

# Importance of international trade and foreign direct investment for economic growth

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This paper analyzes the combined importance of foreign direct investment and trade on a group of 75 countries, comprising OECD, BRICS, CIVETS and low-income economies. The data used in this study covers the period 1995-2013. By means of panel estimations, I record a positive impact between trade and growth, while I find no evidence suggesting a link between FDI on economic development. When testing the combined impact of foreign direct investment and trade on growth, I was unable to find statistical evidence supporting such links.

Keywords: Trade, FDI, Economic growth

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## 1. Introduction

In the years leading to the financial crisis, international trade levels soared, especially the US trade levels recorded a growth rate of around 60% during 2000-2008 (US Bureau of Economic Analysis, 2008). As a result of the financial crisis, international trade levels dropped (Ryuhei, 2009). However, the World Trade Organization (WTO)<sup>1</sup> expects higher international trade levels for the upcoming years, mainly as a result of higher demand from the Eurozone which would speed the pace of the global economic recovery (WTO, 2014). In addition, since the start of the 2000s, global foreign direct investments (hereafter FDI) increased, reaching USD 2.002 billion in 2007, and then dropping to USD 1.461 billion in 2013, as a result of the financial crisis according to Global Investment Trends Monitor UNCTAD (2014).

Trade is classified as a mechanism through which economies grow as a result of allocating production more efficiently to countries having a comparative advantage in such production (Makki and Somwaru, 2004; Deardorff, 2001). Historical trade policies have been focused on inward-looking policies where domestic production was expected to fully serve the domestic market, but since the early 1970s there has been a shift towards a more outward-looking mentality where manufacturers are being exported abroad early in the production process (Keesing, 1967). These outward-looking policies promote domestic firms to engage in international trade and foreign direct investments. According to the existing literature, FDI inflows positively affect economic growth mostly through the dissemination of technology and by promoting the linkages with the domestic firms (Barrel and Pain, 1997; Lall, 1980). There are several findings documenting the relationship between FDI and trade. The consensus is that FDI acts as a substitute in situations where the exporting and importing countries are comparable in terms of market size. However, FDI and trade complement each other in situations where countries differ significantly in terms of market size, trade costs and skill endowments (Brainard and Rikel, 1997). I will address the difference between horizontal and vertical FDI in the next section.

Given the importance of international trade and FDI for economic development, as recently proposed by several authors such as Wei et al. (2001) and Wacziarg and Welch (2008), it is surprising that there is little documentation in the literature assessing the combined impact of these factors on economic growth. The rationale is that open economies<sup>2</sup> receiving FDI benefit more compared to closed

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<sup>1</sup> WTO deals with the international promotion of rules of trade and comprises 160 member countries as of June 2014. For more information on WTO please visit their website at [www.wto.org](http://www.wto.org)

<sup>2</sup> Economies are classified as open or closed depending on the amount of international trade as a portion of GDP

economies, since capital can be allocated more efficiently. The findings of Bengoa and Sanchez-Robles (2003) highlights the notion that open economies benefit more from the inflow of FDI compared to closed economies. Therefore, this paper attempts to contribute to the existing literature by focusing on the combined impact of trade and FDI on development for OECD member countries, CIVETS, BRICS and Low Income countries. Trade entails export and import of a country, since the sum of these represents a country's trading ability. Throughout this paper, the focus will be on the net position of FDI flows across countries, rather than focusing solely on inward FDI, while trade reflects the amount of export and import as a share of a country's GDP. First, I will start my analyses by looking at the direct impact of trade and FDI on economic growth.

Results suggest a positive impact of international trade on economic development across my estimations. When testing the direct impact of FDI on economic progress, I do not find evidence suggesting a link between FDI inflow and GDP per capita growth, although I do find evidence suggesting a complementary relationship between FDI inflow and domestic investment rates. My models are based on panel estimations and comprise developed and developing countries.

This paper comprises different sections. Section 2 gives a literature overview relating to the impact of international trade on economic development and of FDI on economic growth. I highlight the mechanisms through which FDI affects growth as well as some policy challenges FDI receiving countries are faced with. After addressing these concepts, I introduce the dataset and the econometric estimations. My results are presented in section 4, while concluding remarks is covered in the final section.

## **2. Existing literature**

The impact of trade and FDI on economic development has been well documented in the current literature. This section covers the relationship between trade and economic growth, focusing on the different findings relating to the impact of trade on growth. Hereafter, I address the impact of FDI on growth and I look at the mechanisms through which FDI inflow affects economic development of countries.

### **2.1 Effect trade on economic development**

The impact of trade on economic development has been thoroughly analyzed over the years, especially by neoclassic theories. According to neoclassical trade theories, fostering domestic industries

is important for achieving economic development. Countries protect their infant sectors through import taxes and import quotas. Protecting infant industries help the manufacturing sector of countries, as these industries have time to become efficient and competitive, while providing employment opportunities to unskilled workers (Chimni, 2006). However, protecting infant industries also have negative effects on the domestic economy. Lower levels of import also mean a lower supply of the domestic currency on the international market, which would lead to an increase in the value of the domestic currency- known as appreciation-, which ultimately negatively affect a country's export prices and international competitiveness levels (Young, 1993). These were the common practices during the 1950s and the 1960s.

Towards the start of the 1970s, governments started moving away from the protectionism approach towards a more liberal approach focusing more on international trade as a catalyst for economic development. One of the primary reasons for this was the realization that import substitution policies do not deliver long term sustainable growth for economies (Puga and Venables, 1999). Balassa (1971) is one of the first to highlight and document such findings in the literature. He argues that import-substitution policies constrain growth since these do not exploit the competitive advantages found in export sectors. Similar findings are also linked with the works of Krueger (1978). Krueger analyzes the impact of trade on growth using cross-section country data and finds a statistical link between international trade -higher export- and economic development. Moreover, the impact of higher international trade levels and protectionism is thoroughly studied by Kessidis (1991), where he focuses on different time periods of trade levels and reports that higher international trade triggers higher economic growth rates. Adding to the results of Kessidis, the results of Helpman (1991) suggest trade affecting growth through positive externalities such as knowledge spill-overs, product imitation and product innovation.

In addition, several modern neoclassical models, such as, but not limited to, the Stolper-Samuelson theory and the Heckscher-Ohlin theory, predict a positive impact of international trade on development. For example, Sachs and Warner (1995) record a positive link between openness to trade and growth. Their analysis covers 79 countries and by dividing them into separate categories they analyze the direct relationship between the level of trade openness and growth. The findings of Rodriquez and Rodrik (1999), Dollar and Kraay (2001), and Alfonso (2001) all suggest similar findings where countries engaging in higher level of international trade recorded higher growth rates compared to their peers. Moreover, the results of Edwards (1991) argue that a country's liberalization of

international trade will trigger economic growth. According to Greenaway, Morgan, and Wright (2001) liberalization has a positive influence on economic growth, although the magnitude of this impact appears to be relatively limited. Similar results are suggested by the findings of Harrison (1994).

However, according to Edwards (1998), previous studies use different proxies for measuring a country's openness to international trade. Therefore he suggests that previous findings were not comparable due to methodology differentials. As a result, he constructs 9 different proxies for trade openness and analyzes the impact of these 9 factors individually with total factor productivity of 93 countries. His results indicate that the majority of these 9 factors are positively linked with economic growth.

## 2.2 Impact of FDI on economic growth

After acknowledging the importance of trade openness on achieving economic growth, I focus on some of the most influential documentations relating to the impact of FDI on growth. It is noteworthy to start by identifying the two different categories<sup>3</sup> of FDI flows, which are horizontal and vertical FDI. The literature labels vertical FDI as 'multi plant firms creating a global network of production processes in order to benefit from lower production costs elsewhere'. On the other hand, horizontal FDI can be considered as 'multi plant firms setting up global network of plants in order to duplicate production to service that particular market'. When looking at the magnitude of these FDI flows, the OECD indicate that the bulk of FDI flows should be classified as horizontal FDI, since most of the FDI flows are recorded amongst developed economies.

As mentioned, the literature is full of findings relating to the impact of FDI on growth. One of these are the findings of Findlays (1978) which suggest that FDI leads to economic growth, via its effect on technological progress, whereby local firms improve their productivity by replicating the technology used by multinationals.<sup>4</sup> However, according to Borensztein, Gregorio, and Lee (1998) the positive impact of FDI on growth is the consequence of higher efficiency and not of the accumulation of capital in the FDI-receiving country.

The findings of Bengoa and Sanchez (2003) support the idea that FDI is growth enhancing, since it leads to innovation and distribution of goods, which were domestically produced, by further

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<sup>3</sup> Even though I make no distinction of these flows within my econometric estimations, the reader should be aware of the different types of FDI flows

<sup>4</sup> For more in-depth comprehension relating to this topic please refer to the work of Findlays (1978).

developing the transportation and communication system. In the paper of Obwona (2001) he states that FDI increases the balance sheet of countries, which in turn would boost a country's capability for import. There are different means in which economic development can be affected by FDI as documented by De Mello (1997) and Markusen and Venables (1999). Firstly, the imitation of cutting edge technology can be stimulated by means of reproduction in the FDI-receiving country. Secondly, FDI encourages the exchange of knowledge, both in the sense of acquiring skills and the sharing of best practices. However, De Mello states that the direction in which FDI influences economic growth depends on the receiving country's ability to allocate these inflows efficiently.

The impact of FDI on economic growth in developing countries appears to be significantly heterogeneous, as recorded by Nair-Reichert and Weinhold (2001). They find causality from FDI to economic growth and also some proof indicating that FDI is more effective in open economies, albeit this connection is likewise heterogeneous between nations. Opposing to these findings, Boyd and Smith (1992) argue that if a country does not have the proper soft infrastructure, such as developed financial markets and collusion-free markets, in place to efficiently allocate the inflow of FDI, these inflows will harm the domestic economy rather than promoting higher levels of economic activities. Herzer, Klasen and Nowak-Lehmann (2008) argue that FDI inflow do not contribute to promoting social and economic development in the receiving economies.

On the other hand, Raghavan (2000) claims that mergers between foreign and domestic firms not necessarily increase the amount of capital in a low-capital economy. The reason is that foreign mergers and acquisitions simply imply a transfer of current resources. It is only if the earnings originating from abroad are spent on the production of goods that FDI positively affects growth. However, the possible downside of multinationals is that they tend to be more efficient, cost-conscious and more productive, thereby gaining market share of domestic firms. This will eventually lead to bankruptcy of inefficient domestic firms, thereby constraining economic growth (Aitken and Harrison 1999). Domestic firms which manage to stay operational have to accept considerably lower profit margins.

### **2.3 Mechanisms through which FDI operates**

There is an extensive literature assessing the spill-over effects of FDI on economic development. These effects can be divided into five channels as suggested by Crespo and Fontoura (2007), which are (i) demonstration effects, (ii) labor turn-over effects, (iii) export effects, (iv) competition effects, and (v)

linkages. These are briefly touched upon. Firstly, demonstration effect refers to the fact that introduction of new technologies may prove to be too costly for domestic companies, when taking the risks and rewards into consideration. However, domestic firms can simulate the technology introduced by multinationals (Wang and Blomström, 1992). Secondly, labor turn-over effect relates to the probability that a local firm hires an ex-worker of a multinational who has knowledge and skills relating to a technology and who is capable to use it in the local firm (Fosfuri, Motta, and Ronde, 2001), thereby increasing the human capital in the local firm. Thirdly, the export effect channel promotes growth by making use of multinationals' existing networks in order to control costs. According to Greenaway, Sousa, and Wakelin (2004), multinationals have a positive effect on the export volume of local firms, since exporting requires costs related to establishing a network of distribution and information gathering about trading partners, which is more affordable for the multinationals compared to the domestic firms. Fourth, the competition effect explains how the competition among domestic and international companies can be an encouragement for local firms to increase their efficiency or to implement new technologies in order to be able to compete competitively (Wang and Blomström, 1992). Finally, linkages enable domestic firms to increase efficiency and productivity levels through trainings and sharing of knowledge amongst firms (Javorcik, 2004; Driffield, Munday, and Roberts; 2002).

In addition to the findings relating to the impact of FDI on growth, there are also several documentations covering some issues when dealing with FDI inflow. For example, Lall (2002) argues that the FDI-receiving country should minimize any information asymmetry in order to benefit from FDI inflow, while Noorbaksh, Paloni, and Youssef, (2001) argue that receiving countries should have proper infrastructure in place to cope with the effects of FDI inflow. Finally, Te Velde (2002) suggests several policy challenges for attracting FDI, such as, but not limited to, the quality of FDI flows, openness levels to international trade and the promotion of linkages between multinationals and domestic firms.

### **3. Data and methodology**

This section covers the theoretic model by addressing the data obtained and methodology used for the econometric estimations. I start by introducing the variables used throughout the models, after which I cover the econometric models used to analyze the impact of trade and FDI on economic development.



### 3.1 Data

My period of analysis covers 1995-2013 and entails 75 countries comprising OECD members, CIVETS and BRICS<sup>5</sup> and Low Income economies as classified by the World Bank (2014). My dataset comprise several variables enabling me to analyze the link between trade, FDI, and economic growth. For measuring economic development I focus on GDP per capita growth. By using GDP per capita I also control for difference in size of economies across my dataset. My main variables, trade and FDI, are measured as 'the sum of exports and imports of goods and services measured as a share of gross domestic product' and 'net inflows in the reporting economy from foreign investors, and is divided by GDP' (World Bank, 2014)<sup>6</sup>, respectively. The main reason for choosing FDI flows rather than FDI stock lies in the rationale of Kugler (2000), where he argues that FDI flows trigger positive externalities in the economy rather than FDI stock.

My models also control for additional factors contributing to or constraining economic growth. I use inflation rates in order to control for the impact of additional variables on growth. According to the results of Andrés and Hernando (1997) and Fischer (1993), inflation constrains growth by lowering the purchasing power of consumers and ultimately leading to fewer economic activities. Inflation is defined as annual changes in consumer price indices. Inflation rates also address the ability of government to successfully manage macroeconomic conditions. In addition, I also control for countries' gross capital formation ratios, as these represent domestic investments in fixed assets and net changes in inventories (World Bank, 2014). I control for domestic investments, as suggested by the findings of Firebaugh (1992) and Adams (2009). My models also comprise government consumption, defined by the World Bank as 'all government's current expenditures for the purchase of goods and services' (2014), as suggested by the findings of Barro (1989). Following the approach of Makki and Somwaru (2004), the variables trade, gross capital formation, FDI, and government consumption are all measured as a portion of GDP to control for the absolute difference in sizes of economies.

Population growth is included in my models to control for the impact of long term population growth on growth. Finally, following the notion that a basic level of institutional quality should be in place in order for economies to grow, I include the variable Institutional quality. These data cover a wide

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<sup>5</sup> CIVETS economies comprise Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa, while BRICS economies comprise Brazil, Russia, India, China, and South Africa.

<sup>6</sup> According to the World Bank definition, FDI is defined as net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.

range of institutional aspects, such as, but not limited to, business freedom, monetary freedom, financial freedom and corruption freedom<sup>7</sup>. One of the reasons for including this factor in my models can be found in the arguments of Klein (2005), where he argues that countries with higher institutional quality tend to record higher economic growth rates.

Values relating to trade openness, FDI, GDP per capita growth, GDP per capita levels, inflation rates, government consumption, and domestic investments are obtained from the World Bank database. However, data measuring institutional quality are obtained from the Heritage foundation database. Furthermore, my models focus on the period 1995-2013, since I feel prior to 1995 the quality of the available data is not up to par.

Before I start the analysis, I look at my data sample in order to gain more information on the mean, the median, the number of observations, the standard deviation, and the lower and upper limit of the variables. These results are reported in table 1.

**Table 1: Descriptive statistics**

<b>Descriptive Statistics</b>						
<i>Factors</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>	<i>Observations</i>
<i>Gross capital formation</i>	21.32	7.08	21.03	-2.42	60.16	1318
<i>GDP per capita</i>	14239	18444	3169	50	87717	1356
<i>GDP per capita growth</i>	2.3	5.1	2.3	-37.3	91.7	1364
<i>Inflation</i>	29.3	680.7	3.7	-9.0	24411.0	1291
<i>Population growth</i>	1.6	1.3	1.4	-1.8	10.3	1425
<i>Government consumption</i>	15.9	6.4	16.4	2.0	69.5	1290
<i>FDI</i>	3.9	8.1	2.1	-82.9	91.0	1304
<i>Trade openness</i>	71.9	42.7	61.4	0.3	333.5	1327
<i>Institutional quality</i>	60	13	60	1	83	1268

Table 1 indicates the descriptive statistics of the dataset. Gross capital formation, government consumption, foreign direct investments and trade openness are denoted as % of GDP, while GDP per capita, population growth and GDP per capita growth denote GDP per capita USD 2005 and population and GDP per capita year-on-year change, respectively. Institutional quality represents a score ranging from 0 to 100, with 100 being the best available score.

I note that there is a large fluctuation between the growth rates recorded across my dataset. The same trend can be seen for the main variables trade openness and FDI. Relating to FDI inflow,

<sup>7</sup> For a better understanding of the aspects covered by the institutional quality variable, please visit the Heritage Foundation website and database, as they cover these issues thoroughly

Liberia recorded a negative inflow of 83% in 1996, which was the result of an ongoing civil war, while they recorded FDI inflow as high as 91% in 2003 of GDP as a result of the end of the aforementioned civil war. Furthermore, it is noteworthy to indicate that Zimbabwe recorded inflation rates near 25 thousand percent in the year 2007, primarily caused by hyperinflation affecting their economy at that time period.

In addition, I also present a correlation matrix which analyzes the link between the variables. I test the significance of these links. These are shown in table 2. Most of the variables appear to be significant and have the expected signs. The correlation matrix is based on 1268 data points per variable.

**Table 2: Correlation matrix**

Correlation matrix										
	<i>GDP pc growth</i>	<i>GDP pc lag</i>	<i>FDI</i>	<i>Trade</i>	<i>FDI * Trade</i>	<i>Gross capital formation</i>	<i>Inflation</i>	<i>Population growth</i>	<i>Government consumption</i>	<i>Institution al quality</i>
<i>GDP pc growth</i>	1									
<i>GDP pc lag</i>	-0.095***	1								
<i>FDI</i>	0.184***	0.172***	1							
<i>Trade</i>	-0.013	0.351***	0.473***	1						
<i>FDI * Trade</i>	0.167***	0.205***	0.984***	0.556***	1					
<i>Gross capital formation</i>	0.317***	0.039	0.255***	0.216***	0.249***	1				
<i>Inflation</i>	-0.051*	-0.031	-0.02	0.011	-0.017	-0.070**	1			
<i>Population growth</i>	0.021	-0.457***	-0.008	-0.214***	-0.048*	-0.159***	-0.035	1		
<i>Government consumption</i>	-0.161***	0.464***	0.049*	0.175***	0.059**	0.048*	-0.073**	-0.349***	1	
<i>Institutional quality</i>	-0.032	0.703***	0.209***	0.259***	0.227***	0.156***	-0.121***	-0.168***	0.485***	1

Table 2 depicts the correlation between the different factors of the dataset. Gross capital formation, government consumption, foreign direct investments and trade openness are denoted as % of GDP, while GDP per capita, population growth and GDP per capita growth denote GDP per capita USD 2005 and population and GDP per capita year-on-year change, respectively. Institutional quality represents a score ranging from 0 to 100, with 100 being the best available score. \*\*\*, \*\*, and \* denote significance levels of 1%, 5%, and 10%, respectively.

### 3.2 Methodology

After introducing the factors included in the econometric models in the previous section, this section introduces my benchmark models and methodologies. Figure 1a and 1b depict scatterplots<sup>8</sup> between trade and economic growth and FDI and growth, respectively. Based on the scatterplot, there appears to be a slightly positive correlation between these factors. However, only by statistically testing this, I can obtain certainty on these links.

<sup>8</sup> For graphical purposes, Liberia has been excluded from the FDI scatter plot, while Switzerland has also been excluded for the same purposes from the Trade scatter plot.

**Figure 1: Scatterplots of the relations FDI-growth and Trade-growth**

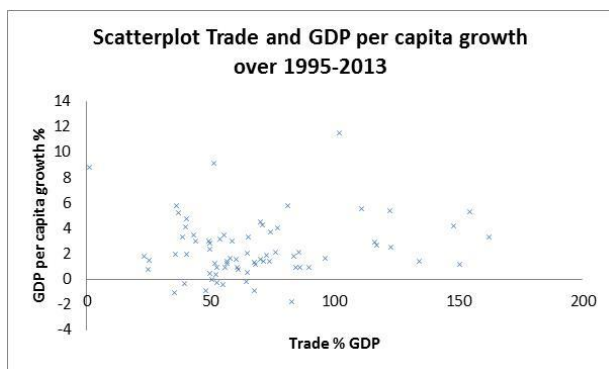


Figure 1a depicts the relation between trade (denoted by the x-axes) and GDP per capita growth (denoted by the y-axes). Each data point represents the average over the period 1995-2013.

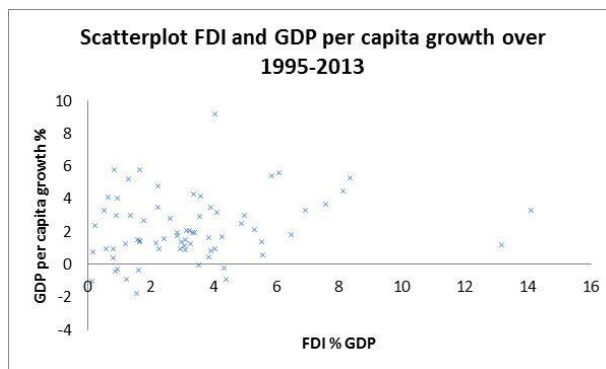


Figure 1a depicts the relation between FDI (denoted by the x-axes) and GDP per capita growth (denoted by the y-axes). Each data point represents the average over the period 1995-2013.

I start my analyses by focusing on the direct impact of trade openness on economic development. The results of Frankel and Romer (1999), Baldwin (2003) and Dollar and Kraay (2002) all suggest a significant and positive impact of trade on growth, since economies benefit from international trading. My benchmark model is the following:

$$\begin{aligned}
 \text{GDP per capita growth}_{i,t} = & \alpha + \beta_1 \text{Trade}_{i,t-1} + \beta_2 \text{Domestic Investment}_{i,t-1} + \beta_3 \text{GDP pc}_{i,t-1} + \\
 & \beta_4 \text{Inflation}_{i,t-1} + \beta_5 \text{Population}_{i,t-1} + \beta_6 \text{Government}_{i,t-1} + \beta_7 \text{Institutional Quality}_{i,t-1} + \\
 & \tau_t + \gamma_i + \varepsilon_{i,t-1},
 \end{aligned} \tag{1}$$

where GDP per capita growth represents the dependent variable of the model, while trade denotes an economy's openness to international trade. The variables Domestic Investments, Inflation and Population denote gross capital formation ratios to GDP, annual inflation rates and population growth rates, respectively. Also, Government and Institutional Quality represent government expenditures to GDP and the overall level of institutional quality present in an economy at a certain point in time. Lagged GDP per capita figures have been included in my models, following the results of Chen and Coulson (2002) where they suggest that lagged GDP per capita is significant in models that link FDI inflow to economic growth. The letters  $i$ ,  $t$ , and  $\varepsilon$  denote cross-section unit, time-periods and the error term of my models respectively. The model also includes lagged GDP per capita figures, as suggested by the findings of Alfaro et al. (2004). Moreover, Barro (1996) suggests a negative link between lagged GDP per capita values and economic growth.

By including country and year dummies- referred to as fixed effects and denoted as  $\tau_t$  and  $\gamma_i$ , respectively- in my models, I try to obtain parameters on the variables that are not subject to biases due to omission of main variables (Nickell, 1981). Additionally, as suggested by Berry (2011) fixed effects capture attributes of the panel dataset which remain constant over time. The findings of Wooldridge (2010) argue that ignoring time-specific and unit specific effects found in time-series and cross sectional data, leads to heterogeneity issues and biased coefficients. By steadily building on the number of variables in my models, I obtain a more in-depth insight into the impact of trade and FDI on GDP per capita growth. The reason for controlling for the influence of population growth rates, inflation, gross capital formation and government consumption, is to avoid overestimating the impact of trade on growth. Population growth rates serve as a control variable in standard macroeconomic growth models, as suggested by Brander and Dowrick (1994), Romer (1990), Cassen (1976), and Barro and Sala-i-Martin (1999).

After analyzing the direct impact of trade on economic development, I focus on the direct impact of FDI on economic growth. The literature is filled with ambiguous results relating to the direct impact of FDI on economic development. Therefore, we attempt to document the direct link between FDI and economic growth before we analyze the combined impact of trade and FDI on growth. My benchmark estimation is as follows:

$$GDP\ per\ capita\ growth_{i,t} = \alpha + \beta_1 FDI_{i,t-1} + \beta_2 Domestic\ Investment_{i,t-1} + \beta_3 GDP\ pc_{i,t-1} + \beta_4 Inflation_{i,t-1} + \beta_5 Population_{i,t-1} + \beta_6 Government_{i,t-1} + \beta_7 Institutional\ Quality_{i,t-1} + \tau_t + \gamma_i + \varepsilon_{i,t-1}, \quad (2)$$

where, FDI represent net FDI inflow as percentage of GDP, while the other variables remain unchanged. Once more, my econometric estimations also include fixed effects in the forms of country and year dummies. As the findings of Bosworth and Collins (1999) and Barrel and Pain (1999) suggest, FDI directly affects growth positively. Once more, I will build on the benchmark model gradually to assess the impact of FDI on economic growth. The variables Initial GDP per capita, Domestic Investments, Inflation, Population, Government and Institutional quality are included in my model in order to follow the consensus in the literature.

After I analyze the direct impact of trade openness and FDI on economic development, I also test the combined impact of FDI and trade openness on growth. As suggested by Moosa and Cardak (2006), countries' openness to trade represent a significant factor in drawing FDI and affecting growth.

My analyses also focus on the combined impact of FDI and trade on economic development; my benchmark estimation is:

$$\begin{aligned}
 \text{GDP per capita growth}_{i,t} = & \\
 & \alpha + \beta_1 \text{Trade}_{i,t-1} + \beta_2 \text{FDI}_{i,t-1} + \beta_3 \text{Domestic Investment}_{i,t-1} + \beta_4 \text{GDP pc}_{i,t-1} + \\
 & \beta_5 \text{Inflation}_{i,t-1} + \beta_6 \text{Population}_{i,t-1} + \beta_7 \text{Government}_{i,t-1} + \beta_8 \text{Institutional Quality}_{i,t-1} + \\
 & \beta_9 (\text{Trade}_{i,t-1} \times \text{FDI}_{i,t-1}) + \tau_t + \gamma_i + \varepsilon_{i,t-1}, \tag{3}
 \end{aligned}$$

with the variables retaining their interpretation as before. We try to test the combined impact of trade and FDI on growth by including the interaction term  $\text{TRADE} \times \text{FDI}$  in the estimations, as proposed by Makki and Somwaru (2004). Moreover, following the methodology of Makki and Somwaru (2004) I test the impact of FDI inflow on domestic investment rates. FDI inflow can have a complementary relationship with domestic investments, where FDI promotes higher domestic investment rates. On the other hand, FDI inflow can ‘crowd out’ domestic investments, suggesting a substitution relationship between FDI and domestic investment rates.

## 4. Results

This section analyzes the results obtained from the benchmark models, while I also compare the results with existing findings in the literature. I start by looking at the benchmark model analyzing the direct link between trade and economic development, after which I analyze the results addressing the direct relationship between FDI and economic growth. Then, I look at the results relating to the combined impact of trade and FDI on economic development. The references for these econometric estimations have been thoroughly discussed in the previous section. Finally, this section also covers some limitations I have identified throughout the analyses.

I do not account for the impact of education, or human capital, in my models. Several authors, such as Barro (1997) and Temple (1999) record a positive link between a country’s human capital and its economic progress. However, due to lack of high quality data I am not able to properly incorporate these values into the analyses.

### 4.1 Impact of trade on economic development

When looking at the direct impact of trade on a country’s economy, I refer to table 3 for the estimated results. Table 3 also presents additional information in connection with my models, such as R-

squared and the number of observations per estimation. Model 1.1 tests the link between trade and growth by controlling for only initial 1995 GDP per capita levels and domestic investments. Model 1.1 does not indicate a link between trade and economic growth, although I find strong evidence suggesting a positive link between domestic investments and economic growth. Model 1.2 builds on model 1.1 by also including the impact of inflation in the estimation. As suggested by the results in model 1.2, trade positively affects economic growth. Furthermore, gross capital formation and inflation rates have a positive and negative impact on economic development, respectively.

After establishing a positive impact of trade on economic growth, I build on model 1.2 by including the impact of population growth on economic development. I re-affirm my findings suggesting a positive and significant impact of trade on economic growth at the usual confidence levels. As expected, domestic investments prove to positively affect growth, while higher inflation and population growth rates constrain economic development. Next, I build on model 1.3 by including government consumption into my estimations. The results of model 1.4 still show a positive link between a country's trading ability and its economic growth at the usual confidence levels. The variable gross capital formation also suggests that economic growth is achieved through domestic investments. I also find evidence suggesting a negative link between lagged GDP per capita and growth, as expected by the findings of Cai et al (2002) and Mankiw et al (1992).

Theory suggests that developed economies grow at a slower pace compared to developing economies, which is highlighted by my findings of model 1.4. Once more, the variables gross domestic investments, inflation rates and population growth show the expected signs in my model. The inclusion of the variable government consumption does not alter my findings when comparing model 1.3 and 1.4 with each other. Only the magnitudes of the coefficients have changed.

**Table 3: Direct impact of trade on economic growth**

<b>Determinants of GDP per capita growth</b>					
<u>Factors</u>	<u>Models</u>				
	1.1	1.2	1.3	1.4	1.5
<i>Intercept</i>	-1.8306 (1.5422)	-2.7383* (1.5258)	-2.5543* (1.5207)	-3.7053*** (1.1194)	0.6251 (2.1257)
<i>Trade</i>	0.2442 (0.1572)	0.4556*** (0.1685)	0.3908** (0.1688)	0.5227*** (0.1767)	0.6559*** (0.1848)
<i>Gross capital formation</i>	1.1291*** (0.1378)	1.2944*** (0.1426)	1.3524*** (0.1430)	1.3733*** (0.1451)	1.3498*** (0.1536)
<i>Initial GDP 1995</i>	-1.2974 (1.1642)	-1.5254 (1.1408)	-1.3752 (1.1369)	-0.6548* (0.3897)	-0.2343 (0.4226)
<i>Inflation CPI</i>		-0.0746** (0.0374)	-0.0735* (0.0375)	-0.0769** (0.0388)	-0.1029** (0.0403)
<i>Population growth</i>			-0.3817*** (0.1169)	-0.3486*** (0.1180)	-0.3333*** (0.1178)
<i>Government consumption</i>				-0.1065 (0.2182)	-0.2397 (0.2254)
<i>Institutional quality</i>					-1.0884** (0.4783)
<i>Country fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.4185	0.4388	0.4439	0.4386	0.4525
<i>Observations</i>	988	940	935	918	887

Table 3 illustrates the effect of trade on the economic growth. Gross capital formation, government consumption, foreign direct investments and trade openness are denoted as % of GDP, population growth denotes a year-on-year change. Institutional quality represents a score ranging from 0 to 100, with 100 being the best available score. Standard errors are denoted in brackets. Significance levels of 1%, 5%, and 10% are denoted by \*\*\*, \*\*, and \*, respectively.



Model 1.5 is my main estimation when assessing the link between trade and economic development. The results are reported in table 3. The results suggest a positive impact of trade on economic growth. My main findings imply that trade affects growth by enhancing a country's economic activities and thereby increasing GDP per capita, which are in line with the findings of Krueger (1980) where a positive link has been established between a country's ability to trade and its economic development. This result is in line with the findings of Fajana (1979) where he argues that the economic development in Nigeria has been primarily stimulated by trade. Moreover, I record that domestic investments trigger growth since higher domestic savings rate promote higher domestic investment levels, as suggested by Bacha (1990). I also find that higher inflation rates and higher population growth rates constrain economic growth. My results are in line with the documentation of Coale and Hoover (1958), where they argue that population growth harms economic development on the long run. The variable institutional quality appears to constrain growth, which does not match my expectation. However, the variable comprises different aspects of institutional quality and does only provide a general view of the impact of institutions on economic growth.

## **4.2 Impact of FDI on economic development**

After looking at the direct impact of trade on growth, I test the direct impact of FDI on economic progress. The results are presented in table 4. I start by looking at the results of model 2.1, where I estimate the impact of FDI on growth, while only accounting for the impact of domestic investment levels and initial GDP per capita levels. I find strong evidence suggesting domestic investments promoting economic development over the period 1995-2013. I find no evidence suggesting a link between FDI inflow and economic growth in model 2.1. I build on model 2.1 by including inflation rates as an additional independent variable. I only find evidence suggesting a positive impact of gross capital formation on GDP per capita growth, while initial GDP per capita values constrain economic growth. I do not find evidence suggesting a statistical link between FDI and inflation rates on economic growth. Next, I add the variable population growth in order to compare the results of my previous models and I report the findings as model 3.3. The results suggest no link between FDI inflow and economic development, while I do report statistical linkages between my other variables and economic growth. Initial GDP per capita, inflation rates and population growth harm economic growth, while higher domestic investment levels promote GDP per capita growth.

**Table 4: Direct impact of foreign direct investment on economic growth**

Factors	Determinants of GDP per capita growth				
	Models		Models		
	2.1	2.2	2.3	2.4	2.5
<i>Intercept</i>	-1.5862*** (0.5315)	-1.8318*** (0.5465)	-1.5785*** (0.5532)	-1.4106 (0.9238)	1.7755 (2.1437)
<i>FDI</i>	0.0499 (0.4255)	0.0556 (0.0432)	0.0541 (0.0431)	0.0471 (0.0433)	0.0530 (0.0435)
<i>Gross capital formation</i>	1.0537*** (0.1440)	1.2152*** (0.1535)	1.2708*** (0.1541)	1.2981*** (0.1570)	1.2417*** (0.1688)
<i>Initial GDP 1995</i>	-0.5966 (0.3839)	-0.7691** (0.3812)	-0.8735** (0.3815)	-0.8931** (0.3841)	-0.6997* (0.4112)
<i>Inflation CPI</i>		-0.0637 (0.0388)	-0.0655* (0.0389)	-0.0604 (0.0393)	-0.0829** (0.0409)
<i>Population growth</i>			-0.3451*** (0.1194)	-0.3492*** (0.1198)	-0.3503*** (0.1196)
<i>Government consumption</i>				-0.0793 (0.2247)	-0.2281 (0.2332)
<i>Institutional quality</i>					-0.6237 (0.4897)
<i>Country fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.4148	0.4302	0.4342	0.4335	0.4433
<i>Observations</i>	940	893	888	881	853

Table 4 depicts the effect of foreign direct investment on the economic growth. Gross capital formation, government consumption, foreign direct investments and trade openness are denoted as % of GDP, population growth denotes a year-on-year change. Institutional quality represents a score ranging from 0 to 100, with 100 being the best available score. Standard errors are denoted in brackets. Significance levels of 1%, 5%, and 10% are denoted by \*\*\*, \*\*, and \* respectively.

Next, model 2.4 builds on model 2.3 by controlling for government consumption as well in the estimation. I record no evidence suggesting FDI inflow to trigger economic growth across the dataset. Once more, the variables gross capital formation, initial GDP per capita, and population growth affect economic growth and show the expected signs. Finally, model 2.5 serves as my main model in analyzing

the impact of FDI inflow on economic growth. The results of model 2.5 suggest FDI does not have an impact on economic growth, while gross capital formation acts as a catalyst for economic growth as suggested by Alfaro et al. (2003) and Levine and Renelt (1992). I find evidence supporting the findings of Aghion et al. (2003) suggesting lagged GDP per capita negatively affecting growth. Moreover, as suggested by the theories of De Gregorio (1993) and Canning et al (1998), higher inflation rates and higher lagged GDP per capita constrain GDP per capita growth. Inflation reduces the level of business environment and the level of efficiency in economies, following the findings of Dotsey and Sarte (1999), De Gregorio (1992) and Andrés and Hernando (1997). In addition, population growth has a negative effect on development, according to the Malthusian view on demography<sup>9</sup> (Brander and Dowrick, 1993). Once more, I find no evidence supporting a link between a country's general institutional quality level and its impact on development, although this link has been highlighted by the findings of Gwartney et al (2004).

### 4.3 Combined impact of FDI and trade on growth

After assessing the direct impact of trade on growth and FDI on growth, I focus my attention at the combined impact of FDI and trade on growth. I proxy this effect by introducing the interaction term ( $TRADE \times FDI$ ) into my models. As mentioned, I also include trade and FDI separately in order not to overstate the effect of the interaction term. The results are reported in table 5.

I start my analysis by looking at model 3.1, where the results relating to the impact of trade and FDI on growth are presented. The results suggest that trade and domestic investments promote economic growth, while FDI inflow and initial GDP per capita levels do not have a statistical impact on economic growth. I build on model 3.1 by including inflation rates in my estimation. Model 3.2 suggest similar results as model 3.1, although inflation rates prove to negatively affect GDP per capita growth. Next, I introduce population growth rates in my estimation and report the results relating to model 3.3. I find evidence suggesting a positive link between the variable trade and GDP per capita growth, while FDI inflow does not appear to affect economic growth. Once more, I find a positive and negative link between domestic investments and inflation rates, respectively. As indicated by model 3.3, population growth harms GDP per capita growth. I expand model 3.3 by including government consumption into the estimation. Model 3.4 re-affirms my findings that trade and gross capital formation triggers GDP per

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<sup>9</sup> For more information relating to this link, please refer to the findings of F. Furedi (1997) and A. Kelly (2003), where they amply discuss these relationships

capita growth, while higher inflation and higher population growth rates negatively affect economic development at my usual confidence levels.

I build on model 3.4 to also include the impact of institutional quality on GDP per capita growth in model 3.5. I report a positive impact of trade and domestic investments on GDP per capita growth, while inflation and population growth appear to constrain economic growth, once more. I find no evidence linking institutional quality and economic growth. Finally, I include the interaction term ( $Trade \times FDI$ ) to assess the combined impact of trade and FDI on economic growth. My results suggest that the variable trade positively affect economic growth, while I find no evidence suggesting a link between FDI and GDP per capita growth. My results relating to trade on economic growth are in line with the findings of Baldwin and Forslid (2000) and Yanikkaya (2003), where they document a positive and strong link between trade and economic development. Unfortunately, my interaction term does not appear to affect economic growth. The results relating to trade and FDI on economic growth differs from the findings of Makki and Somwaru (2004), since they record a positive link between FDI and GDP per capita growth, although they fail to document a link between trade and economic development. Moreover, I record a positive relationship between domestic investments and GDP per capita growth, while inflation and population growth rates constrain growth levels. Similar results are recorded for the models 3.7 and 3. 8, as presented in table 5.

**Table 5: Impact of trade and FDI on economic growth**

Factors	Determinants of GDP per capita growth									
	Dependent: GDP per capita growth rate					Dependent: Domestic Investment				
	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10
<i>Intercept</i>	-3.1702*** (0.8309)	-4.3545*** (0.8969)	-3.8530*** (0.9141)	-3.6534*** (1.1593)	0.1165 (2.1831)	-4.4074 (4.5499)	0.0695** (2.1922)	-5.0531 (4.8494)	1.0611** (0.4724)	0.9046* (0.4702)
<i>Trade</i>	0.4133** (0.1680)	0.6349*** (0.1806)	0.5641*** (0.1820)	0.5764*** (0.1840)	0.6913*** (0.1919)	1.7897* (0.9881)	0.7083*** (0.2033)	2.0490** (1.1735)	0.0695 (0.0425)	0.1254*** (0.0445)
<i>FDI</i>	0.0389 (0.0426)	0.0392 (0.0431)	0.0397 (0.0430)	0.0319 (0.0433)	0.033 (0.0434)	0.0331 (0.0434)	0.1235 (0.3596)	-0.1675 (0.6433)	0.0668*** (0.0092)	0.3688*** (0.0776)
<i>Gross capital formation</i>	0.9879*** (0.1464)	1.1664*** (0.1530)	1.2207*** (0.1540)	1.2498*** (0.1572)	1.2121*** (0.1680)	2.6685** (1.2962)	1.2071*** (0.1692)	2.9081** (1.4489)		
<i>Initial GDP 1995</i>	-0.3291 (0.3981)	-0.4053 (0.3927)	-0.5372 (0.3950)	-0.5559 (0.3971)	-0.1965 (0.4305)	-0.2516 (0.4332)	-0.2070 (0.4328)	-0.2652 (0.4358)	0.5089*** (0.0949)	0.4668*** (0.0948)
<i>Inflation CPI</i>		-0.0789** (0.0388)	-0.0792* (0.0389)	-0.0746* (0.0393)	-0.0981** (0.0408)	-0.0960** (0.0408)	-0.0974** (0.0409)	-0.0952** (0.0410)	0.0193** (0.0083)	0.0212** (0.0682)
<i>Population growth</i>			-0.2997** (0.1196)	-0.0303** (0.1200)	-0.2954** (0.1196)	-0.2842 (0.1200)	-0.2950** (0.1197)	-0.2866** (0.1202)	0.1121*** (0.0249)	0.1113*** (0.0247)
<i>Government consumption</i>				-0.1073 (0.2237)	-0.2341 (0.2313)	-0.2338 (0.2313)	-0.2360 (0.2316)	-0.2508 (0.2349)	-0.0866* (0.0511)	-0.0924* (0.0507)
<i>Institutional quality</i>						-0.9343* (0.4921)	-0.9272* (0.4924)	-0.9439* (0.4932)	0.3287*** (0.1065)	0.3178*** (0.1057)
<i>Trade * Gross capital formation</i>						-0.3491 (0.3080)		-0.4332 (0.3743)	-1.0611** (0.4724)	
<i>FDI * Gross capital formation</i>								0.0756 (0.1775)		
<i>Trade * FDI</i>							-0.0200 (0.0791)	-0.0073 (0.0803)		-0.0673*** (0.0172)
<i>Country fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.4195	0.4396	0.4417	0.4412	0.4535	0.4544	0.4535	0.4545	0.6873	0.6928
<i>Observations</i>	939	892	887	880	852	852	852	852	944	944

Table 5 shows the combined effect of trade and foreign direct investment on the economic growth. Gross capital formation, government consumption, foreign direct investments and trade openness are denoted as % of GDP, population growth denotes a year-on-year change. Institutional quality represents a score ranging from 0 to 100, with 100 being the best available score. Standard errors are denoted in brackets. Significance levels of 1%, 5%, and 10% are denoted by \*\*\*, \*\*, and \*, respectively.

Throughout my analyses, I find no evidence suggesting a link between institutional quality and economic growth, while several authors, such as Acemoglu and Johnson (2005) and Lal (1998), document such findings. I use the general level of institutional quality to test for the impact on economic progress, whereas future research could focus on each aspect of institutional quality on growth separately in order to gain a better understanding on these links.

### **FDI 'crowds-in' domestic investment rates**

The relationship between FDI and domestic investment has been one of the most debated subjects in the literature. Therefore, I also test for the determinants of domestic investment levels over the period 1995-2013. Following the methodology of Makki and Somwaru (2004), I report the link between FDI inflow and domestic investments in table 5. Model 3.9 suggests that FDI positively affect domestic investment rates at the usual confidence levels. My results suggest that FDI inflows have a complementary relationship with domestic investment rates. I also record that richer and larger countries promote higher domestic investment rates, since there is more savings capacity of household and a larger pool of households. I find that countries with higher institutional quality are better equipped to allocate savings towards investment opportunities yielding positive returns. By altering model 3.9, I try to confirm my initial findings relating to the relationship between FDI inflow and domestic investments. Model 3.10, once more, suggests a positive impact of FDI inflow on domestic investment rates, while trade also promotes domestic investments. I find evidence suggesting a positive link between initial GDP per capita levels, population growth and institutional quality on domestic investment rates, while government consumption appears to constrain gross capital formation. My results add to the findings documented by Borensztein, Gregorio and Lee (1998), where they document a positive link between FDI inflow and domestic investments.

### **4.4 Limitations**

Although I try to assess the links between FDI, trade, and economic development as thoroughly as possible, I still identify some limitations of my analyses. This section covers some limitations of the analyses and urges researches to view my models as a basis for future analyses.

I try to limit any endogeneity issues in my models by basing my models on panel dataset, while using lagged values for my independent variables. However, future research could also follow an instrumental variable approach in order to test the robustness of my findings. In addition, since my dataset comprises a large portion of developing economies, the quality of the data is not comparable

with the quality of developed economies. For some periods, there are no data available for some countries, which could also affect my estimations.

## 5. Conclusion

This paper focuses on the relationship between international trade, foreign direct investments (FDI), and their impact of economic development. My analysis covered the period 1995-2013 and comprises OECD, CIVETS, BRICS and Low Income economies classified by the World Bank. Economic development is measured as GDP per capita growth in order to keep in line with existing literature. I used several control variables, such as, initial GDP per capita, inflation rates, population growth rates, gross capital formation- also known as domestic investments-, government consumption and institutional quality. The reason for choosing these control variables are well documented in the existing literature.

I start by looking at the direct impact of trade on economic growth. I find strong evidence suggesting a positive and significant impact of trade on economic growth. My results contribute to the findings of Dollar and Kraay (2001) suggesting trade acts as a catalyst for economic development. My models also suggest a positive impact of domestic investments on economic development, while inflation and population growth harms long term economic progress. After assessing the impact of trade on GDP per capita growth, I also look at the impact of FDI on economic development. In contrast to several authors, I do not find evidence suggesting a statistical link between FDI inflow and economic growth. I document a strong positive link between domestic investments and GDP per capita growth over the period 1995-2013. Moreover, I also find evidence suggesting higher initial GDP per capita, inflation rates and population growth negatively affect economic growth. Finally, I test the combined impact of trade and FDI on economic growth, by including the interaction term ( $Trade \times FDI$ ) in my models. By doing this, I follow the methodology of Makki and Somwaru (2004) when testing the combined impact of trade and FDI on economic growth. I find no evidence suggesting that the interaction term significantly affects growth, although I record strong evidence linking trade with economic growth. In addition, my results show a positive link between domestic investments and economic development. To test for the relationship between FDI inflow and domestic investments, I also construct models to capture these links. I report that FDI inflow have a positive impact on domestic investments, suggesting a 'crowding-in' of domestic investments by FDI inflow. Because of some limitations I have identified in my approach and my models, I urge the reader to consider my results are a stepping stone for future research.

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