they have finished school and start working, they are thought to be more productive than their countrymen who do not have the same level of education.

To investigate the remittances impact on growth in the long-run we will run three different regressions with different time lags of remittances. By doing so we want to see whether remittances are influencing the growth in present period or in future periods. In our theory we brought up the effects that openness towards the world could have on economic growth. To control for this, we run a regression where we use trade as a measure for it. With this reasoning, we constructed the following models:

$$gro_{it} = \alpha_{it} + \beta_1 inv_{it} + \beta_2 oda_{it-1} + \beta_3 enr_{it-1} + \beta_4 gdp_{it-1} + \beta_5 rem_{it} + \varepsilon_{it} \ (7)$$

$$gro_{it} = \alpha_{it} + \beta_1 inv_{it} + \beta_2 oda_{it-1} + \beta_3 enr_{it-1} + \beta_4 gdp_{it-1} + \beta_5 rem_{it} + \beta_6 tra_{it} + \varepsilon_{it}(8)$$

The error terms in all regressions were thought to be heteroscedastic, which was confirmed through a Breusch-Pagan/Cook-Weisberg test in Stata. A Wooldridge test was also performed to test for autocorrelation and according to the result of the test it seems to appear some autocorrelation. If these findings are not accounted for the regressions would be biased. Hence, standard errors were clustered to maintain unbiasedness in the regressions (Hoechle, 2007).

Lastly, before running the regression, a Hausman test was performed to determine whether to use a Fixed-Effect (FE) model or a Random-Effects (RE) model. The difference between them is that a FE model assumes that there is country specific effect that are constant over time. Meanwhile the RE model assumes that countries differs in their error terms, meaning that the variation across countries is random and uncorrelated. According to the Hausman test, a FE model is best suited to describe our dataset (see appendix 8.2 for all tests made).

5.   Result and Discussion

In this section we present our results and findings. We then discuss it with our background and theoretical model as framework.

5.1 Summary of Results

Firstly, it is relevant to mention how the following result should be interpreted. As we have been working with variables in percent, excluding gdp_{t-1}, the result should be interpreted as follows. A one percentage point increase in the independent variable results in an increase in

the dependent variable with β percentage points. For gdp_{t-1}, a one percentage point increase in the independent variable will increase the dependent variable by (β/100) percentage points. Table 2 shows the result from our regressions made with equation 7.

Table 2[1]

VARIABLES	(1) gro	(2) gro	(3) gro
inv	0.077***	0.092***	0.114***
	(0.024)	(0.020)	(0.021)
oda_{t-1}	0.117***	0.067***	0.064**
	(0.029)	(0.026)	(0.031)
enr_{t-1}	0.040***	0.027**	0.028**
	(0.014)	(0.011)	(0.013)
gdp_{t-1}	-1.427***	-1.044***	-0.987***
	(0.357)	(0.283)	(0.343)
rem	0.131***		
	(0.040)		
rem_{t-1}		0.001	
		(0.027)	
rem_{t-2}			-0.038
			(0.025)
Constant	5.991***	4.804***	4.079*
	(2.140)	(1.774)	(2.105)
Observations	324	318	309
R-squared	0.211	0.176	0.205
Number of countries	73	73	71

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As predicted, investment has a positive impact on growth by approximately 0,094, demonstrating the importance of investment within the country. To enable growth a country must invest to maintain and preferably increase the state of its assets. Initial GDP (gdp_{t-1}) has a negative impact on growth as we assumed, of approximately -1,153. This is in favour of the theory of conditional convergence, stating that countries further away from their steady state will have increased economic growth while moving towards it.

As stated earlier we can see that enrolment in secondary school (*enr*) has a lagged positive impact on growth of approximately 0,032. It also seems that Official development assistance (*oda*) has positive significant effect on growth of approximately 0,083 when lagged. With Yeiw Et. Al's (2018) study in mind, it appears that ODA is working as intended, although it could very well be the case that it is working on average but when studying a specific

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[1] Regression 3 consists of only 71 countries due to missing data.

country, the effect of overdependency is more noticeable. When adding trade to the equation, the results are similar, shown in table 3. The only difference between regression one and four is that, in regression four, *tra* has a significant positive effect on growth of 0,031 and *inv* is insignificant.

Table 3

VARIABLES	(4) gro
inv	0.035
	(0.026)
oda_{t-1}	0.132***
	(0.029)
enr_{t-1}	0.037***
	(0.014)
gdp_{t-1}	-1.232***
	(0.363)
tra	0.031***
	(0.010)
rem	0.104***
	(0.039)
Constant	3.624
	(2.346)
Observations	319
Number of countries	73
R-squared	0.215

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Now back to the core of this paper, remittances. According to our findings, remittances have a positive impact on growth of 0,131 in regression 1 and of 0,104 in regression 4. When we run the regression with lagged remittances, we do not see any impact on the economic growth. We find that remittances have a short-term impact on economic growth, boosting it in the period where it is received.

5.2 Discussion of results

Our findings indicate that remittances can have a positive effect on the economic growth when controlling for several different factors. The increased consumption caused by remittances can increase the short-term economic growth. We also find that our control variables for human capital, physical capital formation and trade have a positive impact on economic growth, as suggested by theory.

The result suggests that remittances can increase growth and may help indirectly by increasing the accumulation of human and physical capital. Remittances can also affect the health of the individuals, which in turn can increase economic growth. By investing the money instead of just consuming it, remittances can contribute to the economic growth through these channel as. The increased income from remittances can also allow individuals to escape the poverty trap, which has been considered as a hinder to economic growth.

In our theoretical framework with the model of technology transfer and trade, we also consider openness as a factor which increases economic growth. Keho (2017) shows that trade openness in Cote d'Ivoire has had a significant impact on economic growth, something which we also find in the results of our regression. While we do not consider remittances to cause increased openness, there might be underlying factors which affect both. As people move away from their origin country to work and send money back home it is also possible that knowledge from the host country is spread to the origin country, i.e. promoting ideas and growth.

While we observe the positive effects from remittances sent to developing countries, we limit ourselves to not analysing the differences of the countries included. Different countries will have different characteristics influencing the size of the remittances, as well as how the recipients will use them. Countries with relatively low domestic wages where the labour force choose to emigrate could have a different intent when they send remittances compared to those of refugees who have been forced out of their country.

Previous research that we brought up in this paper has also discussed the negative effects remittances could have. While we found that remittances have a positive effect on the economic growth, we must also consider both the macroeconomic effects which can occur, as well as the political. The case of the Dutch disease could provide long-run effects which are not captured in our model. If the effects of the Dutch disease would outweigh the remittances received, countries could instead of benefitting from the flow suffer from the economic implications. This could be one of the reasons of why the previous research has showed different conclusions.

Instead of seeing remittances as an extra inflow contributing to lift the poorer share of the population out of poverty, it might be viewed as a substitute to government intervention by

politicians. By relying on remittances to the households the politicians can chose to invest the state capital elsewhere and therefore become overdependent on it. The inflow of money to households could also give way to a moral hazard in the country. If remittances provide a great share of the total income, we could observe decreased pressure on governments which might already be weak. Political reforms and changes in policy might be hindered as the individuals can depend on remittances to provide necessities instead of the government. The countries could also experience a reduced labour force if the added income would decrease the incentive to work if the wages are too low. The long run effects of this could be viewed as growth-reducing. Chami et al. (2018) discusses the negative effects remittances have on countries through appreciation of the exchange rate and the moral hazard, and conclude that "*Preventing the two downsides of remittances—Dutch disease and weaker governance—could help countries avoid or escape the remittance*".

While remittances have exploded in the last decades, the transaction costs of sending money abroad remain relatively high (World Bank, 2019). Connections between banks in different parts of the world are not ideal, and the lack of a direct connection between the sending and receiving part will incur fees and security checks, partly attributed to harder regulations and rules regarding money laundering (The Economist, 2019). Money transfer operators (MTO) suffer from strict regulation when transferring money abroad, which could hinder the amount of remittances being transferred. There is also issues where the MTO partners up with the nations post office or commercial banks, allowing them to take out a higher fee and shut out competition in the industry (Knomad, 2017).

Costs of money transfer remain high, and alternative ways for transferring money to avoid the transaction costs are already in place. Remittance systems such as the Hawala-system use informal channels which greatly decrease the transaction costs as well as the security checks which are incurred. In its simplest form, an individual pays a broker in the country of emigration an amount of cash which can then immediately be retrieved by the beneficiary in the country of origin (CMI, 2008). While the Hawala remittance system can help solve some of the issues and costs of money transfer, the lack of regulation which means it could be used for money laundering and financing criminal activity.

The signs of the informal systems indicate that there is room for improvement. As our results indicate that remittances do have an impact of economic growth, it would be in the best

interest of the governments affected to realise the benefits and help facilitate the income received by households through introducing reforms which can lower the cost of sending. A big issue in developing countries is the lack of financial infrastructure, which indicates that improvements for remittances could be made by better financial connections to the developing part of the world, allowing for a smoother and more controlled transaction.

6   Concluding Remarks

In our paper we set out to discuss the effect of remittances on economic growth. We examine which impact the remittances could have directly on the growth, as well as discuss the effects that remittances could have on other factors which are considered to promote it. Through our fixed effect model, we have found support for the theory that remittances can help increase economic growth, and we have found significances showing that both enrolment ratio and gross capital formation has a positive impact on growth. We have also found that the initial GDP of the country has a negative effect on the economic growth, something which we also predict would happen in our model of economic growth. When controlling for openness in our regression we still find a positive impact of remittances.

Furthermore, we discussed the negative effects that remittances could have, through the appreciation of the real exchange rate, as well as the brain drain and labour force reduction, the countries suffer from emigration of the working population. When the emigration of the population is positively selected, the remaining work force in the nation will consist of a larger part of uneducated workers, which could be growth-reducing. While the effects of remittances show an impact on economic growth, it is hard to look away from the fact that most remittances receiving countries do not exhibit the economic growth from which would be expected when the results are estimated (Barajas, 2009). This may partly be due to the several negative effects which we have discussed in the paper, as well as the effects being overestimated. One important note to remember is that the remittances may not be meant to increase the economic growth or be aimed at any long-run effects and investments but may instead be used to prevent poverty and promote consumption, alleviating poverty and increasing the health of the receivers.

Something which would be interesting and provide insight on how remittances are used, would be to study the actual usage of the remittance-receiving households. To be able to see

what the remitted money are primary used for and the effect it could have on the single households. The causes of emigration could be included as a factor when observing how the money is spent, there might for example be differences of usage depending on why individuals have moved outside of their country. The remittances sent by refugees to their home country might be used differently compared to remittances sent by individuals choosing to move abroad to find better paying jobs and working conditions. It would also be interesting to study the impact that governments could have on the remittance flow by decreasing transaction costs allowing for smoother transfers. One example could be promoting competitiveness and getting rid of the partnerships that money transfer operators use.

7 References

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8 Appendix

8.1 Countries

Afghanistan	Guinea	Pakistan
Angola	Guinea-Bissau	Papua New Guinea
Bangladesh	Haiti	Philippines
Benin	Honduras	Rwanda
Bhutan	India	Senegal
Bolivia	Indonesia	Sierra Leone
Burkina Faso	Kenya	Solomon Islands
Burundi	Kiribati	South Sudan
Cabo Verde	Kyrgyz Republic	Sri Lanka
Cambodia	Lao PDR	Sudan
Cameroon	Lesotho	Syrian Arab Republic
Central African Republic	Liberia	Tajikistan
Chad	Madagascar	Tanzania
Comoros	Malawi	Timor-Leste
Congo, Dem. Rep.	Mali	Togo
Congo, Rep.	Mauritania	Tunisia
Cote d'Ivoire	Moldova	Uganda
Egypt, Arab Rep.	Mongolia	Ukraine
El Salvador	Morocco	Uzbekistan
Eritrea	Mozambique	Vanuatu
Eswatini	Myanmar	Vietnam
Ethiopia	Nepal	West Bank and Gaza
Gambia, The	Nicaragua	Zimbabwe
Georgia	Niger	
Ghana	Nigeria	

8.2 Econometric Test

Regression 1, 2, 3

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of gro

        chi2(1)      =        6.21
        Prob > chi2  =      0.0127
```

```
. xtserial gro rem inv lagoda lagenr laggdp

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      54) =        3.314
           Prob > F =       0.0742
```

```
.
```

```
hausman fixed random
```

| | ── Coefficients ── | | | |
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
	fixed	random	Difference	S.E.
rem	.1310318	.066761	.0642708	.0266615
inv	.0774851	.0861217	-.0086365	.0146861
lagoda	.1171686	.0353973	.0817713	.0193837
lagenr	.0400932	.0326141	.0074791	.0101327
laggdp	-1.427352	-1.225728	-.201624	.2294998

```
                b = consistent under Ho and Ha; obtained from xtreg
        B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

            chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =        29.10
        Prob>chi2 =       0.0000
```

Regression 4

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of gro

        chi2(1)      =        3.65
        Prob > chi2  =      0.0560

.

. xtserial gro inv lagoda lagenr laggdp tra rem

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       53) =        6.908
            Prob > F =      0.0112

.

. hausman fixed random
```

	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
inv	.0354632	.074775	-.0393118	.0159577
lagoda	.1321675	.0395583	.0926092	.0188575
lagenr	.0368124	.0328922	.0039202	.0096315
laggdp	-1.231531	-1.245165	.0136336	.229134
tra	.0305161	.0045704	.0259457	.0081638
rem	.1042808	.0559019	.0483789	.0243065

```
                    b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

            chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =        36.78
            Prob>chi2 =      0.0000
```