

ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Bachelor Thesis Economics and Business Economics

**Effect of Foreign Direct Investment on Real Sector
Growth**

Abstract

In this thesis I analyze the effect of foreign direct investment on real sector growth in 19 countries in Latin America between 1990 and 2019. To test the potential impact of foreign direct investment, I employ panel data regression with random effects. I conclude that there is a significant direct negative impact of foreign direct investment on real sector growth and agriculture growth, but no evidence for the other sectors. I also conclude that foreign direct investment has a marginal impact on the manufacturing and service sector for certain levels of financial development. These effects, however, are negative for the manufacturing sector and only positive for high financial development values for the service sector. This shows again what earlier literature suggests that financial development is crucial for foreign direct investment to have a significant impact on sector growth.

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Date definitive version: 10 July 2023

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

1. Introduction

Foreign direct investment, or FDI for short, is an investment done by an entity based in one country with the objective to have more than 10% direct ownership in a foreign entity. Examples of these entities are businesses, real estate, or productive assets. As of 2021, the Netherlands is ranked the world's second country with the highest inward foreign direct investment (FDI) after the United States (IMF, 2022). Part of these investments create productive activities. Other investments do not have a link to the real economy. Most noticeable is that the top 10 inward FDI countries are developed economies. In 2020 due to the COVID pandemic total global investment was USD 859 billion. Compared to the year before covid total global investment was USD 1.5 trillion (UNCTAD, 2021). This shows a dramatic decrease in total global investment during the beginning of COVID. However, FDI increased again 88% in 2021 (OECD, 2022). Previous research shows that foreign direct investment has a positive effect on economic growth. An example is foreign direct investment leading to investments that otherwise would not have taken place. Zhang (2001) suggests that foreign direct investment leads to economic growth in 11 countries in Asia and Latin America between 1960 and 1997. However, this research also shows that there are country-specific factors which lead to economic or real sector growth because of foreign direct investment. This becomes very clear when studying regions like Asia and Latin America, because there are a lot of differences in economic state and characteristics between these countries. Possible factors explaining differences between foreign direct investments and real sector growth are macroeconomic stability, good education, healthy human capital conditions and a liberalized trade regime. Evidence from Asamoah & Alagidede (2023) shows that there are many differences between FDI's effect on sectors in Africa between 1990-2017. General estimations show there are no effects of foreign direct investment on manufacturing and industry in African countries. Even worse, it shows a decline in growth for the agriculture sector. After decomposing the real sector, Asamoah & Alagidede show that the interaction between financial development and FDI results in real sector growth, however only when the relative level of the financial development index is high. This implies that foreign direct investment has a significant impact on real sector growth for high values of the financial development index. However, it is unclear if Asamoah & Alagidede's thesis also holds for Latin America. Like Africa, Latin America has underdeveloped economies. In contrast to Africa, which is known as one of the poorest continents globally, Latin America does have a few developed economies. This could mean

that there are key differences for countries on real sector growth. Following Zhang (2001) it is known that foreign direct investment leads to economic growth in a few Latin American countries, but there is no evidence for the entire continent. In addition to Zhang, it would be interesting to see possible differences in growth factors for all Latin American countries. To get more specific, this research will look at real sector growth in detail. Given the COVID-crisis from 2020, I will not analyze data beyond 2019 to exclude any effects from the COVID crisis. Therefore, given the previous research on these topics, the remaining unanswered question is: How does foreign direct investment effect real sector growth in Latin America between 1990-2019? In order to answer this research question, I will analyze panel data from 19 Latin-American countries between 1990-2019 in order to look for differences or similar results as found by Asamoah & Alagidede (2023). Group clustered observations will be used for this analysis to account for consistent standard errors. Furthermore, I will use a general random effects model. This is used to account for potential systematic individual(country)-invariant effects. The Hausmann-Wu test will be performed on the OLS regressions to check for endogeneity. This should account for potential different economic characteristics between countries in Latin-America. Furthermore, known growth factors will be used as control variables. Real sector growth is defined as annual growth of that economic sector, which means the value added per year. Value added is defined as the net output of a sector after adding up all outputs and subtracting intermediate inputs, not accounting for depreciation of assets of natural resources. Foreign direct investment is measured as the total investment value of all investments that comprises more than 10% direct control in a Latin American country. I expect to have N=500 observations. I will use secondary data collected from databases from the World Bank and the International Monetary Fund. I expect to find evidence that in financially developed countries in Latin America foreign direct investment has a significant effect on real sector growth. I also expect that foreign direct investment does not have a significant effect on real sector growth in underdeveloped economies. The most important and interesting aspect of this research will be the results for policy makers. Policy makers and investors can use this information for their own goals. Investors will then know where to invest and know when their investment has the biggest impact. Policy makers can use the outcome to study opportunities to improve sectors which have no advantage from foreign direct investment. As a result, it should promote economic development in Latin America. However, this research will presumably not give a definitive answer to the question how foreign direct investment impacts real sector growth. Countries and sectors will be split,

but there are presumably a lot of differences between regions in specific countries. I would therefore recommend local policy makers to apply this research/technique on a more local level. This research concerns Latin America and therefore its outcome should not be applied to other regions, just because economic factors differ strongly among continents and countries as explained by Zhang (2001).

Theoretical Framework

2.1 Real Sector Growth

The outcome “real sector growth” consists of two components: real sector and sector growth. The definition of the real sector or better known as the real economy is the part of the economy that is non-financial or in other words produces goods and services that are useful in real life (Cochrane, 2005). Sector growth is defined as an increase of production or produced value by a sector (Drandakis, 1963). Real sector growth can be seen as part of economic growth, but it is important to note that it is not entirely economic growth or economic development. This is because there is the financial sector besides the real sector. Also, a faster expanding financial sector leads to a slower real sector growth (Cecchetti, Setphen, Kharroubi & Enisse, 2015). This analysis will be looking at real sector growth in 19 countries in Latin-America, focusing on the service, agriculture, manufacturing, and industrial sectors.

Previous research shows that there are a lot of determinants of economic growth. Examples of these for central/eastern European countries are human capital, education, financial sector development, economic structure, low interest rates and inflation (Prochniak, 2011). Patrick (1966) determines that the presence of modern financial institutes or rather the lack thereof is the main reason why underdeveloped countries lack economic growth, because they only have a few means for economic growth and development. Barro & Lee (1994) conclude that having a large government and political instability is a negative for stimulating economic growth in the real sector.

2.2 Foreign Direct Investment

The definition of foreign direct investment (FDI) is an ownership stake in a foreign company or project made by an investor, company, or government from another country (Investopedia 2023). As with real sector growth, FDI is strongly associated with economic growth (Borensztein, Gregorio & Lee, 1998). However, important part from their research

is that FDI only has a significant effect if the host economy has absorptive capability of the advanced technology that FDI brings with itself.

In studies concerning foreign direct investment, there is one regarded as seminal. It is also regarded as the first one that studied foreign direct investment in the way we know today. Dunning (1958) studies the relevance and implications of having 40 years of American investment in the British economy. This was relevant because the U.S. had been investing immensely in the British industry after World War I & II. After conducting a study for three years, using summary statistics, Dunning came to the conclusion that the U.S. direct investment had a positive effect on British productivity.

2.3 Foreign Direct Investment on Real Sector Growth

Earlier research on foreign direct investment and economic growth in Latin America suggests a more complicated picture. Alvarado, Iniguez & Ponze (2017) conclude that the effect of FDI on economic growth is not statistically significant for Latin America. However, when looking at different levels of financial development, it is clear there are significant results. Their conclusion is that foreign direct investment has a significant impact in high-income countries. On a wider scale, Herzer (2012) concludes that foreign direct investment even had an average negative impact on economic growth in 44 developing countries. Iamsiraroj (2016) suggests that FDI has a bi-directional relationship with economic growth in the period 1971-2010. His main conclusion was that FDI also has its own determinants, like labor force, trade restrictions and friendly investment climate. This is in line with Prochniak, (2011) and Patrick (1966), who also determine that FDI on itself does not have a positive effect on economic growth but is dependent on other factors. Azman-Saini, Baharumshah & Law (2010) conclude based on a study done of a panel of 85 countries that foreign direct investment does not have a direct positive effect on output growth. In this research the most important factor for foreign direct investment to influence economic growth, is economic freedom. Instead of real sector growth, research suggests that foreign direct investment does not support economic growth for Africa between 1971-2010 (Acquah & Ibrahim, 2019). This is consistent with earlier research that analyzes other countries. One of the main characteristics of the countries where foreign direct investment does not have a significant impact on economic growth, is again a lack of financial development or a strong financial sector. Acquah & Ibrahim also conclude for African

countries that their lack of financial development causes them to have less or null stimulated economic growth because of foreign direct investment.

2.4 Financial Development

Financial development is broadly defined as the level of development of financial markets. It is highly regarded as a critical factor for economic growth (Khan & Senhadji, 2003). In this research financial development is proxied by the Chinn-Ito index and the amount of private credit by banks and other financial institutions as a share of the gross domestic product (GDP). Credit of the private sector has been used extensively in the literature and is considered a good measure compared to available alternatives (Beck, Demirgüç-Kunt, & Levine, 2007).

It is widely implied by studies that financial development has a positive and statistically significant effect on economic growth (Havranek, Horvath & Valickova, 2014). However, their results also suggest that the fastest driver for economic growth of all financial intermediaries is the stock market. Huang & Yongfu (2010) suggests that more open trade policies and attractive investment policies increase financial development. Becsi & Wang (1997) also conclude that financial intermediation or development plays a crucial role in economic activity/growth, because of the ability to generate investments and create a secure environment for the economy to grow as economy.

Desbordes & Wei (2017) shows that countries' financial development jointly promotes FDI worldwide. It is achieved by directly increasing access to external finance and indirectly supporting overall economic activity. However, opening a country up to more foreign investment increases economy vulnerability against international financial shocks (Goldberg, 2009). Agbeluyi, Nwosa & Saibu (2011) show that in Nigeria foreign direct investment had a negative impact on economic growth due to the lack of financial development in the country. Jahfer & Inoue (2014) who research foreign direct investment, financial development & economic growth in Sri Lanka, come to a different conclusion. In their research they suggest it is not FDI what causes economic development, but economic growth and financial development cause FDI. The implication of all literature for this research is that financial development plays an important role in the effect of foreign direct investment on economic growth.

Data

3.1 Data Description

I have obtained panel data from 19 countries in Latin America for the period 1990-2019. The total number of observations in the panel data is 550. See appendix A for an overview of all countries studied. The choice for a country was determined by looking at the available data. Note that there is no definition what constitutes a Latin American country. I studied the maximum number of countries in South & Central American possible. Countries excluded in this research are for example (to) small economies or old colonial islands, but also bigger countries where not enough data was available or missing for the period chosen. The data was collected from databases from the World Bank and International Monetary Fund. The financial openness index, which I will discuss in detail later, was collected from the database provided by Chinn, Menzie & Hiro (2006).

3.2 Variables

I obtained real sector growth, foreign direct investment, GDP growth, government expenditure, gross domestic savings, and private credit from the World Data Bank. The dependent variable which I use for this research is the real sector growth or *RSG*. This variable contains total value added for agriculture, industry, manufacturing and services of the 19 countries between 1990-2019, using 1989 as base year. Value added is defined as the net output of a sector after adding up all outputs and subtracting intermediate inputs, whilst not making deductions for depreciation of fabricated assets. These are added up for all countries for every year based on constant local currency. Then it is transformed into a yearly growth rate. Foreign direct investment or *FDI* is defined as an investment made by a foreign entity to acquire a lasting interest in another entity other than one in its home country. Usually, a foreign entity buys more than 10% interest. The unit of foreign direct investment is total inflow of FDI as a percentage of GDP.

The financial development index or *FD* is obtained from the International Monetary Fund. This variable measures financial markets and institutions development in terms of efficiency, access and debt Svirydenka (2016). This index can take values from 0 up to 1, but not exceeding 0.65 in this dataset. For robustness I will use private credit to GDP (*DCPS*) as an proxy for financial debt. This variable is obtained from the World Data Bank. This variable is defined as credit of the private sector provide by banks as percentage of GDP.

3.3 Control Variables

Throughout my statistical analysis I will use a set of control variables widely known to be covariates of growth, accounting for every country and year. These control variables will be denoted with X . This includes domestic savings rate, GDP growth, government expenditure and financial openness. The first three variables are collected from the World Data Bank. GDP growth or $GDPG$ is a proxy for the growth of the economy, measured as annual percentage growth rate of GDP based on local currency. Government expenditure or $GGFCE$ is used as a control variable for measuring the size of government. It is measured as a percentage of GDP. Gross domestic savings or GDS is a variable that consists of the difference between GDP and total consumption as percentage of GDP. The last control variable that I will use is financial openness. This index is obtained from Chinn, Menzie & Hiro (2006). This index is part of their research into trilemma indexes, where they suggest a possible index to proxy capital openness made of capital transactions. Financial openness is measured 0 to 1, meaning 0 economy very closed and 1 meaning a country has an relative open economy.

3.4 Descriptive Statistics

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>RSG</i>	565	4.32	6.88	-18.86	65.25
<i>DCPS</i>	570	33.75	18.81	6.95	133.08
<i>FDI</i>	568	3.29	2.73	-5.09	16.23
<i>AVA</i>	570	2.89	6.03	-28.99	42.05
<i>GDPG</i>	570	3.5	3.25	-11.95	13.01
<i>GGFCE</i>	556	12.52	3.78	2.93	43.48
<i>IVA</i>	570	2.94	5.19	-30.49	29.56
<i>MVA</i>	569	2.57	4.65	-35.91	24.59
<i>SVA</i>	565	4.19	8.31	-11.03	181.84
<i>FO</i>	570	0.61	0.33	0	1
<i>FD</i>	570	0.23	0.12	0.06	0.66
<i>GDS</i>	566	17.11	9.77	-13.22	58.78

Table 1 Descriptive Statistics for all variables

Table 1 shows descriptive statistics of the variables for 19 South and Central American countries over the period 1990-2019. With 3.29% on average, table 1 shows that the continents still attract small volumes relatively of FDI as percentage of GDP. The service sector clearly shows the highest average growth being 4.19% yearly. The industry,

manufacturing and agriculture sector follow each other closely with respectively 2.94, 2.57 and 2.89% average yearly growth. This suggests that Latin America has a strong growing service sector compared to the other three sectors. The GDP growth is 3.5% on average and real sector growth 4.32%. This suggests that growth is much more evident in the real sector in Latin America. With an average of 0.23, the financial development index suggests Latin America having a relative underdeveloped market. However, this is an average, meaning there could be potential big differences between countries. The financial openness index shows a value of 0.61 on average meaning that Latin American economies are relatively open in compared to other developing continents. Low government expenditure on average (12.52%) and a gross domestic saving percentage of 17.11% illustrate possible differences between the countries in Latin America.

4. Methodology

To analyze the data, I will use a specified regression model in order to investigate direct and indirect effects of FDI and FD on real sector growth. In order to test the first hypothesis that FDI has a direct significant effect on real sector growth, the following regression model (1) is estimated:

$$RSG_{it} = \beta_1 FDI_{it} + \beta_2 FD_{it} + \beta_3 X_{it} + U_i + \varepsilon_t + \vartheta t_{it} \quad (1)$$

Where U_i , ε_t and ϑt_{it} signify an error term, time-varying idiosyncratic shock with standard iid assumption and country effects. X denotes the control variables as discussed in the data section, with also RSG , FDI & FD already being discussed. For this first equation, our main interest is in the first two coefficients β_1 & β_2 , measuring the effects of FDI and FD. However, Durham (2004) discusses the possibility that FDI does not have a direct effect on growth. To investigate the possibility of FDI having an indirect effect on real sector growth via FD, I will estimate a second model (2):

$$RSG_{it} = \beta_1 FDI_{it} + \beta_2 FD_{it} + \beta_3 X_{it} + \beta_4 (FDI \times FD)_{it} + U_i + \varepsilon_t + \vartheta t_{it} \quad (2)$$

In this model the main interest is β_4 . This coefficient tests if the effect of FDI on real sector is dependent on levels of FD. To test this further in detail, the partial derivative of equation 2 with respect to FDI is determined, leading to the third equation:

$$\frac{\delta(RSG)}{\delta(FDI)} = \beta_1 + \beta_4 FDI_{it} \quad (3)$$

If β_1 & β_4 are nonnegative values, then the real sector grows because of an increase in FDI and FD. To test the effect of FDI on real sector growth with respect to various levels of FD, equation 3 will be set to zero, resulting in the last equation of interest (4):

$$\beta_1 + \beta_4 FDI_{it} = 0 \quad (4)$$

Group clustered observations will be used for these regressions, to account for consistent standard errors. Besides using clustered observations in these regressions, I will also use a general random effects model to account for potential systematic individual(country)-invariant effects. To check for endogeneity and using random effects or fixed effects model, I will also perform the Hausmann-WU test when using the OLS models.

5. Results

Table 3A-E show the results for the OLS models 1-6. First every model was regressed without the interaction term and then with the interaction term. The same has been done for every model with credit to the private sector as proxy for financial development. Table 2 shows some diagnostics like the number of observations, random effect and probability F-test of the model. It also shows the R^2 for the panel regressions.

<i>Model</i>	<i>Observation</i>	<i>Randon Effect</i>	<i>Prob>chi2</i>	<i>R-sq</i>	<i>Within</i>	<i>Between</i>	<i>Overall</i>
<i>1</i>	545	Yes	0		0.324	0.133	0.241
<i>2A</i>	545	Yes	0		0.330	0.100	0.230
<i>2B</i>	545	Yes	0		0.331	0.094	0.228
<i>2C</i>	545	Yes	0		0.332	0.085	0.224
<i>2D</i>	545	Yes	0		0.33	0.071	0.217
<i>3A</i>	550	Yes	0		0.164	0.395	0.177
<i>3B</i>	550	Yes	0		0.162	0.400	0.177
<i>3C</i>	550	Yes	0		0.160	0.426	0.177
<i>3D</i>	550	Yes	0		0.167	0.420	0.177
<i>4A</i>	550	Yes	0		0.625	0.734	0.634
<i>4B</i>	550	Yes	0		0.625	0.729	0.634
<i>4C</i>	550	Yes	0		0.625	0.730	0.634

4D	550	Yes	0	0.625	0.730	0.634
5A	549	Yes	0	0.552	0.460	0.543
5B	549	Yes	0	0.552	0.519	0.547
5C	549	Yes	0	0.553	0.448	0.547
5D	549	Yes	0	0.554	0.499	0.549
6A	545	Yes	0	0.139	0.189	0.142
6B	545	Yes	0	0.147	0.167	0.148
6C	545	Yes	0	0.140	0.171	0.141
6D	545	Yes	0	0.141	0.139	0.1417

Table 2 Diagnostics statistics for all models.

Table 2 shows that the least number of observations of all the models is 545 (model 1,2&6) and the most 550 (model 3&4). I also used random effects for my panel data analysis, because the Hausmann Wu test probability was insignificant for every model.

<i>Dependent Variable</i>	<i>RSG</i>	<i>RSG</i>	<i>RSG</i>	<i>RSG</i>	<i>RSG</i>
<i>Model</i>	1	2A	2B	2C	2D
<i>FDI</i>	-0.181* (-0.09)	-0.181** (-0.091)	-0.341* (-0.196)	-0.208** (-0.093)	-0.587*** (-0.217)
<i>Financial Development</i>		7.031* (-3.661)	3.993 (-4.889)		
<i>Private Credit</i>				0.044** (-0.019)	0.018 -0.024
<i>Interaction Term</i>			0.706 (-0.765)		0.008* (-0.004)
<i>GDP Growth</i>	1,014*** (-0.066)	1.015*** (-0.066)	1.020*** (-0.067)	1.040*** (-0.067)	1.047*** (-0.067)
<i>Government Expenditure</i>	0.167* (-0.094)	0.106 (-0.100)	0.127 (-0.102)	0.095 (-0.099)	0.13 (-0.100)
<i>Financial Openness</i>	0.7 (-0.911)	0.23 (-0.94)	0.259 (-0.939)	0.439 (-0.915)	0.499 (-0.913)
<i>Domestic Savings</i>	0.079* (-0.044)	0.056 (-0.046)	0.051 (-0.046)	0.075* (-0.044)	0.074* (-0.044)

Table 3A Real Sector Growth, Foreign Direct Investment and Financial Development. *** notes significance at 1%, ** at 5% and * at 10%.

The first column of the tables 3A-E presents the independent variables and the first row presents the dependent variable. Every model with the same dependent variable has the same number but augmented with a letter. For every coefficient, I will assume it as

significant when it is at 5%. Model 1 in table 3A shows the direct impact of FD and FDI on real sector growth. It shows no evidence that FDI has a significant direct impact on real sector growth. When controlling for FD (model 2A), FDI becomes significant having the same direct negative impact on real sector growth as in model 1 with a real sector decline of 0.181% when FDI increases with 1%. Model 2A shows that FD has no direct significant effect on real sector growth. Model 2C shows that private sector credit does have a significant direct positive effect on real sector growth, with FDI also again showing significant negative direct effect on real sector growth. All the models show an insignificant impact of the interaction terms on real sector growth.

<i>Dependent Variable</i>	<i>AVA</i>	<i>AVA</i>	<i>AVA</i>	<i>AVA</i>
<i>Model</i>	<i>3A</i>	<i>3B</i>	<i>3C</i>	<i>3D</i>
<i>FDI</i>	-0.194** (-0.098)	-0.174 (-0.21)	-0.173* (-0.105)	-0.1 (-0.221)
<i>Financial Development</i>	-0.714 (-2.507)	-0.365 (-4.099)		
<i>Private Credit</i>			-0.01 (-0.017)	-0.002 (-0.025)
<i>Interaction Term</i>		-0.085 (-0.792)		-0.002 (-0.004)
<i>GDP Growth</i>	0.804*** (-0.079)	0.804*** (-0.079)	0.802*** (-0.079)	0.800*** (-0.079)
<i>Government Expenditure</i>	0.082 (-0.083)	0.08 (-0.087)	0.094 (-0.083)	0.081 (-0.087)
<i>Financial Openness</i>	-0.949 (-0.798)	-0.94 (-0.802)	-0.908 (-0.799)	-0.915 (-0.792)
<i>Domestic Savings</i>	0.031 (-0.03)	0.031 (-0.03)	0.031 (-0.028)	0.033 (-0.027)

Table 3B Real Sector Growth, Foreign Direct Investment and Financial Development. *** notes significance at 1%, ** at 5% and * at 10%.

Model 3A-B (table 3B) shows only a direct significant negative impact of FDI on agriculture sector growth, declining with 0.194% when FDI increases 1%, with the effects of FD and private sector credit being insignificant.

Table 3C&D shows that this trend is continued in the industry and manufacturing sector. Private credit has a negative significant impact on manufacturing growth and FDI has a positive significant effect on manufacturing sector growth. All the other direct effects are insignificant for FDI and FD. Model 5C shows that private credit has a direct significant negative impact on manufacturing growth of 0.021%.

<i>Dependent Variable</i>	<i>IVA</i>	<i>IVA</i>	<i>IVA</i>	<i>IVA</i>
<i>Model</i>	4A	4B	4C	4D
<i>FDI</i>	0.028 (-0.054)	0.094 (-0.118)	0.029 (-0.058)	0.038 (-0.125)
<i>Financial Development</i>	-0.807 (-1.632)	0.35 (-2.511)		
<i>Private Credit</i>			-0.002 (-0.010)	0.0001 (-0.014)
<i>Interaction Term</i>		-0.286 (-0.455)		0.000 (-0.002)
<i>GDP Growth</i>	1.193*** (-0.042)	1.191*** (-0.042)	1.191*** (-0.042)	1.194*** (-0.042)
<i>Government Expenditure</i>	-0.127** (-0.049)	-0.139*** (-0.053)	-0.139*** (-0.050)	-0.131** (-0.051)
<i>Financial Openness</i>	0.28 (-0.472)	0.281 (-0.479)	0.281 (-0.472)	0.287 (-0.464)
<i>Domestic Savings</i>	-0.003 (-0.019)	0.000 (-0.120)	0.001 (-0.018)	-0.008 (-0.017)

Table 3C Real Sector Growth, Foreign Direct Investment and Financial Development. *** notes significance at 1%, ** at 5% and * at 10%.

<i>Dependent Variable</i>	<i>MVA</i>	<i>MVA</i>	<i>MVA</i>	<i>MVA</i>
<i>Model</i>	5A	5B	5C	5D
<i>FDI</i>	-0.049 (-0.054)	0.158 (-0.113)	-0.012 (-0.057)	0.249** (-0.122)
<i>Financial Development</i>	-1.646 (-1.492)	2.053 (-2.262)		
<i>Private Credit</i>			-0.021** (-0.010)	0.016 (-0.014)
<i>Interaction Term</i>		-0.897** (-0.429)		0.006** (-0.002)
<i>GDP Growth</i>	1.030*** (-0.042)	1.023*** (-0.042)	1.026*** (-0.042)	1.020*** (-0.042)
<i>Government Expenditure</i>	-0.06 (-0.047)	-0.091* (-0.048)	-0.036 (-0.048)	-0.072 (-0.050)
<i>Financial Openness</i>	-0.334 (-0.449)	-0.285 (-0.439)	-0.249 (-0.457)	-0.272 (-0.452)
<i>Domestic Savings</i>	-0.035** (-0.018)	-0.031* (-0.017)	-0.035** (-0.017)	-0.029** (-0.017)

Table 3D Real Sector Growth, Foreign Direct Investment and Financial Development. *** notes significance at 1%, ** at 5% and * at 10%.

Model 6A-D in table 3E show no statistical evidence of direct FDI, FD or private credit impact on service sector growth. However, the interaction term is significant for FDI and FD.

<i>Dependent Variable</i>	<i>SVA</i>	<i>SVA</i>	<i>SVA</i>	<i>SVA</i>
<i>Model</i>	<i>6A</i>	<i>6B</i>	<i>6C</i>	<i>6D</i>
<i>FDI</i>	-0.225 (-0.146)	-0.795** (-0.314)	-0.269* (-0.155)	-0.848** (-0.340)
<i>Financial Development</i>	-3.028 (-4.228)	-13.239** (-6.569)		
<i>Private Credit</i>			0.015 (-0.027)	-0.035* (-0.038)
<i>Interaction Term</i>		2.467** (-1.201)		0.013* (-0.007)
<i>GDP Growth</i>	1.044*** (-0.114)	1.058*** (-0.114)	1.051*** (-0.115)	1.057*** (-0.114)
<i>Government Expenditure</i>	0.119 (-0.132)	0.204 (-0.14)	0.047 (-0.133)	0.119 (-0.138)
<i>Financial Openness</i>	1.561 (-1.255)	1.389 (-1.272)	1.37 (-1.261)	1.386 (-1.257)
<i>Domestic Savings</i>	-0.015 (-0.050)	-0.028 (-0.051)	-0.033 (-0.050)	-0.037 (-0.047)

Table 3E Real Sector Growth, Foreign Direct Investment and Financial Development. *** notes significance at 1%, ** at 5% and * at 10%.

Therefore, it is interesting to see if FDI has a marginal impact on real sector growth or on the sectors specific. Table 4&5 show the marginal impact of FDI on sector growth for the giving percentiles 25th, 50th, 75th and 90th of FD and private credit.

<i>Financial Development</i>	<i>25th (0.127)</i>	<i>50th (0.192)</i>	<i>75th (0.300)</i>	<i>90th (0.390)</i>	<i>Source</i>
<i>Real Sector Growth Index</i>	-0.252	-0.206	-0.130	-0.066	Model 2B
<i>Agriculture Sector Growth</i>	-0.185	-0.191	-0.200	-0.208	Model 3B
<i>Industrial Sector Growth</i>	0.058	0.039	0.009	-0.017	Model 4B
<i>Manufacturing Sector Growth</i>	0.044**	-0.014**	-0.111**	-0.192**	Model 5B
<i>Service Sector Growth</i>	-0.482**	-0.321**	-0.055**	0.167**	Model 6B

Table 4 Marginal effects of foreign direct investment on real sector growth and other sectors with varying levels of financial development index. *** notes significance at 1%, ** at 5% and * at 10%

As shown in table 4, there is no statistical evidence of FDI having a marginal effect on real, agriculture and industrial sector growth. However, it becomes interesting when looking at the manufacturing and service sector. It shows that there is statistically significant proof of FDI having a marginal effect on the manufacturing sector. At the 25th percentile of FD, FDI

has an 0.044% effect on real sector growth when FDI increases with 1%. However, the most interesting thing is that if look up the effect with higher values of FD, the marginal effect of FDI becomes statistically lower, with even being a negative impact from the 50th percentile. The service sector shows the opposite; the higher the FD level, the higher positive effect FDI has on real sector, with the effect even being negative for most of FD levels, except for the highest (95th).

I also used credit to the private sector as another proxy for financial development besides the financial development index. Table 5 shows the marginal results for the effect of FDI with private credit on real sector growth.

<i>Private Credit</i>	<i>25th</i> <i>(19.986)</i>	<i>50th</i> <i>(28.306)</i>	<i>75th</i> <i>(45.159)</i>	<i>90th</i> <i>(61.634)</i>	<i>Source</i>
<i>Real Sector Growth Index</i>	-0.427*	-0.361*	-0.226*	-0.094*	Model 2D
<i>Agriculture Sector Growth</i>	-0.140	-0.157	-0.190	-0.223	Model 3D
<i>Industrial Sector Growth</i>	0.038	0.038	0.038	0.038	Model 4D
<i>Manufacturing Sector Growth</i>	0.369**	0.419**	0.520**	0.619**	Model 5D
<i>Service Sector Growth</i>	-0.588*	-0.480*	-0.261*	-0.047*	Model 6D

Table 5 Marginal effects of foreign direct investment on real sector growth and other sectors with varying levels of private sector credit. *** notes significancy at 1%, ** at 5% and * at 10%

The results differ from table 4. There is no marginal effect of FDI on real sector growth at 5% significance, however there is for 10%. Furthermore, there is no statistical evidence of marginal impact on the agriculture and industrial sector, same as with FD. On the contrary with table 4, the manufacturing sector has a significant positive impact of 0.619% for the highest private credit percentile. The marginal effect of FDI for the service sector is only significant at 10%, but also decreasing and becoming less negative for every percentile. Concluding from table 5 it suggests that FDI always has a negative impact on service sector growth with a significance of 10%.

6. Discussion

The results will be discussed in comparison with other literature. But first I will compare the results with the hypothesis. In contrary of my hypothesis, the results show that foreign direct investment has a negative direct impact on real sector growth. However, controlling

for levels of FD, the results show for underdeveloped countries that FDI does not have a significant marginal impact on real sector growth. Known literature like Alvarado, Iniguez & Ponce (2017) suggest that for Latin American countries, the effect of FDI on economic growth is not statistically significant in aggregated form, but significant when looking for different level of FD. However, in this research, when accounting for financial development, FDI has a direct significant negative impact on the real sector but no marginal impact for different levels of FD. Note that a potential explanation for the differences between both conclusions is that Alvarado, Iniguez & Ponce (2017) looks at economic growth in general and this research looks at value added for the real economy and the four sectors. The results are in line with Iamsiraroj (2016), who researches 124 countries worldwide on FDI and economic growth and suggests that there is a potential bi-directional relationship between FDI and economic growth. The results of the sectors individually justify what earlier research also suggests: the level of financial development is crucial for FDI to have an effect for specific sectors. This research is the first one to look at the potential marginal impact of FDI on different sectors. Azman-Saini, Baaharumshah & Law (2010) state, using a generalized method-of-moment system estimator that FDI by itself has no direct effect on output growth. This is the same for this research when looking at model 1, where FDI did not have a significant impact on real sector growth. They also suggest that countries with greater freedom of economic activities gain significantly more with the presence of FDI's. In this research a part of the model potentially missing is the absence of a variable that proxies for economic freedom or political stability. Biglaiser & Rouen (2006) suggest however that for attracting FDI in Latin America, good governance and economic freedom are not always the most effective instruments. The findings are supporting evidence from Zhang (2001), stating that the effect of FDI on economic growth differs between countries, having a significant impact for only a few countries in Latin-America. This research is the first one to look at the effect of FDI on sectors individually. It suggests that a good financially developed market is crucial for FDI to have a positive impact on the manufacturing and service sector. Bengoa & Sanchez-Robles (2003) also suggest that FDI only has a positive impact on sector growth if a host country requires the economic stability and liberalized markets to benefit from long-term capital flows. Following earlier research this paper supports the suggestion that FDI only has a significant impact for countries with a highly developed financial market. This statistical analysis also shows that FDI has a significant direct negative impact on real sector growth.

7. Conclusion

In this thesis I analyzed the effect of foreign direct investment on real sector growth in Latin America. Previous research showed that there is no statistical evidence in general that foreign direct investment has a significant impact on economic growth. Particularly no study has been done focusing on the effect of foreign direct investment on the real sector and four specific sectors, agriculture, industry, manufacturing and service for Latin America. Research done in Africa shows a significant evidence of marginal impact of foreign direct investment on real sector growth, but no direct impact. Therefore, the research question is: “How does foreign direct investment effect real sector growth in Latin America between 1990-2019.” To answer this question, data was used from 19 countries, obtained primarily from the World Data Bank and International Monetary Fund. Panel data regression with random effects were employed. Finally, statistical analysis showed that foreign direct investment has a direct significant negative impact on real sector growth, but no statistical evidence on the four sectors in particular, except for a negative direct impact on the agriculture sector. Furthermore, the results showed that for a certain level of financial development, foreign direct investment had a significant marginal impact on the manufacturing and service sector, however doing harm to the manufacturing sector and only having a positive impact on the service sector for high values of financial development. Therefore, this study showed what other literature also showed; the effect of foreign direct investment on real sector growth is a difficult question. Foreign direct investment is not a useful instrument on itself, but it an effective instrument if a particular country has a high financial developed market and a relative open economy.

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Appendix A

<i>Country</i>	RSG	FDI	AVA	IVA	MVA	SVA	GDS	GGFCE	FD	FO	DCPS	GDPG
<i>Argentina</i>	2.37	2.2	3.1	1.94	1.69	2.84	19.2	13.2	0.31	0.41	15.6	2.65
<i>Belize</i>	3.41	4.29	3.96	2.45	2.35	3.92	28.5	15	0.2	0.2	38.3	4.19
<i>Bolivia</i>	4.12	3.76	3.53	4.21	4.16	4.24	15.2	14.7	0.17	0.59	46.4	4.11
<i>Brazil</i>	2.4	2.66	3.25	1.1	1.08	2.27	18.5	19.1	0.49	0.25	50.5	2.2
<i>Chile</i>	4.07	5.99	4.8	2.85	3.18	5.04	27.3	11.9	0.44	0.54	63.6	4.56
<i>Colombia</i>	3.24	3.19	2.47	2.47	2.11	4.12	17.9	15.1	0.27	0.29	32.8	3.49
<i>Costa Rica</i>	3.86	4.86	3.02	2.95	2.6	4.58	17.2	14.7	0.21	0.68	34.3	4.32
<i>Dominic Repub..</i>	4.57	3.29	3.79	5.06	3.82	4.67	17.8	8.21	0.14	0.5	22.9	4.98
<i>Ecuador</i>	3.03	1.43	3.72	2.98	2.87	3.04	22.5	11.9	0.13	0.58	22.6	3.01
<i>El Salvador</i>	2.2	2.22	-0.8	2.4	2.27	2.61	0.44	13.5	0.15	0.74	42.8	2.57
<i>Guatemala</i>	4.04	1.27	2.93	3.06	2.75	5.34	5.42	8.58	0.18	0.86	24.42	3.68
<i>Haiti</i>	0.74	0.55	-0.2	0.37	-0.2	2.23	-2	7.51	0.1	0.78	10.08	1.22
<i>Honduras</i>	4.09	4.21	3.08	3.2	3.59	5.05	11.4	12.8	0.16	0.31	39.35	3.65
<i>Mexico</i>	2.53	2.48	1.96	1.8	2.42	3	22.3	10.4	0.33	0.65	19.9	2.55
<i>Nicaragua</i>	3.3	4.92	3.43	3.39	3.93	3.13	8.12	13.3	0.11	0.84	24.7	3.1
<i>Panama</i>	5.59	7.18	2.22	7.47	2.74	5.58	27.6	13.2	0.34	1	70.64	5.85
<i>Paraguay</i>	3.09	1.36	5.15	2.58	2.59	3.44	27	9.44	0.12	0.53	25.38	3.26
<i>Peru</i>	24.1	3.57	3.66	4.04	3.48	4.79	21.3	10.8	0.26	0.9	26.47	4.25
<i>Uruguay</i>	4.54	3.07	1.85	1.6	1.41	9.82	17.5	12.2	0.17	0.91	29.97	2.92