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Master in Economic Development and Growth

FDI Inflows and Economic Growth in South Africa from 1994 to 2013

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Abstract: Since the beginning of democracy the South African government has been increasingly trying to attract FDI into the country. South Africa is an interesting case, since despite being a middle income country and highly developed compared to other African countries, FDI does not seem to offer positive spill-over effects. This paper critically assesses existing theory on the nexus between FDI, absorptive capacity and economic growth. A time series analysis from 1994 to 2013 is conducted, applying data from the World Bank and Penn World Table databases. The empirical findings show significant ambiguity, as no long-term effects between the variables are found, while economic growth is only affected by FDI in the short-term. In contrast to theory, according to the findings a relatively high level of individual factors' absorptive capacity does not seem to be sufficient to generate overall economic gains and development. This, first of all is due to high populations group inequality through past-dependending institutions and labor markets, still inheriting apartheid's dynamics. Secondly, the capital intensive mining sector receives the main share of FDI in the economy. This promotes rather extractive exports than an inclusive economic development. Weak linkages between other, more labor intensive, sectors discourage employment creation and investments in human capital.

Key words: Foreign Direct Investment, Economic Growth, Absorptive Capacity, South Africa, Extractive Resources

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1. Introduction

The impact of foreign direct investment on economic growth in developing countries remains a contested subject. On the one hand, economic theory suggests that FDI in the host country leads to growth, through the introduction of new technologies, knowledge and capital. The resulting so called spill-over effects of FDI can lead to a higher skilled labor force and increased productivity of the domestic economy (Alfaro et al., 2004). On the other hand, the empirical literature provides divergent views on the role of FDI in developing countries.

According to theory, the relationship between FDI and economic growth is rather indirect; suggesting that transfer of new know-how and business practices is being channeled through other vehicles of growth. Consequently, the host country is only able to extract the potential benefits of FDI if presenting a certain preliminary level of absorptive capacity, which is the country's or firm's ability to adapt new technologies and skills into their existing processes, through imitation as well as assimilation (Cohen and Levinthal, 1990). Following the endogenous growth theory, technological progress, human capital and financial market development are three major channels through which FDI can be absorbed and were identified as highly relevant in recent literature (Borensztein et al, 1998; Alfaro et al., 2004; Li and Liu, 2004; Ahmed, 2012). Also Borensztein et al (1998) argue that in order for FDI to have a beneficial effect on growth a certain level of human capital and technology stock as well as financial market development is necessary. The individual country's absorptive capacity for such investments is of great importance, and its ability to translate them into effective and productive investment that lead to capital formation and employment creation within the country. This ultimately will secure sustainable development (Alfaro et al., 2004).

As a wide spread belief is that FDI accelerates economic growth, through modernization and higher competition of the domestic markets. This results in an increased focus of government policies to promote FDI inflows into their countries. Yet, empirical evidence generally on this topic does not provide such clear results, which raise the issue of the actual impact of FDI on growth. It seems that many developing countries are not sufficiently equipped to make effective use of these investments. Often only firms, directly receiving FDI benefit from increased productivity, while local companies' productivity decreases as they become less competitive within the domestic and global market (Aitken and Harrison, 1999). Therefore, FDI results in harming domestic industries, having a negative impact on economic development and growth.

Recognizing that the relationship between FDI and economic growth is strongly endogenous (Li and Liu, 2004), and therefore is highly influenced by other factors that determine its effectiveness, has substantial policy implications. Governments and policy makers of developing countries need to take into consideration that it might not be sufficient or appropriate to liberalize their economies and implement policies that ease foreign investment, but that a certain level of domestic development is required in order to exploit the potential spillover benefits that FDI offers.

This study aims to investigate the nexus between FDI, absorptive capacity and economic growth, as it is highly debated theoretically and empirically in the case of South Africa (ZA); contributing to the literature, by critically assessing the existing theory of endogenous growth and absorptive capacity. Analyzing South Africa is interesting, since although having the highest level of development in physical and financial infrastructure, as well as human capital accumulation in the African continent, it appears that there is no existing impact of FDI on economic growth in the long-run, which stands in contrast to economic theory. This leads to the question of whether existing theory is wrong in the sense that it might not explain the dynamics of FDI and economic growth sufficiently. While the theoretical approach is straight forward, focusing on the level of local development and absorptive capacity, the empirical evidences are ambiguous. Looking at ZA, I find that since the beginning of democracy and end of apartheid in 1994 the government's focus has been on financial and macro economic development, as well as liberalization of international trade. The opening of the country has led to increases in FDI inflows, even though relatively volatile, and has put ZA as the main recipient of FDI in Sub-Saharan-Africa (Wöcke and Sing, 2013).

Implemented governmental policies and economic development in the past two decades have lifted the country up to be characterized as a middle income country, with well developed economic growth indicators, compared to other neighboring countries.

Following economic theory, the applied times series analysis of cointegration and granger causality testing, would suggest a positive and significant nexus. I analyze the time frame from 1994 to 2013, and use three main factors of absorptive capacity, identified by theory: 1. The development of local financial markets/ intermediaries, which represents the ease of investment allocation technology diffusion (M3 to GDP ratio); 2. Level of technological progress that shows the accessibility to new technologies (Telephone lines per 100 people); 3. Accessibility of education, which estimates human capital accumulation (Primary school enrollment ratio).

I provide two lines of argumentation, towards why South Africa, might not be able to translate the expected positive relationship between FDI and channels of growth into economic development; and why not only the level of absorptive capacity impacts this link.

First of all, the South African economic history of apartheid and colonial repression still plays an important role. The analysis of absorptive capacity and its ability to effectively transfer knowledge and technologies, which then can result in economic growth, is strongly linked to path-dependent socio-economic development. In the case of South Africa, we still find policies and institutions from the apartheid legacy remaining intact today. Spaul (2013) for instance finds that even though racial policy was removed over 18 years ago, a dual education system (former white and former black institutions) producing differing educational quality output still exists today. This leads to overestimation of the average South African school attainment in official statistics. As, high unemployment rates and inequality still remain mayor problems; this might prevent the gains of FDI being translated down to the society as a whole and rather only benefit a narrow elite Taylor and Nel (2002). This makes ZA an interesting case study as it sheds light into economic dynamics that apart from newly implemented programs and policies to foster local development, will significantly influence the country's future path.

Second of all, discussing the role of FDI in South Africa offers valuable insights, as traditionally the mining sector receives the majority of FDI, which provides only weak linkages towards other sectors in the economy, such as manufacturing or services. This prevents transference of higher knowledge and skills, since the first sector is only intensive in technology, while the latter are abundant in labor, and could therefore create substantial employment (Adams, 2009).

It is highly relevant to study the real impact of Foreign Direct Investment on economic growth in South Africa, and which are correlated factors that determine its success or failure. This will provide important policy implications, in order to enhance future economic development. It also becomes clear that policy recommendations might differ for the short-run and long-run perspective.

The remaining of the paper is organized as follows: Section 2 is a critical discussion of the existing literature, reviewing the general debate on FDI, its relationship with absorptive capacity and economic growth, as well as its role in Africa. Section 3 provides an overview on economic theory, this study applies. Section 4 presents a brief background on foreign

direct investment in South Africa, looking at related trends and policies in more detail. Section 5 contains data used in this study, including variable identification and descriptive statistics. Section 6 and 7 provide the method and econometric results respectively. Section 8 offers a critical analysis of the estimated results, while section 9 summarizes the main finding of this paper in concluding remarks.

2. Literature Review

2.1. FDI – The General Debate

The nexus between foreign direct investment and economic growth has been an ongoing debate over decades. Policy makers in many developed and developing countries have directed resources to enhance FDI flows into the country (Nor et al. (2013), Görg and Greenaway (2004)), as it is believed that it significantly improves technology and management practices, as well as increases capital formation.

It is widely believed that FDI potentially fosters economic development, reduces poverty as well as diminishes the savings-investment gap in Africa, through promoting employment and providing more efficient access to international markets with strong linkages between foreign and local firms, which boosts domestic productivity (Ajayi, 2006).

As Ajayi (2006) puts forward, there exist two theoretical determinants, which impact FDI in developing countries; the so called push and pull factors. While the push factors can be defined as externalities, such as growth or financial market characteristics and therefore, provide indication on the overall reserves existing in the country; the pull factors on the other hand depend on local or domestic policy features in the host country and thus, determine the distribution of such resources. Some of the relevant pull determinants of FDI inflows are for instance political and economic liberalization, the size of the local markets, openness to trade, quality of institutions and macroeconomic stability. These theoretical findings, lead to an increased liberalization of existing FDI policies in many developing countries and especially in Africa (Ajayi, 2006). Yet, empirical evidence of the impact of FDI has been contradictory. While Balasubramayam and Salisu (2001) show that policy significantly shapes the share and characteristics of FDI inflows; Asiedu (2003) finds evidence that even though certain policies have worked in some developing economies, they did not impact FDI in Africa. These findings imply that the effect of policies on FDI is dependent on the individual country context. Contributing to this debate, Adams (2009) reviews studies on FDI and economic

growth in Sub-Saharan Africa (SSA), and concludes that FDI in itself is not a sufficient accelerator of economic development, but is only enhancing growth if the host country shows certain preliminary investments in infrastructure and human capital. However, the results might indicate that Africa in general is trapped in a vicious circle, as it finds itself in a resource gap, which offers little possibility to grow without foreign supported investments.

Moreover Taylor and Nel (2002), fuel the ongoing debate on globalization and its effects on development, by arguing that the increase in MNCs in Africa has caused increased class awareness of the multinational elite, which is regulating structural change promoted by governments to obtain their powers. The authors support the view that the results, such as increased market and capital liberalization, do only benefit the global elite, by increasing competition, but do not show any positive effects on development. They further imply, encouraged by for instance Thompson and Leysens (1996) that the high extent of globalization and FDI inflows, which the majority of African states seek, may not be the best way to improve equality and equity. As Bond (2006) states, deeper global integration of the continent has lead to increased wealth outflow instead of wealth creation.

2.2. FDI and Economic Growth – Linkages and Absorptive Capacity

While the endogenous growth theoretical framework, developed by Romer (1989) clearly supports capital flows into the economy as an important driver of economic growth, empirical evidence are rather unclear. Previous literature emphasizes a general importance of FDI on economic growth (e.g. Borensztein et al. (1998), De Mello (1999)). Yet, results seems to be sensitive to the control variables considered.

Carkovic and Levine (2002) use a World Bank dataset from 1960 to 1995, and find inconsistent outcomes with regards to an independent positive effect of FDI on economic growth, arguing that there exist further endogenous relationships, which might affect the FDI-growth nexus. De Mello (1999) shows that there exists long-run FDI led growth evidence for developed and developing countries. Yet on the country level this nexus is highly dependent on country-specific or spill-over effects. De Mello supports Grossman and Helpman's (1991) findings: that the effect of FDI is sensitive to the technological and knowledge gap between the investing and the host country.

Belloumi (2014), who does not find a significant impact from FDI to economic growth for Tunisia, confirms the evidence that this beneficial effect of FDI is not automatic, but rather

determined by the country's ability to effectively assimilate or absorb through other growth explaining factors, like infrastructure, the educational system, or economic and fiscal policies.

Not only does the level of technology in the host country seem to be of importance for increased FDI spillover effects; Alfaro et al. (2004) analyzes domestic financial markets as an important channel for FDI to affect economic growth. Studying a panel of 20 OECD and 51 non-OECD countries between 1975 and 1995, they conclude that on the one hand, the role of FDI cannot be explained independently, as it leads to unspecific results. Local financial development additionally, has been found to be of important significance in explaining the role of FDI on GDP growth in a study conducted by Adeniyi et al. (2012) on small open developing countries (e.g. Ghana, Nigeria and Sierra Leone). Results indicate that in the presence of financial market indicators that are only weakly developed like in Nigeria, the benefits from FDI are not generated sufficiently, which hinders the effect on GDP growth.

Li and Liu (2004) provide empirical evidence for the importance of the country's absorptive capacity when investigating the relationship between FDI and growth. They provide results which support that the relationship between FDI and human capital in developing countries is positive, while the technological gap is negatively correlated with FDI.

Alfaro et al (2004) argue that even though the introduction of FDI promoting incentives such as tax or other fiscal benefits can be an initially effective measure to increase FDI, the country's state of development might limit the extent to which it is able to extract gains from such investments.

Whether, new knowledge and technological progress can be linked from MNCs to the domestic market, depends not only on the domestic and foreign technological gap but also on the ability of domestic human capital or the workers' level of education, to adapt these new processes. Vu and Noy (2009) obtain a significant positive relationship between FDI, labor and economic growth, investigating this link for six OECD countries on a sector level. These results confirm Borensztein et al. (1998), who point out that without a minimum preliminary level of development the country does not obtain the sufficient absorptive capacity to economically benefit from potential knowledge transfers.

Adding to the discussion on absorptive capacity and spill-over benefits, Görg and Greenaway (2004) have investigated spill-over effects in 25 firm-level studies conducted on industrialized, developing and transition countries, of which only six showed a positive significant effect. However, none of those countries were developing and transition

economies. Moreover, Aitken and Harrison (1999) even find a negative impact from the existence of MNCs in Venezuela.

One reason for the lack of positive spill-over evidence or even growth limiting effect in developing countries could be the competition effect MNCs introduce into domestic markets. The absence of linkage between foreign and domestic firms, since domestic firms commonly use low skilled labor and low quality technologies, which prevents the learning-by-observing, networks, or training knowledge transfers (Görg and Greenaway (2004), Alfaro et al. (2004)). As Lall and Narula (2004) point forward, even though FDI can boost exports as well as productivity it does not necessarily lead to growth opportunities or competitiveness for domestic firms if miss the competence to take advantage of these new externalities.

The above examined empirical evidence on the linkage between FDI, absorptive capacity and economic growth, clearly shows contradicting results on the effect of FDI on economic growth as it remains insignificant for most of the developing countries studied. This on the one hand could be caused by the fact that those countries do not present a sufficient level of absorptive capacity, to be able to create the necessary linkages between the investment and society to benefit from this, following economic theory. On the other hand it provides the opportunity to a different discussion, arguing that FDI in fact does not have any significant impact on growth, due to its allocation within the economy and other socio economic aspects, such as high degrees of inequality.

2.3. FDI in Africa

FDI inflows into Africa are significantly lower (7.8 percent by 2004) than towards other developing countries in the world (63 percent by 2004) (Ajayi, 2006). Yet, since the global debt crisis (1980's) the focus of attracting FDI, as a means to achieve the MDGs (Millennium Development Goals) has risen in many regions. Thus, the majority of the countries on the African continent have, according to UNCTAD (2005) implemented many FDI promoting incentives and macroeconomic policies after reaching their independence.

Looking at empirical evidence, Inekwe (2013) investigates the causal relationship of FDI, growth and employment for the Nigerian service and manufacturing sector between 1990 and 2009. He finds varying results. While there seems to exist a positive long-run impact of FDI on growth in services, the effect is negative for the manufacturing sector. The article moreover finds that FDI enhances employment in both sectors, according to significant

granger causality. Contradicting results are estimated by Olumuyiwa (2013), who examines a similar relationship in the pre – and post deregulation era, as well as for the entire time frame in Nigeria (1970 -1986; 1986-2010; 1970-2010). While the outcomes show evidence of a growth-led relationship to FDI for the pre-deregulated era, no causal relationship could be established for the post-deregulation era. Finally, when examine the period from 1970 to 2010 there exist a bidirectional relationship. The paper argues, even though an overall importance of FDI on economic growth is found, in the post-deregulation era, the lack of granger causality might be due to improve infrastructure and support for the domestic private sector, promote economic stability and a favorable investment environment. In order to benefit from increasing FDI inflows, the author suggests to extent the linkage between FDI and the local market.

Examining FDI dynamics in the Southern African region from 1990 to 2005, Bezuidenhout (2009) points forward, that FDI shows a small significant negative effect on GDP growth. The paper reasons that this effect might be due to the majority of FDI is allocated within the primary sector in these countries, which limits technological or knowledge spill-over to other sectors which contribute to economic growth. Adams (2009) puts forward that the lack of benefits of increased FDI inflows, can be partly explained by the lack of diversification of investment from the primary sector to the manufacturing or tertiary sectors. According to UNCTAD (2007, 2008), the highest FDI increase in SSA today is still in oil and mining sectors, which are rather capital intensive with limited impact on employment. Moreover, Cohen and Levinthal (1990) argue that the firm's or country's ability to absorb FDI effectively and benefit from MNC spill-over is path-dependent. They show that a historical lack of innovation might prevent the improvement of technological capacity at a later stage.

This empirical evidence presented, provides a differing view on the impact of FDI in Africa, as results are highly varying amongst studies. Overall, the effect of FDI on growth seems to be small or even negative if significant at all.

Studies conducted on South Africa show weak or nonexistent empirical evidence on a potential relationship of FDI on economic growth. Investigating post-apartheid South Africa, Gossel and Biepkie (2013) find support that growth rather leads to increased FDI, than the other way around. Moreover, examining the effectiveness of labor productivity, they point out, that there is no evidence that labor causes growth, due to its historical labor dynamics, such as a high employment turnover rate through short employment periods, high presence of low-skilled labor, and relatively high labor costs. This prevents MNC-domestic firm linkages,

and therefore innovation and knowledge transfers. Mebratie and Bedi (2013) analyze the effect of FDI on labor productivity (as a channel to economic growth) in South Africa in 2003 and 2007. They are unable to detect any significant spill-over benefits.

While the lack of spill-over effects in many regions of the African continent, on the one hand is caused by the remaining legacy of apartheid, showing its consequences today in trade and taxation systems, expropriation of land, the location of black South Africans into exclusive areas (homelands), as well as the high demand of low-skilled labor and therefore, low human capital accumulation; it on the other hand is related to the focus on exports of primary raw material and the extraction of resources in many countries (Bond, 2006). As these sectors are the most profitable ones, FDI generally concentrates in these areas, which provide small endorsement to allocate resources to education. In contrast, extensive liberalization of markets and trade, such as reduction of tariff protection, mostly benefits large corporations while it has highly damaged local African industries. This especially harms newly growing manufacturing industries and jobs. The World Bank (2005) points out that with rising natural resource exports the African population, living on income below 1\$/day, increases, as trade liberalization causes damages to the local economy. This reduces business for domestic producers, significantly reducing profits and employment opportunities.

When examining South Africa in particular, since 1994 the new government has emphasized its strategy for domestic economic development on increased exports and foreign direct investment inflows (Edwards and Golub, 2004). The increase of international competitiveness of local firms was accompanied by rising unemployment of mostly low-skilled workers in the formal sector and increased inequality in the 1990s was the consequence. Even though, competitiveness increased, it was not sufficient to support the theory that improved exports lead to economic growth, as it was rather generated through laying workers than improved productivity. Again, this shows support of the hypothesis that foreign direct investment instead of benefitting developing economies in Africa, rather uplifting the power of global-elite.

In conclusion, the majority of the empirical literature analyzing the effect of FDI on economic growth in developing countries argues that this is due to the lack of a certain level of absorptive capacity and preceding domestic development. Therefore, any long-run relationship between FDI and GDP growth is either none existing or even negative. Pointing out that in the African region and especially in South Africa, historically the role of FDI is limited to only sectors specialized in natural resource extraction, which provides weak linkage

to the whole economy and society however, proposes an argumentation contradicting existing theory.

The following section discusses the underlying theory used to investigate the nexus between FDI, absorptive capacity and economic growth for South Africa, and elaborates on its potential weaknesses.

3. Theoretical Background

Given the previous review, no consensus on the effect of FDI on economic growth can be found in the empirical evidence. Most of its reasoning for why these results are nonspecific we can find within existing economic theory, as it shows that linkages between foreign companies and the local market are essential to transfer new technologies and knowledge, yet often non-existent. As discussed above, the effectiveness of these linkages are highly determined by the host country's level of absorptive capacity. Which channels are of major interest in this analysis, is derived from the assumptions made by the endogenous growth theory, which views the accumulation of capital inflows as an important driver for economic growth. Consistent with Bailliu (2000), there are various channels, within the endogenous growth model, through which capital flows can positively affect growth. This section identifies the three major channels, which are crucial to provide a certain level of development, for capital flows to be effectively absorbed and linked to the local system.

3.1. Endogenous Growth Theory

The endogenous growth framework by Romer (1989) differentiates from the neoclassical growth theory, which suggests that the effect of FDI, or capital in general has only a temporarily effect on income growth because of its diminishing returns of capital. The endogenous growth theory argues that economic growth is not only obtained through internal processes of technology progress and human capital augmentation, but that FDI can affect long-term income increase through these channels (Belloumi, 2014). According to Bailliu (2000), a third major channel needs to be taken into account: the development of the host country's financial markets, as through which the effective allocation of FDI needs to be guaranteed. These relationships are derived in the endogenous growth model presented below.

This section for simplicity considers a closed economy AK model, following Bailliu (2000), as the general production function

$$Y_t = AK_t \quad (1)$$

Where K is seen considers both human and physical capital (Lucas, 1988) and A is technological progress.

The following equations will clarify the dynamics of capital flows/investments on income:

$$I_t = K_{t+1} - (1 - \delta)K_t, \quad (2)$$

where I_t is gross investment and δ equals the depreciation rate of capital stock. This theoretical framework puts high emphasis on financial markets and intermediations as it assumes that it is the main channel of converting savings in an economy into effective investments (Bailliu, 2000).

According to this model and assuming that in capital market equilibrium the amount of gross investment equals the amount saved S_t times the fraction available for investments of each dollar saved ϕ .

$$\phi S_t = I_t \quad (3)$$

Therefore, the growth rate of the Gross Domestic Product (GDP) g equals:

$$g = A \left(\frac{I}{Y} \right) - \delta = A \phi s - \delta, \quad (4)$$

where s is the saving rate. Bailliu (2000) points out that in the AK model, as the allocation of capital becomes more efficiently it causes an increase in A , the productivity of capital and therefore improved technological progress.

This model allows us to consider different types of capital flows, and consequently we can introduce net international capital flows (NCF). NCF in this study will only consider FDI. This leads to an extension of the gross investment equilibrium:

$$\phi^* (S_t + NCF)^* = I_t^*, \quad (5)$$

which will then translate into an effect of the steady-state growth rate, shown by the following formula:

$$g^* = A^* \left(\frac{I^*}{Y} \right) - \delta = A^* \Phi^* \left(\frac{S+NCF}{Y} \right) - \delta = A^* \Phi^* s^* - \delta, \quad (6)$$

From equation 6 we are now able to derive how international capital inflows are able to effect economic growth and through which channels this is possible.

3.2. Channels of FDI

In this study and as aligned with Bailliu (2000) theoretical framework, I focus on three major channels through which FDI has a positive impact on economic growth: local financial development, technological progress and human capital. First of all, financial intermediation is an important aspect that has to be taken into consideration. Equation 6 clearly shows that increased capital stock, particularly interesting in this study international capital inflows, can cause rise in investment rates compared to equation 4, if $NCF_t > 0$. In general it can be said that the effective use of Foreign Direct Investment (FDI), will highly depend on the development of the domestic financial system (Bailliu, 2000). This becomes clear when looking at the system effectiveness to allocate investments. With an increased development the transaction and investment cost will decrease, and consequently there will be a higher amount available for investment, and $\Phi^* > \Phi$. This will then result in a higher growth in the equilibrium state, than the initial stage.

Second, spill-over effects from foreign multinational corporations (MNCs) investing into a certain country, are expected to lead to increases in technological progress and human capital, which then result in increased growth in GDP. Here, Bailliu (2000) suggests that on the one hand spill-over effects in increased human and physical capital, hence investment in skills development, such as a higher level of training of employees, will in the long-run affect the whole industry. On the other hand there simply might be a spill-over in technologies, such as new technologies introduced by the investing country, usually from developed countries to developing countries; or improvements in transportation and communication infrastructure, due to foreign investments. Borensztein et al. (1998) agree that this technological progress can be achieved through FDI as a major channel to import new technologies and skills into the country. From the presented framework above, we derive that A^* is higher than A , as these spill-over increase the capital's marginal productivity (Bailliu, 2000).

In sum, previous studies have shown, proven by the theoretical framework presented above that financial deepening as well as human capital accumulation is highly correlated with

technological progress, which is a major parameter of driving long-term economic growth in a country (Borensztein et al, 1998). Consequently, it becomes essential to analyze the absorptive capacity of these aspects, in order to be able to derive whether FDI inflows are being implemented effectively as that they generate higher income growth.

3.3. Absorptive Capacity, FDI and Economic Growth

Evaluating the role of technological catch-up when examining growth and productivity, Rogers (2004) discovers that absorptive capacity of a country is an important factor when analyzing economic growth.

Following economic theory, often FDI does not have the expected results, particularly in poor countries, as they lack a minimum level of economic development, which allows them to absorb Foreign Direct Investment in a manner that leads to capital accumulation utilized for further domestic investments (Nguyen, 2008; Bailliu, 2000). Here, a certain level of physical infrastructure (transportation and communication) is crucial to be able to adapt these technologies and skills. Also Girma (2005) acknowledges that high absorptive capacity in a country increases the spillover benefits of MNEs. Nonetheless, one also needs to consider that the absorptive capacities of technologies as well as human capital highly depend on the gap between the local companies and the MNEs of the investing country (Li and Liu, 2005; Xu, 2000). They find that the smaller this gap, the higher the positive impact of international investment on economic growth in the receiving country. According to Li and Liu (2005) high levels of human capital, achieved through education, training and experience function as a catalyst for FDI spillovers.

As Borensztein et al. (1998) find in their cross-sectional study on the effect on FDI on economic growth that FDI has a higher impact on income growth in host countries with higher levels of human capital. In contrast, if levels of human capital are low, FDI tends to be of higher productivity than domestic investment. This can lead to crowding-out domestic investments and harming the local industries in the host-country, which according to Bailliu (2000) will have a negative on economic growth. This theoretical discussion shows that two crucial aspects, highly influencing how FDI can be assimilated into the developing country's depend on how technology can be diffused and adapted within the local economy and whether the knowledge and skills level of the labor force is able to absorb these new technological and business practices. If this is not possible, domestic firms are not able to remain competitive towards the large multinational.

Another reason for this crowding-out effect of domestic investment might be a lack of domestic financial market development, which leads to an ineffective allocation of resources. This leads to the analysis of financial system development, without such FDI inflows could not be implemented efficiently, as it highly influences the ability of technology diffusion (Nguyen, 2008).

However, discussing theory it becomes clear that the literature treats the subject on absorptive capacity rather technical and disconnected from the socio-economic framework of the investigated countries. Usually, it completely disregards any reasoning as to which might be the causes of the lack of positive link between absorptive capacity, FDI and growth. I argue that absorptive capacity can only provide the expected benefits if the society as a whole has equal access to the same level of quality of for instance, physical infrastructure, education, financial services. Supported by Engerman and Sokoloff (2000), I put forward that the initial condition of the society, e.g. during colonial legacy or apartheid in the case of ZA plays an important role today. Therefore, I believe the more unequal the distribution of factor endowment (e.g. availability of education, land and political) amongst a narrow elite and the depressed majority of the population, and the higher the political power of this elite - who had access to these factors - was, the more these conditions remain today. As these dynamics are past-dependent. According to Engerman and Sokoloff the persistence of colonial (or apartheid's) political and social institutions hinder the rise of an equal society in many of today's democratic developing economies. Consequently, even though not included in the theoretical framework in subsection one of this chapter, I also include the host country's institutional development as a control variable in the model.

The level of institutional regulations, such as foreign investment friendly policies, as well as business regulations are believed by theory to affect how FDI is being attracted and assimilated into the country (Belloumi, 2014). The previous literature discussion, however, has been highly critical on the effectiveness of economic policies for FDI attraction (Asiedu, 2003). Yet, we must recognize that they play an important role, either negatively or positively.

The endogenous growth model points out the three major channels of growth: labor force, technology/infrastructure and financial intermediaries. Thus, these factors are the main focus of this study. Nonetheless, I believe that even though well developed, if domestic institutions are unable to distribute the access to these channels (e.g. physical infrastructure, education, access to finance) equally to the whole society, the overall effect on economic growth will be

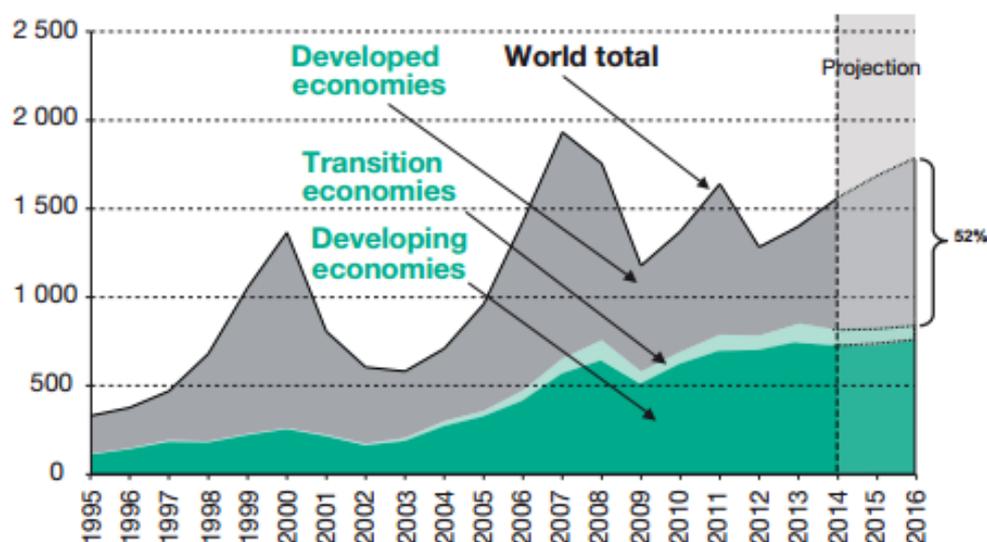
small or nonexistent. Still, it becomes clear that policies and institutional stability, even though not a sufficient channel in itself to absorb FDI efficiently, it has to be considered within the context of human capital, technology, and financial market development, as they interact with each other. Therefore, I include an institutional indicator and the level of capital stock accumulation in the model.

4. Background on South Africa

Following the debate on the role of FDI in Africa, this section analyzes current FDI trends and policy in South Africa, in order to gain a better understanding on investment dynamics and how they link back to existing theory and previous findings.

South Africa, as a middle income country today is often perceived to be the gateway to Sub-Saharan Africa, as one of the major foreign direct investment recipients in natural resources, traditionally oil, but also minerals (Ajayi, 2006). However, before the first democratic elections in 1994, FDI has been close to zero (*graph 2*) and South Africa noted high capital flight, due to international sanctions between 1960 and beginning of the 1990s. The country became increasingly isolated from the global economy during that time (Wöcke and Sing, 2013). As previous research puts forward, new views on the beneficial effects of FDI, especially after 1980s, have led to a substantial increase in global FDI flows from 1995 until 2014 (*graph 1*). The share of developing economies receiving FDI by 2014 is above those of developed countries. In 2013 Asia received 54% of global inflows, while Africa only accounts for 4% (\$55 billion), but still continuously increasing between 2011 and 2013 (UNCTAD, World Investment Report, 2014).

Graph 1: Global FDI inflows



Source: UNCTAD, World Investment Report 2014.

Notes: FDI inflows, global and by group of economies, 1995-2013 and projections, 2014-2016

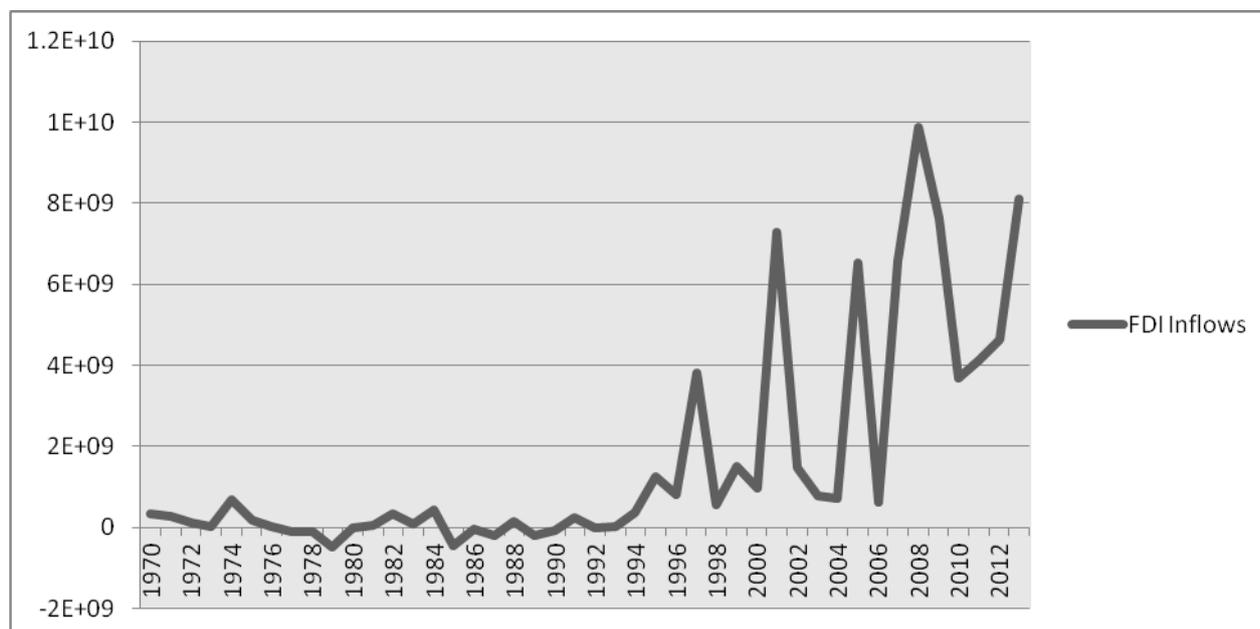
Since, the termination of the apartheid era, the new ZA government, changed the focus of its economic development and growth strategy on deeper global integration, stabilizing its macroeconomic policy and attracting increasingly higher numbers of foreign investors; similar many countries in the African region since the 1980's. These policy changes were dedicated to improve the country's absorptive capacity, as economic theory and many scholars suggest trade openness fosters spill-over effects (e.g. Belloumi, 2014). Yet, this change of strategy was not only influenced by the government, but also by the six major conglomerates (Anglo-American Corporation, SA Mutual, Sanlam, Anglovaal, Liberty/Standard and Rembrandt/Volkskas represented in ZA at that time (Carmody, 2002).

In the past 20 years South Africa has become an important economic player. In 2012 it is one of the largest five recipients of FDI in Africa (Nigeria, Mozambique, South Africa, Democratic Republic of the Congo, and Ghana) with over US\$ 3.0 billion. South Africa has been receiving 89% of its FDI from the European Union (EU), while major contributing countries are the UK with 75.8% and Germany with 6%. Developing economies invest an overall of 4% of FDI to South Africa, of which 2.3% is generated by Asia alone (UNCTAD, 2013).

4.1. FDI flows into South Africa

Beginning with 1994 South Africa was able to increase its FDI. Yet FDI inflows remain highly unstable during the following two decades (*graph 2*), on the one hand responding to global crisis as well as to the local exchange rate fluctuations. This volatility is due to their sensitivity to commodity price changes, as South Africa's FDI is still mainly allocated in the export sector, such as gold or coal; although, the manufacturing sector and financial sector have risen in importance. For instance the FDI inflow crashed 20 percent after 2001 from US\$ 7.3 billion to US\$ 1.5 billion in 2002. This was due to a depreciation of the South African Rand of 37% against the US\$, as this causes increased investors' risk and leads to capital flight. Further, after 2006, we find highly rising FDI flows into the country. These dynamics correspond to the global commodities price boom, which took place until 2009 (Wöcke and Sing, 2013). According to the literature, FDI that is mainly directed at a certain commodity, as is the case in South Africa, might have limited or even a negative effect on economic growth, due to weak linkages and spill-over effects (Bezuidenhout, 2009). Here absorptive capacity will only have a limited role.

Graph 2: South Africa, FDI Net Inflow (US\$)



Source: World Bank Indicators, 2014

When looking at FDI inflows as a percentage of GDP (*table 1*), we find that the five years average since 1994 has never surpassed 2%. Between 2009 and 2013 FDI inflows to GDP have been fluctuating between 1.0 percent and 2.6 percent. The annual growth in 2009 and 2010 was negative at -0.6 percent and improving slightly in 2013 with 0.9 percent growth. South Africa reports one of the lowest contribution of FDI to GDP (1.02% in 2011), when comparing to other developing countries, for instance Chile (7.0%) or Malaysia (4.3%) (Wöcke and Sing, 2013).

**Table 1: five-year average annual growth
 (in percentage), 1994-2013**

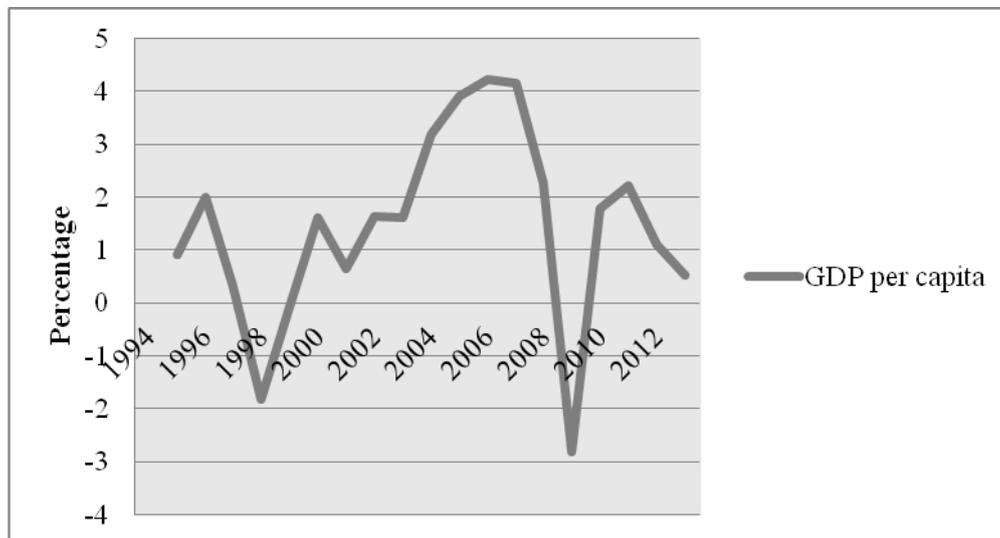
	FDI/GDP
1994-1998	0.9
1999-2003	2.0
2004-2008	1.8
2009-2013	1.6

Source: World Bank Development Indicators (2014)

These FDI inflow trends are similar to annual economic growth rates, which have also been highly volatile since 1995 (*graph 3*). This again, indicates that the ZA economy as well as

FDI is highly responsive to international crises such as the Asian financial crisis in 1997/1998 and the global financial crisis in 2008/2009.

Graph 3: Annual percentage growth, 1994-2013



Source: World Bank Indicators, 2014

As mentioned in the previous section, the focus on foreign direct investment is directed to the extraction of natural resources in South Africa, and thus increases the country's dependency on commodity price development. These in return are sensitive to global economic booms and recessions, which partly causes this high volatility in FDI (e.g. Adams (2009), Chandrasekhar and Ghosh (2008)).

4.2. FDI and Policy Environment

In the process of attracting larger amounts of FDI into the country, South Africa started to promote deeper integration towards the region by issuing various bilateral free trade agreements (BITs) since the early 1990s. This was part of the new Growth, Employment and Redistribution (GEAR) strategy implemented, which was aimed at fighting poverty and inequality, as well as to foster economic growth, through increased economic liberalization, strengthening of the exchange rate, deregulate the control of capital and decrease the domestic deficit (Barbour, 2005). Yet, one needs to be careful, when analyzing these new policy directions, as globalization rather benefits a narrow elite of MNCs, than the society as a whole (Taylor and Nel, 2002). For South Africa, increasing investment by foreign companies provided the opportunity to significantly contribute to the GEAR goal of 400,000 job creation annually, represented an important source of funding, given the small domestic savings rate, and improving the foreign currency reserves (Kransdorff, 2010). This strategy put emphasize

on promoting employment in the manufacturing sector by developing investment incentives, as this is highly labor abundant in South Africa. In order to increase foreign direct investment in this sector various programs were put into place, the Motor Industry Development Programme (MIDP) and Strategic Investment Programme (SIP).

Thus far, investments remained at low levels, since these incentives barely outweigh the cost of doing business in South Africa caused by a high crime rate, low rate of skilled workers in this sector and a still highly fluctuating exchange rate (Barbour, 2005). Even though, prospects for the rise of foreign investment were high and supported by the government, by partly privatizing Telkom and the acquisition of De Beers by Anglo American in the 1990s, the implemented policies did not result in a significant and stable increase of FDI or any expected positive spill-over effects in knowledge and technology. These developments show a strong link towards my critical view on the theory of absorptive capacity and linkages. Despite, previously arguing that ZA has shown signs of economic development and the significant improvement of absorptive capacity, positive FDI spill-over effects remain insignificant. This supports the opposing view, that there exist other factors influencing foreign direct investment and the extraction of these benefits.

Reacting to these unsatisfying outcomes, the government recognized that the benefits of FDI are not automatic. This led to a shift in policy strategy and the creation of the National Development Plan (NDP) in 2001. The NDP aimed at inclusive and more regulated programs to promote growth and reduce accelerating unemployment (Wood and Wentworth, 2014).

Furthermore, acknowledging that limiting trade liberalization was necessary to protect the domestic economy, the state is today in the process of implementing a single domestic investment regime, which will secure sufficient protections, while cancelling existing BITs in the process. Currently, the realization of the Investment Bill is being promoted. This will enable South Africa's government to develop new FDI policies, which concentrate on the achieving greater benefits out of new foreign direct investments (Wood and Wentworth, 2014). As part of this strategy, the government is pushing for increased local content of new FDI investments by putting into practice the black economic empowerment (BEE) act in 2003. This strategy obliges companies to provide a certain percentage of ownership (26%), management shares, as well as supply orders to black individuals and firms, the so called "previously disadvantaged South Africans" (Wöcke and Sing, 2013, p. 11). This however, presents burdens to potential investors, as these requirements make direct investment in South Africa more costly (Wöcke and Sing, 2013).

These FDI legislations are extended by various incentives for foreign investors. Yet, when looking at tax incentives, these are relatively weak compared to other developing countries. According to Kransdorff (2010), South Africa's nominal corporate tax rate is the highest among the developing countries in the sample with 37.5%, while the second highest Tunisia has a rate of 35% and Bulgaria reports the lowest tax rate with 15%. In order to improve the investment climate in South Africa the state has examined the viability of the implementation of Special Economic Zones (SEZs) in all provinces. If these SEZ are being realized, firms operating in these zones will receive new incentives in form of considerable reduction of corporate taxes and exemptions of other investment hindering obligations. These new strategic incentives are crucial in the promotion of future FDI, as the only endorsement scheme the state currently offers is the Enterprise Investment Program (EIP), which allows for a cash subsidy of 30% on the project's "qualifying assets" (Wood and Wentworth, 2014). Yet, when following the line of argumentation of Asiedu (2003), one needs to carefully assess whether these potential tax incentives, will actually generate the desired benefits, or damage the local economy, by providing a competitive advantage only to the multinational elite (Bond, 2009).

After examining historical and current investment dynamics in South Africa, it becomes clear that the individual factors of absorptive capacity are relatively well developed compared to other neighboring countries. Yet, due to the lack of linkages between FDI receiving sectors and other industries in the economy, the potential benefits of FDI might be limited. Moreover, it is likely that the effect from FDI results to be non-existing since the country suffers from high inequalities amongst the different population groups, which might cause an insignificant benefit on GDP per capita growth.

5. Data

In line with the endogenous growth theory, this study examines the effect of FDI on economic growth through the economy's absorptive capacities and channels. This paper examines these dynamics in the case of South Africa in the post-apartheid period from 1994 to 2013. As described in the previous section, channels through which FDI is expected to affect GDP growth are identified by the growth model. Relevant explanatory variables were defined according to their significant relationship with economic growth and FDI (e.g. Borensztein et al. (1998), Adeniyi et al. (2012), Ahmed (2012)). Data on FDI net inflows, financial market development indicators (M3 as a percentage of GDP), and the level of human capital accumulation (Primary School Gross Enrollment) were retrieved from the World

Development indicator Data Base (World Bank, 2014). Furthermore, two other control variables are included; the institutional development indicator (Rule of Law) was obtained from the World Wide Governance Indicators (World Bank, 2014), and the level capital stock (Domestic Investment Share as a percentage of GDP) was taken from Penn World table data base (Penn World Table, 2014). The dependent variable, GDP per capita, defined as constant 2005US\$ real GDP growth as well as obtain from the World Bank (2014). All variables are transformed into logs according to previous studies (e.g. King and Levine, 1993). This offers the option to interpret the outcomes as elasticity dynamics between dependent and explanatory variables as a percentage change.

The following section presents a descriptive analysis of the variables included in this study, with a detailed justification of their use.

5.1. Descriptive Analysis

Table 2 provides descriptive statistics of all variables utilized in this paper. Overall, it can be noted that except for FDI standard deviations are relatively small. This indicates that most of the proxies do not show much variation over the considered period of time, but are rather highly clustered around the mean. Moreover, minimum and maximum values lie very close together, which confirms the first observation.

Table 2: Descriptive Statistics

	Obs	Mean	Std. Dev.	Min	Max
<i>L(Y)</i>	20	8.536	0.102	8.416	8.685
<i>L(FDI)</i>	20	21.518	1.079	19.741	23.014
<i>L(M3/GDP)</i>	20	4.172	0.184	3.892	4.441
<i>L(T)</i>	20	2.318	0.082	2.215	2.520
<i>L(L)</i>	20	4.687	0.045	4.605	4.765
<i>L(K)</i>	20	13.793	0.197	13.514	14.055
<i>L(I)</i>	20	3.999	0.071	3.793	4.083

As GDP per capita is a measure of a country's potential creation of welfare I use this indicator to estimate strength and size of the overall economy. Table 2 shows that GDP per capita (*Y*) has been very stagnant in the post-apartheid period, as the minimum and maximum value lie closely together (from 8.416 to 8.685).

Foreign Direct Investment (*FDI*) is described by the net FDI inflows into South Africa. It is defined as all net investments made to obtain at least 10% equity in a foreign (other than the investors origin) company, which results in a management stock (voting stock) (Alfaro et al.,

2004). FDI, even though showing a larger standard deviation (1.079), remains fluctuating around a small range of values (min. 19.741, max. 23.014). This indicates that all observations are clustered around the mean of 21.518.

Domestic financial sector development, as a potential channel of FDI is included as Liquid Liabilities or broad money (M3) as a percentage of GDP ($M3/GDP$). In line with Alfaro's et al. (2004) argumentation, this indicator is a measure of financial deepening, and therefore provides an indication of the overall dimension of the financial market in South Africa. Another indicator, which is widely used in the literature, is quasi money (M2) (e.g. King and Levine (1993), Nguyen (2008)). This however, only explains the share of currency available in the economy, thus rather looks at monetization instead of financial deepening. Therefore, M3 is preferred here, as it not only measures currency demand but also overall liquid liabilities of all financial institutions: domestic credit, central bank, other non-bank financial institutions, deposit money banks (Adeniyi et al., 2012). According to the descriptive statistics in *table 2*, M3/GDP has been relatively over the period of observation. The standard deviation of 0.184, shows small variation from the mean, while min. and max. values again are found to be closely together (3.9 and 4.4).

South Africa's ability of technological progress and diffusion is characterized by the level of physical infrastructure. Albeit, I am aware that other indicators of technological progress might be more appropriate, such as internet access per 100 people or the amount of tarred roads, due to data limitations and availability this study uses telephone lines per 100 people (T), following Alfaro et al (2004). This proxy can be seen as a potentially valuable indicator, as it is used in previous studies and estimates the availability of access to communicational infrastructure per 100 inhabitants. Additionally, in the case of South Africa, this proxy results to be valid, since in the past decade substantial investments in the telecommunication sector have been made by Vodaphone and Telkom (e.g. \$US 2.4 billion in 2009) (Wöcke and Sing, 2013). Since the numbers of observation range from a minimum and maximum value of 2.1 and 2.5, which is closely located around the mean (2.3), we find this time series again, to be strongly constant over the time period of 20 years. This, points toward a stagnant or rather declining technological progress/ investments in South Africa.

The level of human capital development is the primary school gross enrollment rate (L). It measures the accessibility of education in South Africa, by estimating the share of total population, who is enrolled in primary education and already obtained the official primary school age. Even though, for instance average years of secondary schooling is a more

commonly used indicator (Alfaro et al. (2004), Borensztein et al. (1998)), the lack of data quality for the specific time frame, prevented the use of alternative indicators, such as secondary school gross enrollment. A disadvantage of the chosen indicator could be that it overestimates accessibility of education in the sense that primary education only takes into consideration the attainment of low or elementary skills, but doesn't provide a measure for the availability of high skilled workers in the economy. This indicator reports the smallest standard deviation of 0.045, with a mean of 4.68 (min. 4.6 and max. 4.7).

The amount of domestic investment as a share of GDP (K) is included as a proxy of the level of capital formation (Fambon, 2013). *Table 2* reports a small standard deviation of 0.2, with observations only closely fluctuating around the mean (13.5 and 14.1). This results from the fact that capital formation has been stagnant between 1994 and 2002, further increasing until 2008 and thereafter remaining constant again.

Acemoglu et al. (2001) find, when analyzing the success story of economic growth in Botswana that the establishment good governance of institutions played an essential role. They state that developing a sound institutional framework such as law and order or private property, supported rapid improvement in GDP per capita growth. Previous studies widely estimate institutional environment, using government consumption or overall governance (incl. rule of law, control of corruption, regulatory quality, etc.). Due to poor data availability, I derive the single indicator rule of law (I) as a representative proxy of institutional quality, following Alfaro et al. (2004).

5.2. Data Correlation

Investigating the correlation between the variables in the model (*table 3*); it becomes clear that GDP per capita is highly correlated with all of the explanatory variables included. While the strongest correlation can be found with stock of capital (K), M3/GDP seems to be weaker correlated (-0.545). When turning to the correlation of FDI with the remaining variables, I again find a correlation for most of the identified channels. However, as expected I only find weak correlation for technology (T) (-0.33) and institutional quality (I) (0.42). Moreover, technology seems to be rather uncorrelated with the institutional indicator (0.06).

The results confirm the relevance of each of the factors defined in the model for partly determining economic growth. Moreover, it supports the expected endogenous relationship, discussed widely in the theory, between the identified channels, FDI, and GDP per capita.

Table 3: Correlation Matrix

	<i>L(Y)</i>	<i>L(FDI)</i>	<i>L(M3/GDP)</i>	<i>L(T)</i>	<i>L(L)</i>	<i>L(K)</i>	<i>L(I)</i>
<i>L(Y)</i>	1						
<i>L(FDI)</i>	0.6578	1					
<i>L(M3/GDP)</i>	-0.5452	0.6475	1				
<i>L(T)</i>	-0.671	-0.3326	-0.5534	1			
<i>L(L)</i>	-0.7531	-0.5315	0.5589	0.3849	1		
<i>L(K)</i>	0.9818	0.5946	0.6654	-0.6271	-0.7101	1	
<i>L(I)</i>	0.6368	0.4161	-0.3435	0.0571	-0.7354	0.6619	1

6. Method

Previous literature suggests different methods of analyzing the impact of capital flows on economic development. I apply time-series analysis as I am investigating a potential long-run relationship between FDI, absorptive capacity and economic growth. Therefore, I find this method to be appropriate as I consider a time period of a 16 year time gap.

This study uses the Vector Autoregression model to test for cointegration – a long-run relationship, and short-run dynamics between FDI and economic growth. Unit root and granger causality tests are applied on the sample.

6.1. The Model

Baseline Model

In order to establish, whether there exists an underlying long-run relationship between economic growth and FDI, I first estimate the baseline model:

$$\ln Y_t = c + \alpha \ln FDI_t + \mu_t, \quad (7)$$

where c is the constant, \ln is the natural log of the variable, Y_t represents real GDP per capita, and μ_t is the error term.

Complete Model

Extending the Baseline model, the complete model further includes the variables representing absorptive capacity/ or channels as well as further control variables. Therefore, I construct the following model:

$$\ln Y_t = c + \alpha \ln FDI_t + \beta \ln M3/GDP_t + \varphi \ln L_t + \gamma \ln T_t + \delta \ln K_t + \epsilon \ln I_t + \mu_t, \quad (8)$$

In equation 8, $M3/GDP_t$ is the level of financial market development. L_t represents primary school gross enrollment as human capital; T_t is the measure of the country's ability of technological diffusion (phone lines per 100 people); K_t is defined as the level of capital stock (share of investment/GDP); and I_t is rule of law indicator, estimating the level of institutional development.

6.2. Unit Root Test

First of all, I test the times series variables for stationarity by applying the Augmented-Dickey-Fuller (ADF) test. This unit root test allows determining the order of integration of my variables. I further conduct a different unit root test (Philipps-Perron), which resulted in inconclusive outcomes, due to the short time span included. As this test shows a lower power with a short number of observations than the ADF, I believe this test not to be a suitable alternative.

I moreover, find the time series to be stationary, when I am able to reject the null hypothesis (H0: unit root), since the alternative (H1) hypothesis is defined as having no unit root. In order to confirm the reliability of my results I test for autocorrelation amongst the error terms by applying the Breusch-Godfrey test. In this case I conclude no autocorrelation, when I accept the null hypothesis (H0: no autocorrelation).

The variables are integrated of order zero I(0), when the level logged data is found to be stationary, and integrated of order one I(1), when the first differenced form of the variables is stationary. Finally, in order to correctly apply the VAR model, all time series need to be integrated of the same order.

6.3. Cointegration Tests

After establishing stationary of the data I examine whether there exists cointegration between the series, and thus a long-run relationship. In order to do so, there exist two relevant tests one has to consider. First of all, the Engle-Granger tests of cointegration. Yet, this test only allows assessing for unidirectional cointegration. In other words, using this test I can only analyze one direct relationship at the time. Since however, I apply a complex model, including various explanatory variables, I utilize an alternative test: the Johansen Maximum Likelihood test, as it allows for various cointegrating vectors (Pradhan, 2009).

In order to, apply this test I construct a conditional Vector Error Correction Model:

$$\Delta \ln(Y_t) = \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln(Y)_{t-i} + \sum_{i=0}^p \varepsilon_i \Delta \ln(FDI)_{t-i} + \sum_{i=0}^p \vartheta_i \Delta \ln(M3/GDP)_{t-i} + \sum_{i=0}^p \gamma_i \Delta \ln(L)_{t-i} + \quad (9)$$

$$\sum_{i=0}^p \alpha_i \Delta \ln(T)_{t-i} + \sum_{i=0}^p \delta_i \Delta \ln(K)_{t-i} + \sum_{i=0}^p \rho_i \Delta \ln(I)_{t-i} + \tau_1 \ln(Y)_{t-1} + \tau_2 \ln(FDI)_{t-1} + \tau_3 \ln(M3/GDP)_{t-1} + \tau_4 \ln(L)_{t-1} + \tau_5 \ln(T)_{t-1} + \tau_6 \ln(K)_{t-1} + \tau_7 \ln(I)_{t-1} + \mu_t$$

where the coefficients β_i , ε_i , ϑ_i , γ_i , α_i , δ_i , and ρ_i are defined as the short-term effects of the model; and τ_1 , τ_2 , τ_3 , τ_4 , τ_5 , τ_6 , τ_7 the long-run effects (Fambon, 2013). β_0 is the so called drift component and μ_t is the white noise error term.

Applying the Johansen test, I analyze a possible cointegration of the variables, and therefore, test for each long-term relationship that might exist (Fambon (2013), Pradhan (2009)). With this aim, I determine the number of cointegrating vectors within the model according to the significant trace-value. In line with Pradhan (2009), this is proven to be more robust than the eigenvalues if error-terms are found to be non-normally distributed.

To identify the correct model specification, I define the length of lags to be included into the equation, which I chose consistent with the minimum Akaike Information Criterion (AIC) and the Schwarz-Bayesian Information Criterion (BSIC). Both ICs decline in value as the goodness of fit increases.

6.4. Granger short-run and long-run causality tests

Possible long-run and short-run granger causality is examined, applying the granger causality test on the underlying VAR model. This method is utilized in order to, determine any multidirectional granger causality between GDP per capita, FDI, the explanatory variables functioning as supposed channels (M3/GDP; Gross Enrollment; Phone lines), and the additional control variables (investment share/GDP; Rule of Law).

The level logged VAR model is used for testing for long-run granger causality:

$$\ln(Y_t) = \beta_0 + \sum_{i=1}^p \beta_i \ln(Y)_{t-i} + \sum_{i=0}^p \varepsilon_i \ln(FDI)_{t-i} + \sum_{i=0}^p \vartheta_i \ln(M3/GDP)_{t-i} + \quad (10)$$

$$\sum_{i=0}^p \gamma_i \ln(L)_{t-i} + \sum_{i=0}^p \alpha_i \ln(T)_{t-i} + \sum_{i=0}^p \delta_i \ln(K)_{t-i} + \sum_{i=0}^p \rho_i \ln(I)_{t-i} + \mu_t$$

while the VAR model in first differences estimates potential short-run granger causality.

$$\Delta \ln(Y_t) = \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln(Y)_{t-i} + \sum_{i=0}^p \varepsilon_i \Delta \ln(FDI)_{t-i} + \sum_{i=0}^p \vartheta_i \Delta \ln(M3/GDP)_{t-i} + \quad (11)$$

$$\sum_{i=0}^p \gamma_i \Delta \ln(L)_{t-i} + \sum_{i=0}^p \alpha_i \Delta \ln(T)_{t-i} + \sum_{i=0}^p \delta_i \Delta \ln(K)_{t-i} + \sum_{i=0}^p \rho_i \Delta \ln(I)_{t-i} + \mu_t$$

6.5. Data Limitation

The analysis in the study is subject to various limitations. First of all, the time frame investigated is relatively short. As the complete model only includes 16 years, detecting a potential long-run relationship is fairly difficult; as such an effect might only be extracted over a longer period of time. When interpreting the results, I need to take into account that 16 to 19 years can barely be considered as a long-term time frame.

Moreover, this raises issues autocorrelation amongst the residuals, as detected by the Lagrange Multiplier Test conducted. This is issue of low quality of data. Consequently, the validity of the outcomes needs to be reflected critically. As discussed above the variability of the data is being reduced, when increasing the number of explanatory variables within the model, as the amount of degrees of freedom decreases. This study only applies one unit root test, as utilizing alternative tests, e.g. Philipps-Perron Test, for robustness checks result to be inconclusive due to the small number of observations. Looking at, the ADF outcomes for stationary, in the case of telephone lines per 100 people, I only find weak stationarity at 10% significance. This of course, further influences the reliability of my estimation findings.

Finally, the results obtained in this study are highly sensitive to indicators chosen for the model estimation (De Mello (1999), IMF (2000)). As the International Monetary Fund (IMF) (2000) put forward, due to differing economic dynamics across the individual countries, the outcomes and the size of the estimators will highly depend on the proxies used.

In order to, overcome these limitations future research should include a longer time series to be analyzed. First of all reported econometric results will be more reliable testing of stationarity, and cointegration. Usually, it is recommended to consider and compare various such tests to show the robustness of the outcomes. This is not possible here. Second of all, a larger time period is more appropriate to investigate potential long-run relationships. Moreover, the inclusion of further control variables is essential to reduce the likelihood of omitted variable bias. For instance, previous research suggests a strong link between a country's trade openness, FDI and economic growth (Belloumi, 2014). Due to the limited degrees of freedom and numbers of observations in my specified model, I am not able to add more variables. Finally, a future study should provide robustness checks through including alternative measures for the indicators of human capital, technology and financial market development. This allows, proving the validity of the results and the estimated relationship in the light of differing proxies.

7. Econometric Results

7.1. Stationary tests

A preliminary test before investigating cointegration is analyzing stationarity properties of the time series. Using the Augmented Dickey-Fuller test for unit root testing, I cannot reject the null hypothesis of an existing unit root for all the variables in *table 4*, when tested in logged levels.

After, taking the first difference I find that for the remaining variables I can now reject the null hypothesis at a 5% significance level. Therefore, I conclude that the majority of the time series are integrated at order one (I(1)). When looking at D(L(T)), I can only reject the null at a 10% significance level. However, since the time period of the sample is relatively short, this is acceptable. I conclude that all identified variables are integrated of the same order (I(1)), and are therefore suitable to be included into the model

Table 4: Unit Root Test

Variable	Augmented Dickey-Fuller		
	No. Obs.	Test-Statistics (5% critical value)	Order of integration
Economic Growth			
D(L(Y))	19(0NTNC)	-2.034*** (-1.950)	I(1)
Foreign Direct Investment			
D(L(FDI))	18(1NTNC)	-5.037*** (-1.950)	I(1)
Financial Market Development			
D(L(M3/GDP))	17(0NTNC)	-2.707** (-1.950)	I(1)
Technological Progress			
D(L(T))	13(5TC)	-3.293* (-3.600)	I(1)
Institutional Indicators			
D(L(I))	18(0NTNC)	-4.492*** (-1.950)	I(1)
Physical Capital Stock			
D(L(K))	18(1NTNC)	-3.012*** (-1.950)	I(1)
Human Capital			
D(L(L))	18(1NTNC)	-2.468*** (-1.950)	I(1)

Notes: (0NTNC) - 0 number of lag with No Trend & No Constant; *** - 1% significance level, ** - 5% significance level, * - 10% significance level

7.2. Tests of Cointegration

After detecting the order of integration of the variables, I conduct the analysis of cointegration applying the Johansen Maximum Likelihood test. This approach identifies whether there exists a unique cointegrating relationship within an equation system. If so, the test further determines the number of ranks/number of cointegrating relationships.

In order to conduct the Johansen test, I construct a functional VAR model, obtaining the appropriate number of lags using the Akaike (AIC) information criteria. As verification, I also report the Schwarz Bayesian (SBIC) information criteria (*table 5*).

Table 5: Johansen Maximum Likelihood Test for cointegration

functional VAR model	No. Obs.	No. Lags (AIC/SBIC)	Trace-Statistics (5% critical value)	Rank	Conclusion
Model 1: $D(L(Y)) = f(L(FDI))$	19	1(1)	0.0319* (3.76)	1	Cointegration
Model 2: $D(L(Y)) = f(FDI) L(M3/GDP) L(L) L(T)$	16	4(4)	. (3.76)	-	No Cointegration
Model 3: $D(L(Y)) = f(FDI) L(M3/GDP) L(L) L(T) L(K) L(I)$	16	4(4)	. (3.76)	-	No Cointegration

Notes: * shows the number of cointegrating relationships according to Trace-Value within the underlying VAR-model

Table 5 shows the results for different regressions, starting with the baseline model (1), which analyzes a univariate direct relationship between FDI and GDP per capita. Here, I find one cointegrating relationship, since the trace statistical value rejects the null hypothesis of no cointegration at rank 1. The AIC and BSIC specify one lag. However, when adding further explanatory variables, which represent the channels as the level of the economy's absorptive capacity of FDI: M3/GDP, Primary School Gross Enrollment, and Telephone Lines per 100 people (model 2), any previous significantly existing cointegrating relationship between the time series vanishes. I obtain the same result when again, adding further control variables: physical capital stock (domestic share of investment/GDP) and the institutional indicator (rule of law), as can be seen in model 3. One reason of the diminishing long-term relationship, when extending the model, is that on the one hand, the first model might be subject to omitted variable bias. Thus, FDI captures all effects that other explanatory variables might have on growth, and therefore showing a relationship, due to model misspecification.

On the other hand, the small number of observation in this sample might also cause this diminishing relationship. One has to consider that 16 to 19 years (no. of Obs in *table 5*) is a

short time frame to detect a potentially existing long-run relationship. The fact that the first model however, is able to show significant cointegration, while when adding further variables, thus reducing the number of degrees of freedom to 9 (model 3) this relationship turns insignificant, indicating low variability of my data. Consequently, no significant cointegration might also be subject to lack of data quality (Wooldridge, 2008).

7.3. Relationship between FDI and Economic Growth

In this section, I examine long-run dynamics for the baseline model, which found one cointegrating relationship between FDI and GDP per capita growth (see *table 5*). In order to do so, I estimate VECM for model 1.

As reported in *table 6*, I detect the long-run effect of FDI on economic growth to be negative and significant at a 1% level. The outcomes below indicate that a one percentage point increase in FDI will result in a -.1855 percent decrease in GDP per capita. This supports the debate that FDI has a growth limiting effect. Nonetheless, reflecting on this effect it has to be pointed out that the coefficient is very small, thus suggesting an overall minor impact if FDI in general.

Table 6: Long-Run Dynamics

Sample period: 1995-2013	
Dependent variable: L(pc_GDP)	
	<i>Coefficient</i>
<i>L(FDI)</i>	-.186 (0.000)***
<i>Trend</i>	0.005 (0.313)
<i>Constant</i>	-4.570 (0.000)***
Obs. 19	
<i>Notes</i> : *** - 1% significance level, ** - 5% significance level, * - 10% significance level	

Yet, it has to be considered, that these results are subject to omitted variable bias, since model 1 does not include other growth explaining variables. Hence, when turning to the complete model 3, the previous existing long-run relationship becomes non-existent.

7.4. Granger Causality

In the following I present long-run and short run granger causality results for the baseline model (model 1) and short-run granger causality for the fully specified model (model 3). As

reported in the Johansen test (*table 5*) there is no cointegration, and thus no long-run relationship existent for this model. Therefore, I only analyze a potential short-run relationship.

When examining the long-run granger causality of model 1, I find that granger causation is only one directional. As expected, there exists no long-run granger causality from FDI to GDP per capita, yet FDI is found to be granger caused by GDP per capita at a 1% significance level. This indicates a GDP led hypothesis. Turning the short-run results however, I find that granger causation is reversed. Here again being anticipated, growth is rather FDI-led, as I detect significant granger causation at a 5% level, while in the short-run, growth does not seem to granger cause FDI significantly.

As mentioned before, for model 3 there exists no significant long-run granger causality. Nonetheless, I find short-run granger causality for most of the variables included in the model. First of all, the results for granger causation between FDI growth and GDP per capita growth are robust to those of the first model. Again, I estimate a significant FDI-led GDP growth causation at a 1% significance level, while there is no significant reverse granger causality from GDP per capita growth to FDI growth found.

Table 7: Long-Run and Short-Run Granger Causality

Model 1: $L(pc_gdp) = f(L(FDI))$				Model 3: $(L(Y)) = f(FDI) L(M3/GDP) L(L) L(T) L(K) L(I)$	
		Chi2	P-value	Chi2	P-value
<i>Long-Run Granger Causality</i>					
$L(pc_gdp)$	$L(FDI)$	2.1878	0.139		
$L(FDI)$	$L(pc_gdp)$	18.584	0.000***		
<i>Short-Run Granger Causality</i>					
$DL(pc_gdp)$	$DL(FDI)$	5.9845	0.014**	8.84	0.003***
$DL(pc_gdp)$	$DL(M3/GDP)$			28.97	0.000***
$DL(pc_gdp)$	$DL(K)$			5.13	0.024**
$DL(pc_gdp)$	$DL(T)$			6.22	0.013**
$DL(pc_gdp)$	$DL(L)$			3.44	0.064*
$DL(pc_gdp)$	$DL(I)$			11.50	0.001***
	<i>All</i>			52.09	0.000***
$DL(FDI)$	$DL(pc_gdp)$	0.081	0.776	1.78	0.182
$DL(M3/GDP)$	$DL(pc_gdp)$			0.67	0.413
$DL(K)$	$DL(pc_gdp)$			1.18	0.277
$DL(T)$	$DL(pc_gdp)$			15.07	0.000***
$DL(L)$	$DL(pc_gdp)$			11.40	0.001***
$DL(I)$	$DL(pc_gdp)$			0.58	0.446
$DL(M3/GDP)$	$DL(FDI)$			0.03	0.867
$DL(K)$	$DL(FDI)$			29.67	0.000***
$DL(T)$	$DL(FDI)$			7.01	0.008***
$DL(L)$	$DL(FDI)$			0.03	0.871
$DL(I)$	$DL(FDI)$			1.25	0.263
$DL(FDI)$	$DL(M3/GDP)$			0.03	0.853
$DL(FDI)$	$DL(K)$			0.67	0.413
$DL(FDI)$	$DL(T)$			0.87	0.351
$DL(FDI)$	$DL(L)$			0.00	0.945
$DL(FDI)$	$DL(I)$			2.49	0.114
$DL(FDI)$	<i>All</i>			6.10	0.412

Notes : *** - 1% significance level, ** - 5% significance level, * - 10% significance level

Furthermore, *table 7* examines causal relationships between GDP per capita growth, FDI growth and growth of the identified channels through which FDI can affect economic growth. Results show that all of these factors granger cause GDP per capita growth in the short-run at least at a 10% significance level, and are jointly significant at a 1% level. Therefore, I can conclude that all of these channels are relevant in this model as they explain economic growth.

Now I turn to analyze, whether growth in these channels granger causes FDI growth in South Africa, in the short-term. I find all explanatory variables significantly granger cause economic growth at least at a 10% level. The fact that the channels of growth are found to be significant

is essentially important as it supports the theory that the absorptive capacity in ZA is sufficiently high enough to potentially translate FDI benefits into economic growth. The table reports no significant granger causation from growth in the level of financial market development, capital stock, technological progress, human capital, and level of institutional development to FDI growth, neither individually nor jointly. Looking at reverse causality, unsurprisingly I find that the FDI growth rate only granger causes changes capital stock and technological progress with high significance at a 1% level. The empirical evidence is supported by the historical role of FDI in ZA, as its major share is allocated into the capital intensive mining sector.

7.5. Diagnostic Tests

Finally, in order to test for reliability of my results, I perform different diagnostic tests to study characteristics of normality of the distribution, as well as whether autocorrelation is present in the residuals.

The conducted normality tests are reported in *table 8*. The Jarque-Bera test is a general test of normality. In this case for none of the variable I can reject the null hypothesis of normality. Since, this test is of low power, I also examine skewness, which characterizes the symmetrically distribution of the time series, and the Kurtosis, which provides information on the formation of the tails of the distribution. For both tests I do not reject the null hypothesis of normality. Summarizing, the time series' of all variables in the model are distributed normally, when analyzing them individually and jointly.

Table 8: Normality Tests

	Jarque-Bera Test		Skewness		Kurtosis	
	Chi2	p-value	Chi2	p-value	Chi2	p-value
<i>L(pc_gdp)</i>	0.358	0.83597	0.3	0.58374	0.058	0.80953
<i>L(FDI)</i>	1.445	0.48558	0.955	0.32838	0.49	0.48412
<i>DL(M3/GDP)</i>	2.299	0.31676	2.033	0.15392	0.266	0.60586
<i>DL(K)</i>	1.889	0.38882	1.218	0.26984	0.672	0.41246
<i>DL(T)</i>	0.776	0.67841	0.661	0.41611	0.115	0.73481
<i>DL(L)</i>	11.711	0.28286	6.26	0.12356	5.452	0.19552
<i>DL(I)</i>	1.277	0.52816	0.051	0.82155	1.226	0.26822
<i>All</i>	19.756	0.13803	11.478	0.11909	8.278	0.30872

Notes : *** - 1% significance level, ** - 5% significance level, * - 10% significance level

The Lagrange Multiplier test identifies whether there is autocorrelation in the error terms. From *table 9* it becomes clear that in the second lag there exists autocorrelation. One method

to eliminate this kind of autocorrelation is to include additional lags into the model. However, in this case, since the number of observation is relatively small, this does not solve the problem. Hence, when interpreting the results, one has to take into account that this might lead to unreliable outcomes.

Table 9: Test for Autocorrelation

<i>Lagrange-Multiplier Test</i>		
<i>Lag</i>	<i>Chi2</i>	<i>P-value</i>
<i>1</i>	35	0.089
<i>2</i>	22.961	0.043**
<i>3</i>	28.014	0.307

Notes : *** - 1% significance level, ** - 5% significance level, * - 10% significance level

Concluding, the econometric analysis points out that, even though there is found direct granger causality from FDI to GDP per capita growth in the long-run, only when applying the simple model, and in the short-run for both models, I am not able to extract any significant relationship between FDI and the majority of the channels of FDI in the short-run. The overall results suggest, in line with previous research, contrasting results with no significant long-run relationship between FDI, economic growth and absorptive capacity in South Africa. This, according to economic theory would suggest a lack of absorptive capacity in the economy.

Even though I have established that absorptive capacity is ZA is strong, the discussion and descriptive statistics in the following section show that there exist weaknesses in existing theory, as it doesn't consider important past-persisting socio-economic dynamics. Moreover, it does not offer any explanation towards the allocation of FDI into economic sectors that do not offer beneficial spill-over effects for for instance employment creation or infrastructure improvements.

8. Critical Assessment

This paper investigated How FDI affects GDP per capita growth in South Africa, and whether this relationship is being influenced and rather indirectly caused by other economic growth explaining channels: the level of financial market development, human capital accumulation, and technological progress, or whether other dynamics might play a role. I apply various econometric time series methods such as unit root testing, the Johansen cointegration test and the granger causality tests.

Supposing that the absorptive capacity of these channels is crucial for the size of this effect, I find no long-term relationship between FDI, GDP growth per capita, and any other of the additional explanatory variables in the complete model (model 3). The baseline model (model 1), only looking at the direct relationship between FDI and GDP per capita, in contrast shows one cointegrating relationship and a statistically significant but small negative long-run effect from FDI to economic growth. This relationship is reversed when looking at granger causality, where I find only find a growth-led FDI relationship. When controlling for the previously defined vehicles of FDI however, the long-run relationship diminishes and I only find significant short-run granger causality.

Taking into consideration the issue of omitted variable bias in the baseline model, the overall results are in line with previous literature analyzing this topic in developing countries (e.g. Adeniyi et al. (2012), Aitken and Harrison (1999), Herzer et al. (2006), etc.).

This section discusses two lines of argumentation. First of all, I examine the role of absorptive capacity in South Africa and the implications of path dependency of today's educational, financial and economic institutions in the light of remaining apartheid dynamics. Second of all, I explore how the distribution of FDI into certain sectors, such as the mining industry and other extraction of natural resources may be responsible for no significant or even a negative effect of FDI on growth, since this sector is rather capital intensive with weak linkages to other sectors or the society as a whole.

8.1. FDI, Economic Growth and South Africa's Absorptive Capacity

Investigating how the relationship between FDI inflows into South Africa and GDP per capita is affected by the absorptive capacity of human capital, technology and financial markets. The results found in this study are ambiguous.

Therefore, I can conclude that for ZA there exists no long-run relationship between FDI, economic growth and the FDI channels. Even though, evidence supports a short-run relationship, where FDI and all other explanatory variables granger cause economic growth; there is no significant causation between FDI and human capital and financial markets, only for technological progress. These evidences are supported by Herzer et al. (2006), who investigate education and financial market development as a channel of FDI; finding no significant correlation between FDI and economic growth for the majority of the developing countries in the sample. Alfaro et al. (2004) argue that the ability to absorb FDI is highly dependent on the level of development of these proxies. As the results in this paper suggest,

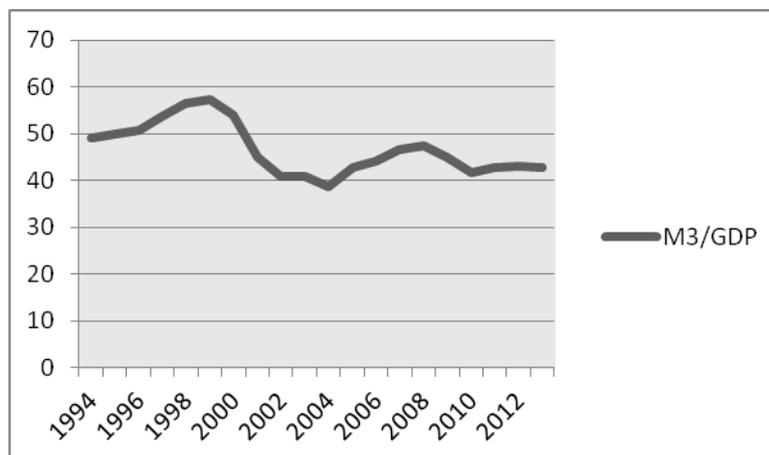
the majority of the channels analyzed do not seem to provide the necessary links between FDI and economic development, neither in the long-run nor in the short-run.

This indicates that in South Africa, albeit being a middle income country, with relatively high absorptive capacity as shown below, other factors highly influence the FDI and growth nexus. Thus, where does South Africa lack behind and which role does its persisting history of apartheid play?

Financial Market Development

After the democratic elections in 1994 the South Africa, was able to stabilize the domestic financial markets, after a decade of international sanctions and isolation which lead to investors withdrawals (Akinboade and Kinfack, 2014). Even though, the new government focused on improving the efficiency and effectiveness of the financial market through expansion and political stability, *graph 4* shows that after an initial recovery in the late 1990s of the broad money (M3) from 50 percent to almost 60 percent of GDP, this ratio decreases from 2000 onwards. Since 2004 broad money remains stagnant between 40 and 50 percent.

Graph 4: Broad Money to GDP (in percentage), 1994-2013



Source: World Bank Indicators, 2014

ZA has a well and deeply developed financial sector, as it has sound fiscal policies, offers broad financial services, and operates on international standards. As can be seen in the graph the indicator remained relatively stable during the financial crisis in 2008, and the South African M3/GDP ratio continues to be one of the highest compared to other developing countries (World Bank, 2014). Despite these developments, financial inclusion of still results in challenges to offer affordable services to all economic actors. According to the African Development Bank (2015), the state faces severe inequality of access to bank accounts between working and unemployed population. Moreover, small and medium sized companies

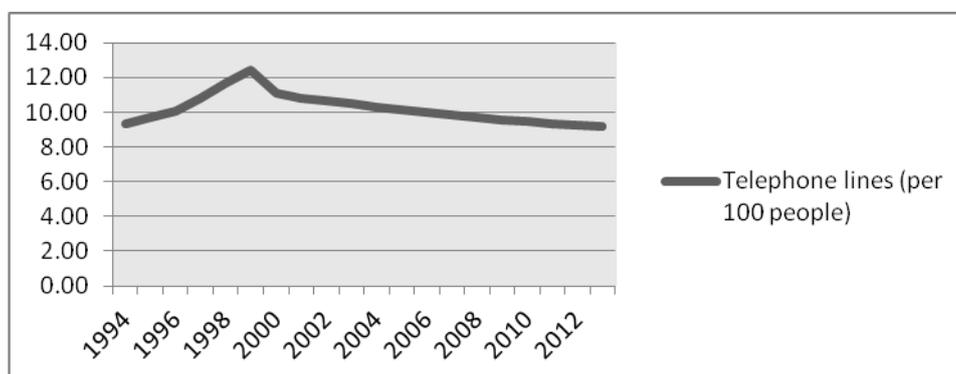
lack availability of affordable credit lending. Moreover, offerings on general savings as well as insurances are still low for the overall South African population.

These results provide a contradictory indication from discussed economic theory above. As for instance findings presented by Alfaro et al. (2004) put forward that a high level of financial market development contributes positively to effective allocation of FDI. Nevertheless, in the case of ZA the existing absorptive capacity of financial markets does not have any significant positive impact from FDI on growth. This is due the lack of financial inclusion towards the whole society equally. Looking critically at the theory, I find that even though level of local market development is high, since the financial services are not accessible for the broad population but only benefitting a rather narrow elite, which. My position is supported by the findings in this paper, showing that the M3/GDP ratio indicator does not show significant importance as a vehicle of FDI to positively impact GDP growth per capita. This leads to the conclusion that conversely to what theory states, inequality seems to be more crucial than the level of financial market development in the FDI and GDP growth nexus.

Technological Progress

Telephone lines per 100 people, as a proxy for new technologies and progress, similarly to the financial market development indicator, does not present any long-term correlation. However, it is found to be affected by FDI in the short-term. These ambiguous results on the one hand are in line with previous research, as for instance Li and Liu (2004) and Grossman and Helpman (1991) point forward. Compared to other African countries, South Africa has one of the highest number of telephone lines per 100 people (*graph 5*) with 9.12 in 2013 (e.g. Zambia: 0.80, Nigeria: 0.21, Egypt: 8.31) (World Bank, 2014).

Graph 5: Technological Progress, 1994-2013



Source: World Bank Indicators, 2014

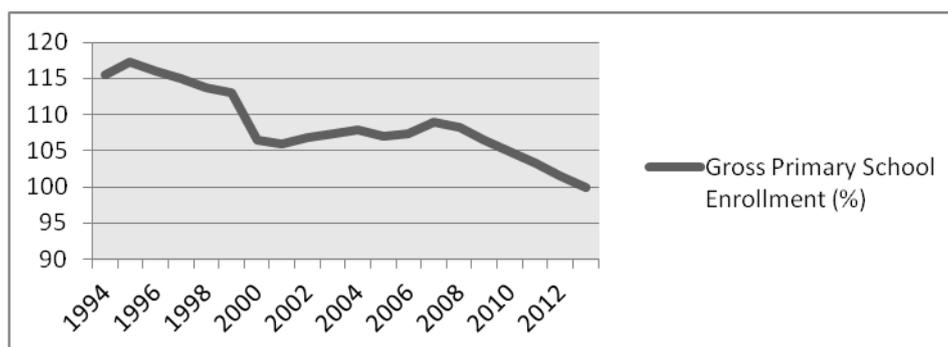
Therefore, one can argue that the degree of absorptive capacity of physical infrastructure is relatively high, even though it has been slowly decreasing after an initial boom from 1994 to 1999. Economic theory in this case would suggest, a certain degree of FDI benefit generating effect, which is not found. Still, in 2008 the South African Poverty Hearing critics that many rural provinces, such as Limpopo or the Eastern Cape, remain lacking access to transportation and roads, telecommunication, and health services. Today, even though decreasing over the last decade, still 36% of the South African population lives in rural areas, with low levels of infrastructure. This high level of inequality of accessing communication infrastructure is partly due to the high population density in the remote rural areas, which lack substantial infrastructure. This has its roots in the apartheid system, where the majority of the black society was banned into remote landlocked homelands, with no essential facilities (Kerby, 2014). These past-persisting socio-economic ties, prevent FDI to lead to positive-spillover effects on overall economic growth per capita

Furthermore, it is still possible that FDI inflows have a short-term impact on technology investments in the host country, especially in certain regions, where FDI is being allocated in order to build up a suitable operational network. This however, might not show any significant long-term effects on the whole economy. This is supported by Herzer et al. (2006) who also find unclear results for developing countries in the long- and short-run.

Human Capital Accumulation

As a certain level of education in the host country is found to be crucial in order to allow for positive spill-over of knowledge and skills from FDI (Belloumi (2014), Borensztein (1998)), regression results reported in this study confirm this argumentation. The proxy of human capital accumulation (gross primary school enrollment) shown in *graph 6*, indicate that albeit initially high enrollment levels in the first two years after apartheid, the number of enrolled students has been decreasing ever since, despite a stabilized time period between 2000 and 2008.

Graph 6: Gross Primary School Enrollment (in percent), 1994-2013



Source: World Bank Indicators, 2014

South Africa`s labor market, even though counted as a middle income country, still struggles with low levels of educational attainment, a population majority of low-skilled workers, and high population group inequalities in education and employment.

Table 10 shows that 50% of the labor force in 2011 has at most an incomplete secondary education, and only 16% percent represent the share of the labor force with tertiary education.

Table 10: Labor force by level of educational attainment

	Labor force 2011
Education status	
No schooling	2.4
Primary not completed	7.9
Primary completed	4.5
Secondary not completed	36.7
Secondary completed	31
Tertiary	16.5
Other	1.1

Source: Statistics SA 2012; Labor Market Dynamics in SA 2011

When looking at level of education one can see that inequality amongst the different population groups remains dominant (*table 11*), as according to Statistics Africa (2012) 69% of the black African population has only complete or incomplete secondary education, while 12.5% have uncompleted primary education. This stands in strong contrast to the white South Africans (0.1% primary not completed; 45.3% tertiary education). These racial differences remain dictating today`s labor market dynamics, as part of path dependent long-run effects of the apartheid system.

Table 11: Labor force by level of education and population group, 2011

	Black African	Coloured	Indian/Asian	White
	Percentage			
Education status				
Primary not completed	12.5	8.3	2.4	0.1
Primary completed	5.1	6	1.2	0.3
Secondary not completed	40.4	41.6	20	13.5
Secondary completed	28.8	30.6	48	39.8
Tertiary	12	12.2	27.9	45.3

Source: Statistics SA 2012; Labor Market Dynamics in SA 2011

Policies implemented during apartheid, continue to facilitate a high demand for low skilled labor, and an absence of semi-skilled workers (Mariotti and Fourie, 2014). This view is supported by further descriptive statistics (*table 13*). The job reservation policy carried out during apartheid, determined that semi-skilled tasks were only available for white South African minority. According to Mariotti and Fourie (2014), this leads to a structural change in the manufacturing as well as the mining and farming sector, as they became capital intensive due to lack of labor supply.

Secondly, South African unequal educational attainment profile is still affected by Bantu Education Act from 1953, where education for black and white became separated, and a redistribution of educational subsidies from black to white institutions was introduced (Mariotti and Fourie, 2014). Almost no support was given to “black” educational facilities, and their training was reduced to be mainly that of unskilled workers (Mandela, 1994), while education was not compulsory nor free for black children. Today, many of these former “black” colleges lack quality of education. This is in line with Spaul (2013) results, which show still existing racial dynamics in the South African education system, since the quality of primary educational output is still significantly higher for previously white institutions. This causes remaining uneven educational opportunities between blacks and whites even over 20 year after apartheid, which leads to disadvantages in the labor market and contributes to high unemployment rates

According to SA statistics (2009), while only around 5.7 percent of the white population was unemployed in 2000, it was 26.8 percent of the black-African population. By 2007 this number was reduced as officially 23.9 percent of all Blacks in South Africa were unemployed, and only 4 percent of the whites.

Table 12: Unemployment rates aged 15-64 years, by population group

Official unemployment rates aged 15-64 years								
years	2000	2001	2002	2003	2004	2005	2006	2007
Percentage								
Black African	26.9	30.8	31	29.2	26.6	26.8	25.6	23.9
Coloured	22.6	24	24.9	23.6	24.1	24.2	21.3	23.4
Indian/Asian	18.3	18.8	17.8	15.8	12.3	16.6	9.3	9.5
White	5.7	5.8	6	4.8	5.5	5.1	4.1	4.1
Total	23.3	26.2	26.6	24.8	23	23.5	22.1	21

Source: Labor Force Survey 2009, Statistics South Africa

I further disaggregate the employment structure in order to gain a better understanding of the nature of prevailing skills demanded. The labor force survey conducted by Statistics Africa in *table 13* shows that the majority of South Africans are engaged in only elementary occupations (on average 22%), which can be understood to only need narrow training or education. Another 13% of the workers occupy services, shop and market sales tasks, as well another 13% work as craft and related trade workers.

Only on average 7% of the overall workers in South Africa are legislators, senior officials or managers, while 3% are professionals. This points to a labor market structure where low skilled labor is in high demand and highly educated workers seem to suffer from the lack of employment opportunities.

Table 13: Workers aged 15-64 years by occupation

Share of total workers by occupation								
2000	2001	2002	2003	2004	2005	2006	2007	
Percentage								
Legislators, senior officials and managers	5.4	6.3	7.0	7.6	8.4	7.3	7.1	7.6
Professionals	3.3	3.2	3.3	3.3	2.7	3.4	3.4	4.7
Technical and associate professionals	11.3	12.4	13.0	11.9	11.5	11.3	11.0	11.0
Clerks	9.5	10.1	10.2	10.5	10.4	9.7	9.7	10.0
Service workers and shop and market sales workers	13.4	13.7	11.8	12.5	13.1	13.6	13.3	12.9
Skilled agricultural and fishery workers	3.0	1.3	1.8	0.8	0.8	0.7	0.9	0.8
Craft and related trades workers	14.0	13.6	13.3	12.8	13.3	14.3	15.2	14.6
Plant and machine operators and assemblers	10.3	9.8	10.1	9.6	9.1	8.8	8.6	9.0
Elementary occupation	21.4	20.8	21.3	22.7	22.5	23.3	23.3	22.0
Domestic workers	8.3	8.7	8.2	8.2	8.1	7.4	7.5	7.4
Total	100.0							

Source: Labor Force Survey 2009, Statistics South Africa

After analyzing South Africa's labor market and education, my results agree with Görg and Greenaway (2004), who find that a too low-level of skills will hinder an effective assimilation of knowledge and technological and operational know-how, which again prevents beneficial

spill-over from FDI as the absorptive capacity of human capital is relatively low (Alfaro et al., 2004).

After critically assessing the role of the FDI's absorptive capacity in ZA, I find that albeit the level of infrastructure, school enrollment and financial market deepening appears to be high compared to poorer neighboring countries, it falls short in offering this overall access evenly to its whole population, which seems to have a significant impact on FDI's contribution to economic growth. As presented above, South Africa is shaped by different opportunities in education and employment between the different ethnic groups, since institutional and labor market dynamics from the apartheid era remain. I find that many black South Africans are not provided with the same educational quality and attainment, and are therefore trapped in low-skilled labor jobs, with lower wages. These dynamics will prevent FDI to be assimilated by the whole economy and not only a few population groups, and therefore not be able to impact overall GDP per capita growth in the long-run, as benefits are not being distributed equally. Here, economic theory on absorptive capacity presented above, shows its limitations in explaining the potential positive effect of FDI on growth.

As high demand for unskilled labor remains in the system, it would offer employment opportunities for many black South Africans, as their school attainment is one of the lowest and most elementary in the country. The majority of jobs offered can be found in the so called industrial zones. Yet, the lack of infrastructure and transportation from the former homelands and rural areas to these industrial zones increases the difficulty for workers to access such jobs. Therefore, work place availability decreases (Kerby, 2014). This partially leads to high unemployment rates. This again creates unequal access to jobs amongst population groups, and thus discouraging the improvement of a more equally distributed absorptive capacity in human capital.

Following this summary, it becomes clear that not the lack of availability but the equal distribution of human capital accumulation and infrastructure investments are one of the biggest challenges the country faces. This highly impacts the economy's effectiveness and therefore its ability to absorb. Former apartheid institutions and systems currently prevent the creation of a more equal society, which might offer a better absorptive capacity of foreign direct investment in the local economy. Finally, I believe that the financial market, although of great importance, as it provides the possibility to increased access to finance for the whole society, in this case will not offer a similar high potential of further improvement as the other two channels. In my opinion, greater access to credit for the low earning population, and often

financially uneducated, usually bears higher risks of indebtedness, which would be the case here, and essentially would not improve their living or operating standards sustainably, nor improve absorption of FDI.

8.2. FDI and Sectoral Investments in South Africa

A second discussion on why FDI has not been found to be beneficial for economic growth in ZA, critically examines to which economic sectors existing FDI flows are being directed.

According to the Statistics South Africa (2015) the manufacturing sectors is one of most important sectors for the economy, even though it's contribution share has decreased from 1993 onwards due to structural change. *Table 14* shows that while manufacturing still contributed 14 percent of value added to GDP in 2005; by 2014 this number has declined to 12.6 percent. This is in line with the reported increase in GDP contribution of sectors in the tertiary industry such as finance, real estate and general government services (e.g. finance 17% by 2005; 20% by 2014). This lets suggest a highly diverse South African economy, which is shaped by not only recent growth but also historical roots.

Table 14: Value added sector contribution to GDP (percentage)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Agriculture, forestry and fishing	2.45	2.19	2.14	2.48	2.47	2.39	2.34	2.31	2.29	2.38
Mining and quarrying	10.45	9.84	9.28	8.52	8.21	8.38	8.06	0.79	7.79	7.55
Manufacturing	14.00	14.11	14.11	13.99	12.70	13.05	13.02	12.97	12.79	12.60
Electricity, gas and water	2.77	2.72	2.67	2.49	2.49	2.47	2.43	2.37	2.31	2.25
Construction	2.64	2.76	3.03	3.22	3.55	3.47	3.38	3.37	3.39	3.44
Wholesale, retail and motor trade; catering and accomodation	13.36	13.41	13.44	13.25	13.31	13.49	13.57	13.75	13.70	13.66
Transport, storage and communication	8.19	8.16	8.32	8.35	8.46	8.35	8.34	8.36	8.34	8.40
Finance, real estate and business services	17.47	18.14	18.46	18.89	19.39	19.05	19.22	19.35	19.51	19.64
General government services	14.21	13.87	13.78	14.09	14.77	14.73	14.90	15.10	15.23	15.45
Personal services	5.49	5.47	5.48	5.51	5.55	5.41	5.36	5.36	5.34	5.33

Source: Statistics South Africa (2014); Gross Domestic Product, Fourth quarter 2014; Statistical Release

When comparing *table 14* and *table 15*, it becomes clear that FDI until 2010 was mainly allocated to sectors of declining economic importance to the country, mining and manufacturing. While, FDI investment in the Finance sector drastically decreased after 2008, which is in contrast to its increase in overall economic contribution.

Table 15: Contribution of FDI stocks to total FDI in ZA, by industry, 2001-2010

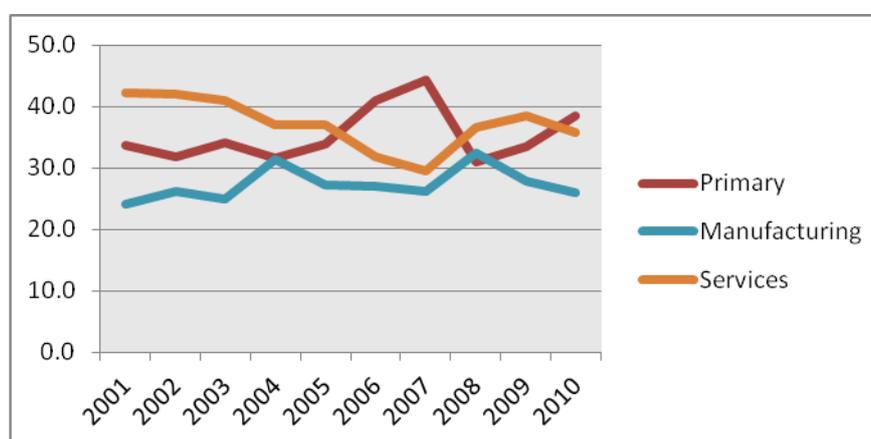
(in million of Rand)

Sector/ Industry	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	100.0									
Primary	33.6	31.8	34.1	31.6	33.9	41.1	44.3	31.0	33.6	38.4
Agriculture, hunting, forestry and fishing	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Mining, quarrying and petroleum	33.5	31.5	34.0	31.4	33.8	40.9	44.2	30.9	33.4	38.3
Manufacturing	24.1	26.3	24.8	31.4	27.3	27.0	26.2	32.4	27.9	25.9
Services	42.2	41.9	41.0	37.0	37.0	31.9	29.5	36.6	38.5	35.7
Electricity, gas and water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.5	0.7	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.2
Trade	4.1	5.2	4.4	4.1	3.0	2.6	3.7	4.9	3.6	3.4
Transport, storage and communication	2.4	4.0	7.3	4.0	1.9	2.3	1.7	2.5	7.5	8.3
Finance	35.2	31.9	28.6	28.2	31.6	26.6	23.7	28.8	27.1	23.8
Community, social and personal service activities	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source : UNCTAD, FDI/TNC database based on data from the South Africa Reserve Bank.
 Note : Trade includes hotels and restaurants. Finance includes business activities.

UNTACTAD (2012) reports that in 2010 the majority of FDI was allocated to the primary sectors (38.4%), 35% of total FDI to services, and 26% to the manufacturing sector (*table 15*). *Graph 7* shows that the share of FDI in manufacturing and services is currently declining, while investments in mining are steadily recovering since 2008.

Graph 7: Share of FDI stock by sector



Although mining, over the past ten years has not been one of the main contributor GDP anymore (*table 14*), we find that it still hosts the main share of FDI until 2010 of 38.3 million of Rand (*table 15*). These statistics are supported by Austen (1987), who argues that mining historically has offered the highest profits and encouragements to allocate fixed investments, compared to other types of productive and export industry. Yet, in order for FDI to positively affect economic growth it should be allocated in a way to contribute to job creation and human capital accumulation.

When analyzing the South African labor market, I find that between 2000 and 2007 half of the active labor force was concentrated in three main sectors (manufacturing, wholesale and retail trade and community and social and personal services) (*table 16*). Even though, mining receives the highest share of FDI inflows it only occupies 2.4 % of the working labor force in 2007. This shows the previously pointed out argument that mining is rather capital intensive than abundant in labor. This analysis shows that FDI in ZA has limited impact on job creation and increased investments in education are rather discouraged, as the mining sector only employs a minor share of the labor-force and offering mainly low-skilled tasks. Linking back to economic theory, the level of absorptive capacity and its contribution to increase benefits from FDI, in the case of South Africa is of minor and limited importance. It does not explain sufficiently why FDI in ZA fails to contribute to economic growth.

Table 146: Workers aged 15-64 years by main industry

Employment by industry	2000	2001	2002	2003	2004	2005	2006	2007
	Percentage							
Formal and Informal								
Agriculture, hunting, forestry and fishing	11.0	7.4	9.0	7.5	6.3	5.4	6.1	5.7
Mining and quarrying	3.5	3.4	3.5	3.3	2.4	2.4	2.3	2.4
Manufacturing	14.2	14.9	15.3	14.3	15.0	14.1	13.7	14.3
Electricity, gas and water supply	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.6
Construction	5.7	5.6	5.4	5.8	7.2	7.7	8.1	8.0
Wholesale and retail trade	23.5	23.9	21.4	23.4	23.4	26.3	25.9	25.1
Transport, storage and communication	5.5	5.5	5.7	5.3	5.5	5.5	5.1	5.4
Financial intermediation, insurance, real estate and business services	8.3	9.6	10.0	9.9	10.4	10.6	10.3	10.6
Community, social and personal services	17.0	18.1	18.6	19.5	18.6	17.6	17.9	18.7
Private households	10.5	10.9	10.5	10.4	10.5	9.8	9.8	9.3
Total	100.0							

Source: Labor Force Survey 2009, Statistics South Africa

Overall, it can be said that South Africa suffers from low labor productivity, which is mainly due to the high share of low-skilled labor in the economy, as discussed above (table 13), consequently many sector are not able to benefit from FDI since MNCs tend to allocate their investments into the most profitable sectors. This hinders the channels of FDI to have an effect on economic growth, as the country fails to distribute these potential benefits towards all sectors in the economy and within all groups of society.

Similar to the African continent, South Africa is rich in natural resources. Already during the era of European colonial power and apartheid this created an increased political orientation on the extractive industries and trade liberalization. As the previous analysis shows, today the majority share of FDI flows into the mining sector, which in contrast hosts less labor force than other sectors. Therefore, when looking at short-term policy recommendation, I do not

suggest increased investments in human capital, as this will not improve the effect of FDI on economic growth since the mining sector is highly capital intensive. Consequently, a higher skilled labor force will not be provided with improved opportunities to assimilate new technology and know-how. It shows that the individual absorptive capacity indicators, even if relatively high developed, are not able to create the expected benefits as they are not being linked effectively with the economic sector, to which FDI is allocated.

Moreover, a challenge that arises from FDI in the mining sector, is that the ability to build linkages between local firms in other more labor intensive sectors is rather weak, since this sector focuses on export of the extracted raw materials, with further production in Asia for instance (Adams, 2009). This reduces the benefits of FDI for the South African manufacturing sector amongst others. Finally, the long-term outlook of major FDI being allocated in the natural resource sector also is critical, as mineral wealth will be limited in the future (Harvey, 2014). This encourages macro policy focus not only on diversifying the local economy but also further distribution of FDI within the economy.

9. Conclusion

The aim of this paper is to examine the relationship between FDI, absorptive capacity and GDP per capita growth in developing countries. Conducting a case study on post-apartheid South Africa from 1994 to 2013, I critically assess existing theory, which argues that the host country needs to present a preliminary level of local development in financial markets, infrastructure, and human capital in order to for FDI to be channeled effectively towards economic growth. While theory is straight forward on this subject, showing an endogenous and indirect relationship of growth promoting FDI through vehicles of economic growth; foregoing literature however, is rather contradictory. Empirical results mostly report a significant nexus for developed countries, but no significant long-term relationship for many developing economies.

Using time series analysis of cointegration and granger causality testing, my empirical results confirm previous studies. There exists no significant long-run relationship between FDI, the indicators for infrastructure, financial market development and education, and GDP per capita growth. The main growth explaining indicators, data for M3/GDP, telephone lines per 100 people, and primary school enrollment ratio only show significant granger causality in the short-run. Further, the analysis controls for level of good governance, using rule of law and the level of capital stock, applying domestic investment share/GDP. Yet, limitations in

number of observations and data quality exist. For instance, when adding these supplementary growth explaining variables, the specified model loses its variation due to decreasing degrees of freedom, which influences the viability of my results.

Even though, these results seem to support existing theory, one has to consider that South Africa is one of the highest developed countries in the African region, with potentially relative high levels of absorptive capacity. Furthermore, empirical results show a significant impact from the channels of growth to economic growth in the short-run. When turning to South Africa, I find that FDI inflows have been significantly, although volatile, increasing since its first democratic election in 1994. This is partly due to the government's focus on progressively promoting FDI through trade liberalization and partly due to improved economic and political stability. Nonetheless, FDI's impact on GDP per capita does not appear to be persistent, also supported by my econometric results and previous literature.

Critically assessing these outcomes, on the one hand I find that albeit absorptive capacity in South Africa is relatively high, with very well developed financial markets and overall infrastructure, inequality amongst population groups is still significant and has not decreased after apartheid. This is due to path persistency of traditional institutions and labor market dynamics, where educational attainment for black people is low and expensive compared to the white population, and the demand for low-skilled workers in many sectors remains intact. Moreover, investments in transport, communication and health infrastructure is unequally distributed and lacking in the remote rural areas of former black homelands. This prevents technology and know-how being assimilated equally within the society and its benefit being distributed down to a GDP per capita effect. When examining the allocation of FDI in the economy it becomes clear that that the impact of absorptive capacity is limited impact, as the majority share of FDI being invested into the extraction and export of natural resources. This sector is capital intensive and provides weak links to other more labor intensive sectors. Therefore, FDI in South Africa is not able to improve GDP per capita growth, since it does not significantly improves to employment creation. FDI in capital intensive industries does not offer high opportunities of economic growth through investments in human capital. Therefore, advising on short-term policies, resources should not be allocated to human capital as a means to promote more beneficial FDI. In the long-term, FDI in the economy should be more diversified by benefitting other sectors such as services and manufacturing, where higher employment rates are being found. This will offer better linkages with the society and absorptive capacity.

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