Panel Data Analysis of the Relation between Aid and FDI

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Supervisor: Jean-Marie Viaene

Name: Wilco van der Ham

Student number: 345961

E-mail address: wilco_vdham@hotmail.com

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Abstract

This thesis applies a panel data approach with more than 100 countries to analyse the relation between aid and Foreign Direct Investments (FDI). While research on the effects of official development aid (ODA) as a whole is abundantly available, this thesis distinguishes itself by analysing the effects of aid flows that are intended for human capital, infrastructure or physical capital. Economic theory predicts a positive relation between human capital, infrastructure and FDI, and a negative relation between physical capital and FDI. It appears from the empirical analysis that the general relation between aid flows and FDI is not convincing. By dividing the sample into sub-samples according to income or location, it appears that the relation is strong in some specifications. This gives use to the conclusion that the aid-FDI relation is present in some cases and not in others, which means that local characteristics have a decisive influence on this relation.

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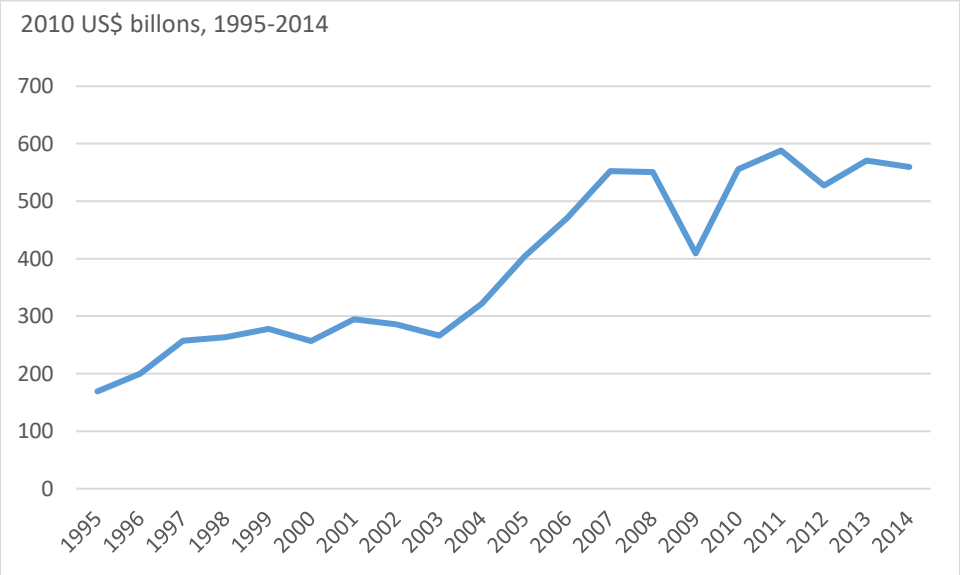
1. Introduction

In a world of increasing globalization it is still a challenge for poor countries to participate. Multinationals are always looking for new opportunities of investments and when profit opportunities are within reach they certainly will locate in new countries to use cheap labour and serve new markets. Graph 1.1 shows that since 1990 Foreign Direct Investment (FDI) is increasing in developing countries, but it is still highly concentrated: 10 countries account for 70% of all receipts by developing countries (Development Initiatives, 2013).

Graph 1.1 FDI level in developing countries



Source: own calculations based on data from the World Bank.

Policymakers in general agree that FDI stimulates the transfer of technology, stimulates economic growth in host countries and increases employment (Hansen and Rand, 2006). This leads to the view of the United Nations (2003, p. 9), that it is important to create both domestic and international conditions that contributes to direct investment flows. That makes the relation between aid and FDI relevant, because policy makers can decide how to spend aid. If their goal is to attract more FDI to a country, they can spend aid in a sector that is complementary to attract FDI. Poor countries often face lack of infrastructure and a low level of human capital, which

prevent huge companies from opportunities to make profit. In this situation, aid can make a difference. Aid can contribute to increase infrastructure or human capital investments. These investments will not be paid by private investors or by governments that face low budgets. These investments could make the country more attractive to private investors. At the same time, aid that competes with private capital can lead to an outflow of capital.

This thesis investigates the relation between aid flows and the level of FDI. Economic theory predicts that aid spend on human capital or infrastructure has positive impact on the level of FDI and that aid spend on physical capital has a negative effect on the level of FDI. The results from the empirical analysis are mixed. Only aid spend on human capital has a convincing positive impact on the level of FDI. When the sample is divided in sub-samples according to income or location, it appears that the relation is present in some specifications. This shows that there could be an effect of aid on FDI, but that other characteristics have impact on this relation.

The thesis is organized as follows. After the introduction, the literature is reviewed: the literature about aid, the theory about the relation between aid and FDI and finally the empirics about this relation. From this literature the testable hypotheses will be derived. Section three describes the data and methods followed by a section that discusses aid effectiveness. The empirical results will be discussed in the next section and the final part is a conclusion.

2. Literature Review

Both foreign aid and FDI are topics of interest to many researchers. An overwhelming amount of research is available about both FDI and aid related with development. Surprisingly, there are only a few papers available that investigate the relation between aid and FDI. This thesis will add to the small amount of research that is available. In this section the available literature will be discussed. First, to get a better understanding of the effects of aid, the background of aid is depicted followed by the pros and cons of aid. After that, papers regarding the economic theory about the relation between aid and FDI will be discussed followed by a discussion of papers with empirical research about this relation. Finally, resulting from the content of these papers, the hypotheses of this thesis will be derived.

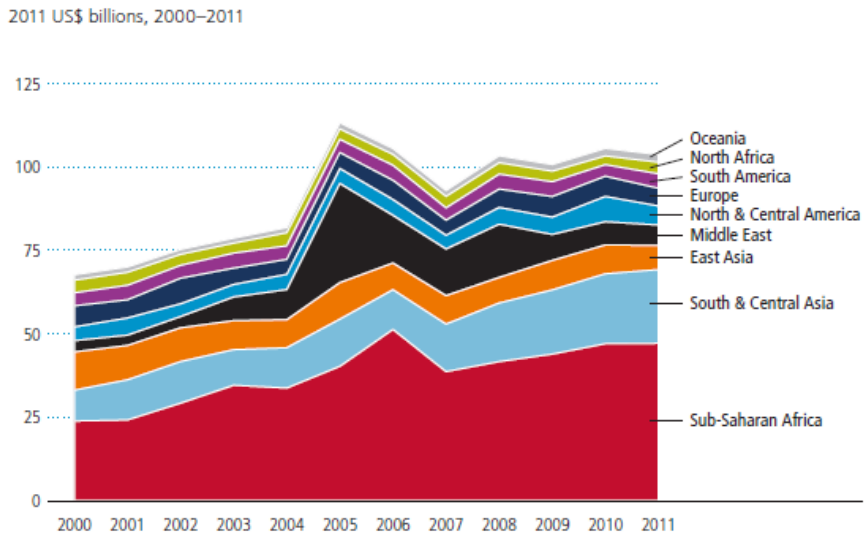
2.1 What is Aid?

Aid can be either publicly or privately funded. A major part of aid is official development aid (ODA). ODA is aid that is provided by official agencies. The official goal is the promotion of economic development in development countries. Does this aid help? Many studies investigated the relation between ODA and economic growth and the outcome is not decisive. One influential paper about aid and growth is written by Burnside and Dollar (1997). They argue that aid spend on countries that have an environment with good policies will result in a positive growth effect and that aid spend on countries with an environment of bad policies will not result in a growth effect. The intuition is that corruption ensures that aid will be wasted instead of spend on the intended projects. This paper had a major impact on the public opinion and even policies were based on this result. A few years later Easterly (2003) evaluated this research and concluded that the outcome from Burnside and Dollar (1997) is not robust against an extended dataset and a different specification. He found no significant relation between aid and growth. This shows that it is difficult to draw conclusions about the relation between aid and growth. Many others like Angeles and Neanidis (2009), Dalgaard and Hansen (2001), Rajan and Subramanian (2005) and Roodman (2007) studied this relationship, where some conclude that there exists a positive relation and some that there is no relation.

While the official goal of ODA is the promotion of economic growth, there could be other effects that resulted from ODA flows. One of these possible effects is that ODA could impact a country's attractiveness to receive FDI flows. The possible relationship between these two variables will be discussed in the next section.

Below the numbers of ODA will be discussed. ODA has risen between 2000 and 2011. Graph 2.1 shows the levels of ODA to different continents over time. ODA to sub-Saharan Africa and South & Central Asia has increased over the last years while ODA to the Middle East has decreased.

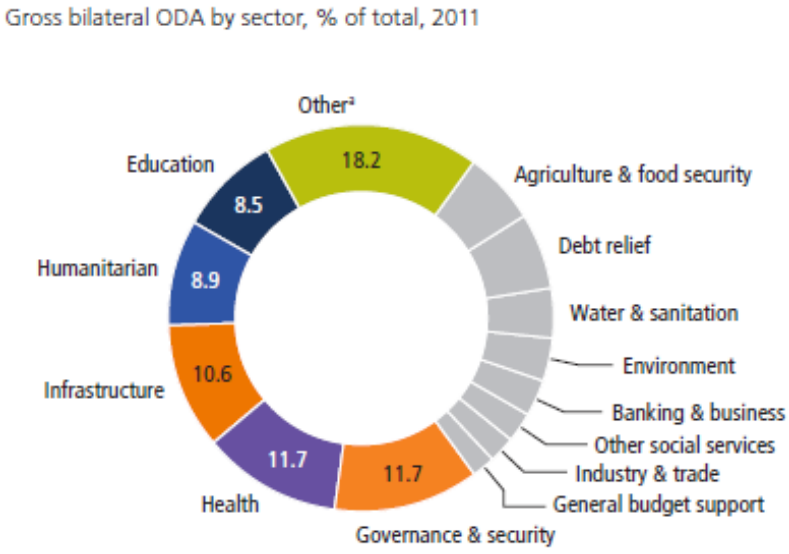
Graph 2.1 Level of ODA by continent



Source: Development Initiatives (2013).

Graph 2.2 shows percentage of aid by sector. Health, infrastructure and governance & security receives the highest funding in 2011, every sector accounting for more than 10%.

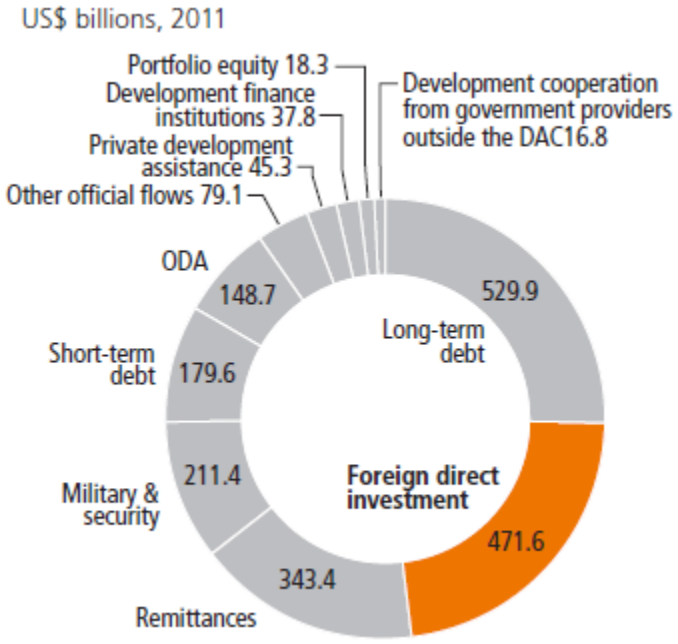
Graph 2.2 ODA by sector



Source: Development Initiatives (2013).

Besides ODA there are many other flows to developing countries. Graph 2.3 shows the levels of several flows to developing countries in the year 2011. The graph shows that FDI flows are bigger than ODA flows. FDI has a level of 471.6 billion, while ODA has a level of 148.7 billon. Another aid flow is private development assistance. This flow is significantly lower than ODA, but still of sizable amount. This thesis uses only ODA in the empirical analysis, because suitable data of private aid is not available. Private development assistance is expected to have the same effect as official development assistance.

Graph 2.3 Resource flows to developing countries



Source: Development Initiatives (2013).

2.2 The pros and cons of Aid

Aid is needed for several reasons. The best reason is definitely that many people are living in terrible circumstances and do not have the power to help themselves. Examples of these circumstances are poverty, disasters and war. These people need help from outside to improve their living conditions. After a disaster emergency aid saves lives and is necessary to build up livelihoods again. Another advantage of aid is that it can help to improve production, for example

in the agriculture sector. By using new techniques farmers can get a higher yield which can decrease poverty. Another example is that aid can help to improve healthcare by providing medical training, medicines and equipment.

Many people who are living in good conditions want to help these poor people, that is why governments of rich countries give away money to help poor people. Unfortunately for the poor, many other interests play a role in the decision how much money and in which way the money is spent. Although morality, ethics and altruism convince rich countries to donate money, self-interest is an important factor that influences the decision how to spend the money. Poverty has negative consequences like a higher probability of war and a higher chance to spread diseases. Examples of self-interest for rich countries are avoid these conflicts that could harm the aid giving country and fight diseases that could spread to the aid giving country as well. Besides these general self-interest motives, aid donating countries can get benefits by making deals with the aid receiving countries, to get something in return for the given aid. This is called tied aid: offering bilateral aid on the condition that money should be spent on the donor's products and services. This is very inefficient, since a developing country could usually get more value buying elsewhere. Another example of self-interest can even be: trying to get more political influence in the region.

A disadvantage of aid is that much is wasted. Researchers like Easterly (2003) argue that aid is often wasted and sometimes doing even more harm than good. A corrupt regime can prevent aid from reaching their intended destination, local civil servants can use it for themselves. Another disadvantage is that aid could increase the dependency of developing countries on donor countries. Sometimes aid is partly a loan, and countries can struggle to pay this loan back. Another disadvantage is that aid can have a huge impact on the local market. If a lot of food overflows the market, local farmers cannot sell their food anymore.

2.3 The relation between Aid and FDI

An important contribution regarding the theoretical relation between aid and FDI is the paper by Selaya and Sunesen (2012). They developed a theoretic model about this relation. They set up a Solow model that explains output per capita (y). Output is determined by two terms: physical

capital per capita (k) and a factor that is complementary to physical capital (A). This provides the following equation:

$$y_t = Ak_t \quad (2.1)$$

Aid contributes to the economy in two ways in this model. It contributes to the complementary factor A or to physical capital k. Complementary factors include infrastructure and education and physical capital includes investments in production sectors. The first effect of aid in this model is described by changes in physical capital. When capital mobility is not restricted, the marginal product of capital (MPK) should be at the same level in all countries. When capital flows into the economy, the MPK will decline. This will lead to movement of other capital because the return on capital is smaller (Caselli and Feyrer, 2007). The result is that if aid is spent on projects that could have been financed by the private sector the MPK decreases and other capital leaves the economy. This result reflects a negative relation between foreign aid and FDI. The second effect of aid is described by changes in complementary factors A. Aid spend on better technologies, infrastructure or public institutions increases A. This results in a rise of the MPK and consequently more FDI will flow to the economy. However, as a result of the higher A, aggregate income (y) increases as well. This results in higher domestic savings, which subsequently results in a lower MPK and therefore less FDI will flow to the economy. It is not clear which one of these two effects dominates, so the combined effect is in theory ambiguous. Aid spend on physical capital k has a negative influence on attracting FDI and aid spend on complementary factors A has an ambiguous effect on the level of FDI. As a result, this theory does not expect a certain outcome of the relationship between aid and FDI. However, it reveals that the effect of aid depends on the destination of aid. According to this theory, aid should be spent on complementary factors if the goal is to attract more FDI.

The model above shows that “complementary aid”, is the part of aid that is expected to have a positive relation with FDI. Complementary aid is defined as aid spent on human resources and infrastructure. The model above captures an endogenous growth effect. One channel of aid leading to FDI is through human capital. Bowen et al. (2012) contributed to this topic by

explaining that growth could be driven by human capital accumulation within an endogenous growth model. Growth is influenced by both physical and human capital. An endogenous growth model is illustrated by the following:

$$y(t) = f\big(k(t), h(t)\big) = Ak(t))^{\alpha} h(t)^{1-\alpha} \quad 0 < \alpha < 1 \tag{2.2}$$

In this formula y(t) represents output per worker, h(t) is human capital per worker, k(t) is physical capital per worker, A is a productivity parameter and α is the share parameter of the k factor. This single commodity is used for consumption or for accumulation of the stock of physical capital. The marginal product of the k factor is represented below:

$$f_k' = \alpha A \left(\frac{h(t)}{k(t)}\right)^{1-\alpha} \tag{2.3}$$

$f_k' = \partial f / \partial k$. From the formula above it follows that $\partial f_k' / \partial k < 0$ and $\partial f_k' / \partial h > 0$. When k(t) accumulates it depends on the effect on h(t) whether the marginal product of k decreases or increases. When h(t) accumulates no slower than k(t), the marginal product of f_k' will not be decreasing and consequently, long-run growth can be sustained.

2.3 Empirics about relation Aid and FDI

Besides their theoretical contribution Selaya and Sunesen (2012) performed an empirical research as well. They tried to investigate whether or not ODA has a catalysing effect on FDI. They found that aid complementary to attracting FDI has a positive effect on FDI and aid that is substitutional crowds out FDI. Together this effect is positive as well. This result provides the policy recommendation that more aid should be spent on aid that is complementary to physical capital. They extended their research to a broader definition of complementary aid than they used in their previous estimation. Originally they used aid oriented to social infrastructure (like education and health) and economic infrastructure (like energy, transportation and communication projects), but they extended this by Technical Cooperation Grants as well. These grants are aimed at contributing to human resources, so are arguably complementary aid. This extension of the definition of complementary aid does not influence the result. Furthermore,

they controlled for allowing for perfect capital mobility. In their theoretic model this is not the case, so in their initial empirical analysis perfect capital mobility is assumed as well. The results appear to be robust against this assumption. Finally, they controlled for regional fixed effects and traditional FDI correlates and the results appeared robust.

Bhavan et al. (2011) investigated the same relationship focusing on South Asian economies. They used the same approach as Selaya and Sunesen (2012) by evaluating the effect of aid spent on physical capital and human capital and infrastructure. They mentioned that the relation between aid and FDI depends on local characteristics. One example is strong economic growth. This is an important factor that supports strong potential for FDI. Furthermore, supportive institutions and liberalization policies during 1990s and early 2000s supported the level of FDI. Although FDI has increased, it is still below the level of other regions. One reason that could hamper the inflow of foreign capital, is poor infrastructure. Foreign aid can play a vital role when it is used to improve the infrastructure and, as a result, more FDI could flow to the region. Bhavan et al. (2011) test this hypothesis by dividing aid into the two broad categories: aid spent on physical capital and aid spent on human capital and infrastructure. Surprisingly, the result is that both categories of aid have a positive relation with FDI in the analysed region.

The two studies mentioned above split aid in two components to measure the possible substitutable or complementary effect of aid on FDI. Other researchers did not split aid, but used ODA as a whole in their analysis. Karakaplan et al. (2005) used ODA in a panel data setting with many countries. They provided three comments that are important in the relation between aid and FDI. The first one is that the aid-FDI relation is important in the aid effectiveness discussion. The relation between aid and economic growth has been researched extensively with ambiguous results. Some studies suggest that local conditions as macroeconomic policies or financial markets are important factors that influence the effectiveness of aid (Burnside and Dollar, 1997). The second comment includes a question whether or not official financing will eventually be replaced by private financing. Aid-recipient countries could use this money efficiently and having implemented first and second-generation reforms, they can attract more FDI that replaces the aid flows. The third comment is that aid flows could have an effect on the institutional quality of

a country. Knack (2001) and Alesina and Weder (2002) showed that aid flows could impact governance. This is mainly the result of the nature of capital flows. Aid flows generate rent, which could lead to rent seeking activities and deadweight losses. These flows intermediated by the private sector would be a better option, because private managerial control is probably more efficient than official assistance control. The last comment elaborated that loans have become increasingly comprehensive to include private sector enabling reforms. In view of these arguments, Karakaplan et al. (2005) hypothesised that aid will lead to a higher level of FDI only in cases of good governance and the development of financial markets. Their findings supported this hypothesis: both good governance and the development of financial markets contribute to the impact of aid on FDI flows.

Harms and Lutz (2006) contributed to this topic by including the political and institutional framework in their analysis. They investigated whether countries that received more aid ceteris paribus also received more private foreign investments in the 1990s. For their analysis they used a large number of emerging and developing countries during these years. In theory, aid can increase or decrease a countries' attractiveness for foreign investors: investments in infrastructure can increase the productivity, but aid can also incentives for unproductive rent-seeking. This rent-seeking effect might be stronger in countries with a repressive political regime and insecure property rights. The analysis of Harms and Lutz (2006) investigates this possibility by including an interaction term between aid and variables that measure the quality of governance. Surprisingly, they found that this interaction term is negative. Although the marginal effect of aid on FDI is almost zero for countries with average institutional characteristics, it is positive in countries facing a high regulatory burden. This shows not that a regulatory burden leads to more FDI, the empirical results show a clear negative relation, but that the 'catalysing effect' of aid on FDI is greater in economies with an unfavourable institutional environment.

The papers mentioned above performed macro analyses with many countries together. However, some other researchers performed micro analyses. One of them is Blaise (2005). She studied the relation between Japanese ODA and FDI in China, using province level statistics from 1980 to 1999. Conditional logit analysis showed that the destination of aid had a significant effect

on private investment location choice. Another micro analysis is performed by Carro et al. (2010). They investigated the aid FDI relation for Argentina and Brazil. One interesting finding is that the main donors are the main investors as well. They could not find a systematic relation between ODA and FDI flows.

2.4 Derivation of testable hypotheses

To provide more insight in the relation between aid and FDI several hypotheses have been derived. Spending of aid on three different components will be evaluated: aid spent on physical capital, human capital and infrastructure. Therefore the research question of this thesis states: What are the effects of aid flows with different destinations on FDI? This question results in three hypotheses:

First hypothesis H_a: **The relation between aid spend on human resources and FDI is positive.**

Second hypothesis H_a: **The relation between aid spend on infrastructure and FDI is positive.**

Third hypothesis H_a: **The relation between aid spend on physical capital and FDI is negative.**

While aid spent on human resources and infrastructure have an expected positive impact on FDI, aid spent on physical capital has an expected negative effect. These hypotheses will be tested in the short-run and the long-run, because it can take some time before the effects of the aid flows results in a higher or lower attractiveness to FDI flows. To evaluate the relation between aid and FDI at a more detailed level the sample will be divided according to income and location.

3. Data and Methods

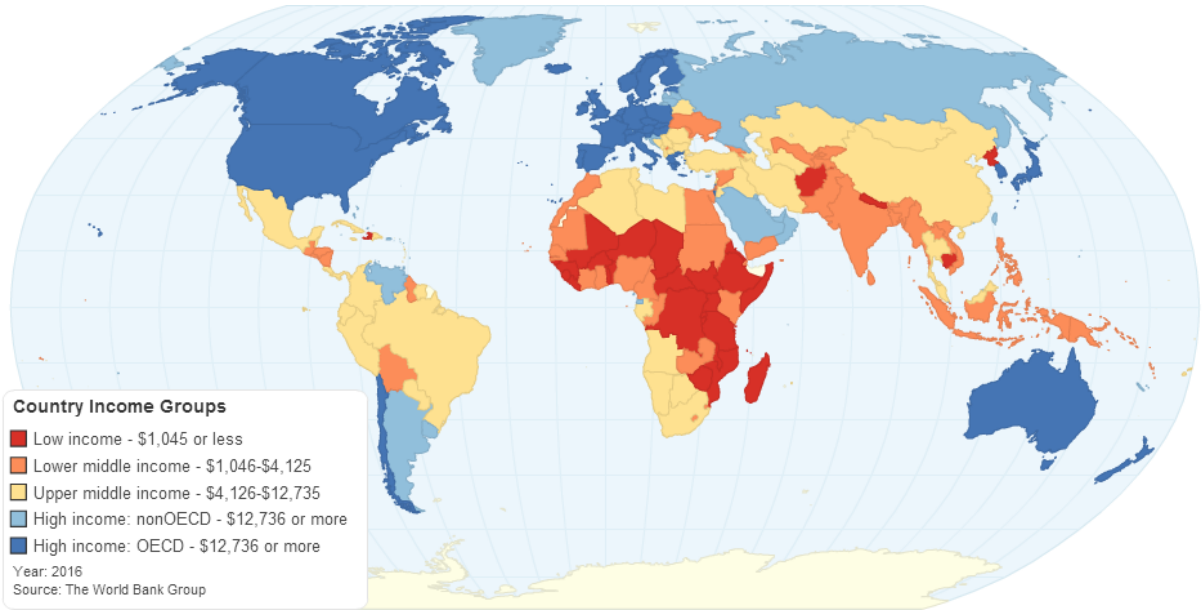
3.1 Data

The data is drawn from three sources. The data about FDI is drawn from the World Bank Development Indicators database. This series provides the net FDI inflows per capita (new investments inflows less disinvestment). Both FDI and aid flows are per capita to control for size of the population. The data about aid flows are drawn from the Creditor Reporting System (CRS) database from the OECD. This database classifies ODA into seven categories. Three of them are used to analyse a possible relation with FDI. The first is aid spend on human capital, Aid_h, which is classified as Social Infrastructure and Services in the CRS database. Examples of social infrastructure are health and education. The second category is aid spend on infrastructure, Aid_i, which is classified as Economic Infrastructure and Services in the CRS database. The last one is aid spend on physical capital, Aid_k, which is classified as Production Sectors in the database. The data is drawn from the database in current prices and then calculated to constant 2010 prices by use of a GDP deflator. Table 3.1 shows an overview of these variables. Besides these variables some control variables are included as well. These are GDP growth (GDP), trade openness index (TO), population growth (POP), control of corruption (COR) and a dummy that indicates the effect of the financial crisis(FIN). All data of the control variables except COR are drawn from the World Bank. The data about COR is drawn from the Worldwide Governance Indicators project. Furthermore, COR is interacted with all aid flows to control for the influence of corruption on the effectiveness of aid. In the section Aid Effectiveness the last four variables will be explained: CPIAHR, EDUSEC, Portquality and Capital.

Table 3.1 Description of variables

Name	Description	Source
FDI	FDI net inflows per capita, constant in US 2010 dollars.	World Bank Development Indicators, World Bank
Aid_h	Aid flows spent on human capital per capita in constant US 2010 dollars. Categorised as Social Infrastructure & Services in Creditor Reporting System (CRS).	Creditor Reporting System, OECD
Aid_i	Aid flows spent on infrastructure per capita in constant US 2010 dollars. Categorised as Economic Infrastructure & Services in CRS.	Creditor Reporting System, OECD
Aid_k	Aid flows spent on physical capital per capita in constant US 2010 dollars. Categorised as Production Sectors in CRS.	Creditor Reporting System, OECD
GDP	GDP growth per year per capita in percentages.	World Bank Development Indicators, Wold Bank
TO	Trade openness index. Imports+exports divided by GDP.	World Bank Development Indicators, Wold Bank
POP	Population growth per year in percentages.	World Bank Development Indicators, Wold Bank
COR	Control of Corruption. Index between -2.5 (bad governance) and 2.5 (good governance) that reflects the control of corruption.	Worldwide Governance Indicators project (WGI). Aggregate indicator based on more than 30 data sources.
FIN	Dummy to measure the impact of the financial crises. 1 for period 2007-2010 and 2008-2011 and 0 for other periods.	Own calculations
Aid_h*COR	Aid flows spent on human capital interacted with control of corruption.	Own calculations
Aid_i*COR	Aid flows spent on infrastructure interacted with control of corruption.	Own calculations
Aid_k*COR	Aid flows spent on physical capital interacted with control of corruption.	Own calculations
CPIAHR	Country Policy and Institutional Assessment (CPIA) building human resources rating (1=low, 6=high).	World Bank Development Indicators. CPIA rating developed by International Development Association which is part of the World Bank.
EDUSEC	The percentage of the population aged 25 and over that attained or completed lower secondary education.	World Bank Development Indicators, Wold Bank
Portquality	Quality of port infrastructure index (1=extremely underdeveloped, 7=well developed).	World Bank Development Indicators, Wold Bank
Capital	Gross Capital Formation in constant 2010 dollars per capita.	World Bank Development Indicators, Wold Bank

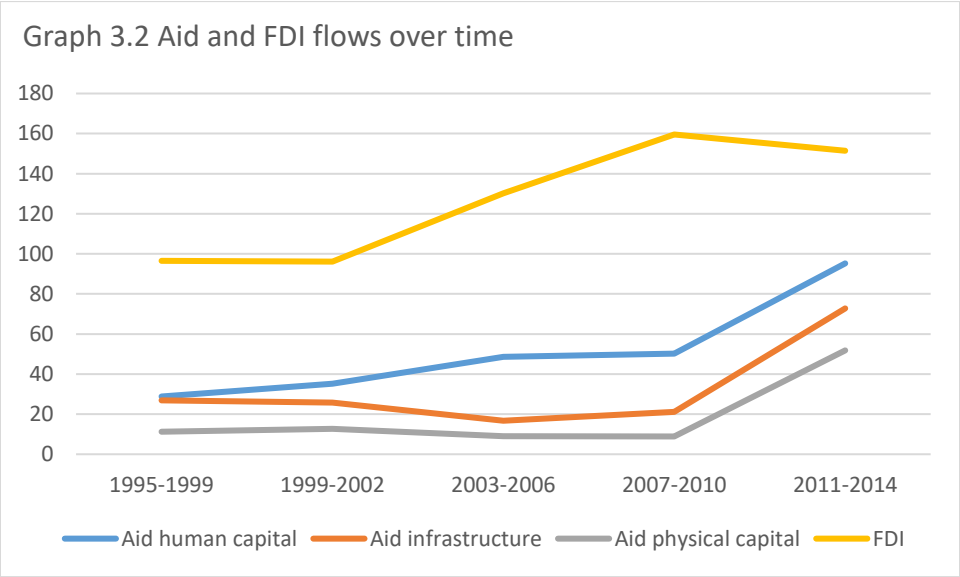
Graph 3.1 Map of country income groups



In the analysis all low income, lower middle income and upper middle income countries with appropriate data are included. For some countries the required data is not available, so these countries are excluded from the analysis. In particular data concerning aid flows are not available for all countries, especially very poor countries or countries that have been involved in war. In total 111 countries are included in the analysis. On the map above it is visible which countries belong to a particular income group. Most countries used in the analysis are located in Africa, South-America or Asia. Following the general approach in the literature, the data is averaged over 4-year intervals, to avoid short-term volatility in the flows. In the analysis a rolling window approach with moving averages is performed. The dataset contains data between 1995 and 2014, which results in 17 moving averages: 1995-1998, 1996-1999, 1997-2000 and so on. The CRS database provides no data before 1995.

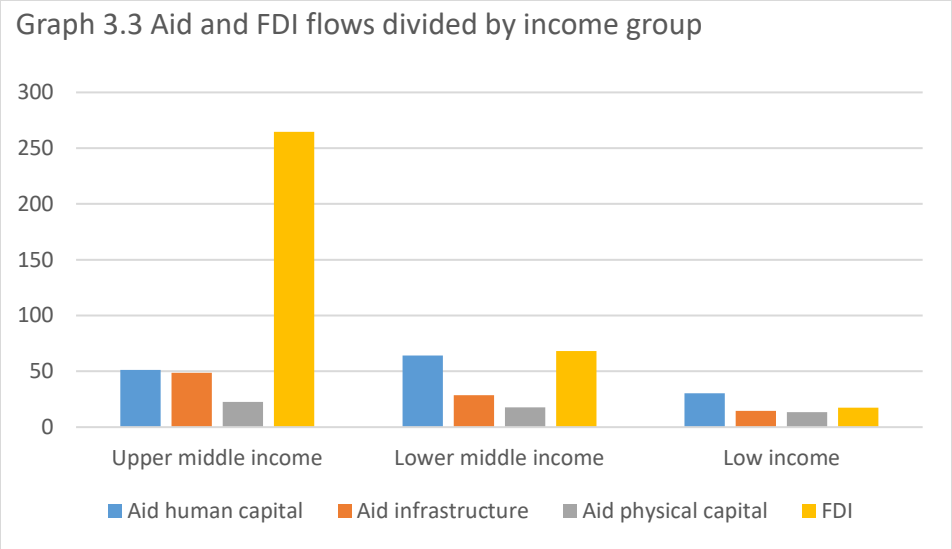
3.2 Patterns

This section provides the levels of aid and FDI flows. The graphs below show these numbers, which are based on the dataset that is used. A table with a numerical overview is included in the appendix.



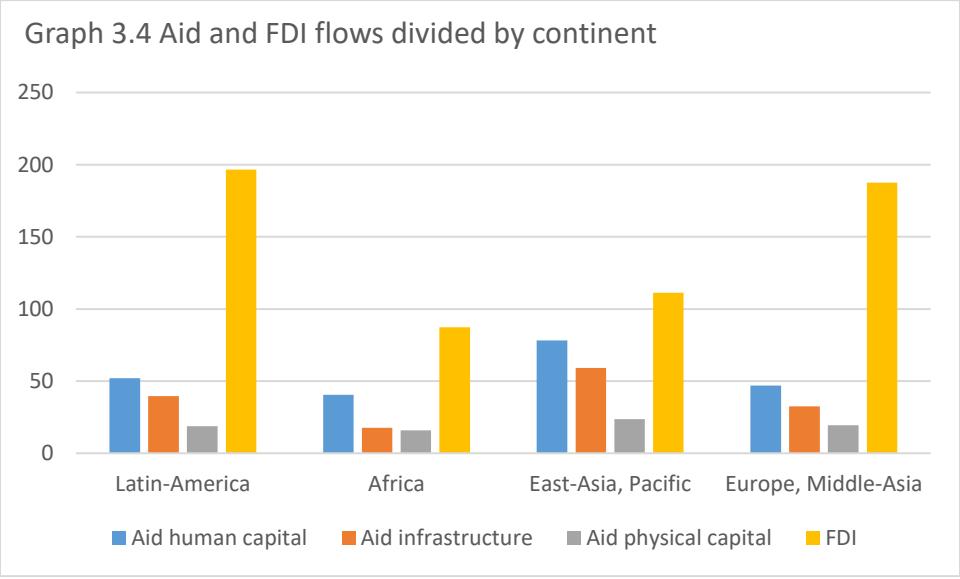
Source: own calculations based on data from the World Bank and CRS. Notes: vertical axis shows the level of the flows in constant 2010 dollars. The number shows the average to a country per capita per year.

The graph above shows the flows of aid to the different sectors and the FDI flow. The FDI flow shows the increase in the level of FDI, so this graph shows that FDI is always increasing between 1995 and 2014. After 2010 the upward trend is going down, possibly as a result of the financial crisis. The graph shows that aid spent on human capital is the highest aid flow. The highest level is reached in the period 2011-2014 with on average around 100 dollar per capita per year spent on human capital. Aid spent on infrastructure is the second highest aid flow and aid spent on physical capital is the lowest flow. Remarkable is that during the last period the numbers are significant higher.



Source: own calculations based on data from the World Bank and CRS. Notes: vertical axis shows the level of the flows in constant 2010 dollars. The number shows the average to a country per capita per year.

Graph 3.3 shows the levels of aid and FDI flows divided by income groups. FDI is clearly the highest in the upper middle income group, so it is clear that poor countries attract a low level of FDI. Aid flows are more equal over income, but are still the highest in the upper middle income group.



Source: own calculations based on data from the World Bank and CRS. Notes: vertical axis shows the level of the flows in constant 2010 dollars. The number shows the average to a country per capita per year.

Graph 3.4 shows the differences between continents. Remarkable is that aid flows are significantly higher in East-Asia, Pacific. The flow of FDI is the highest in both Latin-America and Europe, Middle-Asia.

3.3 Table with expected signs

The theory part of the chapter with current literature elaborated about the expected signs of the aid variables. The table below summarizes these results. Aid spent on human resources or infrastructure is expected to have a positive relationship with FDI and aid spent on physical capital is expected to be negatively related.

Table 3.2 Expected signs of aid variables

Aid human resources	+
Aid infrastructure	+
Aid physical capital	-

3.4 Correlation matrix

Table 3.3 shows the correlation between the aid variables. The correlation between all variables is of a significant level. This correlation can have an influence on the regression output, so this will be controlled for by estimating the regression both with separated aid flows as well as with all aid flows together.

Table 3.3 Correlation matrix

	Aid human resources	Aid infrastructure	Aid physical capital	GDP
Aid human resources	-	0.598	0.440	-0.034
Aid infrastructure	0.598	-	0.523	-0.026
Aid physical capital	0.440	0.523	-	-0.078
GDP	-0.034	-0.026	-0.078	-

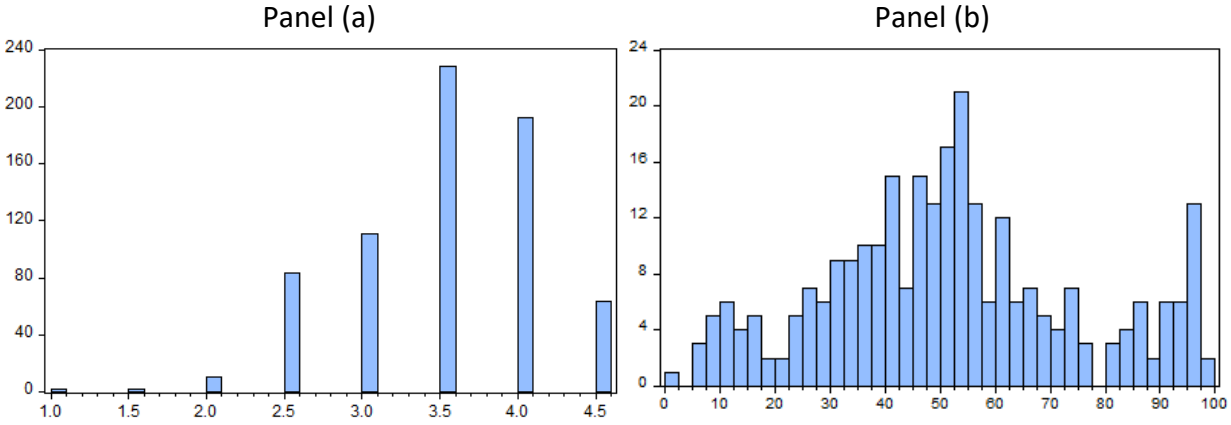
4. Aid Effectiveness

The channel of aid that impacts FDI is through human capital, infrastructure or physical capital. A question is whether or not aid reaches the intended destination and has an impact on human capital, infrastructure or physical capital. Only if this is the case, it is possible that these aid flows have an effect on FDI. This section describes an attempt to measure the effect of the aid flows on human capital, infrastructure and physical capital. Because human capital and infrastructure indicators do not provide data information for every year and country, this analysis is performed by a year to year analysis instead of averages over 4 years. The panel analysis includes country fixed effects to control for the differences between countries.

Aid spent on human capital is the first aid flow that is tested on its effectiveness. Two dependent variables are used to test this effect: CPIAHR and EDUSEC. CPIAHR is an index that describes the building of human capital in a country. The Country Policy and Institutional Assessment(CPIA) index has a value between 1(low) and 6(high) and is composed by staff of the World Bank. The index consists of many indicators varying from national policies to public and private sector service delivery that influence the access to and quality of health and education services. The average of all of these indicators is the final index. EDUSEC is a variable that measures the percentage of people above the age of 25 that has at least an educational degree in lower secondary education. Two different dependent variables are used, because both of the variables do not contain data of every country and year. By using two dependent variables more available data is captured.

The distribution of the CPIAHR variable and the EDUSEC variable is shown in graph 4.1. The left side shows the distribution of the CPIAHR variable and the right the distribution of the EDUSEC variable. The CPIAHR index varies between 1 in Zimbabwe and 4.5 in a lot of countries, for example Georgia and Sri Lanka. The percentage of lower secondary education attainment varies between 2 percent in Burkina Faso and 99 percent in Uzbekistan.

Graph 4.1 Panel (a): CPIAHR distribution. Panel (b): EDUSEC distribution.



Source: own calculations based on data from the World Bank. Notes panel (a): The horizontal axis shows the index value of the CPIAHR index and the vertical axis shows how many times this value occurs. Notes panel (b): The horizontal axis shows the percentage of the EDUSEC variable and the vertical axis shows how many times a percentage within the range of a bar occurs.

The effect of aid flows are analyzed in the same period and one year later, because it will take some time before the aid flows result in a better level of human capital. The output in table 4.1 shows that in this regression aid spend on human capital has not a significant impact on the dependent variables, both in the same period and one period later. Unfortunately, it is very difficult to measure the level of human capital in a way that it is appropriate to use it for data analysis. The dependent variables represent an index (CPIAHR) or a percentage (EDUSEC) which results in outcomes that are very close to each other. The index contains values between 1 and 6, and most values are 3, 3.5 or 4. As a result, the levels of aid flows do not have much impact on these numbers and Aid_h is not significant. The dependent variable EDUSEC contains a percentage and this percentage does not change much over the years. Therefore aid flows do not have much impact on this variable. As control variables $CPIAHR_{(t-1)}$, $EDUSEC_{(t-1)}$ and GDP are used. $CPIAHR_{(t-1)}$ and $EDUSEC_{(t-1)}$ represent the dependent variables of one year before, which appeared to be a good indicator of the level this year. GDP is only significant in the regression where CPIAHR is the dependent variable, showing a positive influence on the human capital index. The lag of the dependent variable has much influence on the dependent variable, therefore an analysis without the lag of the dependent variable is performed. This does not provide any significant output.

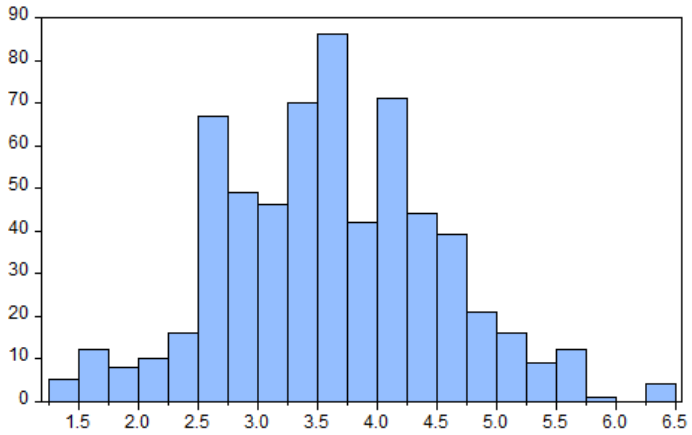
Table 4.1 Effectiveness of aid flows spent on human capital

	Dependent: CPIAHR	Dependent: CPIAHR	Dependent: CPIAHR	Dependent: EDUSEC	Dependent: EDUSEC	Dependent: EDUSEC
Aid_h	0.001 (0.85)		-0.000 (0.59)	-0.007 (0.49)		-0.005 (0.66)
$Aid_{h(t-1)}$		0.001 (0.83)			-0.010 (0.38)	
$CPIAHR_{(t-1)}$	0.697*** (0.00)	0.696*** (0.00)				
$EDUSEC_{(t-1)}$				0.74*** (0.00)	0.74*** (0.00)	
GDP	0.004* (0.06)	0.004* (0.05)	0.001 (0.61)	0.12 (0.10)	0.13 (0.10)	-0.086 (0.38)
R-squared	0.92	0.92	0.86	0.98	0.98	0.96
Log likelihood	211	211	15	-313	-313	-739
Number of observations	616	616	689	132	132	254

Notes: (1) country fixed effects are added; (2) *,**,*** denotes significance at a 10%, 5% or 1% level. The p values are shown in parentheses; (3) data point is value in a single year.

Table 4.2 shows the output of a regression that tested the effect of aid spent on infrastructure. Unfortunately, no very good indicators are available that makes it easy to compare the level of infrastructure over all countries. One indicator that is available is an index that measures the quality of ports in a country. Ports are important for trade and an important part of infrastructure in a country. The index has a level between 1 (extremely inaccessible) and 7 (extremely accessible). The indicator is composed by a survey among many institutes, which in total lead to a response from more than 13.000 business executives with the perception of the quality of ports in their country. Landlocked countries provide a perception how well sea ports are reachable. Graph 4.2 shows that the quality of ports varies a lot between countries.

Graph 4.2 Distribution of Portquality



Source: own calculations based on data from the World Bank. Notes: the horizontal axis shows the index value of the Portquality index and the vertical axis shows how many times a value within the range of a bar occurs.

The effect of the aid flow on this index is measured both in the same year and one year later. Table 4.2 shows that the aid flows do not have a significant impact on the port quality index. The same reasoning as explained above at testing the effect of aid spend on human capital applies here: it is not possible to analyze the effect of aid flows using an index as dependent variable. Aid flows do not make enough impact that it would be visible in indexes.

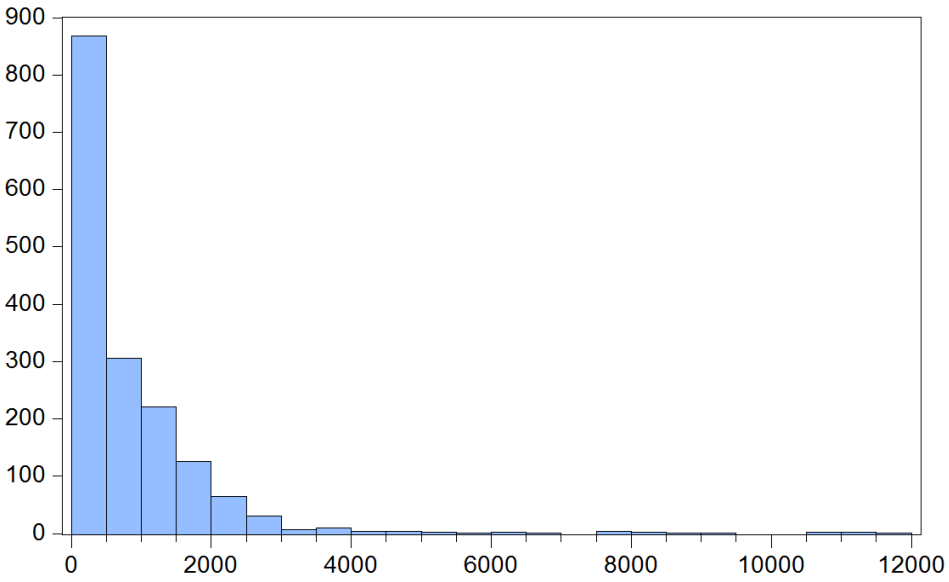
Table 4.2 Effectiveness of aid flows spent on infrastructure

	Dependent: Portquality	Dependent: Portquality
Aid_I	0.001 (0.87)	
$Aid_{I(t-1)}$		0.001 (0.28)
$Portquality_{(t-1)}$	0.67*** (0.00)	0.67*** (0.00)
GDP	0.001 (0.83)	0.001 (0.81)
R-squared	0.94	0.94
Log likelihood	53	55
Number of observations	534	535

Notes: (1) country fixed effects are added; (2) data point is value in a single year.

The third aid flow that is investigated is aid spent on physical capital. The question is whether or not this aid reaches the intended destination. If this is the case, this aid will be included in the gross capital formation. Gross capital formation consists of outlays on additions to the fixed assets of the economy plus the net changes in the level of inventories. The output shows that the aid flow does not have a significant effect on the dependent variable Capital, probably because the Capital variable consists of much more capital than the aid flow, which makes the aid flow negligible. Graph 4.3 shows the distribution of the Capital variable.

Graph 4.3 Distribution of Capital



Source: own calculations based on data from the World Bank. Notes: the horizontal axis shows the value of total real investment per capita per year in a country. The vertical axis shows how many times a value within the range of a bar occurs.

Table 4.3 Effectiveness of aid flows spent on physical capital

	Dependent: Capital	Dependent: Capital
Aid_k	-0.138 (0.84)	-0.138 (0.84)
$Capital_{(t-1)}$	0.814*** (0.00)	0.814*** (0.00)
GDP	7.405*** (0.00)	7.405*** (0.00)
R-squared	0.95	0.95
Log likelihood	-10685	-10685
Number of observations	1541	1541

Notes: (1) country fixed effects are added; (2) data point is value in a single year.

A big issue regarding measuring the effect of aid is availability of appropriate data. This thesis makes use of a big panel dataset and there are no indicators available of human capital and infrastructure that makes it possible to compare these levels over a lot of countries and time. Therefore no good underpinned analysis can show the effect of aid in this panel setting. For the remainder of this thesis it will be assumed that the aid flows reach their intended destination. This may be a strong assumption, but to test this assumption carefully is beyond the scope of this thesis and a suggestion for further research.

5. Empirical Results

5.1 Empirical methods

In this chapter the empirical methods and results will be discussed. The econometric interpretation of the relationship between aid and FDI is:

$$FDI_{it} = \beta_0 + \beta_1 Aidh_{it} + \beta_2 Aidi_{it} + \beta_3 Aidk_{it} + \beta_4 GDP_{it} + \beta_5 TO_{it} + \beta_6 POP_{it} + \beta_7 COR_{it} + \beta_8 FIN_{it} + \beta_9 Aidh_{it} * COR_{it} + \beta_{10} Aidi_{it} * COR_{it} + \beta_{11} Aidk_{it} * COR_{it} + \mu_i + \varepsilon_{it} \quad (5.1)$$

where FDI_{it} is foreign direct investment in country i at time t. $Aidh_{it}$ is aid spend on human capital. $Aidi_{it}$ denotes aid spend on infrastructure. $Aidk_{it}$ is aid spend on physical capital. Three control variables that are often used in the literature to explain FDI flows are included in the regression: GDP_{it} is the first, it determines GDP growth. The second is TO_{it}, that is an indicator for trade openness. The third is POP_{it}, which is population growth. Two other control variables are COR_{it}, that is a corruption index, and FIN_{it}, which is a dummy to capture the effect of the financial crisis. Furthermore three interaction effects are included in the model: $Aidh_{it}$, $Aidi_{it}$ and $Aidk_{it}$are interacted with COR_{it}, to measure whether aid has more impact in countries with less corruption. The β_0 is the intercept, μ_i is the country fixed effect and ε_{it} is the error term. This model can be estimated with a Fixed Effect Model that controls for the observed and unobserved individual effects of the countries (Verbeek, 2008). Not all countries start with the same conditions, so cross sectional differences are allowed by including fixed effects. To control for significance of the fixed effects the Fixed/Random Likelihood Ratio test is performed and the null-

hypothesis of redundant fixed effects is clearly rejected. A second econometric issue is to control whether the variables are stationary over time. Therefore unit root tests are performed on all aid and FDI variables. It appeared that after dividing by population the variables are stationary.

5.2 Results

This section shows the results. The first, second and third table show results from analysing the total sample of 111 countries. The fourth and fifth table show results following from dividing the sample in sub-samples regarding income group or location. In all outputs FDI is the dependent variable.

Table 5.1 FE model, analysis with entire sample. Dependent variable is real FDI per capita.

	(1)	(2)	(3)	(4)
Aid_h	**0.410*** (0.00)**			**0.561*** (0.00)**
Aid_i		-0.199 (0.14)		**-0.598*** (0.00)**
Aid_k			**-0.701** (0.01)**	**-0.594** (0.04)**
GDP	1.771** (0.03)	1.905** (0.02)	1.798** (0.03)	1.638** (0.04)
TO	0.954*** (0.00)	1.022*** (0.00)	0.970*** (0.00)	1.016*** (0.00)
POP	18.982** (0.01)	17.287** (0.01)	16.340** (0.02)	18.080*** (0.00)
COR	-17.617 (0.28)	0.703 (0.96)	20.819 (0.15)	-6.941 (0.67)
FIN	57.316 (0.23)	53.944 (0.26)	53.795 (0.26)	58.124 (0.22)
Aid_h*COR	**0.318** (0.03)**			**0.438** (0.01)**
Aid_i*COR		**-0.663*** (0.00)**		0.462 (0.11)
Aid_k*COR			**-1.473** (0.01)**	**-2.465*** (0.00)**
R-squared	0.81	0.81	0.81	0.81
Log likelihood	-11228	-11231	-11230	-11208

Notes: (1)*,**,*** denotes significance at a 10%, 5% or 1% level. The p values are shown in parentheses; (2) rolling window: analysis includes 17 periods of 4 year moving averages (1995-2014).

Table 5.1 shows four regression outputs. Specification (1) until (3) shows the output of all aid variables analysed separately. Specification (4) includes all variables. This is conducted to control for the possible influence of correlation between the aid variables. The first two specifications show significant impact of Aid_h and Aid_k. In the last specification all aid variables are significant. With respect to the control variables, GDP, TO and POP have a significant positive impact on FDI in these specifications and in all following specifications as well. COR is not significant in all specifications, which means that corruption does not have much impact on the level of FDI. FIN appears to be not significant as well. Since COR and FIN are not significant, they will not be included in all following specifications. Interaction effects between Aid_h, Aid_i, Aid_k and COR are included to investigate the possible relation between corruption and the effect of aid flows. It appears that these interaction effects are significant.

It is questionable what the time scope is between the arrival of aid and the possible impact on the level of FDI. The analysis above measured the effect of aid in the same period. Possibly, the effect has a longer time scope, so lags of one, two and three periods of the aid variables are included to measure the time scope of the effect on FDI. This analysis includes no interaction effects, because every specification already includes four aid variables. By adding more aid variables the outcome would not be reliable anymore.

Table 5.2 FE model, analysis including lags of aid to measure time scope of aid effect. Dependent variable is real FDI per capita.

	(1)	(2)	(3)
$Aid_{h(t)}$	0.080 (0.72)		
$Aid_{h(t-1)}$	-0.405 (0.22)		
$Aid_{h(t-2)}$	0.154 (0.64)		
$Aid_{h(t-3)}$	**0.614***** **(0.00)**		
$Aid_{i(t)}$		-0.184 (0.14)	
$Aid_{i(t-1)}$		-0.172 (0.20)	
$Aid_{i(t-2)}$		0.048 (0.61)	
$Aid_{i(t-3)}$		**-0.112*** **(0.09)**	
$Aid_{k(t)}$			**-1.437***** **(0.00)**
$Aid_{k(t-1)}$			**1.310**** **(0.01)**
$Aid_{k(t-2)}$			-0.670 (0.17)
$Aid_{k(t-3)}$			**-0.683*** **(0.06)**
GDP	7.532*** (0.00)	7.911*** (0.00)	8.145*** (0.00)
TO	1.661*** (0.00)	1.796*** (0.00)	1.737*** (0.00)
POP	18.303** (0.04)	23.269** (0.01)	22.158** (0.02)
R-squared	0.85	0.85	0.85
Log likelihood	-9170	-9170	-9174

Notes: (1) rolling window: analysis includes 14 periods of 4 year moving averages (1995-2014).

Table 5.2 shows that Aid_h and Aid_i are most effective after three years. Aid_k is significant both in the same period and two or three periods later. The most significant result is the effect during the same period. This time scope test shows that it is better to test the effect of aid spent on human capital and infrastructure over a longer period. Aid spent on physical capital results in an immediate effect on the level of FDI. Table 5.3 shows an analysis with the preferred lags of aid. A lag of three periods is used to measure the effect of aid spent on human capital and

infrastructure. The effect of aid spent on physical capital is measured in the same period. Furthermore, the interaction effects are included in the regression. The level of corruption is measured in the same period as the arrival of the aid flows, because local circumstances at the time of the arrival of aid are decisive to the effectiveness of aid.

Table 5.3 FE model, including preferred lag of aid flows. Dependent variable is real FDI per capita.

	(1)	(2)	(3)	(4)
$Aid_{h(t-3)}$	**0.446*** (0.00)**			**0.431*** (0.00)**
$Aid_{i(t-3)}$		0.124 (0.44)		0.000 (0.99)
$Aid_{k(t)}$			**-0.686** (0.01)**	**-0.962*** (0.00)**
GDP	7.357*** (0.00)	8.072*** (0.00)	1.737** (0.03)	7.402*** (0.00)
TO	1.628*** (0.00)	1.740*** (0.00)	1.001*** (0.00)	1.633*** (0.00)
POP	23.015** (0.01)	25.854*** (0.00)	16.434** (0.02)	22.698** (0.01)
$Aid_{h(t-3)}*COR_{(t-3)}$	-0.103 (0.47)			-0.169 (0.34)
$Aid_{i(t-3)}*COR_{(t-3)}$		-0.015 (0.95)		0.242 (0.42)
$Aid_{k(t)}*COR_{(t)}$			**-1.252** (0.03)**	-0.030 (0.96)
R-squared	0.85	0.85	0.81	0.86
Log likelihood	-9088	-9104	-11231	-9081

Notes: (1) rolling window: analysis includes 14 periods of 4 year moving averages (1995-2014); (2) specification (3) includes 17 periods, because no lag is used; (3) rolling window results in: (t-3)=on average 3 years ago.

It appears from the specification showed in table 5.3 that Aid_h and Aid_k are significant. This shows that aid spend on human capital has a positive impact on the level of FDI and that aid spend on physical capital has a negative impact on the level of FDI. The parameter of Aid_h is 0.446. The intuition is that an increase of 1 dollar aid per capita results in an increase in FDI of 0.446 dollar per capita 3 years later. The values have to be interpreted with caution, because the value changes when other variables are added or removed from the model. The interaction effects are not significant in almost all specifications, so these will not be included in the following analyses.

A weakness of panel analysis is that differences between groups of countries can influence the outcome. If the relation between aid and FDI is strong for a certain group of countries and not existent for another group of countries the general outcome is misleading. Therefore, the sample is divided in sub-samples according to income or location. The table below shows results from dividing the sample by income groups according to the definition of the World Bank. The analysis includes three income groups: Upper middle income, lower middle income and low income.

Table 5.4 FE model, sample divided by income group. Dependent variable is real FDI per capita.

	(1) Upper middle income	(2) Lower middle income	(3) Low income
$Aid_{h(t-3)}$	**0.708****	**0.214*****	**1.264*****
	(0.02)	**(0.00)**	**(0.00)**
$Aid_{i(t-3)}$	**-0.249*****	**0.367*****	**0.336****
	(0.00)	**(0.00)**	**(0.04)**
$Aid_{k(t)}$	-0.177	**-1.016****	**-1.664*****
	(0.65)	**(0.02)**	**(0.00)**
GDP	7.435***	6.395***	1.352**
	(0.00)	(0.00)	(0.02)
TO	3.553***	0.579**	-0.082
	(0.00)	(0.01)	(0.30)
POP	19.001	51.343	-2.008
	(0.35)	(0.00)	(0.58)
R-squared	0.86	0.58	0.90
Log likelihood	-3983	-3135	-1483
#countries	46	42	23

Notes: (1) rolling window: analysis includes 14 periods of 4 year moving averages (1995-2014); (2) rolling window results in: (t-3)=on average 3 years ago.

By use of this approach the aid flows appeared to be significant in almost all specifications. Aid spend on human capital has a positive impact in all income groups. Aid spend on infrastructure is significant in all specifications, but negative in the upper middle income group and positive in the lower middle income and low income group. Aid spend on physical capital is not significant in the upper middle income group and negative significant in the lower middle income and low income group.

Table 5.5 FE model, sample divided by continents. Dependent variable is real FDI per capita.

	Latin America	Africa	East Asia, Pacific	Europe, Middle Asia
$Aid_{h(t-3)}$	-0.121 (0.72)	**0.750***** **(0.00)**	**0.433***** **(0.00)**	**3.147***** **(0.00)**
$Aid_{i(t-3)}$	0.065 (0.87)	0.433 (0.17)	**-0.355***** **(0.00)**	**-2.241***** **(0.00)**
$Aid_{k(t)}$	**-1.168***** **(0.00)**	**-2.227***** **(0.00)**	**1.207***** **(0.00)**	-0.365 (0.85)
GDP	5.409* (0.09)	5.682*** (0.00)	13.471*** (0.00)	11.632*** (0.00)
TO	-0.144 (0.82)	2.178*** (0.00)	-0.596 (0.22)	1.815*** (0.00)
POP	-121.84*** (0.00)	8.289 (0.43)	74.688*** (0.00)	87.356 (0.00)
R-squared	0.82	0.90	0.71	0.78
Log likelihood	-1930	-4196	-1829	-1113
#countries	23	52	23	13

Notes: (1) rolling window: analysis includes 14 periods of 4 year moving averages (1995-2014); (2) rolling window results in: (t-3)=on average 3 years ago.

The table above shows the results from regressions where the sample is divided by continents. Aid_h has a positive impact in all continents except Latin America. Aid_i has a negative impact in the continent East Asia, Pacific and Europe, Middle Asia. Aid_k has a negative impact in Latin America and Africa and a positive impact in East Asia, Pacific.

5.3 Interpretation of results

5.3.1 Realised versus expected signs

This section describes the interpretation of the results. Three tables summarize the outcome of the research and the interpretation of the results is explained below every table. It appeared during the analysis that the relationship is quite sensitive to changes in the specification. This makes clear that the relationship between aid and FDI is not very strong, and that interpretation of the results should be done with restraint.

Table 5.6 Interpretation results analysis of entire sample

	Expected sign	Realised short-term	Realised long-term
Aid human resources	+	+	+
Aid infrastructure	+	No effect	No effect
Aid physical capital	-	-	-

Notes: short-term means effect in the same period. Long-term means the effect after three years.

Table 5.6 shows that the relationship between aid and FDI is both measured in the short and in the long-term. Short-term means during the same period and long-term after a period of three years. Aid spend on human resources has a positive relation with FDI both in the short and in the long-term, but the effect is stronger in the long-term. The intuition is that it takes time for human capital to develop. Aid can be spent on education, but it takes time to educate the working force. After a while the labour productivity will increase and as a result the country becomes more attractive to investors. Aid spend on infrastructure appeared to be not significant when the entire sample is analysed, so there is no strong relation between aid spend on infrastructure and the level of FDI. The second measured effect is a negative effect of aid spend on physical capital. This means that aid spend on physical capital is followed by a decline in the level of FDI. Thus, it can be concluded that the expected relation between aid and FDI exist in some cases, but that it does not exist in other cases.

Table 5.7 Interpretation results sample divided by income groups

	Expected sign	Upper middle income	Lower middle income	Low income
Aid human resources	+	+	+	+
Aid infrastructure	+	-	+	+
Aid physical capital	-	No effect	-	-

The following interpretation of Table 5.7 resulted from an analysis in the long-term, as is explained in the previous Results section. It appeared that dividing the sample by income groups has impact on the results. Aid spend on human resources has a positive impact on FDI in all income groups. Aid spend on infrastructure shows varying results. It is positive in the upper middle income group and negative in the lower middle income and low income group. It is possible that the very low level of infrastructure in countries with a low income is a barrier to firms from abroad that want to invest. Aid can contribute to this level of infrastructure and as a result the country becomes more attractive to investments. The effect of aid spend on physical capital is only present in the lower middle income and low income group.

Table 5.8 Interpretation results sample divided by continents

	Expected sign	Latin America	Africa	East Asia, Pacific	Europe, Middle Asia
Aid human resources	+	No effect	+	+	+
Aid infrastructure	+	No effect	No effect	-	-
Aid physical capital	-	-	-	+	No effect

Table 5.8 shows the results from dividing the sample by location. This approach delivers some interesting findings. Aid spend on human resources is significant in all continents except Latin America. Aid spend on infrastructure is negative significant in East Asia, Pacific and Europe, Middle Asia. Aid spend on physical capital is negative in Latin America and Africa and positive in East Asia, Pacific. These results show that the relationship between aid and FDI is present in some areas and not in others. The intuition is clear: in some countries the relation between aid and FDI is existent while in others it is not. That is the final conclusion of this thesis. There could be a relation between aid and FDI, but it is not possible to analyse it in a convincing way by use of a panel setting with a lot of countries and over a long period of time.

5.3.2 Policy implications

Drawing policy implications following from this research is risky. As discussed above, the results do not show an absolutely convincing outcome. Therefore it can be concluded that aid flows spent on human capital or infrastructure in general will not help to attract more FDI flows. On the other hand, some specifications show a clear relationship. Policy makers should investigate a local situation and make decisions dependent on the local situation. Aid spend on infrastructure in general does not help to attract FDI, but building a harbour in a specific country that improves trade possibilities could help to attract FDI. An interesting outcome is the result that corruption has no effect on FDI. Corruption influences the effectiveness of aid, but apparently this effect is not strong enough to influence FDI. One strong policy implication can be drawn from this research. If the goal is to attract more FDI to a country, aid should not be spent on physical capital. The relation between aid spend on physical capital and FDI is in almost all cases negative, so aid can better be spent on other sectors.

5.3.3 What are the theories of stake?

The theory section clearly describes the expected relation between aid and FDI. The theory describes an expected complementary effect between aid spend on human capital and infrastructure and FDI and a substitution effect between aid spend on physical capital and FDI. Only the effect of aid spend on human capital is significant in almost all specifications and has always the same sign as expected by economic theory. The effect of aid spend on infrastructure or physical capital is in some cases not significant or has a sign that is opposite of what would be expected by economic theory. Unfortunately, too many results are insignificant so it is not possible to conclude anything about the validity of the economic theory.

6. Conclusion

This research shows that it is very difficult to draw conclusions about the aid-FDI relationship on the basis of a panel analysis with many countries. Aid is a flow that has very different outcomes. Aid can do good in a particular situation, but can harm in another situation. In one situation it can improve the infrastructure which increases attractiveness of FDI, while in another situation aid can vanish in the pockets of corrupt officials. This difference in the efficiency of aid makes it really difficult to measure any effect related to aid. These disadvantages can be the reason that by analyzing all countries together no strong relation between aid and FDI could be found, except for aid spend on human resources. Aid spend on human resources has a positive impact on the level of FDI a few years later. The second approach was dividing the sample in sub-samples. This approach showed that in some income groups and within some group of countries, effects of aid on FDI are present. This shows that aid can have an impact on FDI, but that it depends on the specific situation of a country. For further research I recommend research in a micro setting. Probably, there are forces in a country that impact the relation between aid and FDI. If policy makers try to make a country more attractive to FDI and use aid to reach this goal, a better understanding of when aid will have the desired outcome is necessary.

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Appendix

Table A.1 List of countries included in the analysis

Albania	Gabon	Nigeria
Algeria	Gambia, The	Pakistan
Angola	Georgia	Palau
Argentina	Ghana	Panama
Armenia	Grenada	Papua New Guinea
Azerbaijan	Guatemala	Paraguay
Bangladesh	Guinea	Peru
Belize	Guinea-Bissau	Philippines
Benin	Guyana	Rwanda
Bhutan	Haiti	Samoa
Bolivia	Honduras	Senegal
Bosnia and Herzegovina	India	Serbia
Botswana	Indonesia	Sierra Leone
Brazil	Iran, Islamic Rep.	Solomon Islands
Burkina Faso	Jamaica	South Africa
Burundi	Jordan	Sri Lanka
Cabo Verde	Kazakhstan	Sudan
Cambodia	Kenya	Suriname
Cameroon	Kiribati	Swaziland
Central African Republic	Kyrgyz Republic	Tajikistan
Chad	Lao PDR	Tanzania
China	Lesotho	Thailand
Colombia	Liberia	Togo
Comoros	Macedonia, FYR	Tonga
Congo, Dem. Rep.	Madagascar	Tunisia
Congo, Rep.	Malawi	Turkey
Costa Rica	Malaysia	Turkmenistan
Cote d'Ivoire	Mali	Uganda
Djibouti	Mauritania	Uzbekistan
Dominica	Mauritius	Venezuela, RB
Dominican Republic	Mexico	Vietnam
Ecuador	Moldova	West Bank and Gaza
Egypt, Arab Rep.	Mongolia	Yemen, Rep.
El Salvador	Morocco	Zambia
Equatorial Guinea	Namibia	Zimbabwe

Table A.2 Mean of aid and FDI flows

	Aid human capital	Aid infrastructure	Aid physical capital	FDI
Entire sample	51.66	32.83	47.7	127.78
1995-1999	28.82	26.90	11.19	96.48
1999-2002	35.15	25.69	12.74	96.11
2003-2006	48.57	16.72	8.94	130.12
2007-2010	50.23	21.12	8.87	159.55
2011-2014	95.23	72.77	51.80	151.41
Sample divided by income/location. Average over time.				
Upper middle income	51.28	48.58	22.73	264.54
Lower middle income	64.11	28.68	17.86	68.18
Low income	30.27	14.49	13.37	17.58
Latin-America	52.08	39.55	18.76	196.56
Africa	40.59	17.65	15.99	87.24
East-Asia, Pacific	78.14	59.23	23.57	111.14
Europe, Middle-Asia	46.88	32.62	19.50	187.53