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Master's thesis:

Foreign Direct Investments in Africa: determinants and effects on the local economy

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Abstract

The African continent, in particular the Sub-Saharan area, hasn't leveraged enough the opportunities to start a solid industrialization process.

FDI have been argued to represent one of the most important resource to allow the development of the manufacturing sector and of the secondary industry (Chen *et al.*, 2015). However, despite the development processes in the economic, political, institutional, and trade spheres, Africa still accounts for less than 3% of the global share of FDI inflows, and about 6% of the share of all developing economies (UNCTAD, 2018).

The current literature on FDI determinants has clearly highlighted how the choice of the right set of determinants is crucial to prevent biases and have a correct representation of the phenomenon of FDI attraction and magnitude, and of the impact on local economies. The choice becomes crucial when the target countries are in extreme need of this type of investment: as a matter of fact, African countries have been shown not to have wide access to international capital markets, and are using less and less official loans to obtain the needed capital to sustain growth (Asiedu, 2002).

The dissertation is aimed at investigating the main determinants of foreign direct investments (FDI) for the particular environment of the African continent, and their impact on local economies.

We hence provide a literature review of the main economic theories concerning international trade and FDIs. Afterwards, we move to the analysis of the determinants that make FDI occur in specific areas rather than others. Moreover, we analyse the different impact that FDI determinants trigger in local economies for the specific environment of the African continent. We conclude the analysis with a discrete econometric model, which points out the relationships between the chosen determinants and a count of FDI flows in the period 1997-2017, and discuss results according to previous literature.

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Chapter 1. Foreign direct investments: an overview

The first chapter of the work is a literature overview on the nature of foreign direct investments (FDI): after detailing definitions and similarities with the concept of multinational companies, we will briefly explore multinationals from an historical perspective, to give context and a first qualitative representation of FDI trends.

Afterwards, we will proceed with an extensive theoretical description of FDI types, from different points of view, and with a literature review of the main economic theories concerning international trade and FDIs.

Eventually, we will provide quantitative insights on some of the general trends of FDIs globally, and conclude with the main methodological issues for their analysis.

1.1 Multinationals and FDIs: definitions

The growth and diffusion of multinational enterprises has been argued to be a crucial determinant for the global economic growth and development of the last fifty years, and has been greatly influenced and impacted by the phenomenon of Foreign Direct Investments (FDI): this impact involves the financial, economic, and social spheres, and the influence between the two phenomena is reciprocal (Dunning, 1993).

The very first definition of multinational enterprises dates back to 1960, and is provided by David Lilienthal, American attorney and public administrator:

“Such corporations [...] which have their home in one country but which operate and live under the laws of other countries as well” (Kobrin, 2009).

The close connection between the concepts of multinational enterprise and foreign direct investment is clearly shown since the early literature on multinationals, as multinational enterprises are explicitly defined as firms engaging in foreign direct investments; through this type of investments, they acquire a substantial interest in a foreign firm or set up subsidiaries in foreign countries. Different authors clearly state that the two terms can be used interchangeably (Markusen, 1995); however, TNCs and MNEs are only example of types of organizations that have been using FDI.

A more recent and specific definition of transnational corporations (TNCs) is provided by the United Nations Conference on Trade and Development (UNCTAD), as enterprises that possess at least one subsidiary abroad, owning at least 10% of their capital and exercising control over them (Unctad.org, 2018).

Despite the differences across countries on the capital thresholds for a company to be defined multinational, it is clear that a control component is needed: this is what distinguishes a FDI from a portfolio investment: the former entails both the ownership and the managerial components.

In order to explore the dynamics of foreign direct investments, it is hence crucial to have and understanding of the phenomenon of multinational enterprises: in the next section we will briefly summarize the history of multinational companies, significantly drawing on the literature contribution of Goldstein and Piscitello, 2007.

1.2 Brief history of multinationals

The main features within a multinational enterprise, namely hierarchical organisation, multi-ethnic workforce, value creation in multiple locations, and strategies aimed at the collection of new resources and at the access of new markets, have historically been present even before the concept of nation itself. In fact, despite their role more as a commercial intermediary rather than an entity accomplishing production activities, the so called *trading companies* have played an important role in the international exchange of resources since pre-industrial times.

The second industrial revolution represents a turning point for the development of multinational enterprises, with the emergence of technologies that enabled a centralised management of production centres dislocated in different locations: United States were the first source and destination of capital, and in this period they acquired extensive competences in mass production, that would turn to be crucial for their supremacy in the twentieth century.

A well-known example is the one of Singer, an American sewing machinery manufacturer: it opened the first subsidiary in Glasgow in 1867, becoming the first multinational company of all times, and reached control of more than 90% of the global market fifty years later, with operations in five different countries.

The hallmark of American activities during this period is the prevalence of direct investment with respect to portfolio ones: once again, the tight relationship between FDIs and multinational activity. At the outbreak of the First World War, the total stock of foreign direct investments counted around 15 billion dollars, which was around 9% of the world GDP (Goldstein and Piscitello, 2007).

Between the two World Wars, the tendency was instead to focus on national markets, with an increase of portfolio investments both in United States and Europe, and a growing interest on financial speculations, that culminated in the Great Depression of 1929: around a half of the total American foreign loans turned into bad debt.

The period between 1945 and 1975 represented a rather unexpected time of economic and social growth worldwide, considering the extreme political divisions and the restrictions in capital circulation. These growth perspectives were, once again, mostly seized by United States, which owned almost half of the total foreign direct investments stock in 1960; furthermore, they accomplished a significant expansion across European territories, and got increasingly interested in developing economies (Goldstein and Piscitello, 2007).

The target sectors also gradually changed, from production activities to services, in particular support activities towards companies: the general strategy was to replicate successful business models, trying to minimize the differences with respect to the country of origin, and service enterprises represented an catalyst for this dialogue.

However, the economic crisis of 1973 showed the points of weakness of the American economy, whose multidivisional structures were less agile and prepared to exogenous shocks than other structures, such as the ones of Japanese enterprises. A significant trend of this period is the growth of foreign direct investments of European companies towards other European countries. Despite more than 30 years of economic growth, the global foreign direct investment stock was stable around 5% of the world GDP, half of the value reached before the First World War.

It's only in the 1990s that foreign investments started to grow exponentially, thanks to the removal of many international commercial barriers, and the regionalization of global economy through fragmented value chains across different locations: the multinational model, foreign direct investments, and globalisation hence shared the same ground.

Eventually, the realization of political and economic stabilization programs and the liberalisation of services let also developing economies open their markets to foreign investments. The growing interest towards this category of countries justifies the research objective of the dissertation: the study will analyse FDI flows towards African countries, investigating the determinants for FDIs in Africa and the expected effects on the local economy.

1.3 Types of foreign direct investments

In this section we explore the nature of FDIs from several points of view: first, we will analyse FDI types according to the objective that pushes the outside firm to invest abroad; afterwards, we will place FDIs into the general framework of international contractual agreements, and see the differences and potential advantages with respect to other low-risk investments (namely exports); eventually, we will see how FDIs change the activity structure of a company, with the integration of the new plants on a horizontal or vertical level.

1.3.1 FDI by investment motives

Dunning (1993) provides a first theoretical distinction on the types of FDI, by motives of investment: this plurality of reasons for accomplishing investments abroad is argued to be one of the six distinguishing features of the global economy in the 1990s, and a basis for a restatement of Porter's Diamond model on competitive advantage, to include the international dimension.

The first reason why to invest abroad is the willingness of a firm to get access to resources that are not available in the country of origin, or that are available at a much higher cost (*resource seeking*): the term resource doesn't only refer to natural resources and raw materials - though they are certainly a major component - but also to products, workforce, and technology.

Another motive detailed by Dunning is the chance to gain access to the market of the host country, or to one or more of the neighbouring ones (*market seeking*), due to a plurality of reasons: a company may have for instance experienced issues in previous commercial relationships with the target country, or the political environment may have changed towards more protectionist measures.

Moreover, the proximity to certain markets entails a number of different advantages, in terms of adapting the product to the consumer needs more effectively, and of being faster than competition in serving them.

The optimisation of production processes across the value chain represents another motive for FDI (*efficiency seeking*), as having access to a portfolio of geographically dispersed activities enables the source enterprise to make the most of production factors and of the different economic and political systems and policies. This motive partly justifies the great interest towards developing economies, which represent an opportunity to accomplish labour intensive and low-tech activities at a much lower cost.

Eventually, enterprises are always aware, when assessing their growth potential and competitive advantage, of the dangers of assuming that their *status quo* will be stationary in the future (Anthony *et al.*, 2011), and actively seek for new competences and resources that can guarantee the sustainability of their competitive advantage (*strategic asset seeking/competence creating*): as a matter of fact, investments in research and development abroad are often the cause of positive spillovers and learning effects that can lead to new innovative competences for the source enterprise.

It is important to point out that these categories of FDI are not mutually exclusive: on the contrary, it is often a combination of two or more of them that provides a solid reason for a foreign company to accomplish this high-risk kind of investment abroad.

1.3.2 Degree of control and resource commitment: from exports to FDIs

The foreign enterprise can commit financially to a whole range of levels: each type of entry mode to access a new market entails a specific level of control over foreign activities, and a different grade of internationalization. The least risky mode is the import-export relationship, where the source enterprise doesn't need to commit their resources to get internationalized, but it gains very little control over the foreign market. On the other hand, a greenfield investment (FDI) is considered the opposite extreme, as the enterprise decides to build a subsidiary abroad from scratch, taking on all the costs and risks, but having as a result complete control over the activities, and getting the chance to become a multinational company.

Between exports and FDIs there are a number of different contractual relationships, such as subcontracting, resource/technology transfer agreements, joint ventures, and acquisitions: these solutions are often preferred due to the extreme unpredictability of certain target markets, and due to the chance to leverage local knowledge of affiliates, privileged access over production factors and distribution channels, and solid relationships with political institutions (Goldstein and Piscitello, 2007).

Technological progress has also opened the way to completely new paradigms, such as global sourcing and virtual organization, further broadening the range of possible foreign investments (Nanut and Tracogna, 2011). *Figure 1* summarizes different contractual arrangements and investments, according to resource commitment and degree of internationalization, as well as to the corresponding level of control obtained.

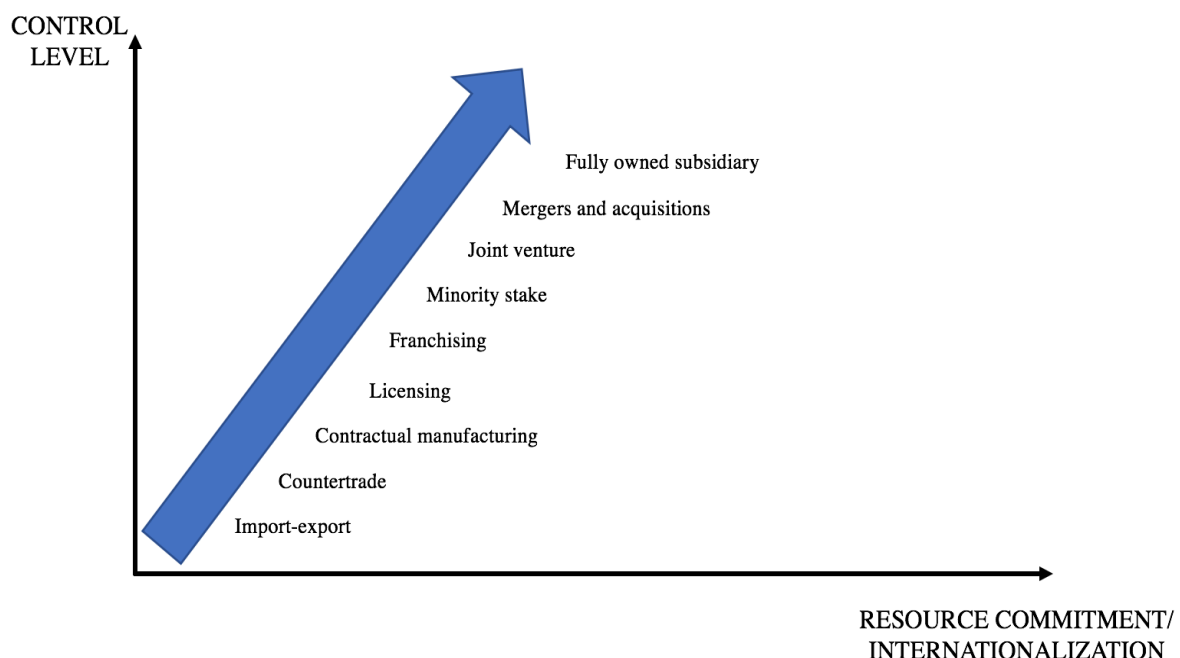


Figure 1. From Exports to FDIs, adapted from Goldstein and Piscitello, 2007

The final decision for the type of international activity usually comes as a result of a cost-benefit analysis: exports, for instance, may be influenced by tariff disadvantages, by absolute advantage in production costs, and by other variables such as market size; similarly, comparing FDI with contractual arrangements, there are contractual costs involved, such as negotiation costs, haggling, monitoring and enforcing. These variables have also been argued to become strategic tools to attract FDIs: for instance, many developing countries have applied policies such as tariffs, anti-dumping regulations, and quantitative restrictions, to discourage foreign imports and attract FDIs (Loree and Guisinger, 1995).

Eventually, the high-risk nature of foreign direct investments, due to the significant transfer of financial, tangible and intangible resources, further differentiate them from other types of contractual relationships. Therefore, the decision to pursue FDIs instead of other kinds of investment must be sustained by high expected returns, that mitigate this extreme risk differential. Ahmed *et al.*, 2002 identify the relationship between the type of investments accomplished to get access to a foreign market and multiple risk variables, pointing out how, in an international environment, risk becomes more complex and spans over different dimensions (11 identified in the research). The trade-off between risks and benefits is argued to necessitate the inclusion of all risk variables (social, political, industry-specific, environmental, etc.) at the same time, due to their strong interrelation: considering a risk dimension individually is argued to bias results. In the next chapter, we will explore FDI determinants and their relationship with risk dimensions.

1.3.3 By activity structure: horizontal and vertical FDIs

From the point of view of the structure of activities accomplished nationally and abroad, there is a further distinction of FDI types, that has something to do with the complementarity and replicability of the aforementioned activities.

When the aim is to use a local affiliate abroad to supply a new market, the need for proximity and velocity implies a replication of some or all the activities accomplished in the source country, with few adaptations aimed at tailoring the product to the local market: this kind of FDIs are called horizontal FDIs (HFDI). The resulting multinational firm will produce the same lines of goods in each targeted market, and it's common for domestic industries with local markets that are fragmented (Caves and Caves, 1996).

On the other hand, when the aim is to leverage local resources to optimise the production process, and supply different markets from a chosen one, the priority is to exploit differences in factor prices across countries by disintegrating production activities in different locations: these FDIs are called vertical (VFDI). Therefore, the resulting multinational enterprise will

utilise some of their plants to produce outputs that serve as input for others: these “linkages” can also follow the opposite direction, as it will be discussed in the following chapter.

A third type of FDI is the one of enterprises whose plants are neither vertically nor horizontally integrated: an example are export-platform foreign direct investments, where the source firm accomplishes an investment in a destination country with the specific purpose of exporting goods to a third one. These kinds of FDI share aspects of market-seeking FDI, characteristic of HFDI, and resource-seeking, typical of VFDI, and have been mainly explored in literature in the form of case studies, due to the complexity in disentangling the horizontal and the vertical components (Ekholm *et al.*, 2007).

This phenomenon is particularly beneficial when the low-cost country chosen to accomplish the vertical component is part of a preferential trading arrangement area (PTA), which is an area where artificial tariffs and costs for commerce are eliminated, while keeping restrictions for the countries which don't belong to the agreement. Caves and Caves, 1996, highlight possible strategies regarding FDI in PTAs: the first one is the case of non-member countries that may find interesting to produce locally in the PTA area, and freely trade goods within it. The second case is the one of companies which used to export in the PTA area, and are forced to shift to FDI, not to lose their previous market: these companies are usually willing to use a specific country within the PTA as a base for multiple exports within the area: an example comes from the significant investment flows of US companies in Ireland with the objective of serving the whole EU (Barry, 2004), or from the ones in Mauritius aimed at serving the African continent (Reza Cassam Uteem, 2018).

Each of these FDI structures has different advantages: HFDI for instance imply significant trade costs savings, due to the distributed production, but also entail significant replication costs to set up new plants, and prevent the enterprise from leveraging economies of scale. On the other hand, VFDI generate economies of scale across the fragmented activities and obtains factor price savings, but the fragmented production generates costs in terms of coordination of activities and trade (Barba Navaretti *et al.*, 2006).

Empirical evidences on FDI flows show that horizontal foreign investments represent the majority in number with respect to vertical or mixed ones. Caves and Caves, 1996 point out the generic research strategy to test HFDI prevalence: “if attribute x promotes MNE formation, and best-in-class in industry A possesses a lot of x, then such MNEs should prevail in the said industry”. Research results generally confirm the central role of proprietary assets in FDI, through the use of predictors like research and development intensity or advertising intensity.

Moreover, HFDI seem to prevail in large countries, and the case of United States is the widest example: Ramondo *et al.*, 2011 utilised firm data from the U.S. Bureau of Economic Analysis to assess HFDI prevalence. The results on affiliates activity report almost no physical shipment

of goods to or from the parent firm (0.1% volume of inputs), and sales exclusively directed to unrelated parties in the local market (97%).

Eventually, expenses on property right protection are argued to be positively correlated with foreign investments, whereas scale economies seem to deter plant dispersion and hence foreign investments (Caves and Caves, 1996).

1.4 Economic theories of international trade and FDIs

In this section we briefly review some of the most important economic theories on international activity and foreign direct investments: the knowledge of economic theories is the basis to understand the main determinants for FDI attraction in specific countries, as well as their realization and impact.

The first contributions are the classical trade theories developed by Smith and Ricardo, pillars of economic models of the nineteenth century. According to the theory, the specialization of a country in certain types of activities and the international exchanges are a result of differences in costs and production factors: each country specializes in the activities that result in the biggest advantage for them. Therefore, a country with extensive workforce will specialize in labour-intensive activities, leaving capital-intensive activities to countries with more capital; both types of countries eventually exchange their resources and benefit from that (Morgan and Katsikeas, 1997).

However, the classical theory, together with the theories of factor proportions of Hecksher and Ohlin, 1933, wouldn't explain the exponentially growing flows happened at the beginning of the twentieth century between developed countries, which had a similar factors configuration.

General equilibrium theories have also included the dynamics of MNEs: as a matter of fact, keeping the assumption that different rates of return to capital cause differences in its social marginal productivity, FDI activity becomes strictly related to changes in the world's real income. In other words, the individual choice between exports and capital investment is reflected in the general economy, with the alternatives of trade and capital exchanges.

In particular, the *new trade theory*, based on the relaxed assumptions of differentiated products, growing returns to scale, and imperfect competition, was partly able to predict, alongside intra-industry trade, the unexpected capital flows between similar countries, as well as multinational growth and value chain fragmentation (Krugman, 1995; Markusen and Venables, 1998).

The focus hence moved on the necessity of enterprises to increase their market power: expansion becomes the result of the willingness of a company to gain unique advantages abroad, when the national environment doesn't provide the same opportunities for growth

(Goldstein and Piscitello, 2007). However, the clear preference of FDIs over low-risk forms of investments remained an open question, which partially found answer in market inefficiencies and imperfections.

Moreover, the increased role of technology brought up the debate of the influence of technology gaps between countries involved in international activities: the *product lifecycle model*, to be attributed to Vernon, 1979 and Wells, 1968, points out the relationship between international activity and innovative potential and market expansion. The first phase of the cycle is the product introduction, where uncertainties in technology and demand force the enterprise to a high level of flexibility and proximity to suppliers and consumers. When the product becomes more mature and standardised, the focus moves from flexibility to cost optimisation, allowing scale economies that enable both to serve the national market and to start exports. In the third phase, the product is fully standardised and the market saturated, and the company moves part of the production activities to countries with lower production costs, and subsequently re-imports finished products to the country of origin.

The first actual contribution on multinational organization literature is the *internalization theory* of Ronald Coase, developed in the 1970s to explain the growth of MNEs and the spread of FDIs: according to the theory, a multinational enterprise exists when internal coordination costs are lower than external exchanges from the market (Casson, 2015). This differences can be explained by market failures and inefficiencies, by bounded rationality, and by asymmetries and imperfections in information, which lead to opportunistic behaviours from local enterprises. The internalization paradigm works both for horizontal and vertical FDIs: the difference is that the former internalizes a market for proprietary assets (ownership inputs), the latter for intermediate products (Caves and Caves, 1996).

The Swedish school places international activity in an incremental process, where the enterprise gradually acquires experience that diminishes the “psychic distance” from the target market, and allows expansion (Sullivan and Bauerschmidt, 1990).

The *eclectic model* (or *Ownership-Location-Internationalization framework*) proposed by Dunning, 1980, summarizes all the theories into three main determinants for international activity. The starting point is that the objective of every enterprise is to transform, through production processes, a valuable input into a more valuable output. The value generation has different dynamics according to the type of input, and there are two main categories: the first includes inputs that are available to all firms, regardless their size or nationality, but that are specific to a particular location (*location-specific inputs*). Ricardian endowments (natural resources, labour, proximity to markets) fall into this category, together with the environment in which the endowments are used (government policies, market structure). The second type of input is property of a company, hence not available in the market, and can be developed or

acquired, but the result is that the company has exclusivity on it with respect to competitors (*ownership-specific inputs*).

The three dimensions for international activities are the extent to which a company is able to create or acquire assets, namely the amount of ownership-specific assets; the company's preference on internalization of these assets with respect to their sale; and the comparison in terms of profitability between the aforementioned assets and assets present in the source or in the target market (hence, *internationalization*).

The approach hence points out the incompleteness of models that take into account only the location or the ownership aspects to generically explain international trade: the former determines which are the firms that will supply a certain foreign market, the latter determines the entry mode to the market, namely through exports or FDIs. In other words, given the possession of proprietary assets, location forces must justify the dispersion of production, and there must be an advantage (in terms of governance as well as transactions) for placing activities abroad (Caves and Caves, 1996).

Eventually, in the last decades of the past century, new factors such as information and communications technology (ICT) and liberalizations have directed the internationalization problem more towards R&D, to make the most of spillovers and learning effects and gather knowledge and competence to sustain competitive advantage. According to the *knowledge capital model*, knowledge-based assets are a crucial input for the international configuration of an enterprise: in particular, as seen in the previous section, the property of transferability of knowledge leads to a vertical configuration, whereas knowledge being a public good leads to an horizontal one (Carr *et al.*, 2001).

The evolutionist approach based on technological accumulation (Nelson and Winter, 1973; Cantwell, 1989) explores the actors in international dynamics from a different standpoint: from vertical transfers from parent to subsidiary, multinationals are described as a network, a thinking brain, where subsidiaries contribute bidirectionally to the increase of knowledge of the group. The capacity of going international influence competitiveness in a virtuous cycle where the advantages of internationalization become determinants for increase in competitiveness.

Figure 2 (drawn from Morgan and Katsikeas, 1997) summarizes some of the literature contributions for international trade and foreign direct investments.

Theory type	Theoretical emphasis	Credited writers
International trade theories		
Classical trade theory	Countries gain if each devotes resources to the production of goods and services in which it has an advantage	Ricardo (1817) Smith (1776)
Factor proportion theory	Countries will tend to specialize in the production of goods and services that utilize their most abundant resources	Heckscher and Ohlin (1933)
Product life cycle theory (for international trade)	The cycle follows that: a country's export strength builds; foreign production starts; foreign production becomes competitive in export markets; and import competition emerges in the country's home market	Vernon (1966, 1971) Wells (1968, 1969)
Foreign direct investment theories		
Market imperfections theory	The firm's decision to invest overseas is explained as a strategy to capitalize on certain capabilities not shared by competitors in foreign countries	Hymer (1970)
International production theory	The propensity of a firm to initiate foreign production will depend on the specific attractions of its home country compared with resource implications and advantages of locating in another country	Dunning (1980) Fayerweather (1982)
Internalization theory	Internalization concerns extending the direct operations of the firm and bringing under common ownership and control the activities conducted by intermediate markets that link the firm to customers. Firms will gain in creating their own internal market such that transactions can be carried out at a lower cost within the firm	Buckley (1982, 1988) Buckley and Casson (1976, 1985)

Figure 2. Theories of international trade and FDIs, (Source: Morgan and Katsikeas, 1997)

1.5 General trends of FDIs

1.5.1 FDIs before the 2007 crisis

FDI flows have fluctuated significantly in the past century, in terms of quantitative levels, composition, concentration, and direction: different literature contributions have tried to summarize FDI trends from an historical perspective, and we now draw insights mainly from Te Velde and UNCTAD, 2006 and Twomey, 2002.

After the boom registered in the 1920s, FDI stocks, measured as a percentage of GDP, didn't register a considerable growth, due to the complex political tensions that spanned from the Second World War until the Cold War, and an economic climate that was unevenly and uncontrollably increasing. The general vision towards FDI was hence rather negative, and FDIs were thought to be unhelpful, and to bring unappropriated technologies to target countries (Te Velde and UNCTAD, 2006).

However, in the past three decades the view has radically changed, and countries from developed as well as developing economies have started to change their economic environments to attract FDI flows: *Figure 3* shows the global FDI inflows trend from 1980 to 2008, reporting an exponential increase between 1990s and 2000s, from \$ 200bln to \$ 1400bln (+600%).

The figure clearly shows the presence of developing countries as main contributors (namely Asia, Africa, Latin America, and the Caribbean) but developing countries also registered a consistent growth, not being as much affected by the "Dot-com bubble" crisis that crushed the developed world from March 2001 to October 2002.

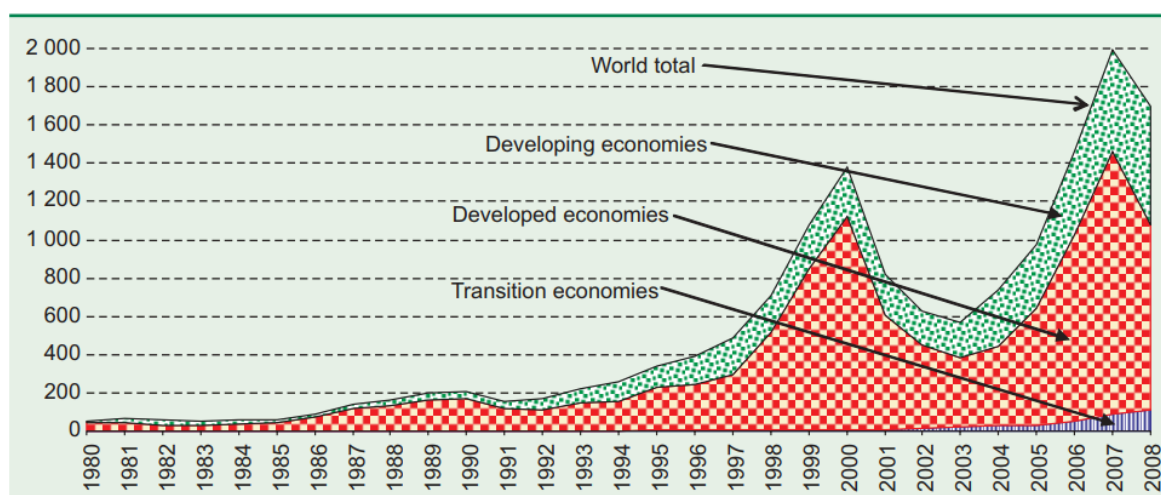


Figure 3. FDI inflows, global and by groups of economies. (Source: UNCTAD, 2009)

Moreover, the concentration in FDI flows has also significantly changed throughout the past century: at the beginning of the twentieth century, two thirds of FDI flows were directed to developing countries, whereas at the beginning of the twenty-first century the value decreased to one fourth (Twomey, 2002). The decreased values explain the differences in FDI composition, but don't provide information on the absolute quantities per category, both considerably increased.

It is also worth remarking that the categorization of developing countries has considerably changed throughout the century, as well as the ratio between inflows and outflows that they attracted and generated: China and India stand out as an example, showing how countries that used to be just targets for FDI investments became also major investors: China is now greatly contributing to investments in Africa, whereas India has significantly invested in United Kingdom in the past decade (Te Velde and UNCTAD, 2006).

Another noteworthy change concerns industries, and the first major twist is the boom in manufacturing and mass production activities of the first half of the century, and the more recent technological boom -mainly happened in past three decades- that has corresponded to a switch towards knowledge-intensive markets as a target for FDIs. In 1914, the distribution of FDI flows across agriculture, manufacturing, and services was respectively 70%, 1% and 26%; in 1998, the values counted instead respectively 14%, 27%, and 59%. The variation reflects the priority switch in value creation from the utilization of natural resources and the infrastructure creation to efficiency and competence-seeking activities (Twomey, 2002).

Eventually, the financial crisis of 2007-2008, the most severe episode since the Great Depression of 1929, has again destroyed international activity, especially for developed economies: the values before and after crisis (2007-2009) correspond to a decrease in FDI

inflows of 40% for developed economies, and of only 6% overall for developing and transition economies (UNCTAD, 2008; UNCTAD, 2010).

The crisis has also dramatically changed the distribution of inflows: developing economies didn't result much affected from the financial crisis, and managed to keep their values steady, increasing significantly their share in global FDI flows, both for what concerns inflows and outflows. In particular, West Africa registered a 63% rise in inflows over 2007; South, East and South-East Asia a 17% expansion; Latin America and the Caribbean rose by 13%; and noteworthy were also the inflows towards South-East Europe, South, and West Asia (UNCTAD, 2009).

1.5.2 FDI trends from 2009 to present

The 2007 crisis has followed a long and complex period of recovery, especially for developed countries. On the other hand, developing countries (Africa, Asia, Latin America and the Caribbean) and transition economies (South-East Europe, the Commonwealth of Independent States, Georgia), that had absorbed more than half of the global FDI flows just after the crisis (from 2009-2010), haven't stop increasing since.

Figure 4 graphically represents the trends of the post-crisis FDI inflows, divided by group of economies, and includes projections for year 2018. The figure shows recent stable trends for what concerns developed and transition economies, with the exception of the recession started in 2014, with a decline that is due to a fragile global economy, elevated uncertainty in policies and increased geopolitical risks (UNCTAD, 2015).

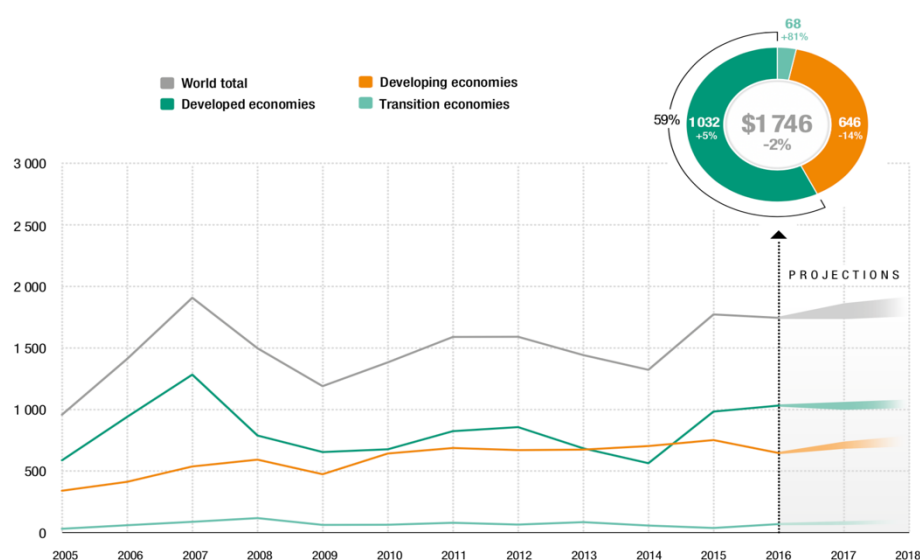


Figure 4. FDI inflows, global and by group of economies, 2005–2018, (Source: UNCTAD, 2017)

Moreover, the steady projections for year 2017 didn't reveal to be accurate, as the actual inflows values for developed and transition economies registered a significant decrease (respectively of 37% and 27%), with a global FDI inflows decrease of 23%: *Figure 5* shows the quantitative percent variations both in inflows and outflows for the years 2014-2017.

The decreased values, however, are in strong contrast with other macroeconomic variables, such as GDP and trade, and find partial explanation in the extensive corporate reconfigurations and significant decline in rates of return of the past five years, despite the more recent stabilization in commodity prices (UNCTAD, 2018).

Developing countries didn't seem to be subjected to further decrease, after a drop of 10% and 13% in 2016, thanks to a slight increase in commodity prices (especially crude oil) and a more extensive economic expansion in natural resources from major countries like China. Furthermore, the slightly negative values in Africa have been compensated by positive ones in Latin America and the Caribbean (respectively -21% and +8%) (UNCTAD, 2017).

For what concerns FDI outflows, developed economies have recently recovered part of the value lost between the years 2007 and 2014, reaching \$ 1 trillion, which corresponds to a share in global FDI outflows of 70% (UNCTAD, 2018) (values indicated in *Figure 5*).

On the other hand, developing and transition economies, that have more than doubled their FDI outflows in the after-crisis years, have now recently decreased their investments levels, with negative variations during the recession of 2014-2016. The situation seems to be partially recovered, with transition economies increasing their outflows by 59% (see *Figure 5*), mainly thanks to the contributions of Russian Federation, Azerbaijan, and Kazakhstan.

A

FDI flows		2005–2007*	2014	2015	2016	2017
World	Inward	1 415 431	1 338 532	1 921 306	1 867 533	1 429 807
	Outward	1 451 593	1 262 007	1 621 890	1 473 283	1 429 972
Developed economies	Inward	937 460	596 699	1 141 251	1 133 245	712 383
	Outward	1 223 039	731 670	1 183 568	1 041 458	1 009 208
Developing economies	Inward	419 061	685 292	744 032	670 158	670 658
	Outward	196 092	457 994	406 237	406 668	380 775
Transition economies	Inward	58 909	56 541	36 022	64 129	46 767
	Outward	32 462	72 343	32 085	25 157	39 989

* Pre-crisis annual average

B

FDI % variation		crisis-2014	2014-2015	2015-2016	2016-2017
World	Inward	-5.4%	43.5%	-2.8%	-23.4%
	Outward	-13.1%	28.5%	-9.2%	-2.9%
Developed economies	Inward	-36.3%	91.3%	-0.7%	-37.1%
	Outward	-40.2%	79.6%	-12.0%	-3.1%
Developing economies	Inward	63.5%	8.6%	-9.9%	0.1%
	Outward	133.6%	-11.3%	-13.2%	-6.4%
Transition economies	Inward	-4.0%	-36.3%	78.0%	-27.1%
	Outward	122.9%	-55.6%	-21.6%	59.0%

Figure 5. FDI inflows and outflows (A) and their percent variation (B), 2007–2017. Adapted from UNCTAD, 2018

Alongside the value of FDI activities, other two indicators for FDI activity are the number and value of mergers and acquisitions sales and purchases, as well as the number and value of announced greenfield investments. As a matter of fact, they represent the two different

investment options, that respectively utilise existing foreign assets, or generate new ones abroad.

Annex 1 gathers all M&A purchasing activities since the crisis of 2007, in terms of number and value, and are divided by economic area and by industrial sector. The figures show a great preponderance for the service sector, which accounts for 78% of the global number of M&A purchases in 2017, compared with 20% in manufacturing, and 2% in the primary sector.

These same purchases, in terms of value, show a slightly different distribution: manufacturing deals seem to be larger, since they represent 39% of the total value of M&A purchases in 2017, whereas services reported a value of 61% and the primary sector a negative value.

Overall, the three sectors have decreased in value of purchases in 2017, a slightly negative trend with respect to the extreme increase of the years 2015-2016 (a world value growth of 72% in 2015 and 21% in 2016, for an overall value of almost \$ 900 billions).

Annex 2 shows all M&A sales from 2008 to 2017, again in terms of number and value, and divided by economic area and by industrial sector. The trends of number of sales mirrors the one of purchases for the service and manufacturing sector; instead, the primary sector in 2017 reported an increase in number of M&A sales of 170%, yet not reaching the values of 2008. However, this increase in number of deals doesn't correspond to an increase in value: while the three sectors have seen a consistent growth in value of sales for the years 2016-2017, the primary sector has decreased by 70% over the past year, whereas the other two sectors have decreased by less than 20%. Eventually, most of the sales involved developed economies, in terms of number as well as value.

Annex 3 depicts the main trends concerning announced greenfield investments: the service and manufacturing sectors compose entirely the global numbers of greenfield investments, as well as the global value, yet not reaching the 2008 levels.

Developed countries are still the major source in terms of value for greenfield investments, but developing countries have produced the biggest number of investments in the past 6 years: in particular, Europe is the largest source, followed by Asia, and North America.

As for destinations, Asia has been with no doubts the protagonist in the past two decades, followed by Europe, and North America. A significant trend is the one of Africa, fourth destination for greenfield investments, accounting for 12% of the overall allocated value: in the following chapter, we will extensively analyse FDI trends for Africa, to clarify their importance in the world economy and support the research model.

1.6 Methodological issues

Before moving to the literature analysis of FDI determinants, and understanding the differences for the African continent, it is crucial to mention the copious methodological issues observed in literature.

As a matter of fact, the different approaches adopted so far in literature led most of the times to ambiguous or contradictory results due to the extremely complex nature of the phenomenon, and the complex interrelation of the many determinants, that span from the economic world to the social, political, cultural, and environmental ones. The bottom line is that both determinants and effects of FDI remain a very controversial issue.

For instance, different approaches must be adopted if the point of view is the one of the investors, with respect to the one of the local enterprises that are the object of the FDI: most of the literature has focused on the destination areas to determine effects on economic and social development, but for the same flows there are non-negligible effects also for the country of origin (Goldstein and Piscitello, 2007).

Similarly, the analysis can be firm-level, industry-level, or country-level; furthermore, international activity often involves indirectly third parties, that again could be countries, industries, or specific firms. As we will see in the following chapters, there is also a considerable difference in the type of countries analysed, depending on their development: the analysis of FDI determinants for developed economies can't be accomplished the same ways as the one for developing economies, or transition ones.

The focus could also be on the production factors of the two parties, as well as on the workforce. Moreover, as analysed in the previous sections, there is a wide variety of FDI investments, each having particular conditions and different roles of the determinants: greenfield investments hence have different dynamics with respect to mergers and acquisitions.

Eventually, the impact of international activity is strongly time-dependent, therefore the choice of an appropriate time horizon and range for the specific analysis is fundamental.

In particular, FDI activity can be disentangled in two time-dependent stages, involving different decisions: the approach can hence take the form of a two-stage game, where the firm first has to choose whether or not to locally produce in a target country, and in a second phase decide the production levels. FDI determinants have been argued to have completely different impacts according to the different decision-making phase (Barba Navaretti et al., 2006). The same research highlights the different strategies that are to be adopted to differentiate data between horizontal and vertical FDI: regression models can hence ignore the difference, and accept results that are a mitigation of the two (sometimes opposite) trends; another options is to split data making assumptions on observable trends, but it's a rather difficult and not always

possible process; or the approach can be to try and include both in the same model, augmenting the complexity of the regression.

For instance, variables like sum of countries GDP or similarity of market size, which are known to have a positive effect for HFDIs, can be tested in a joint hypothesis against the null alternative, which represents the VFDI model (Carr *et al.*, 2001).

However, regardless the type of strategy chosen, it is to be remarked that one of the biggest challenges for FDI analysis in literature is data availability: models need to face a wide range of constraints and approximations for most of the determinants, because quantitative values are not available or scarcely representative of the desired phenomenon.

Furthermore, for what concerns the dependent variable, that is usually representative of the operations carried on abroad with the FDI (firm sales, investment flows, value added), a common trend has been the utilisation of balance-of-payments data, due to the extreme availability. However, this measure well describes the financial components of the flows, but doesn't provide a complete representation of real activities.

In the following chapters, after discussing the nature of FDI determinants, and adapting them to the point of view of the African continent, we will discuss the methodology utilised for the econometric analysis.

Chapter 2. Foreign direct investments: determinants and effects

Once clarified the existence of the strong relationship between FDI and MNE activity, we now move to the analysis of the determinants that make FDI occur in specific areas rather than others.

Moreover, we analyse the different impact that FDI determinants trigger in local economies; as a matter of fact, FDI is argued to provide a wide variety of contributions for economic development, both in the short and long-term, through employment, foreign exchange, trade and investment, and FDI spillovers in the local environment: the second step of the analysis is hence focused on understanding in which way FDI impact economic development.

2.1 FDI attraction and extent: determinants

2.1.1 A general framework

The general research model to investigate the effects of FDI on multinational activity and on local economy usually takes the form of a regression, where the dependent variable represents a proxy for multinational activity, and regressors the different determinants.

Barba Navaretti *et al.* (2016) provide the following representation for a generic FDI determinants regression model (with i = country of origin, j = host country, h = industry):

$$Y_{ij}^h = f(X^h, X_i, X_j, X_{ij}, X_{ij}^h, X^h \times X_i, X^h \times X_j) + \varepsilon_{ij}^h$$

The dependent variable represents FDI activity, and it can be modelled in different ways: it can be continuous, and represent for instance the extent of operations accomplished in the host country (Y_{ij}^h), in terms of value added, sales, or investment flows; or it can be discrete, and depict the number of deals completed per industry sector, or country.

The hypothesis of the two-stage game mentioned in the previous chapter hence involves both types of dependent variable: in the first phase, the representation is discrete, to analyse the choice of entry into different markets; afterwards, the decision moves to the production levels, and a continuous model is utilised to modulate flows.

For what concerns the regressors, they span to an incredible variety, and touch the economic, political, social, cultural, and environmental spheres. A common way to approach them is to

divide them into industry and/or firm-specific determinants (X^h), home and host country determinants (X_i, X_j), and bilateral determinants, which involve the interaction of the two countries and/or sectors (X_{ij}, X_{ij}^h). All these variables can then have combined effects, that may or may not be represented explicitly in the econometric equation (i.e. $X^h \times X_i, X^h \times X_j$).

2.1.2 First phase of the game: FDI attraction

The first stage of the game, namely the FDI location decision, is usually modelled in literature with partial equilibrium models, usually at a firm-level, but possible at industry and country-level as well. As a matter of fact, these models are not explicitly designed around a firm profit function: the single determinants for the firm or the industry are not included in the models, which rather focus on aggregate effects.

The firm-specific factors which lead to MNE activity are not always directly observable, therefore different proxies have been used in literature for firm-level empirical specifications: the general trend is that firms that have a high average R&D investment level, with more skilled workforce, and producing high-tech products, are more likely to be a good ground for multinationals attraction. However, if very high values of variables such as foreign firm R&D are positive for the first stage of the game, they appear less beneficial in the second stage, due to costs of technology transfers and possible prevalence of exports over local production (Barba Navaretti et al., 2006). Advertising intensity is also used as a variable, but it is argued to produce more mixed results than R&D intensity.

In this stage, the most crucial variables have been argued to be macroeconomic factors, exogenous in nature, such as taxes, exchange rates, and tariffs (Blonigen, 2005).

The common assumption for what concerns taxations is that a higher level of tax rates reduces the number of FDI decisions, leaving the question open for the problem of magnitude. However, different evidences in literature have shown that the taxation problem is less straightforward, as the effects vary on the type of taxes (i.e. corporate income taxes, international business taxes, bilateral international tax treaties, etc.), on their different treatment in the two countries, on measurements of FDI activity, and on the issue of double taxation (Blonigen, 2005).

Different firm-level studies on US inward investments have even argued a positive relationship between tax rates and FDI decisions (Scholes and Wolfson, 1989; Swenson, 1994). On the other hand, Hines, 1996, points out that the problem depends on the way to resolve the double taxation issues: FDI from countries with worldwide taxation and where the parent is offered credits on tax liability are argued to be insensitive to tax variations.

For what concerns exchange rates, the common hypothesis is that an expected increase in the home country currency doesn't have any effect on FDI decisions, as the savings in investment costs are mitigated by lower nominal returns (Blonigen, 2005), even if there are instances of a positive inward FDI effect as a result of currency depreciation (Froot and Stein, 1991). Literature instead agrees on a positive effect on inward FDIs coming from short-run movements of exchange rates. Eventually, exchange rates are framed in the problem of uncertainty and expectations: Campa, 1993 argues that an increase in the level of uncertainty generates more options for the investing firm, which can decide to wait for a better moment to invest, thus depressing the number of FDI.

Institutions are also an important determinant for FDI decision and magnitude, as well as FDI attraction, despite the complexity of data identification. Legal protection can reduce the risk of asset expropriation and foster FDI decisions; poor quality in institutions, usually modelled through corruption indexes, is a crucial variable especially for developing countries, which negatively affects FDI activity (Phung, 2017); eventually, mediocre institutions decisions lead to poor infrastructure, which often decreases the expected profitability for the investment and reduces FDI.

Trade protection is also argued to encourage what is called "tariff jumping FDI", even though literature is not rich on the topic, due to problems related with data, as trade protection is mainly represented by tariffs despite its nature is much wider, and there is a possible endogeneity issue with FDI (Blonigen, 2005).

Eventually, FDI decision and location is affected by proximity to other firms: in addition to positioning close to customers and to factor price differentials, companies tend to form industrial clusters, in order to mutually benefit from their proximity.

Literature has heightened different types of agglomeration effects, and the two most important contributions are Marshall's localization economies, against Jacobs' urbanization economies. The former argues that companies within the same industry may benefit from being located in clusters, enabling the whole cluster to grow faster due to a knowledge sharing process that is limited within the industry; the latter rejects the hypothesis of knowledge flowing across the same industries, arguing that a growth effect would come instead from a cluster of companies belonging to different sectors, due to an environment that is diverse and with different ideas (Lehmann and Kluge, 2012).

Nonetheless, agglomeration effects have been argued to reduce the general level of uncertainty from investment, due to demonstration effects and the possibility to build linkages with customers and suppliers faster (Barba Navaretti *et al.*, 2006). The effect is argued to be particularly evident for the case in which the industry of the investors is of central importance in the host country (Braunerhjelm *et al.*, 2000). Moreover, agglomeration and herding effects

have been argued to increase knowledge spillovers, that we extensively discuss in the following section, for the relationship between FDI and economic growth.

2.1.3 Second phase of the game: FDI magnitude

The partial equilibrium models and determinants analysed in the previous section represent the majority of models developed in literature: the trend is to be explained with the extreme difficulty in coinciding general equilibrium features with a decision making process that is microeconomic in nature. However, partial equilibrium models have as a main drawback the risk of producing omitted variable biases, as they have a short-term focus and often ignore long-run factors, instead included in macroeconomic theory (Blonigen, 2005).

Moreover, the determinants utilized to assess the magnitude of FDI, once the decision on the country choice is made, are different from the ones utilised in partial-equilibrium theory, being mainly exogenous and policy-related: literature working on partial equilibrium from a country or industry perspective tend to ignore such factors, that are tackled in a more direct way in general equilibrium ones, despite also country-level models inevitably produce an average effect that comes from the necessary inclusion of country endowments (Blonigen, 2005). Once again, general equilibrium models always need to face the problem of reconciling theory with data.

A first crucial step in literature to move from MNE general equilibrium theory to an empirical model is Brainard regression, designed to investigate the role of proximity and concentration for FDIs using outwards investments by the US to 27 host countries and 63 sectors in the year 1989 (Brainard, 1997). The resulting equation is detailed here:

$$\ln\left(\frac{EXP_{ij}^h}{AS_{ij}^h + EXP_{ij}^h}\right) = \alpha_0 + \alpha_1 \ln(firmscale^h) + \alpha_2 \ln(plantscale^h) + \alpha_3 \ln(tax_j) + \alpha_4 \ln(pwgdp_{ij}) \\ + \alpha_5 \ln(freight_{ij}^h) + \alpha_6 \ln(tariff_{ij}^h) + \alpha_7 \ln(X_j) + \varepsilon_{ij}^h$$

In this regression, the dependent variable is the share of exports over total sales accomplished by the origin country in the destination one, for the specific industry. The firm specific determinants (namely $firmscale^h$, $plantscale^h$) are measures of economies of scale for the industry. The country-specific determinants (X_j) represent the corporate tax rate for the host country, and a number of variables of the foreign country, including trade, investment, and political ones. Eventually, the bilateral variables ($freight_{ij}^h$, $tariff_{ij}^h$) include the country difference in per-worker GDP ($pwgdp$), and variables measuring trade costs and barriers. The

results showed the expected negative relation with transportation costs and tariffs, and a positive one with the fixed costs for plants.

As confirmed in Barba Navaretti et al. (2006), these variables do not have the same values for the two stages of the game: as a matter of fact, transportation costs are found to increase the share of affiliate sales with respect to exports, but have no impact on the likelihood to actually observe affiliate activity. In other words, if the MNE has already made the decision to invest, the more costly to transport goods, the more convenient the choice of local production; but the variable has no power in affecting the initial investment choice.

However, one of the main pitfalls of Brainard model is the focus on the industry, which implies stronger assumptions on the country characteristics: country size and differences in factor endowments are not included.

The knowledge capital model (Carr *et al.*, 2001) attempted to reconcile the horizontal and vertical components of FDI, and added, with respect to Brainard model, complexity for what concerns factor requirements and released assumptions on the competitive sector (Cournot oligopoly).

The main finding of this work is factor endowments being as important as trade variables and market size (proxied respectively through distance and GDP), and significant evidence of both horizontal and vertical FDI. The weight of the vertical component has then been questioned, but the importance of factor endowments as a determinant has not changed: Yeaple (2003) argues that factor endowments differences augment FDI activity only in industries which make extensive use of the factor located in the host countries, somehow relating the horizontal and vertical weights to the specific industries.

However, the biggest problem for these second category of models is data quality: the economic environment of the country often leads to wrong estimations, in particular developed countries' variables are argued to usually be subjected to underestimation, and vice versa for developing economies. This "white noise" produced by general equilibrium models is to be related to profound differences in determinants for the two types of economies, which brings up the need for a more tailored analysis for less developed countries (Blonigen, 2005).

The finding justifies the research approach of the present dissertation, which is aimed at tailoring FDI determinants to the specific environment of the host developing countries (African countries), and which attempts to disentangle country-level results across industries. Eventually, the work is oriented to the analysis of the different FDI determinants from the point of view of economic development, understanding the effects on local economies, which is the subject of the following section.

2.2 FDI impact: spillovers

2.2.1 FDI and economic growth: a non-obvious relationship

In the previous section, we analysed the FDI determinants in the two-stage game approach, focusing on the reasons that attract FDI investments and make them more likely to happen, and on the behaviour of the foreign firm once the decision is made.

However, FDI presence and multinational activity do not always guarantee the expected effects on host countries: literature unanimously agrees on busting the false hypothesis that links FDI presence with economic growth.

On the contrary, results have been proven to be mostly ambiguous and contradictory, and the fact that FDIs have become the prime external financing source for developing countries (whose economic growth under the global spotlight) further augmented the general interest of literature on the issue (Borensztein *et al.*, 1998; Carkovic and Levine, 2005; Fortanier, 2007; Farole and Winkler, 2014b).

One of the most important reasons for a country to implement actions to attract FDIs is the belief that this type of investment will generate positive externalities for the local economy: economic growth can be generated through direct effects (namely size effects), or through indirect ones (namely changes in the market structure). Direct effects have been shown to be circumscribed and easily identifiable: for instance, for greenfield investments, it is possible to track capital flows, capacity creation, employment, and knowledge transfers (Fortanier, 2007).

On the other hand, indirect effects are much wider, and responsible for the majority of the total effect on economic growth. In particular, consistently with recent literature on international activity and economic development discussed in the previous chapter, knowledge and competence are of primary importance for economic growth, and have been argued to be transferred mostly indirectly (Carkovic and Levine, 2005).

The mechanism beyond this trend is simple: technology and competence brought by foreign enterprises “leak” across different local industries and in the host country, generating an increase in productivity for local firms, and hence fostering economic growth for the country.

FDI spillovers have hence acquired a central role in international economics literature: studies have tried to understand how knowledge flows across national, industry, and firm boundaries, and what are the elements that modulate this competence leakage, making it positive, negative, or null.

The aim of this section is to deeply examine the magnitude and direction of FDI spillovers, mainly drawing on the conceptual framework of Paus and Gallagher, 2008, subsequently adapted by Farole and Winkler, 2014b. The framework includes characteristics of the two countries in a wider set of mediating factors, that determine the actual FDI spillover generation.

We hence analyse the extent to which FDI contribute to economic growth in a positive, negative, or ambiguous way, by decomposing spillovers in all their different determinants. This analysis will provide a first overview of the possible variables to be utilised in the econometric model of the research. Variables will then be refined and explored in the following chapter for the specific context of Africa.

2.2.2 FDI spillovers: conceptual framework

Farole and Winkler, 2014b provide a conceptual framework to investigate how different determinants generate actual spillovers, in particular their extent and nature: we extensively draw insights from this model, which has the merit of analysing the phenomenon from a broader perspective, being one of the most complete ones in current literature.

The multiple determinants are grouped into six macro categories: the first two are the *spillover potential* of the foreign investors and the *absorptive capacity* of locals. The former is defined as the “productivity gains possibly resulting from the diffusion of technology and knowledge from foreign investors to local workers and firms” (Farole and Winkler, 2014a); the second one is “the firm’s ability to recognize the value of the new piece of information, and to absorb it applying it to commercial ends” (Cohen and Levinthal, 2000), hence absorptive capacity.

These two variables interact with four main mediating factors, namely the source and host firm characteristics, the institutional frameworks, and the transmission channels, in determining all combined the actual spillover realised (see *Figure 6* for a graphical representation of the framework, with mediating factors depicted in green colour).

In the next sections we analyse the mediating factors individually, and get insights on the main determinants for FDI spillovers in each of them.

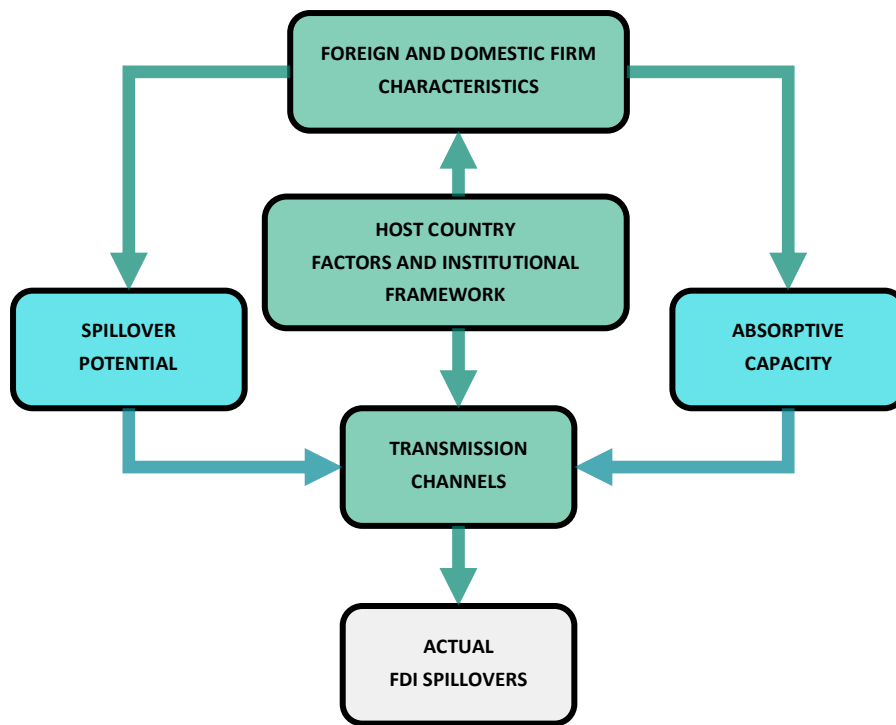


Figure 6. Determinants and mediating factors for FDI spillovers, adapted from Farole and Winkler, 2014b

2.2.2.1 Spillover types: transmission channels

The three main channels where spillovers are likely to occur are supply chains, labour turnover, and changing market forces.

Spillovers across supply chains are called vertical spillovers, since the local firm is integrated vertically, accomplishing one or more activities within the chain. When the local firm becomes a supplier for the investing firm, the occurring spillovers are called *backward spillovers*; on the other hand, when the outside firm provides input to the local firm, they are called *forward spillovers*. Eventually, when host firms are entrusted with part of the production through a subcontract, spillovers fall into the category of *subcontracting linkages*. Figure 7 summarizes spillover types.

There is a wide variety of reasons why these kinds of spillovers occur across the supply chain: for instance, the MNE could push the local affiliate to provide a higher quality level in their inputs, or a higher diversity in the product range, as MNEs need to keep their products' quality at the international standards levels.

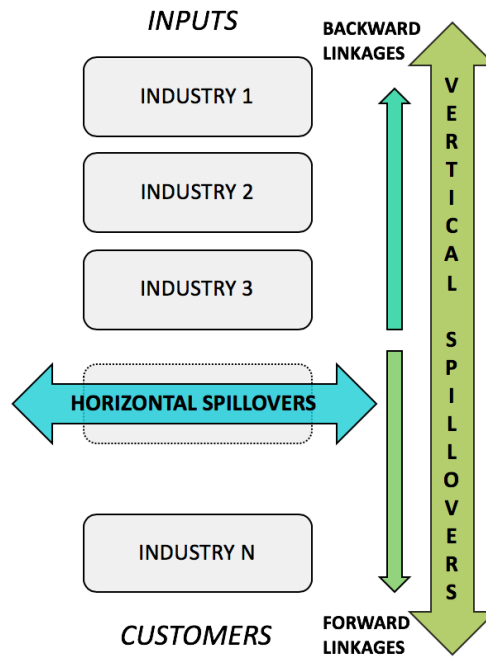


Figure 7. Spillovers types.

Therefore, spillovers may happen intentionally, as MNEs could be interested in assisting the local firm in upgrading production techniques and technologies: they can provide formation and training, insights for a better organization of product lines, even machineries and inputs. As mentioned above, the realization of spillovers is not a direct consequence of the willingness or potential of the foreign firm, but depends on the capacity of the host firm to absorb it, as well as on the differences between the two countries, and the sourcing strategy of the investors (Farole and Winkler, 2014a).

Spillovers may also happen unintentionally, through diffusion mechanisms within the industry in the host country, that happens as a consequence of the proximity of the multinational firm: assistance and support to the host firm can leak the suppliers' boundaries and diffuse in the industry, increasing its competitiveness.

However, investing firms are not necessarily willing to prevent these spontaneous effects, as they can generate a win-win mechanism: in fact, increasing the general level of competition for the specific industry in the host country can augment productivity, reliability, and quality within the industry (Blomström *et al.*, 2001). Nonetheless, competition effects are not always positive, as too aggressive foreign strategies can cause a *market stealing effect*, where local industries are left out of a market that is simply too competitive for them (Goldstein and Piscitello, 2007).

The second category of spillovers concerns human capital: the investments in workforce is never completely internalized within the MNE, and it can leak both on a horizontal and vertical level through labour turnover.

The problem is that turnover doesn't always occur in the short term, because the process of knowledge absorption is slow and complex, and MNE may attract high-quality labour from the source country instead of generating it outside the organisational boundaries; the problem is potentially mitigated in the long-run, but the overall effect of labour spillover can be negative. Moreover, the impact of spillovers is dependent on the level of skills of the target workforce, as they possess different learning curves, and hence difference absorptive capacities (Farole and Winkler, 2014a).

Moreover, spillovers may happen through imitation or reengineering, which don't only include the product offered, but also practices: know-how on production processes, transportation channels, distribution and consumer relationships can be emulated by local enterprises, generating advantages for the local economy.

Eventually, spillovers occur due to changing market forces, through competition, demonstration, and collaboration effects (Farole and Winkler, 2014b), that depend on the relationship with foreign investors and their willingness to share knowledge. While most of these effects are positive for the local economy (either through direct imitation or through increases in the competitiveness of the local industry), there are negative effects coming especially from horizontal spillovers: as a matter of facts, these type of investments can have a negative impact on the economy, especially in the short term, due to a crowding-out effect that results from FDI displacing instead of complementing domestic investments. Ahmed *et al.*, 2015 identifies significant crowding-out effects in Uganda for the agricultural and construction sector, and safety measures to protect domestic investors are suggested for such sectors.

2.2.2.2 Foreign firm characteristics

As for the specific characteristics of the foreign firm, Fortanier, 2007 provides a model that tests the weight of country of origin in the relationships FDI-economic growth, analysing flows for the countries of Japan, USA, Germany, France, Netherlands, and UK.

The results highlight two main factors responsible for the occurrence of economic growth: the sector specialization, in particular related to technology, and the organizational structure, in particular the way that a firm manages to get embedded into the local environment. The main finding of the article is the excessive literature tendency of proxying USA with global results for FDI determinants: in spite of USA being one of the main actors for FDI inflows and outflows, it has been overutilized as a flag country to explain FDI spillovers, where the specific

characteristics are proven to generate completely different effects on economic growth with respect to countries like Japan or European ones.

Farole and Winkler, 2014b decompose these source country factors in multiple determinants: the first one is the ownership share that the company is willing to take in the investment, which has an ambiguous impact on the knowledge transfer process. As a matter of fact, a high level of foreign ownership, which entails greater control over management, mainly foster voluntary knowledge transfer, especially in the form of technology.

On the other hand, contractual relationships like joint ventures, which include great participation of the host firm, can foster involuntary knowledge leakages through the so called *demonstration effects*, beneficial for local human capital, as it gets the chance to get involved in management and to learn faster.

Another aspect concerning the foreign firm is the time horizon of the relationship: a long relationship provides a bigger positive impact on the local economy, as the enterprise gathers experience on the local context, and learns to be more effective in dealing with local suppliers and workforce.

The FDI motives explored in the previous chapter have also a role to play in spillover generation: resource-seeking¹ FDIs don't leave much ground for spillovers, whereas market-seeking and efficiency/asset-seeking offer more opportunities, due to human capital learning effects, their labour-intensive nature, and a closer relationships with suppliers and customers, which causes backwards and forward effects.

The different global production and sourcing strategies also impact spillovers: a completely internalized production leaves little space to the local environment, whereas solutions such as outsourcing and co-sourcing that give a bigger scope to local firms to take over on the activities and make the most of spillovers. Effects for local firms, especially for high-technology industries, are also indirect: if they are often not able to be first-tier suppliers, due to the established global supplier network, they have the chance to break in as second-tier ones.

For all these strategies, the technological level of the foreign firm, as well as the technological gap with the local ones, has great impact for spillover potential and absorptive capacity: if the innovation intensity of the foreign firm is a positive element for spillover generation, it may

¹ Gerlach and Liu, 2010 provide a comprehensive case study review of resource-seeking FDI in Africa, in particular in the agricultural sector: Uganda, Mali, Madagascar, Morocco, Senegal, and Egypt are selected to prove that this kind of FDI are still an important component for the continent. Coffee, fish, rice, corn, cotton, fruits, vegetables, and biofuels are the resources that are sought the most from countries like United Kingdom, United States, Spain, France, India, China, and South Africa. The economic impact of this kind of direct investments is ambiguous, and government are argued to play a crucial role in aligning institutions, policies and regulations so that the effects for the country's development become significant.

imply a very broad gap with the local firm, with consequences on the capabilities of the latter of absorbing knowledge.

Eventually, the entry mode chosen by the foreign firm matters: greenfield investments imply a sudden change for the local environment, that gets in contact with the leading technology abruptly, in a quite broad knowledge transfer process, which can the options for positive spillovers or generate a technology gap what is too wide for them to happen. On the other hand, brownfield investments such as M&As are argued to determine lower effects, as there is an incremental improvement of domestic technology, and less chances for technology and knowledge linkages and employment creation.

2.2.2.3 Domestic firm characteristics: absorptive capacity

If the foreign firm characteristics mainly have an impact on the spillover potential variable, the domestic firm ones mainly dialogue with absorptive capacity, through a wide range of determinants.

The first determinant, in common with the foreign country characteristics, is the technological gap: the different points of view on the issue lead to conflicting results, that span for very positive ones due to a “catching-up” effect, to negative ones, due to the scarce capacity of local firms to absorb a too different knowledge (Blomström *et al.*, 2001). In Girma, 2005, the two points of view are integrated, and the positive effect is argued to become evident for a middle range of technological gap.

Research and development in local firms have positive effect on the absorptive capacity, as well as the local firm size: larger firms have greater visibility in the market, they are better positioned and more compliant to standards; they have higher capacity, being able to provide volumes that are more in line with foreign needs, and a larger share of human capital, which is argued to better absorb spillovers for large firms (Sinani and Meyer, 2004).

The firm location is another mediating factor: geographical distance and the presence of agglomeration economies due to co-location may negatively impact spillovers, especially when the activities accomplished by the foreign firm take the form of exports rather than local production, in environment such as export processing zones, which are highly populated by foreign firms, and leave little access to local ones.

Moreover, the local firm export intensity, which alone is argued to lead to ambiguous results for what concerns productivity gains and spillovers, combined with a high foreign exporting intensity, unambiguously lead to small spillovers (Lin *et al.*, 2009).

Eventually, local firms may be differentiated by the nature of their ownership: private firms, differently from state-owned ones, are argued to have a higher absorptive capacity, as they are market-oriented and willing to emulate best-in-class actors.

The competition variable has a trend that is similar to the technological gap one, where middle values are responsible for a positive spillover effects, whereas too low levels implicate to little incentives to improve, and to high ones too high pressure (Farole and Winkler, 2014b).

2.2.2.4 Host country: country factors and institutional framework

The mediating factor concerning the host country occupies a central position in the conceptual framework of FDI spillovers, and it impacts all the other mediating factors, namely both the firm characteristics and the transmission channels, which in turns influence the spillover potential and absorptive capacity.

Labour market regulations are a first important determinant: host countries with flexible regulations for labour market have been proved to attract FDI more, which means more chances for spillovers to happen; moreover, the absorptive capacity of the local firm can be influenced by regulations through wages: private firms are usually less constrained, and can seek skilled workforce by paying more, thus increasing their absorptive capacity; state-owned enterprises have slimmer chances to benefit from spillovers, as they can't always compete for skilled workforce. Moreover, regulations are responsible for the generation of skilled workforce through training: in particular, rigid employment regulations are argued to increase the investment amount in training, thus augmenting the absorptive capacity of the local firm. Furthermore, rigid employment policies reduce labour turnover, hence decreasing the chances for spillovers (Farole and Winkler, 2014b).

Another determinant is the importance that the host country attributes to IP rights: countries with strong regulations on IP rights are able to attract more FDIs, as they reduce risk for foreign countries to transfer their technology abroad, making FDI a better alternative rather than exports. However, the actual effects of IP rights regulations for spillover generation are unclear, as they have an influence on the knowledge transfer across local industries: IPR reforms across regions seem to encourage FDI while controlling spillovers and preventing the risk of free-riding (Klein, 2015).

What increases the chance for knowledge transfer in the local dimension is instead innovation: countries with an innovative infrastructure have a higher absorptive capacity and imply a knowledge transfer process that is smoother and more efficient.

Moreover, policies on trade and investment affect the potential for spillovers as well as the absorptive capacity: especially for developing countries, open trade regimes have attracted

more FDIs (Liargovas and Skandalis, 2012), but too open economies have also fostered export activities rather than local production. Moreover, firms in open trade economies are argued to be more prepared to competitive pressures as a result of the entry into the market of the foreign firm, which enables them to absorb spillovers faster. For what concerns investments, public policies (i.e. subsidies, tax exemptions) can enhance positive spillovers (Du *et al.* 2014). Furthermore, industrial regulations, created to sustain the local industry within the FDI environments, also have a positive effect on spillover potential, but their realization is a consequence of the specific capacity of the local firm to absorb knowledge.

Eventually, the political situation of the local economy highly influence spillovers, in various ways: the quality of institution is argued to be crucial especially for developing countries, and it spans from bribery, to corruption, to the proactivity of policies and their enforcement (Bénassy-Quéré *et al.*, 2007).

Figure 8 wraps up all the determinants for the relationship FDI-economic growth, divided by mediating factors. In the next chapter, we will explore deeper the nature of the institutional variable and the other determinants for the specific environment of the African continent.

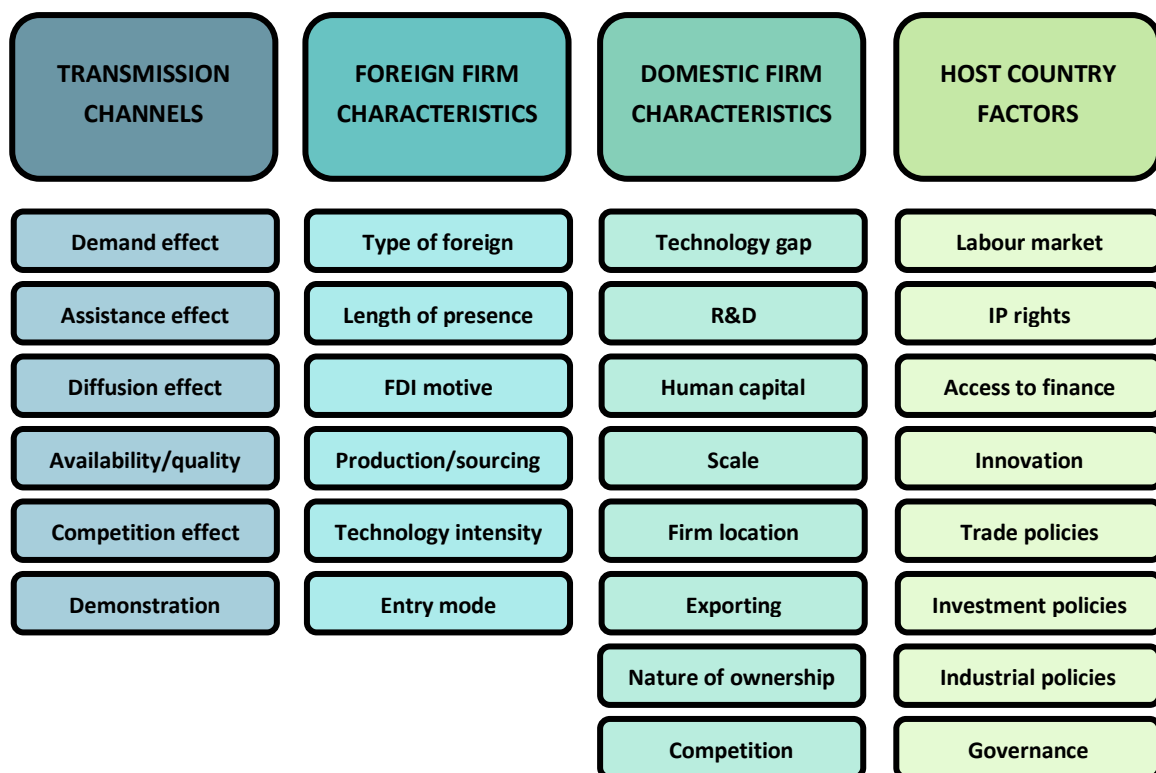


Figure 8. Wrap up of FDI determinants and economic impact, adapted from Farole and Winkler, 2014b

Chapter 3. Foreign Direct Investments in Africa

3.1 The African continent and FDI trends

3.1.1 The African continent: geography, population, economy

The African continent is divided in 54 states, most of which gained independency in the second half of the twentieth century from European colonists. The different economic, social, and political history of the African continent widened profound differences between two large regions: North Africa, and Sub-Saharan Africa (SSA). The former comprehends 6 states (namely Algeria, Djibouti, Egypt, Libya, Morocco, Tunisia), which have leveraged the heritage of the medieval Islamic expansion to raise up economically; the latter comprehends 48 states, with a great variety of spoken languages and different cultures, which are now experiencing a first phase of industrialization and growth (Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe) (World Bank, 2018).

The population in SSA has recently reached the value of 1 billion (1.06 billion in 2017), accounting for 14% of the world's population. The demographic growth is quite recent: in 1960 the overall population in SSA was about 22% of the current one. Moreover, in the period from 2008 to 2017 the average growth rate per year in SSA was of about 2.8%, with respect to the 1.2% of the rest of the world (230% faster). By 2050, the African population is expected to overcome 2 billion people, with a share over world population of 25% (World Bank, 2018).

The population is distributed in a heterogeneous way across the different countries: there are countries that are both very small in surface and population (namely Swaziland or Lesotho), countries with low population and vast territories (such as Mozambique), and countries that are both big and very populated (namely Nigeria). There is a general trend of consistent migrations towards most densely populated centres, as well as outside the continent, mainly to Europe.

As for income, the GDP of the African continent in 2017 has reached the value of 1.649 trillions (SSA only), which is not enough to cover the GDP of Canada only. When weighted on the purchasing power of the country the value doubles, but it is still alarming, especially as it constitutes one of the biggest barriers to economic development.

In North Africa, two out of six countries belong to the upper middle income level (namely Algeria and Libya), and the rest to the lower middle one; in Sub-Saharan Africa, with the exception of Seychelles, there are no countries belonging to the high or upper middle income level. Out of 48 countries, 20 belong to the middle category, and 27 to the low income one (World Bank, 2018); see *Annex 4* for more detailed information.

Moreover, half of the extreme poor live in SSA, with a number of people living under \$ 2 a day that was around 390 millions in 2013, which is significantly above every other region in the world (World Bank, 2018b).

The economic situation made the African continent, and in particular the Sub-Saharan area, the first target for international organizations, such as the International Monetary Fund (IMF), the World Bank, the Food and Agriculture Organization of the United Nations (FAO), and the United Nations Development Program (UNDP). All these organizations, and many more at a national level, are contributing with different types of economic aid, which span from debts cancellations, to credit facility, donations, and forms of undirect investments; these contributions, despite losing importance with respect to other forms of investments such as FDI in terms of economic value, are believed to be crucial for the economic development of the continent, and for the accomplishment of the first of the 17 UN Sustainable Development Goals, whose objective is to eradicate extreme poverty (measured with the number of people living on less than \$1.25 a day) from all over the world (Sustainabledevelopment.un.org, 2018).

3.1.2 The African continent: institutions

Sub-Saharan Africa is not a politically united area, nor a federation of states or an international political entity: the reasons why it is differentiated by North Africa are mainly economic, despite the fact that a future political integration for the area is possible and desirable (Ingrao, 2009).

The SSA area is politically and economically fragmented, despite international efforts: there are groups of States with economic agreements, which promote development on a more than national basis. Examples are the East African Community (EAC)², the Economic Community of Central African States (ECCAS)³, the Economic Community of West African States

² Member countries: Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda.

³ Member countries: Angola, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo, São Tomé and Príncipe.

(ECOWAS)⁴, the Southern African Customs Unions (SACU)⁵, the Southern African Development Community (SADC)⁶, and the West African Economic and Monetary Union (WAEMU)⁷. Despite the efforts of these organizations, the actual economic integration is still quite low⁸, and bureaucratic and tariff barriers represent a crucial obstacle to FDI, as they alter the perception of the size of the market from the point of view of investors, thus influencing the possible economic growth and development of the area (Arbache, 2008).

The historical development of the regions is a result of the colonization processes started in the sixteenth century over the northern coast, and that continued for the next three centuries, with the main European political powers (United Kingdom, France, Germany, Portugal, Belgium, Italy, and Spain) splitting up the whole continent, and imposing institutional models accordingly.

The twentieth century has led to independency for most of the States, which then have experienced internal and external conflicts that are a result of an abrupt transformation and of political systems that were not solid nor ready for it: a whole branch of literature has investigated the impact of political instability after independency, highlighting the negative effect of “predatory” behaviours from local political actors (Carbone, 2005). The problem extends to the legitimacy and authority of public power, as well as to the actual control on the territories: too often opportunistic behaviours prevail, and wealth is unevenly distributed on a family, regional, or ethnic basis, with no transparency whatsoever.

This contradiction, which alone exposes the States to political risks and civil wars, is exacerbated by the combination of traditional institutions with innovative organisms, that have necessarily been established in the countries after independency, to align the region to the needs of Western models and allow investments (Fessehaie and Rustomjee, 2018). Moreover, lack of education acts as an additional barrier to an efficient political environment, and to a proper awareness of political rights.

A common measurement for the political vulnerability of a country is the Fragile States Index created by Fund for Peace, which combines economic (namely economy, economic inequality, human flight and brain drain), political (namely state legitimacy, public services, human rights,

⁴ Member countries: Benin, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

⁵ Member countries: Botswana, Lesotho, Namibia, South Africa.

⁶ Member countries: Angola, Botswana, Comoros, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

⁷ Member countries: Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal, Togo.

⁸ None of the aforementioned communities currently has a structured and integrated system to attract and manage FDI. The only exception is represented by COMESA RIA (Regional Investment Agency), which promotes investments at a regional level.

security of apparatus, factionalized elites, and group grievance), and social (namely demographic pressures, refugees and IDPs) measurements and ranks countries for their likelihood to fall into conflicts or collapse (Messner et al., 2018).

The index shows that 35 out of the 50 riskiest countries in the world are in Africa, with South Sudan, Somalia, Central African Republic, and Democratic republic of Congo in the first 6 positions.

Figure 9 depicts the share of number of countries belonging to different stability ranges: the highest scores (> 110) indicates an alarming situation for the country, whereas a low score indicates stability and sustainability: in the figure we selected only data from a value of 40 onwards, as all the African countries report a value that is higher than that. As indicated in the figure, the worldwide share of countries at risk across the selected ones, (index major than 90) is about 20%: out of this portion, almost 70% of the countries belong to the African region. Similarly 55% of the countries that are in a slightly concerning situation are African states. Seychelles and Mauritius are the only two exceptions, both belonging to positive index ranges. For more information on the list of countries and the index values, see *Annex 4*.

The general political environment is hence not favourable for investors: the scarce functioning of the justice system, the low protection to property rights, the absence of transparency in power management, and the extreme level of corruption have a negative impact on the outside perception of the area, and will be investigated as determinants for FDI flows in the next sections.

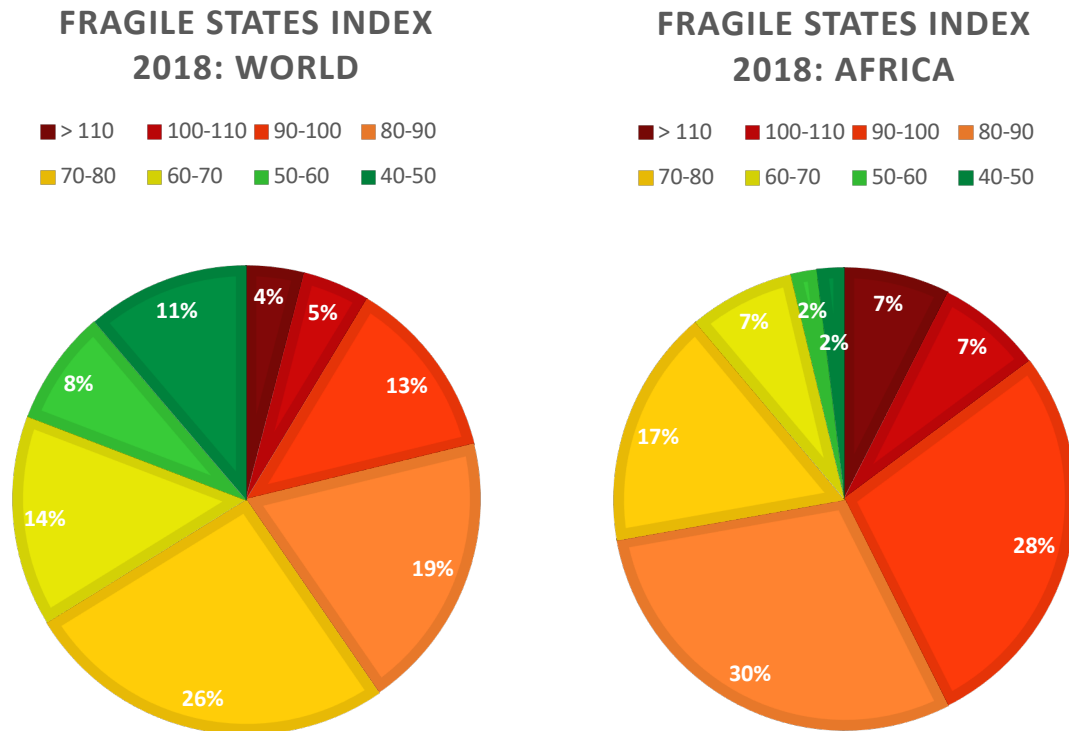


Figure 9. Fragile States Index 2018 in the World and in Africa. Adapted from Messner et al., 2018

3.1.3 The African continent: urbanization and industrialization

The twenty-first century represents the end of the brutal transformations of the previous one, and many countries are starting to gain stability, and to focus their resources on economic growth, by opening their markets and promoting investments. However, for most of the countries the financial sector is very weak, and access to credit is hard: banking services are completely absent in rural areas, especially due to the lack of proper infrastructure that allows its spreading.

If the economic division of Sub-Saharan Africa into areas is not clear, regions are often divided by geopolitical characteristics into four sub regions, namely West, Central, East, and Southern Africa, and the first two are often mentioned as the most problematic areas for what concerns industrialization and development (World Bank, 2018). Another classification is according to the level of resources owned by the country, namely the oil-rich countries, the mineral resources-rich countries, the countries on the coasts, and the countries that both lack resources and access: the first two categories leverage natural resources extraction, the countries on the coasts have lower transportation costs and a better integration with global markets, whereas the last category is disadvantaged.

Eventually, a refined classification prioritizes the type of specialization of the countries, dividing them into natural resources specialized countries, commercial agriculture specialized countries, differentiated economies, and poor economies. Literature highlights how industrialization and urbanization should be driven by natural resources, as they represent one of the most important assets for the continent, but in a way that promotes the manufacturing sector and that allows a growth that is independent on resource depletion⁹.

The general development process doesn't seem to be going in this direction: all industries' value added is too reliant on commodity prices, and it appears fluctuating and not consistent. Moreover, the growth process doesn't seem to show a catching up effect of the poorest states, despite growth is happening in almost every region of SSA (Arbache, 2008).

Annex 4 contains relevant information on the progress of SSA across the industries: data are gathered in 2010 and 2017, over four sector categories, namely "agriculture", "industry", "manufacturing", and "services". The first sector corresponds to the ISIC groups 1-5, and includes forestry, hunting, fishing, crops cultivation, and livestock production; the second includes ISIC groups 10-45, in particular mining, manufacturing, construction, electricity, water, and gas. The third a subset of the second one (ISIC 15-37), as it includes only manufacturing activities, which are to be monitored alone as they are a good proxy for the industrialization process. Eventually, services include ISIC groups 50-99, which include wholesale, retail, transport, education, healthcare, and real estate services (Wdi.worldbank.org, 2018a).

The graphs show a general reduction in the value added as percentage of GDP for the agriculture and industry category in SSA from 2010 to 2017: the trend is not necessarily discouraging, considering that the activities are not the main contributors for value adding in the area, mainly for the scarce productivity, the obsolete technology, the lack of warehousing sites, and low quality of grounds, irrigation, and pesticides systems. For the natural resources sectors, profitability is much higher than manufacturing and agriculture ones, but there is a strong need to enhance local entrepreneurship, improve technologies, and build a more expert labour class (Ingrao, 2009).

The manufacturing sector is stable at 10% of GDP, a value that is still too low to infer conclusions on the pace of industrialization in the region; the service sector, which was already

⁹ The case of Norway stands out as an example for a successful resource-based development, for its extreme rapidity and effectiveness: the country was able to turn competences from shipbuilding to the oil industry in less than a decade, and to become an independent participant in the oil market, thus sustaining growth and averting the possibility of being "eaten" by foreign actors. The incredible success is argued to be determined by a democratic political and institutional framework that was solid, participative and open in leveraging the new opportunity for growth, and left no room for conflicts and objectives' misalignments (Wright and Czelusta, 2007).

the main determinant in 2010, shows instead an increase, which is similar to the one of the rest of the world.

As for the share of the value added per sector across the single countries, we noticed a significant concentration: we selected the top 10 economies for each sector, as together they contribute to most of the value added of the whole area. In particular, the agricultural sector has recorded strong improvements in Sierra Leone, Chad, Guinea-Bissau, Togo, and Mali; the industry category improved in Democratic Republic of Congo, Zambia, Guinea, and Lesotho; the value added of the manufacturing and services categories generally increased in all the top 10 economies.

As for urbanization, the urban population growth rate in SSA has grown significantly in the decades between 1960 and 1990 (from 4.5% to 5% per year), which corresponds to the time of political transformations happened in most of the countries; afterwards, the growth has been slightly slower.

Figure 10 compares the annual growth rate in SSA and in the rest of the world: the African continent is growing 1.5 times faster than the rest of the World, which increases the necessity to provide sustainable solutions to make this demographic growth also economic. Moreover, as shown in *Annex 4*, the share of SSA urban population in 1990 was at about 6%, whereas in 2016 it reached 10%; in the same time span, the population in agglomerates bigger than 1 million people has increased in SSA from 12% to 15%, and the share of people using basic sanitation services has increased by about 2% both in urban and rural areas.

However, the rapid urbanization process calls for much bigger efforts in terms of hygiene, infrastructures, and education for the expanding agglomerations: the phenomenon of shanty towns has been increasing rapidly, in most countries the current structures don't have the capacity to absorb expansion adequately, and agriculture hasn't yet reach the commercial level, causing complications in the supply of food in those areas (Ingrao, 2009).

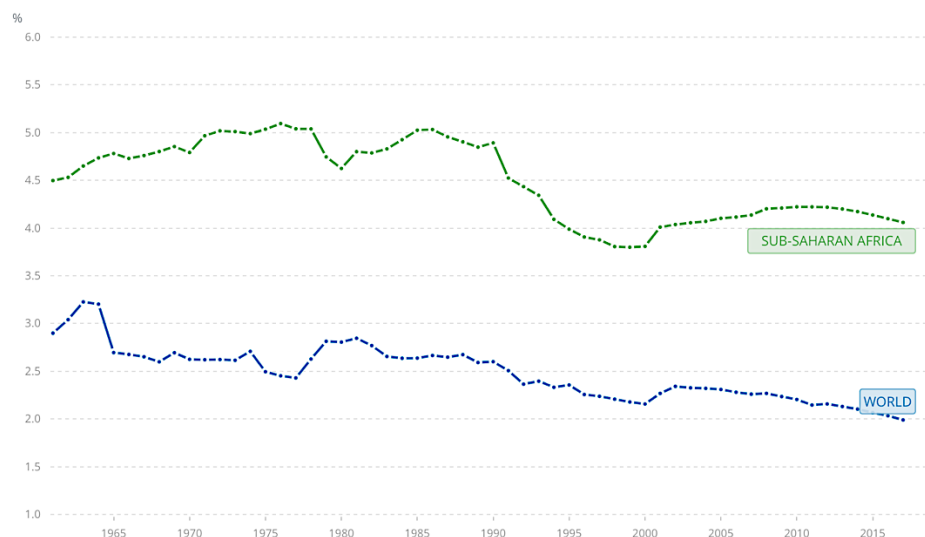


Figure 10. Urban population annual growth rate in the world and in SSA, 1960-2016, World Bank, 2018

It is eventually relevant to notice that in all these considerations South Africa represents an exception, as the completely different development (in financial, agricultural, and touristic sectors) of the country has generated urbanization and industrialization processes that have very little in common with the other SSA economies. Moreover, the country has acquired a crucial role as a financial intermediary, vehiculating FDI and other forms of investments in the other states, thus supporting the economy of the whole area.

3.1.4 FDI trends in Africa

As shown in the previous section, the African continent, in particular the Sub-Saharan area, hasn't leveraged enough the opportunities to start a solid industrialization process: FDI have been argued to represent one of the most important resource to allow the development of the manufacturing sector and of the secondary industry (Chen *et al.*, 2015).

As a matter of fact, the weakness of the signs of industrialization in Africa is supported by the statistics on FDI flows trends (see *Figure 11*): since 1990, FDI flows in Africa have surely registered a significant increase, which is similar to the rest of the developed economies (13 times more against 18, respectively). Both economies have been less impacted by the economic crisis of 2008 than developed ones, even though Africa registered a general decrease in the years 2009-2012, which is partially explained by the political turmoil happened in North Africa (UNCTAD; 2012). However, despite the development processes in the economic, political, institutional, and trade spheres, Africa still accounts for less than 3% of the global share of FDI inflows, and about 6% of the share of all developing economies (UNCTAD, 2018).

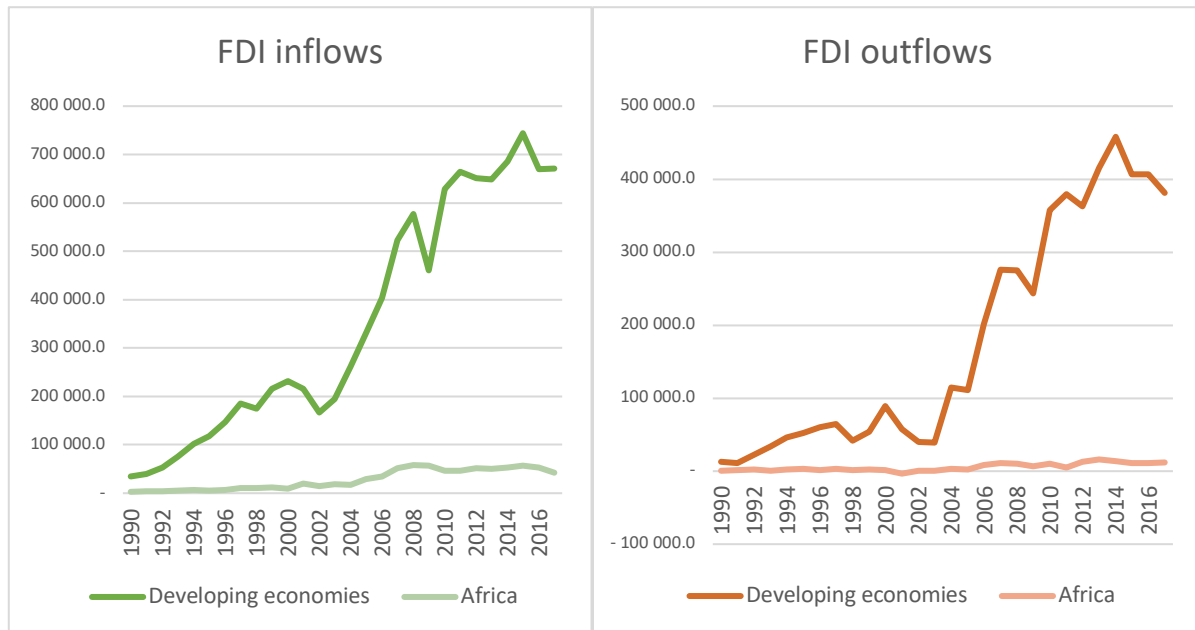


Figure 11. FDI inflows and outflows(millions of dollars) from 1990 to 2017 in Africa and in Developing economies, adapted from UNCTAD, 2018

The starting point to analyse FDI determinants in Africa is understanding that the continent has an extreme heterogeneity, diversification, and differences in performance (Chen *et al.*, 2015).

As a matter of fact, FDI trends result all but homogeneous over regions, countries and sectors: in 1990, the share of FDI inflows was distributed in West and North Africa (respectively 54% and 41%), leaving less than 5% to the other regions; in 2017, West and North Africa still lead in terms of FDI inflows shares (respectively 27% and 32%), but East, Central, and Southern Africa have registered a significant increase, acquiring respectively 18%, 14%, and 9%; the slight decline in the Sub-Saharan area registered in 2016 is due to low and unstable commodity prices, which have diminished the countries' attractiveness (UNCTAD, 2017; UNCTAD, 2018).

Within the regions, heterogeneity in FDI flows is high as well, with oil-producing countries accounting for most of the flows per regions, and a quick rise of a few non-oil-producers: in 2017, Egypt and Morocco account alone for 86% of North Africa FDI inflows, mainly due to new investment reforms and gas discoveries, such as Shell's discovery of gas reserves in the western desert of Egypt. Nigeria and Ghana account for 60% of West Africa; Democratic Republic of Congo and Gabon for 50% of Central Africa; Ethiopia and United Republic of Tanzania for 63% of East Africa; Mozambique, South Africa, and Zambia for 94% of Southern Africa (UNCTAD, 2018).

The source countries of FDI inflows have increasingly diversified and become less volatile since the 2008 crisis: while developed economies (namely Europe, US, Japan) are still major

contributors, non-OECD countries such as China, India, and Brazil have become important investors in the African territory, in addition to intraregional partners, such as South Africa, Nigeria, and Angola. These source countries have been argued to be particularly important contributors for the economic growth of the continent, since they are the main ones that have invested in the manufacturing industry, hence seeking for new markets in addition to precious resources only. The main reasons why these actors are more willing to invest in Africa are a structural higher tolerance to risks, a better reliance on word of mouth rather than formal available information, and a stronger willingness to experiment and gain access to unserved markets (Chen *et al.*, 2015). In the section concerning FDI impact we analyse other possible determinants that make new partners invest in the continent, such as institutional proximity.

Similarly to inflows, FDI outflows trends also show a certain level of heterogeneity: in 1990, Southern Africa was the main FDI investor (70%), followed by West and North Africa (respectively 16% and 11%). In 2017, West Africa has taken the first place (62%), followed by Northern Africa (21%), and Southern Africa (9%). While East Africa is still not able to dedicate capital resources abroad, Central Africa has seen a slight increase, accounting for 8% of total FDI outflows.

Moreover, outflows are highly concentrated in South Africa (61%), followed by Angola, Nigeria, and Morocco (respectively 14%, 11%, and 8%). For more information on the distribution of FDI inflows and outflows, see *Annex 5* and *Annex 6*.

Greenfield investments have decreased by 30% since the highest peak of 2011, but the decrease rate is consistent with the one registered in general for developing countries (-24%): moreover, in terms of value Africa has performed positively, with an increase of 23% opposed to a general decrease of 30% of other developing economies. In general, FDI prospects indicate the necessity for the continent to rely more on non-oil FDI to sustain growth: manufacturing activities have been shown to provide a higher profitability for investors, and more benefits for the host country for what concerns development, being mainly market-seeking, hence providing jobs and resources to the same country where production is located (Chen *et al.*, 2015). Ethiopia represents a good example of infrastructure and manufacturing-driven growth, with a 46% increase of FDI inflows in 2016 (UNCTAD, 2017).

Moreover, the fact that greenfield investments in Africa registered an increase in industries such as real-estate, infrastructure, automotive, and renewable energy represent a positive evidence on the matter. Eventually, North Africa's shares of greenfield investments have increased since 2011 and now represents the destination for half of the African greenfield projects in 2017. However, their value still represents around 30% of the total value produced by greenfield projects in the continent (UNCTAD; 2017).

As for M&As, the general trends are positive: M&A sales in developing economies have registered an increase of 8 times in terms of number of projects and of 10 times in terms of

value since 1990. The growth of the number M&A deals results consistent, whereas the total value of the deals is more fluctuant throughout the years. Africa currently holds around 10% of the share of M&A sales of all developing economies; however, in terms of value the past two years have registered a significant decrease for the African continent, with a drop of 54% in 2016 and 64% in 2017, and a subsequent M&A sales share falling from 25% to 3% of the total value for the developing economies. The decrease is explained by significant divestment from developed-country MNEs from developing economies, in particular China (UNCTAD, 2017).

At a regional level, concerning M&A, Sub-Saharan deals are significantly preponderant, 85 in number in 2017, which correspond to 64% of the total deals in the continent. Once again, the value of the deals is more fluctuant: since 2013, Sub-Saharan M&A registered a boom, with sales localized mainly in Southern Africa, until the drop of 95% of 2015. In the past two years, the eastern and northern regions registered an increase in value of sales, accounting alone respectively for 74% and 18% of the overall value. South Africa, Egypt, Kenya, and Morocco are the main sellers in terms of number of deals, whereas Mauritius islands registered the highest value in 2017, with net deals for a value of \$ 2.5 billion: the area is strategically used by MNEs to get access to the continent, especially for what concerns financing, banking, and insurance sectors, due to their structured tax laws, such as investment promotions and protection agreements (IPPA) with 27 countries and their domestic tariff areas (DTA) with 43 countries (Reza Cassam Uteem, 2018).

For what concerns M&A purchases, the African contribution to the total coming from developing countries is quite low: in 2017 Africa accounted for 9% of the deals, which corresponds to 1% in terms of value. Nonetheless, the trend, both for developing countries and Africa in particular, is increasing: the number of deals has grown by more than 20% from 2007 to 2016 for developing economies, with a subsequent drop of 13% in 2017. The drop in terms of number of purchases doesn't correspond to a drop in value: in 2017 M&A purchases have grown in value by 18% in developed economies. Africa's number of M&A purchases has been quite stable over the past few years, with an average of around 70 deals concluded per year; however, in 2017 the continent has experienced a significant drop in value, with overall purchases value decreased by more than 70% (UNCTAD, 2017).

The main purchasers used to belong to the North and Southern regions, but since 2013 the value is better distributed across the five regions: in particular, in 2017 East Africa gained momentum, with a share in net M&A purchases value of 95%. The country that concluded most deals in 2017 is still South Africa, with an overall number of 64 out of 103 net purchases deals. However, purchases in terms of value are again highest in Mauritius, together with Morocco and Egypt. For more information on M&A sales and purchases data, see *Annex 7* and *Annex 8*.

3.2 FDI Determinants in Africa

3.2.1 Africa is different

The literature review on FDI determinants has clearly highlighted how the choice of the right set of determinants is crucial to prevent biases and have a correct representation of the phenomenon of FDI attraction, magnitude, and impact on local economies.

This choice becomes crucial when the target countries are in extreme need of this type of investment: as a matter of fact, African countries have been shown not to have wide access to international capital markets, and are using less and less official loans to obtain the needed capital to sustain growth (Asiedu, 2002).

A few research works have stressed how differences in FDI trends are to be explained with determinants that are specific to regions and industries. Batra *et al.*, 2003, highlight the profound differences in terms of investment climate across different regions of the world, by comparing economic policies, regulations, governance, infrastructure, and finance across more than 80 countries. In particular, developing economies have been shown to have a higher level of uncertainty (regulatory administration uncertainty, financial, labour regulations, policy uncertainty, etc.) which justifies the development of a specific set of FDI determinant for the African continent.

Asiedu, 2002 provides a first solid evidence on the profound difference in FDI determinants for Sub-Saharan Africa, with respect to the rest of developing economies: the study utilizes cross-sectional data from 71 developing countries to test the differential impact of regressors for the African continent.

The econometric regression includes measures for return on investments, infrastructure development, openness, political risk, and some variables to test for robustness (namely financial depth, size of public sector, economic stability, and GDP growth). Results show that net FDI flows over GDP are not significantly affected by higher ROI or better infrastructure, and mildly positively affected by trade openness: therefore, the structural differences of the target area should be prioritized when it comes to policy decisions, which shouldn't mirror the ones of other successful developing economies to maximize the produced benefits. The research paper mentions an "African effect" which implies a bad perception from investors, with risk perceived as inherent in the country itself and a low willingness to invest that is strongly related to the scarce level of knowledge about the specific countries: this is one of the reasons why FDI inflows are not fairly distributed over the continent, and agglomeration effects are extensive.

In the generic theoretical frameworks of FDI determinants, we have seen different categories such as firm factors, country factors, and bilateral factors: in the following sections we deeply

analyse FDI determinant literature in Africa with a focus on host country factors, consistently with the scope of our empirical model. The literature analysis is aimed at finalizing a set of determinants that will be utilised in the econometric model.

3.2.2 FDI attraction: exogenous factors are not enough

The first contributions that examined the issue of FDI determinants for the specific context of Africa, in particular Sub-Saharan Africa, highlight the crucial importance of exogenous factors for FDI attraction: the presence of natural resources and important market size have been argued to be the first determinants for inward FDI flows (Morisset, 1999; Chen *et al.*, 2015). Indeed, even nowadays the countries in SSA that possess the highest amount of mineral resources (namely Ghana, Tanzania, Mozambique, Democratic Republic of Congo, South Africa) account alone for 35% of the total inflows for the SSA region (UNCTAD, 2018).

However, the influence of the exogenous variables as a determinant for FDI attraction and magnitude is not the only component, as it would mean that policy interventions have no role to play to encourage flows and that half of the African continent would be left out of the FDI dynamics for their small market size only. Moreover, for what concerns the relationship between FDI and economic growth, we have shown in the previous chapters how resource-seeking FDIs are generally the ones that generate the least opportunities for FDI spillovers: therefore, economic growth and poverty reduction in the continent wouldn't be improved by the presence of FDI, if they were driven by exogenous factors only.

On the contrary, since the beginning of the twenty-first century, policy improvements and FDI promotion across all African countries have been strongly encouraged: in 2000, the United Nations listed FDI as a key determinant for the achievement of the Millennium Development Goal (MDG) 2015 in Africa:

“To take special measures to address the challenges of poverty eradication and sustainable development in Africa, including debt cancellation, improved market access, enhanced Official Development Assistance and increased flows of Foreign Direct Investment, as well as transfers of technology” (Un.org, 2018).

Asiedu, 2002, proves the specificity of the African context with regressors that are modelled around the assumption that African FDI are non-market seeking, hence attributing to exogenous factors considerable weight: market-seeking FDI are argued to imply a strong local demand and a high income level of the host country, as these kinds of FDI are oriented not only to local production, but also to local sales, which has not always been the case for Africa. For instance, when modelling openness to the host country, the relationship with the dependent variable is assumed to be positive, as trade restrictions have been shown to be beneficial for market-seeking FDI; the same assumption justifies the non-significant impact of infrastructure

development, which is argued not to be strongly correlated with resource-seeking FDI. However, the strong assumption on the type of FDI inflows, despite being useful to the purpose of the dissertation and highlighting that FDI determinants are different for Africa, presents limitations for the effects of non-exogenous variables, especially for FDI impact: the discussion on host country factors, for instance, such as institutional variables (political risk, policies), is blurred, and it's treated separately in a subsequent paper by the same author.

Fiodendji, 2013 instead highlights the central role of institution quality for FDI attraction, with data from 30 SSA countries over the period from 1984 to 2007, divided in 5-year average groups to limit business cycles biases and missing observations. The research shows that countries whose market size is small and with a low level of natural resources are still able to attract FDI and to benefit from them, by relating the host country characteristics (in particular, the availability of solid minerals and crude oil) with institution quality, and investigate whether the marginal effect of these resources depends on the type of institutions.

The three general literature approaches to measure institutional quality are: quality of public affairs management, existence and application of IP rights, and decisions from politicians; the variables are usually not easily traceable and may entail endogeneity, which can be resolved through instrumental variables in the econometric regression. The model of Fiodendji, 2013 proxies institutional quality with different political risk variables, such as government stability, profile investment, democratic accountability, law and order, and control of corruption. Results show the weak significance of some of the controlling variables, such as market size, exchange rate and macroeconomic stability, whereas almost all the institutional quality indicators are significant and positively correlated with FDI inflows. An interesting finding comes from the introduction of an interaction variable between natural resources and institution quality: results show that the lower the level of institution quality, the more natural resources are the main determinant for FDI attraction. The opposite effect is the same, meaning that the lower the presence of natural resources, the more poor institutions will discourage FDI.

Therefore, exogenous country characteristics have been shown to be still crucial as a determinant for FDI attraction, but alone they are not a sufficient determinant to encourage an increase in FDI flows and to provide benefits to local economies; moreover, a lack of natural resources doesn't prevent FDI activity, as other host country variables can encourage their attraction: in the following section we will focus on the weight of other host country variables as contributors to a resource-based industrialization, hence moving to the impact that realized FDI generate in local economies in the African continent, fostering or hindering economic growth.

3.2.3 FDI attraction: other host country factors

As mentioned, an empirical evidence on the primary importance of host country variables for the African context comes from Asiedu, 2006, which analyses the effects of a wide set of determinants for the context of SSA, with data for 22 countries over the timespan from 1984 to 2000.

In addition to exogenous variables, such as market size and natural resources (modelled respectively through mineral resource share of total exports and GDP), the research combines four different surveys about FDI constraints in the African territory, namely World Business Environment Survey (WBE), World Development Report Survey (WDR), World Investment Report Survey (WIR), Centre for Research into Economics and Finance in Southern Africa Survey (CREFSA), and comes up with an additional set of variables concerning policies, institutions, and political risk.

In particular, policies include macroeconomic stability, infrastructure development, openness to trade and human capital, and are modelled respectively through inflation rate, telephone lines intensity, and literacy rate. Institutional variables consist in corruption and law enforcement indexes; political risk is represented by the number of coups, assassinations, and revolutions per country.

The results confirm the crucial importance of the second set of variables, and identify regional cooperation as a main policy implication: as a matter of fact, regionalism is argued to increase the political stability across the whole area, while constraining the problem of free-riding and unwanted spillovers, and augmenting the size of the market from the point of view of investors. On the other hand, the complexity of policy coordination is bound to increase, hence it's important to include it in the trade-off for a correct policy choice. These implications, differently from Asiedu, 2002, seem to be oriented to a more general perspective of FDI inflows types, while keeping in consideration the evidence of the importance of resources in the African continent.

3.3 FDI impact on economic growth

After reviewing some literature contributions for FDI attraction, we now move to the determinants for a positive impact of FDI over local economies, always with a focus on the host country factors. We start by reframing the theoretical model of the previous chapter (Farole and Winkler, 2014b) for the case of developing countries; afterwards, we bring evidence of the prevalence of particular kinds of linkages that work better for Africa, and explore those extensively. Eventually, we summarize the findings for host country FDI determinants, both for FDI attraction and impact, categorizing the different analysed literature contributions into a unique model.

3.3.1 Productivity and FDI spillovers: mediating factors

Farole and Winkler, 2014c adapt, through a study over the 2006-2010 period, the framework of FDI spillovers to developing countries: as a matter of fact, similarly to the issue of FDI attraction, also the problem of FDI impact on local economies is to be approached differently for developing countries. The point of view hence moves from FDI determinants to FDI mediating factors: the former are investigated to draw conclusions on the attraction of FDI, the latter on the kind of impact that established FDI generate.

The categories of mediating factors utilized in the work are three: the foreign firm characteristics, the domestic firm characteristics, and host country factors, which include the institutional framework. These variables are argued to have a combined direct impact on host firms' productivity in addition to sustaining their growth. Moreover, they are framed in the global value chain dynamics, meaning that decisions such as the sourcing strategy and the FDI motive are included in the analysis, together with the foreign ownership structure: the aim is to control both for spillovers and productivity while analysing the three mediating factors; eventually, a possible endogeneity is addressed through instrumental variables.

The model, whose dependent variable is the firm's productivity (namely value added per worker), controls for fixed effects of regions, industries, and time, and utilises a set of independent variables for FDI spillovers, and an interaction variable between spillovers and mediating factors. Firm-level data are then combined with country-level ones to account for the country's institutional framework.

The overall results show a negative impact of FDI determinants on productivity and spillovers, which is motivated by the short-term focus of the analysis, which shows more the competition effects rather than the long-term benefits for the whole restructuring of the industry.

However, the impacts of the three mediating factors on the firms' productivity and spillovers are different: for what concerns the spillover potential, productivity and spillovers react positively to a market orientation (market-seeking FDI); domestic attributes like a lower technology gap, size, agglomeration, and export behaviours also interact positively; eventually, national and institutional variables matter especially for low-productivity firms.

Overall, low-productivity firms benefit from FDI through the three mediating factors the most; high-productivity firms only through their absorptive capacity, and medium-productivity firms weakly from the three mediating factors.

Chen *et al.*, 2015 include as policy recommendations for their research similar factors: a proactive FDI management oriented to spillovers maximisation; positive effects of domestic linkages created by FDI when there is a good level of absorptive capacity; more attention on the communication channels with potential investors to reduce information asymmetries; and focus on market-seeking FDI and investments in infrastructure to sustain growth.

3.3.2 Technology linkages

Bwalya, 2006 analyses FDI determinants in particular for technology spillovers: the underlying assumption for the research is that FDI represents one of the most effective ways to trigger technical progress in a developing economy, bringing newer technologies compared to other investment forms (namely licensing). Fiscal incentives for FDI are to be balanced with the expected benefits from technology transfer in order to provide benefits to the host country.

The study utilizes firm-level data for manufacturing firms in Zambia, including food, textiles, and metal sectors; the model is a Cobb-Douglas production function that includes three spillover variables: an horizontal component, proxied with the ratio of labour employed by the foreign firm with respect to the one in the industry; a vertical component, which represents backward spillovers; and a regional one, which depicts agglomeration effects through the ratio of sales of foreign firms over the total sales of the region. Results show little evidence on the impact of horizontal spillovers, consistently with the strong competition effect found by Farole and Winkler, 2014c; on the other hand, backward vertical linkages are positive and significant for an augmentation of productivity, and regional concentration seem to speed up the spreading of technology spillover, being positive as well.

In the next section we further explore different literature contributions on the theme of linkage developments, which seem to be the most promising determinants for FDI impact in Africa, and draw insights on possible determinants for our empirical model.

3.3.3 Linkages development

Most of the literature on FDI in Africa agrees on the importance of linkage development for positive FDI impact: Pérez-Villar and Seric, 2015 points out how a good institutional framework can enhance enforcement, transparency, and security. In turns, this is the base for uncertainty reduction for all the economic agents involved in economic exchanges in the host country, and enables domestic linkages to increase and spillovers to be generated, leading to economic growth for the host country.

Fessehaie and Rustomjee, 2018 explored through three case studies of SSA countries (Botswana, Zambia, and Zimbabwe) the impact of policies and trade reforms on industrialization: policies are argued to have a crucial role in orienting the presence of natural resources towards the development of backward and forward activities across the value chain. With respect to developed economies, the development of technological capabilities for regions like the African one is strongly connected with skills development rather than just R&D, so industrial and human capital policies need to be even more consistent.

The work focuses especially on the mining sector, analysing different kinds of linkages that can possibly be developed (backward/forward, fiscal, consumption, etc.): the main finding is on the impact that these linkages generate to infrastructure development and productivity. Despite these linkages being sector and country specific, upstream linkages are argued to offer more opportunities due to their diversification in technology, capital, and skills.

Zambia, for instance, has lived an increase in FDI in the past two decades, due to privatization of mining resources and trade liberalization; however, due to scarce information, foreign mining firms' strategies that exclude local actors, low technological abilities, and high cost of finance, the activity is still quite low. The problems are exacerbated by a mediocre policy framework, which lacks implementation, clear objectives, and focus on upgrades of human capital. The most crucial issue, however, is the lack of coherence and coordination across policy makers: different approaches have been utilised at the same time to revive local manufacturing, with misaligned objectives leading to disappointing results and to a private sector that promotes local content on their own as a result.

Botswana has a completely different situation, being more stable and with better infrastructure, due to the diamond extraction sector and the strategic relationship with De Beers. Policies have been clearly formulated, implemented, and enforced, partly thanks to a good relationship with the private sector.

The main finding of Fessehaie and Rustomjee, 2018 is that market forces alone don't allow for a correct resource-based industrialization in the particular environment of Africa: governments occupy a central role in enabling linkage development, modulating relationships with the private sector and with the regional partners, ensuring cooperation and coordination that allow the development of value added assets and technological competencies for the country.

Pérez-Villar and Seric, 2015 agree on the importance of vertical backward linkages for Sub-Saharan Africa, but move the discussion of the determinants from the absolute quality of host country institutions towards the concept of institutional distance: a certain level of similarity between the two actors' institutional framework is argued to reduce uncertainty and encourage linkages as a determinant more than an absolute good level of institutional quality.

Cuervo-Cazurra, 2006, for instance, argue that a higher corruption level has a significant negative impact on FDI flows, but also a redistribution in the country of origin from which the flows originate: in particular, countries that are more sensitive to corruption, namely OECD countries, register a significant decrease, but this decrease is mitigated by an increase in flows from countries whose corruption level is closer to the destination one.

Pérez-Villar and Seric, 2015 structure the econometric model at a firm level, with the assumption that investments decisions have already been made (stage one of the game): the focus is hence more on the magnitude of FDI flows and on the impact of local economies. The

dependent variable depicts linkage development through the ratio of domestic inputs over the total inputs used by the foreign firm; regressors are modelled in the classic way, accounting for firm characteristics, country characteristics, bilateral ones, and a variable for the institutional framework. The latter is composed of indicators on enforcement costs, disputes, and corruption control, with robustness check variables such as IP rights and ethical behaviours. The study confirms the negative and significant impact of lack of contract enforcement and corruption on domestic linkages, and supports the hypothesis of institutional homogeneity as a positive determinant.

3.4 Host country factors: a summary

Dondashe and Phiri, 2018 analyse the problem of FDI determinants from a macroeconomic perspective, and provide a simplified representation of the different aspects to take into account for the host country, utilising data from 1994 to 2016 for the economy of South Africa. The model depicts five main regressors, namely: GDP per capita, inflation rate, government size, real interest rate, and trade. The model utilizes the autoregressive distributive lag technique (ARDL) and performs a sensitivity analysis over the pre and post-crisis timespans (before and after 2007). Results seem to prove a general positive effect of macroeconomic variables over the dependent variable, with positive and significant results for all but the inflation variable, which is instead negative, consistently with literature (Asiedu, 2002).

The simplification of the regressors vector coming from Dondashe and Phiri, 2018, together with the work of Asiedu, 2006, inspired a categorization of host country FDI determinants for the African continent that spans over four groups of variables: exogenous factors; political/institutional factors, financial factors, and policy ones. The first group of variables is more directly linked with the issue of FDI attraction, whereas the other three act also as mediating factors for FDI impact, as shown in the previous sections of this chapter.

The provided categorization differs from classical representations of FDI categories, for it is specifically designed around the destination country's point of view, rather than other more popular aspects, such as the investor's point of view or FDI motives or types: for instance, Chen *et al.*, 2015 combine the investors' and the motives perspectives into a categorization of FDI host country determinants that includes business facilitation, policy, and economic aspects. The latter category is then decomposed into three sub groups, namely resource, market, and efficiency-seeking, somehow showing which are the most crucial variables to take into account with respect to the chosen strategy.

The reason for a different choice again relates to the main idea of the work, which mainly aims at tailoring the issue of FDI determinants to the African context, due to the strong urgency in terms of policy recommendations and the literature gap: therefore, we prefer to reframe the

same variables from the point of view of the FDI beneficiaries, to make the problem and the econometric model appear clear and the direct consequence of one another.

Figure 12 hence summarizes our literature categorization: for each FDI variable, we crossed literature contributions and compared measurements, finalizing a general qualitative expected impact, depicted in green or red colour: the choice has been to provide a general assessment of the impact on the variable rather than on the specific measurements, as for the latter the correlation to FDI depends on how they are designed rather than if they are conceptually on the same direction (for instance, political risk indexes are designed in Fiodendji, 2013 so that high values correspond to low risk levels, which has nothing to do with the conceptual correlation of political risk with FDI).

For contributions of the same variables that appear disagreeing, we depict the effect as mixed, with a yellow colour. Afterwards, after the final choice of regressors for our econometric analysis, we will justify more extensively our vision of the expected signs for the chosen variables: the aim of this preliminary model is to provide an overview of literature achievements on the issue.

EXOGENOUS VARIABLES			
AUTHORS	VARIABLE	EFFECT	MEASURES
Asiedu, 2002	Country attractiveness		GDP growth rate
Fiodendji, 2013			
Asiedu, 2005	Market size		GDP per capita
Anyanwu, 2011			
Fiodendji, 2013			
Anyanwu, 2011			% urban population over total population
Asiedu, 2002	County ROI		Inverse of real GDP per capita
Farole andWinkler, 2014c	Competition		HHI sector concentration index (sectoral)
Farole andWinkler, 2014c			
Dondashe and Phiri, 2018			GDP per capita in the country (national)
Anyanwu, 2011			
Fiodendji, 2013			Real exchange rate (international)
Asiedu, 2005	Natural resources		Percent share of oil and minerals in exports
Anyanwu, 2011			
Fiodendji, 2013			
Bwalya, 2005			

POLITICAL/INSTITUTIONAL VARIABLES			
AUTHORS	VARIABLE	EFFECT	MEASURES
Asiedu, 2002	Size of government		Ratio of government consumption to GDP
Anyanwu, 2011			
Dondashe and Phiri, 2018			
Asiedu, 2002	Political risk/governance		Average numbers of assassinations and revolutions
Asiedu, 2005			Number of forced changes in government
Asiedu, 2005			Attempted/relized political murder to government officials
Asiedu, 2005			Forced/illegal change in ruling government
Fiodendji, 2013			Government stability index
Pérez-Villar and Seric, 2014			Average governance
Fiodendji, 2013			Democratic accountability index
Fiodendji, 2013			Bureaucratic quality index
Fiodendji, 2013			Profile investment index
Anyanwu, 2011			Political rights index
Fiodendji, 2013	Conflicts		Internal conflicts index
Fiodendji, 2013			External conflicts index
Asiedu, 2005	Corruption		Nepotism, excessive patronage, bribery
Fiodendji, 2013			Control of corruption index
Pérez-Villar and Seric, 2014			Control of corruption
Pérez-Villar and Seric, 2014			Corruption perception index
Farole andWinkler, 2014c	Business freedom		Institutional development (ability to start, operate, close business)
Asiedu, 2005	Law enforcement		Effectiveness of rule of law
Fiodendji, 2013			Law and order index
Pérez-Villar and Seric, 2014	Security of transactions		Contract enforcement costs/claims
Pérez-Villar and Seric, 2014			Days to resolve disputes
Pérez-Villar and Seric, 2014			Contract enforcement index

POLICY VARIABLES			
AUTHORS	VARIABLE	EFFECT	MEASURES
Asiedu, 2002	Infrastructure development		Number of telephone lines per 1,000 population
Asiedu, 2005			
Anyanwu, 2011			
Kariuki, 2015			
Asiedu, 2005	Openness of the host country		Country's attitude towards inward investment index
Asiedu, 2002			
Anyanwu, 2011			Trade (import + export) over GDP
Fiodendji, 2013			
Kariuki, 2015			
Dondashe and Phiri, 2018			
Asiedu, 2002	Macroeconomic instability		Inflation rate
Asiedu, 2005			
Anyanwu, 2011			
Dondashe and Phiri, 2018			
Fiodendji, 2013			Inflation rate (annual % change consumer price index)
Asiedu, 2005	Human capital		Percent adult literate people
Bwalya, 2005			Skilled/unskilled labour
Farole andWinkler, 2014c			Labour market index (wages, layoffs, severance, regulatory burdens)
Farole andWinkler, 2014c			Government spending on education over GDP
Farole andWinkler, 2014c			People with tertiary education over people over 15 years old
Farole andWinkler, 2014c			Share of exports over GDP
Farole andWinkler, 2014c			Trade variabes

FINANCIAL/INVESTMENT VARIABLES			
AUTHORS	VARIABLE	EFFECT	MEASURES
Asiedu, 2002	Financial depth		Liquid liabilities to GDP
Kariuki, 2015	Financial risk		Foreign debt as a percentage of GDP
			Foreign debt services as a percentage of exports
			Net international liquidity as months of import cover
			Exchange rate stability in a country
Farole andWinkler, 2014c	Financial freedom		Banking efficiency and independence from government
Anyanwu, 2011	Financial development		Ratio of domestic credit to the private sector to GDP
Anyanwu, 2011	Remittance		Inflow international remittance as % of GDP
Farole andWinkler, 2014c	R&D		R&D expenditures over GDP
Farole andWinkler, 2014c	Investment freedom		Resource movability
Dondashe and Phiri, 2018			Real interest rate

Figure 12. Overview of literature review of host country factors

Chapter 4: econometric model and results

After the analysis of the literature about FDI determinants in the African context, we now move to the econometric model: we start with the description of the databases used to extract data on the dependent variable and on the regressors; we then move to the methodology to build the final model, and we discuss results, comparing them with literature.

4.1 Database description

The first step to build the econometric model is the extraction of the data of the dependent variable: in order to reduce complexity, we decided for a discrete econometric model, so we focused on FDI flows in Africa as a count of the number of completed projects rather than as their economic value.

We hence extracted data from Zephyr¹⁰ database, produced by Bureau Van Dijk: the database collects the number of FDI projects that have been completed since 1997 (grouped in 3-years periods), and includes the source and destination countries. Moreover, for each transaction, there is a set of information available, such as the acquiror and vendor names, the announcement and completion dates, the deal type and value, and the industry.

We chose a search strategy that prioritizes the destination country (namely Africa), and the type of industry. In order to obtain solid datasets, we decided to group industries into two categories: “manufacturing” and “other”. The former contains all major manufacturing sectors¹¹, whereas the latter is a sum of all the remaining industries, in particular the primary sector (agriculture, mining, etc.) and the service one¹². Due to the significant weight of the service sector on the primary one, we believe that this grouping choice will not affect specific industry-related considerations.

Moreover, the main focus will be on the manufacturing sector, as it has become clear from the literature analysis that this sector is fundamental for the specific context of Africa to produce positive effects towards economic development (Chen *et al.*, 2015).

¹⁰ More information about the database are available at: <https://www.bvdinfo.com/en-gb/our-products/data/specialist/zephyr>

¹¹ Food, beverages, tobacco, Textiles, wearing apparel, leather, Wood, cork, paper, Publishing, printing, Chemicals, rubber, plastics, non-metallic products, Metals & metal products, Machinery, equipment, furniture, recycling.

¹² Gas, Water, Electricity, Construction, Wholesale & retail trade, Hotels & restaurants, Transport, Post and telecommunications, Banks, Insurance companies, Other services, Public administration and defence, Education, Health (Target)

We decided to keep the original time periods, obtaining 7 periods from 1997 to 2017: this type of data aggregation is not a limit for the econometric model with respect to the alternative of having 21 different periods, as it eliminates yearly effects that could bias results. Moreover, we utilize an approach that counts the average over the whole chosen period, or at least over half of it, which we will describe in the next section.

Eventually, data availability has been shown to be a major issue for African FDI, so we intend to keep the model below a certain level of complexity, especially because we need to align data of the dependent variable with the ones of regressors, which often face a wide range of constraints and approximations, as quantitative values are not available or scarcely representative of the desired phenomenon.

Annex 9 shows the count of completed FDI projects by destination country in manufacturing, primary and service sectors.

After choosing the dependent variable, we moved to regressors: the effort was to be consistent with FDI literature, both in the choice of the type of regressors, and in the source utilised to retrieve them. We tried to represent all the determinants mentioned in the final table of the previous chapter, including exogenous, political, institutional, and policy variables.

The first category of variables comprehends the amount of natural resources of the target country, the market size, and the market attractiveness: consistently with literature, we used different measures of the gross domestic product (GDP) to proxy the size and the attractiveness of the country, and we combined measures of the main resources exported from the target country to come up with a unique regressor for natural resources.

For these variables, we extracted data from the World Development Indicators (WDI) by The World Bank ¹³, which gathers global development data, with estimates at a national, regional, and global level. The database includes more than 800 indicators for more than 150 economies, it's presented yearly and updated on a three-monthly basis.

For the market size, we selected “GDP per capita, current US\$” ¹⁴: the indicator represents the GDP divided by the country's population. In other words, it is the sum of gross value added of all the producers in the target economy, with product taxation and without subsidies; depreciation, depletion, and degradation of the fabricated assets are not included in the measure. This variable is utilised also by Asiedu, 2002; Asiedu, 2005, Anyanwu, 2011; Fiodendji, 2013. We named the variable “*GDP_cp_yy*”, where “yy” represents the last two digits of the year of the indicator. For this variable and all the other selected ones, we then

¹³ <https://data.worldbank.org/products/wdi>

¹⁴ <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

calculate the average over the period we decide to investigate in the regression, and replace the years digits with “avg”.

Variable 1. Market size: “*GDP_cp_yy*”

For the country attractiveness, we retrieved from the WDI database the index “GDP growth, US\$”¹⁵: the measure indicates the annual percentage growth rate of GDP, with market prices calculated at the constant local currency, hence aggregated on constant 2010 US dollars. This variable is utilised also by Asiedu, 2002, and Fiodendji, 2013. We named the variable “*GDP_gr_yy*”.

Variable 2. Market attractiveness: “*GDP_gr_yy*”

Eventually, we retrieved and aggregated different measures of the country’s natural resources: in this case our assumptions slightly differ from literature, which mainly utilizes the percent share of oil and minerals in exports (Asiedu, 2002; Fiodendji, 2013; Bwalya, 2005). We decided instead to include three main measures of the country’s resources, retrieved again from WDI database: “ores and metals exports, % of merchandise exports”¹⁶, “fuel exports, % of merchandise exports”¹⁷, “agricultural raw materials exports, % of merchandise exports”¹⁸.

The first index includes the commodities in Standard International Trade Classification (SITC) sections 27, 28, and 68, which correspond to crude fertilizers, minerals, metalliferous ores, scrap, and non-ferrous metals; the second one includes the commodities in SITC section 3, which corresponds to mineral fuels, lubricants, and related materials; the third one includes SITC section 2, which corresponds to crude materials except fuels and crude fertilizers and minerals except petroleum, coal, and precious stones¹⁹. The periodicity for the three indexes is annual, and the aggregation is the weighted average.

Due to the fact that all the measures come from the same data set and that are homogeneous, we simply apply an algebraic sum to obtain the final yearly index, which we name “*natural_yy*”. The choice of combining different measures for natural resources is consistent with the focus of the model on the manufacturing sector, argued to be the most promising one for economic development in the African area (Alfaro, 2003).

Therefore, we believe that a more comprehensive measure could better represent this industry, which is not directly related with the ownership of fuels.

¹⁵ <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>

¹⁶ <https://data.worldbank.org/indicator/TX.VAL.MMTL.ZS.UN>

¹⁷ <https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN>

¹⁸ <https://data.worldbank.org/indicator/TX.VAL.AGRI.ZS.UN>

¹⁹ All these measures are estimated by the World Bank through the World integrated Trade Solution platform (WITS) from the Comtrade database, which is maintained by the United Nations Statistics Division.

Variable 3. Natural resources: “*natural_{yy}*”

After detailing the exogenous variables for the host countries, we move to the political and institutional ones: for this analysis, we extensively draw from Fiodendji, 2013, as it represents one of the most accurate literature contributions for these particular determinants.

The author includes in the econometric model a set of 6 variables to proxy the political risk of a host African country: the measures are withdrawn from the International Country Risk Guide (ICRG) by the Political Risk Services Group (PRS) ²⁰. The guide includes 12 different indicators for institutional quality, among which the author selects a subset only.

Due to the limited observations of our econometric model, we eventually decided to retrieve data from another database, namely the Worldwide Governance Indicators (WGI) by the World Bank ²¹: the reason is that the same aspects of political risk and institutional quality are grouped in a more limited number of variables, among which we picked the most representative ones for our econometric model.

All the indicators are normalized on a 0 to 1 range, but since they have an annual periodicity only from 2002 onwards (whereas the periodicity was biannual before) we observe missing values for the years 1997, 1999, 2001. Moreover, data for the year 2017 are not yet included.

We hence decided to replicate the values of the previous years, respectively 1996, 1998, 2000, to fill in the missing values and have a complete dataset. The final set includes 5 indexes: “control of corruption”, “government effectiveness”, “political stability and absence to violence/terrorism”, “regulations quality”, and “rule of law”. The measures are designed so that a high value corresponds to a low level of risk: hence, a positive sign on the econometric regression indicates a positive effect of institutions on FDI flows.

The first index (control of corruption) proxies the inverse of the level of corruption of a political system: the reason why this measure is crucial for FDI in Africa is that it is argued to influence the economic and financial environment of the country, to reduce the government’s efficiency by encouraging patronage over ability. The index is quite similar in nature to the corruption one provided by the IPRG, and it includes bribery and related activities connected with tax assessments, export and import licences, exchange controls, loans etc.

As a consequence, the general environment hinders the establishments of foreign investments, and sometimes force their withdrawal. Moreover, corruption can take the form of nepotism, excessive patronage, job reservation, and secret party founding (Prsgroup.com, 2012).

²⁰ <https://www.prsgroup.com/explore-our-products/international-country-risk-guide/>

²¹ <https://datacatalog.worldbank.org/dataset/worldwide-governance-indicators>

Variable 4. Control of corruption: “*contr_corr_yy*”

The second index (government effectiveness) captures the quality of public and civil services, their independence from political pressure, the quality of policies and the extent to which the government commits to them (Info.worldbank.org., 2018). It includes measures of bureaucratic quality, infrastructure disruption, state failure, and policy instability. We name the variable “*gov_eff_yy*”.

Variable 5. Government effectiveness: “*gov_eff_yy*”

The third institutional index (political stability and absence to violence and terrorism) measures how unlikely is for a country to experience instabilities and politically motivated violence (Info.worldbank.org., 2018). Examples of political instability are protests, riots, terrorism, interstate war, and civil war. We name the variable “*pol_stab_yy*”.

Variable 6. Political stability: “*pol_stab_yy*”

The fourth political measure (regulations quality) has common nature with government effectiveness, but is more oriented to private sector development: as a matter of fact, it is defined as the ability of government to formulate and implement policies and regulations that allow and promote such sector (Info.worldbank.org., 2018). Two measures of this indicator are the regulatory burden, which is the risk of making daily business operations more complex and costly due to the regulation environment, and tax inconsistency, which is the collection of fines and penalties that are disproportionate or manipulated for political ends. We name the variable “*reg_qual_yy*”.

Variable 7. Regulations quality: “*reg_qual_yy*”

The last institutional variable that we chose to build our regressors (“rule of law”) is related with the extent to which agents are confident and abide by the society’s rules: in particular, it captures the level of contract enforcement, intellectual property rights, and police and courts (Info.worldbank.org., 2018). Expropriation and state contract alteration without due process are examples of low values of such index, which we name “*rule_law_yy*”.

Variable 8. Rule of law: “*rule_law_yy*”

Eventually, we selected a final set of variables that are crucial to capture the host country characteristics, but that are less exogenous in nature: in other words, for this set of variables, policy interventions could produce a positive effect, hence influencing the level of investments in such country.

The first variable belonging to this final set proxies the level of infrastructures in the country: the variable is withdrawn from the World Bank’s database (WDI), and it’s called “fixed telephone subscriptions per 100 people”; the original source is the World Telecommunications/ICT Development Report and database. The measure refers to the active

numbers of analogue fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones.²² It is consistent with most of the literature of FDI in Africa (Asiedu, 2002; Asiedu, 2006); however, it represents only partially the concept of infrastructures (buildings, roads, bridges, power supplies, etc.), which can't be proxied differently due to the lack of available data. The index is generated with annual periodicity, and it is obtained by dividing the total number of fixed telephone line by the country's population, and then multiplied by 100. We call the variable "*fixed_tel_yy*".

Variable 9. Infrastructures: "*fixed_tel_yy*"

Another crucial component to determine the state of a country concerns literacy: once again, we pick from the World Bank database (WDI) the "literacy rate, adult total (% of people ages 15 and above)"²³. The rate is calculated by counting the number of people who are able to read and write, together with understanding a short simple sentence about everyday life.

The number is hence divided by the total number of people ages 15 and above. The variable is important to draw inferences on the educational attainment of the target country: in other words, high values of the index suggest that the country offers a wide range of opportunities to acquire literacy skills, which strongly affect the quality of future labour force. Despite the index lacks a significant portion of the analysed countries, we decided to include it as a regressor for its extreme importance and implications for FDIs. However, in the analysis we will take into account the nature of the regressor, which we name "*literacy_yy*".

Variable 10. Educational attainment: "*literacy_yy*"

Moreover, consistently with literature (Liargovas and Skandalis, 2012), we decided to include as a variable a measure for openness of the target country: a correct indicator for this aspect, offered by WDI database, is "merchandise trade, % of GDP"²⁴. The utilization of this indicator is extremely wide in literature (Asiedu, 2002; Asiedu, 2006; Anyanwu, 2011; Fiodendji, 2013; Kariuki, 2015; Dondashe and Phiri, 2018), and it corresponds to the sum of merchandise exports and imports, divided by the value of GDP in current US dollars. In the next sections we will see how this index can be interpreted in different ways, meaning that it can also be negatively correlated with FDI. We name the variable "*trade_yy*".

Variable 11. Openness of target country: "*trade_yy*"

²² <https://data.worldbank.org/indicator/IT.MLT.MAIN.P2>

²³ <https://data.worldbank.org/indicator/SE.ADT.LITR.ZS>

²⁴ <https://data.worldbank.org/indicator/TG.VAL.TOTL.GD.ZS>

Eventually, the last variable concerns the macroeconomic instability of the target country, and it is represented by WDI “inflation rate, annual % change in consumer prices”²⁵: it is the annual percentage change in the cost that a customer needs to pay to buy a basket of goods or services, which may be fixed or vary in specific time intervals; the consumer price index is obtained through the Laspeyres index, and the chosen name for the variable is “*infl_yy*”

Variable 12. Macroeconomic instability: “*infl_yy*”

The number of variables chosen to start the analysis is consistent with the literature summary, but is not identical to the final set of variables which are included in the econometric model: as a matter of facts, the idea is to test different combinations of the various indexes to understand which are more relevant for the specific analysis of FDI in Africa.

In the next section we analyse the methodology to build the econometric model, and the various iterations to reach the final set; eventually we present the main results of the analysis drawing comparisons with literature.

4.2 Methodology and model

After collecting the necessary data both for the dependent variable and regressors, we move to the refinement of the database, which involves the alignment of all the data and the formulation of the strategy to explore all the regressors.

The first step is hence the alignment of all the variables to our observations, which correspond to the 54 African countries: to simplify the process, we utilized a two-digit country code as a primary key, and we merged all the regressors into a unique dataset.

The result is a database that has the country codes and names as rows, and the dependent variable as column: the set includes one different column for each year of registered FDI projects in the target African country, with a distinction between the manufacturing industry and the others. The format name utilised is “*m_yy*” for manufacturing and “*o_yy*” for the other sectors; however, the most important variables utilised as the dependent component of the regressions are the averages over the period.

About this matter, the decision has been to produce two different types of average: a general one, which is the simple average over the 21 years, named “*manuf_avg*” and “*other_avg*”, and an average only on the last 12 years of the sample, named “*manuf_avg_p2*” and “*other_avg_p2*”. As it will be clarified later, the decision is to explore different scenarios:

²⁵ <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>

firstly, a general one, where regressors affect the dependent variable in real time, which is not logically meticulous, but it is useful to produce a first representation of the phenomenon, and it is a flag for potential mistakes in the regression. Afterwards, we move to the hypothesis of a time discrepancy between regressors and dependent variable: in other words, what happens in the economic, political, and institutional environments of the target country affects FDI flows in the following years rather than in the same one.

In addition to the dependent variable, we add to the database one column for each of the 12 regressors and for each of the 21 years of the period (1997-2017): as mentioned in the previous section, each of these columns has been named in the format “*regressor_yy*”, for a total number of columns of 252.

Similarly to the dependent variable, the overall average is calculated for each regressor, in the format “*regressor_avg*”, and the partial average, corresponding to the first 9 years of the period, with the format “*regressor_avg_p1*”.

The reason to apply an average both to regressors and the dependent variable is to obtain a clear, simple measurements and to avoid problems coming from different missing values throughout the years. However, despite this operation, there are a few problems coming from missing values of a few variables for some of the African countries.

Figure 13 summarizes the selected variables that represent the set of potential regressors for the econometric model.

HOST COUNTRY FACTOR	MEASURES	VARIABLE NAME
MARKET SIZE	AVERAGE GDP PER CAPITA	GDP_cp_avg(_p1)
MARKET ATTRACTIVENESS	AVERAGE YEARLY GDP GROWTH	GDP_gr_avg(_p1)
NATURAL RESOURCES	ORES, METALS, FUELS, AGRI EXPORTS %	natural_avg(_p1)
CONTROL OF CORRUPTIN	WGI CC INDEX	contr_corr_avg(_p1)
GOVERNMENT EFFECTIVENESS	WGI GE INDEX	gov_eff_avg(_p1)
POLITICAL STABILITY	WGI PS INDEX	pol_stab_avg(_p1)
REGULATIONS QUALITY	WGI RQ INDEX	reg_qual_avg(_p1)
RULE OF LAW	WGI RL INDEX	rule_law_avg(_p1)
INFRASTRUCTURES	FIXED TELEPHONE SUBS. 1000 PEOPLE	fixed_tel_avg(_p1)
EDUCATIONAL ATTAINMENT	ADULT LITERACY RATE	literacy_avg(_p1)
COUNTRY OPENNESS	MERCHANDISE TRADE % GDP	trade_avg(_p1)
MACROECONOMIC INSTABILITY	INFLATION RATE CONSUMER PRICES	infl_avg(_p1)

Figure 13. Wrap up of the selected potential regressors.

After selecting the potential regressors, we apply two different strategies to make them homogeneous across observations: the first one, when a country has missing values for more than a regressors, we eliminate the whole observation, namely the country row, from the database; the second one, for missing variables that concern only one regressor, which is also not crucial for the analysis, we simply fill the missing value with an average from the other observations.

This way, we make sure that we don't influence significantly the expected values, and we obtain comparability across different models, since they share the same number of observations. Another decision could have been to utilize values of the neighbouring countries, but we believe it is a too strong assumption, since there is a great variability across national environments in the area.

Moreover, when operating these two data modifications, we combine the results for the general averages and for the partial ones, to make sure to obtain absolute comparability also across the two time scenarios: in other words, we obtain a final number of observations that is consistent across the hypothesis that FDI flows depend on determinants in real time and with a time discrepancy. This decision implies a loss of two additional observation, which we believe to be worth the overall comparability of the scenarios.

The final results hence have 9 countries excluded from the database ²⁶, and 9 single values for regressors' averages modified ²⁷; the fixed value of observations will hence include 45 African countries.

The following step is the creation of additional variables, to explore variants of the regressions that do not include countries with specific characteristics: in particular, we generate the variable "*north*" which includes all the countries in North Africa²⁸, which will be excluded from the analysis from time to time, to see the impact of determinants on the SSA area only. This decision is consistent with the information gathered in literature about the different economic development paths of the two areas, detailed in the previous chapter.

Moreover, throughout the analysis, South Africa (country code: "ZA") will be often excluded, since it greatly contributes to the overall FDI flows, and it might alter the impact of determinants with its major weight on the dependent variable.

²⁶ The codes of the countries removed from the list are: "SS", "SO", "CD", "GQ", "TD", "LR", "AO", "CG", "DJ", corresponding respectively to South Sudan, Somalia, Democratic Republic of Congo, Equatorial Guinea, Chad, Liberia, Angola, Republic of Congo, Djibouti.

²⁷ infl_avg for "ER", Eritrea; infl_avg_p1 for "ER", Eritrea; literacy_avg for "DJ", "LY", Djibouti and Libya; literacy_avg_p1 for "CV", "GA", "LY", "ZA", "ZW", Cape Verde, Gabon, Libya, South Africa, Zimbabwe.

²⁸ Morocco, Tunisia, Egypt, Libya, Algeria.

Eventually, we generate alternative variables for the GDP per capita regressor, dividing it by 1000 and applying the logarithmic scale, in order to highlight that increments in values entail progressively lower impacts.

After finalizing the database and generating the necessary variables, we move into the strategy to explore the different combinations of regressors and scenarios: we hence create a decision tree on 4 levels, summarized in *Figure 14*.

First, we differentiate scenarios according to the hypothesis on the time discrepancy: the former refers to average values built on the period 1997-2017 (21 years); the latter refers to 2 different averages: a partial average on the first 9 years for all the regressors (1997-2005), and a partial one on the last 12 years (2006-2017) for the dependent variable. We name the different averages with labels “*regressor_avg_p1*”, “*manuf_avg_p2*”, and “*other_avg_p2*”.

Afterwards, we produce different scenarios for the two represented industries, namely manufacturing and all the others, in order to unveil differences in the set and effect of regressors: for instance, according to Chen *et al.*, 2015, natural resources have great impact on FDI for the primary and manufacturing sector, and are less relevant for the service one.

The third level of the decision tree concerns the probability distribution of the dependent variable: the discrete nature of such dependent variable brought us to two alternatives to model the regression, namely a Poisson distribution and a Negative Binomial one.

The Poisson regression is one of the simplest and effective alternative for a discrete econometric model, since it is just a generalized linear model that assumes that the logarithm of the expected value of the dependent variable is a linear combination of its regressors (log-linear category of regressions).

One limit of this model is that the expected value and the variance of the dependent variable correspond ($P_X = (\lambda^x/x!) * e^{-\lambda}$, $E(X) = V(X) = \lambda$), which may not be a good solution for the count of FDI in Africa, that has been shown to be unevenly distributed across countries (see *Annex 9*).

The generalization of this regression is the negative binomial regression, which includes an additional parameter, hence releasing the constraint of mean and variance being equal. This regression is argued to be a better solution for over-dispersed data sets: in other words, when the variability of the data is greater than it would be expected with a theoretical model.

In order to identify if this issue is present in our model, the usual test that is pursued is the “likelihood-ratio test $\alpha = 0$ ”, where α is the dispersion parameter: if the test returns values of α that are positive and far from 0, then a Negative Binomial is a better solution rather than a Poisson.

Therefore, we modelled the decision tree considering both types of regressions, even if the exploration of the first branch will provide enough $\alpha = 0$ tests to infer that a type of regression is generally better than the other for the given data set.

Eventually, for each explored scenario, we consider four different variants, that remove specific sets of observations: the first variant is the base case, which includes all the 45 observations; afterwards, the “no north” scenario removes all the countries in North Africa (namely Morocco, Tunisia, Egypt, Libya, Algeria). In addition to these variants, the “no ZA” variant removes South Africa from the regression, and the “no north & no ZA” removes both sets.

The decision of separating scenarios also according to different observations is consistent with the different nature of these regions compared to SSA, and will reveal what is the weight of such territories in explaining FDI flows in the continent.

Figure 14 summarizes the decision tree built as a strategy to explore variables and come up with a final econometric model.

We utilize Stata/IC 14.2 for Mac (64-bit Intel) to produce the regressions.

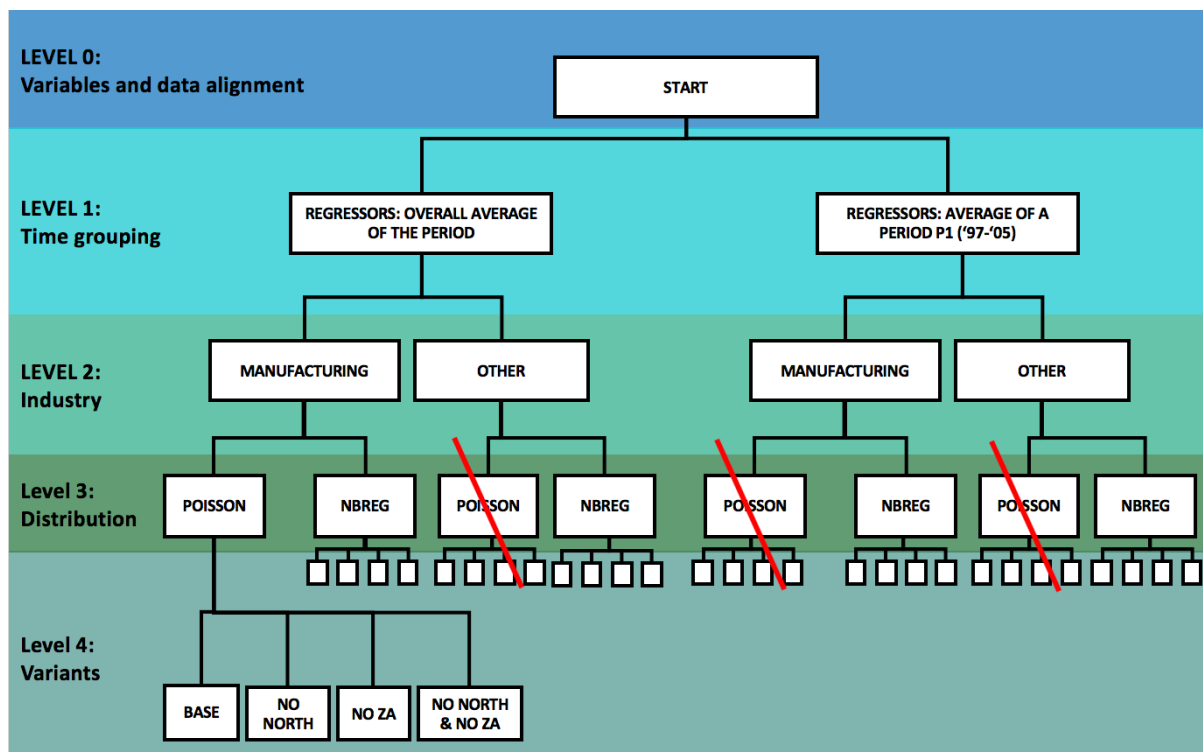


Figure 14. Decision tree representing the strategy to build the econometric model

4.3 Results

4.3.1 Time contingency hypothesis, manufacturing sector, Poisson regression

The first scenario we explore is a Poisson regression for the manufacturing sector, with average values over the whole period (1997-2017): we first explore the so called exogenous factors, that are the natural resources, the market size, and the market attractiveness.

The relationship with natural resources and GDP per capita (market size) is significant and positive, whereas we find a negative sign for the GDP growth: we realize that the set of observations is too small to include indexes that are so similar in nature, therefore we decide to select only market size (namely GDP per capita) and to drop the market attractiveness from our analysis.

We hence add a political variable, namely rule of law, and we divide by 1000 the GDP per capita value, hence turned in logarithmic scale (“log_GDP_cp_avg2”).

Figure 15 shows the preliminary result for the first version of the Poisson regression: the three regressors are significant (P-value below 5%) and positively correlated with the dependent variable. Similarly to the GDP variables, testing two political variables at the same time produces insignificant results, which we can explain again with their similarity and with the number of observations, which is too limited to capture the singular effects.

<pre>poisson manuf_avg natural_avg log_GDP_cp_avg2 rule_law_avg if butta_p1==0 Poisson regression</pre>						
			Number of obs		=	45
			LR chi2(3)		=	1097.51
			Prob > chi2		=	0.0000
			Pseudo R2		=	0.2669
Log likelihood = -1507.5832						
manuf_avg	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
natural_avg	.009198	.001075	8.56	0.000	.0070911	.011305
log_GDP_cp_avg2	.4807866	.0291762	16.48	0.000	.4236023	.537971
rule_law_avg	.6966127	.0650511	10.71	0.000	.5691149	.8241105
_cons	3.271423	.0425231	76.93	0.000	3.188079	3.354767

Figure 15. Time contingency hypothesis, manufacturing sector, Poisson regression.
The impact of natural resources, market size, and rule of law.

We hence move to different variables, starting from trade: unexpectedly, the level of exports of the host country divided by its GDP is negatively correlated with the count of FDI. The effect can be partially explained with the “tariff jumping” phenomenon: the foreign firm is encouraged to invest in an African country in order to avoid trade barriers by localizing production abroad (Blonigen *et al.*, 2004). For the tested sample, this component seems to be

prevalent, with foreign exports being an obstacle for FDI rather than an enabler. Moreover, the addition of the trade variable makes natural resources not significant (P-value > 10%), but the problem doesn't appear in the variant without South Africa. This can be explained by the fact that South Africa is a significant part of the overall FDI in the continent, but is not a resource-rich country: therefore, by removing it, natural resources become a central determinant again. The variants that remove North Africa alone or in addition to South Africa don't produce different results.

The next variable added to the regression is the one proxying infrastructures: unfortunately, the addition of the variable worsens the overall model (which has a lower pseudo- R^2 , which represents how much the dependent variable is explained by regressors overall) and it is negatively correlated with the FDI count. The explanation of this unexpected result is that the variable captures only a component of infrastructures (namely fixed telephone subscriptions), which is not strong enough to capture any effect of the dependent variable: the lack of data on other measurements for infrastructures (such as buildings, roads, bridges, power supplies, etc.) makes the regressor a poor representation of the country factor. However, before drawing conclusions on this index, we will test if this inconsistency appears also in the other scenarios.

The last tested variables are inflation and literacy: despite being both significant and positively correlated with the FDI count when added singularly, the former has an impact on natural resources, which becomes non-significant in all the variants, included the one without South Africa. We hence decide to keep only the literacy variable, and eventually try to switch the political index ("rule of law") with another one ("control of corruption"): both results are relevant and produce the expected results.

For the case of rule of law, which mirrors the governments' behaviour on intellectual property rights (IPR), all the variants (without South Africa, North Africa, and both of them) produce good results, whereas for the case of control of corruption, only some of the variants produce a solution that is not worse than the base one. Moreover, the pseudo- R^2 value is over 55%.

Overall, we have a first confirmation of the hypothesis raised by literature of political indexes being crucial for FDI in the particular context of Africa: both a low level of corruption and a good management of IPR are enablers for foreign direct investments, as well as market size, natural resources, trade level, and literacy. Moreover, we have a first demonstration on the effect that South Africa produces alone on the overall FDI count.

Figure 16 depicts the final results for the first branch of the decision tree.

poisson manuf_avg natural_avg log_GDP_cp_avg2 rule_law_avg trade_avg literacy_avg if butta_p1==0						
Poisson regression						
				Number of obs	=	45
				LR chi2(5)	=	2264.40
				Prob > chi2	=	0.0000
				Pseudo R2	=	0.5506
Log likelihood = -924.13691						
manuf_avg	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
natural_avg	.004184	.0015334	2.73	0.006	.0011785	.0071895
log_GDP_cp_avg2	.7808711	.0606843	12.87	0.000	.6619321	.8998101
rule_law_avg	.3557983	.0794057	4.48	0.000	.200166	.5114305
trade_avg	-.0462454	.0018474	-25.03	0.000	-.0498662	-.0426247
literacy_avg	.0315764	.0028405	11.12	0.000	.0260091	.0371438
_cons	3.414247	.244491	13.96	0.000	2.935053	3.893441

Figure 16. Time contingency hypothesis, manufacturing sector, Poisson regression.
The impact of natural resources, market size, rule of law, trade, and literacy.

The next step of the analysis is to explore the same industry with the same hypothesis on the time grouping, but with a Negative Binomial regression.

4.3.2 Time contingency hypothesis, manufacturing sector, Negative Binomial regression

We explore the different regressor in the same order utilized for the Poisson distribution, but we substitute it with a Negative Binomial regression: a first test of natural resources produces a value of α of more than 3000, strongly suggesting that the hypothesis of a Poisson regression is not correct due to over dispersion. However, the regressor is not significant (P-value over 50%): the results are slightly better in the variants without South Africa and North Africa, but not significant yet. The addition of the GDP per capita slightly improves the solution, but natural resources are still not significant; the addition of GDP growth produce a result which is similar to the previous scenario, hence we decide to keep only GDP per capita as before.

We now test all the five political regressors singularly, each of them in the four variants (without South Africa, North Africa, and both of them): the general trend is that removing South Africa makes the solution less significant, meaning that the country is highly affected by political regressors, whereas removing North Africa slightly improves the solution. Out of the five political indexes tested, control of corruption seems to be the worst fit across the four variants, being not significant and with unexpected negative sign for the four variants.

As for government effectiveness, it is positively correlated with the FDI count, but it makes the GDP variable insignificant, so we decide to discard it, since the exogenous variable is believed to be an essential variable for the regression. Rule of law and political stability also don't produce satisfying results, with great variability in terms of sign and relevance. The best

fit seems to be the one with regulations' quality, which is related with government's decisions in support of the development of the local private sector.

Figure 17 shows the base case for the regressor “*reg_qual_avg*”: all the signs of the variables are as expected, but natural resources are not significant (P-value of 15%).

Negative binomial regression				Number of obs	=	45
				LR $\chi^2(3)$	=	21.36
Dispersion = mean				Prob > χ^2	=	0.0001
Log likelihood = -189.79814				Pseudo R2	=	0.0533
manuf_avg	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
natural_avg	.0095388	.0080893	1.18	0.238	-.0063159	.0253936
log_GDP_cp_avg2	.5118251	.2364562	2.16	0.030	.0483794	.9752708
reg_qual_avg	.7691556	.3645214	2.11	0.035	.0547068	1.483604
_cons	3.221251	.3536681	9.11	0.000	2.528074	3.914428
/lnalpha	.3238095	.1957715			-.0598956	.7075145
alpha	1.382384	.2706314			.9418628	2.028942
LR test of alpha=0: $\chi^2(01)$ = 2021.00				Prob >= χ^2 = 0.000		

Figure 17. Time contingency hypothesis, manufacturing sector, Negative Binomial regression.
The impact of natural resources, market size, and quality of regulations.

The following step is to add the trade variable: we decided to test the four variants both for the case of quality of regulations and rule of law as political regressors, since we were not sure that the tests accomplished alone were enough to choose quality of regulation as a unique political variable. As expected, the best results come from the alternative of quality of regulations, which is hence confirmed as political variable for this scenario.

Moreover, the test of infrastructures doesn't produce positive results across the four variants; however, differently from the Poisson scenario, the inflation rate seems to be a good predictor for FDI flows. As shown in Figure 18, all regressors are significant and have the expected sign; moreover, the variants without South Africa and North Africa are relevant as well: the former is even slightly better than the base case, whereas the latter is worse. The pseudo- R^2 (10%) value has significantly decreased comparing it with the Poisson scenario, but it is the highest value yet registered with the Negative Binomial.

```

nbreg manuf_avg natural_avg log_GDP_cp_avg2 reg_qual_avg trade_avg infl_avg if butta_p1==0
Negative binomial regression      Number of obs      =      45
                                LR chi2(5)              =      41.07
                                Prob > chi2              =      0.0000
                                Pseudo R2               =      0.1024
Dispersion      = mean
Log likelihood = -179.93889

```

manuf_avg	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
natural_avg	.0114366	.0060951	1.88	0.061	-.0005095	.0233827
log_GDP_cp_avg2	.5506789	.2146767	2.57	0.010	.1299203	.9714376
reg_qual_avg	1.644737	.4003188	4.11	0.000	.8601267	2.429348
trade_avg	-.031303	.0085636	-3.66	0.000	-.0480874	-.0145186
infl_avg	.0022693	.0007478	3.03	0.002	.0008037	.003735
_cons	5.002685	.5584456	8.96	0.000	3.908152	6.097219
<hr/>						
/lnalpha	-.0630303	.2115683			-.4776965	.3516359
<hr/>						
alpha	.938915	.1986446			.6202104	1.421391
<hr/>						
LR test of alpha=0: chibar2(01) = 910.86				Prob >= chibar2 = 0.000		

Figure 18. Time contingency hypothesis, manufacturing sector, Negative Binomial regression.
The impact of natural resources, market size, quality of regulations, trade, and inflation.

The next step of the analysis is to investigate if the addition of inflation as a regressor is positive for the solution in an absolute way, or if the addition of other regressors greatly improves the solution as well: in other words, we test if the effect of inflation is actually relevant, or if it is the generic addition of a variable what makes the solution relevant.

We start by adding the literacy variable, both with and without inflation: the first solution is definitely worse than the case of inflation only, whereas the second one has only the problems of P-values for GDP and natural resources, which are around 15%.

Substituting political and GDP indexes doesn't help solving the aforementioned problems, hence we consider the solution depicted in *Figure 18* as the final one for the scenario.

The exploration of this scenario unveiled the presence of inflation as a positive determinant, which has been instead classified ambiguously in literature, from a negative (Asiedu, 2002) to a non-significant effect (Fiodendji, 2013). However, we believe that the effect is strongly related with the timespan of the analysis, and that what appears from the regression is the short-term impact of inflation as a determinant for FDI, which is not necessarily positive in the long run (Dondashe and Phiri, 2018). Moreover, we have a confirmation of the tariff jumping hypothesis for trade as an important determinant for FDI attraction (Blonigen, 2005).

Eventually, political factors are confirmed as crucial determinants: in particular, the quality of regulations seems to be the most relevant contributor to FDI flows, with a bigger impact than corruption and political stability, coherently with other literature papers on institutional quality in Africa (Fiodendji, 2013).

We now move to a different scenario, which puts together the primary and service sectors instead of the manufacturing one, and we explore if different sets of regressors are needed and what is their impact.

4.3.3 Time contingency hypothesis, other sectors, Negative Binomial regression

The last analysis accomplished for the hypothesis of time contingency between regressors and dependent variable is on the primary and service sectors.

The first test is with natural resources: as expected, the variable is less significant than in the manufacturing sector; moreover, the fourth variant (without both South Africa and North Africa) provides the worst solution, meaning that the relevance decreases when taking into account SSA only.

The addition of the GDP indexes slightly improves the result for the natural resources index, but it is still not quite significant. In particular, differently from the Poisson scenarios, the GDP growth index is positive but not significant: we hence decide to discard it also for this scenario and continue with the GDP per capita only, following the assumption of diversification of regressors.

We then adopted the same approach as before for political indexes, which is to test them singularly to have a first understanding of which one would be the best fit for the regression, since we assumed that the data set constrain us to utilize only one of them.

Government effectiveness and regulations quality seem again to be the best fit for the regression, even if the former is slightly worse, since natural resources and GDP become non-significant. What is interesting is the test of the same political indexes without natural resources: eliminating the index makes the two political regressors almost identical, being both significant and positively correlated with the FDI count. Moreover, all the other variables are significant as well. It appears evident that natural resources are not a good predictor for the selected sectors as they are for the manufacturing one.

We then move to the addition of infrastructure, inflation, and literacy: the number of fixed telephone subscriptions is confirmed to be a bad measure for the model, in the same way as the previous scenarios. On the other hand, inflation and literacy perform well, despite the latter generates problems in the other variables.

Once again, instead of testing different political indexes and GDP-related ones with only literacy, in order to understand if the inflation effect is as relevant as it seems, we decide to repeat the test removing natural resources from the model.

Figure 19 shows the results: surprisingly, all the regressors are significantly related with the dependent variable without the presence of the inflation component.

nbreg other_avg log_GDP_cp_avg2 reg_qual_avg trade_avg literacy_avg if butta_p1==0		Negative binomial regression		Number of obs	=	45
				LR chi2(4)	=	38.71
Dispersion = mean				Prob > chi2	=	0.0000
Log likelihood = -220.6999				Pseudo R2	=	0.0806

other_avg	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
log_GDP_cp_avg2	.4789261	.190039	2.52	0.012	.1064565	.8513957
reg_qual_avg	.80655	.2822108	2.86	0.004	.2534271	1.359673
trade_avg	-.0217729	.0076901	-2.83	0.005	-.0368453	-.0067006
literacy_avg	.0213647	.009417	2.27	0.023	.0029076	.0398218
_cons	4.152811	.7172778	5.79	0.000	2.746972	5.55865

/lnalpha	-.1501664	.198231			-.538692	.2383592
alpha	.8605648	.1705906			.583511	1.269165

LR test of alpha=0: chibar2(01) = 2155.04		Prob >= chibar2 = 0.000	
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Figure 19. Time contingency hypothesis, other sectors, Negative Binomial regression.
The impact of market size, quality of regulations, trade, and literacy.

Therefore, from this scenario we obtain new findings: FDI directed to an industry that is different from the manufacturing one, and that primarily corresponds to the service one, are less impacted by natural resources. Moreover, the same FDI are both impacted by the effectiveness of government and the quality of regulations. Eventually, for the service sector the human capital has a more central role to play, with the adult literacy rate being a significant determinant that positively affects the FDI count.

4.3.4 Time discrepancy hypothesis, manufacturing sector, Negative Binomial regression

After analysing the different country variants, industries, and distributions for the time contingency hypothesis, we move to the same analysis with a different assumption: all regressors of the first part of the sample (1997-2005), called “ $p1$ ”, are responsible for FDI flows of the second part of the same sample (2006-2017), called “ $p2$ ”. In other words, foreign investors don’t only look at the current situation of the target country to make their investment decision, but they are rather influenced by the economic, political, and social environment of the period immediately before such decision.

We hence start with the manufacturing industry, but we decide to discard the Poisson alternative *a priori*, since we gathered enough results of the $\alpha = 0$ test to infer that the Negative Binomial is a better alternative.

Before exploring the model, we point out that the new hypothesis entails a massive loss of data for what concerns the dependent variable: if before we had 45 observations across 21 years, we now span over 12 years only. Therefore, especially for what concerns the country variants (namely no South Africa, no North Africa, and no both of them), we expect to obtain less accurate results than in the previous scenarios, since we further reduce the number of observations of an already restricted model (respectively to 44, 40, and 39 observations).

The main objective of the analysis is to verify if the obtained findings are consistent with a different time categorization both of regressors and of the dependent variable: since the data set is less rich, obtaining solutions that are close to the previous ones would be a good result.

We decide to keep the same process to explore regressors, in order to make the two solutions comparable: we hence start with natural resources, then test the GDP variables, and add singularly the five political ones.

Figure 20 shows the final result of this first phase: as expected, the regression is slightly more fragile, especially in the variants without South and North Africa. However, we obtain good results with the addition of the quality of regulations index, which proves to be an important determinant for FDI in Africa.

nbreg manuf_avg_p2 natural_avg_p1 log_GDP_cp_avg2_p1 reg_qual_avg_p1 if butta_p1==0					
Negative binomial regression		Number of obs		=	45
		LR chi2(3)		=	18.12
Dispersion = mean		Prob > chi2		=	0.0004
Log likelihood = -180.59556		Pseudo R2		=	0.0478
manuf_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
natural_avg_p1	.0104998	.0079978	1.31	0.189	-.0051756 .0261753
log_GDP_cp_avg2_p1	.3685305	.2202443	1.67	0.094	-.0631404 .8002014
reg_qual_avg_p1	.797164	.3743678	2.13	0.033	.0634167 1.530911
_cons	3.095971	.3427741	9.03	0.000	2.424146 3.767796
/lnalpha	.3124793	.2009542			-.0813837 .7063422
alpha	1.36681	.2746661			.9218399 2.026565
LR test of alpha=0: chibar2(01) = 1505.55		Prob >= chibar2 = 0.000			

Figure 20. Time discrepancy hypothesis, manufacturing sector, Negative Binomial regression.
The impact of natural resources, market size, and quality of regulations.

The addition of the trade and infrastructure variables provide the expected results: the tariff jumping effects continues to be relevant, and the number of fixed telephone subscriptions not representative of the infrastructure factor. Moreover, in a way that is similar to all the previous scenarios, the addition of the inflation components causes a substantial improvement of the

regression, this time not further improved in the 3 country variants, for the mentioned reasons of the reduced observations.

Eventually, the addition of the literacy component provides an overall positive solution, depicted in *Figure 21*: despite literacy and natural resources not being significant, we obtain a general positive picture for all the other regressors. Moreover, an additional test without inflation and with a change of political regressors from quality of regulations to government effectiveness makes the literacy component significant as well.

```
nbreg manuf_avg_p2 natural_avg_p1 log_GDP_cp_avg2_p1 reg_qual_avg_p1 trade_avg_p1 infl_avg_p1 literacy_avg_p1 if butta_p1==0
Negative binomial regression
```

Number of obs	=	45
LR chi2(6)	=	30.10
Prob > chi2	=	0.0000
Pseudo R2	=	0.0794

```
Dispersion = mean
Log likelihood = -174.60374
```

	manuf_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
natural_avg_p1		.0102185	.0067534	1.51	0.130	-.0030179 .023455
log_GDP_cp_avg2_p1		.4694215	.2246507	2.09	0.037	.0291143 .9097288
reg_qual_avg_p1		1.10424	.406853	2.71	0.007	.306823 1.901658
trade_avg_p1		-.023508	.0079538	-2.96	0.003	-.0390972 -.0079187
infl_avg_p1		.0163899	.008169	2.01	0.045	.000379 .0324008
literacy_avg_p1		.1057118	.096327	1.10	0.272	-.0830858 .2945093
_cons		3.362582	.8306256	4.05	0.000	1.734585 4.990578
/lnalpha		.069791	.2118321			-.3453922 .4849743
alpha		1.072284	.2271442			.7079426 1.624133

```
LR test of alpha=0: chibar2(01) = 692.19      Prob >= chibar2 = 0.000
```

*Figure 21. Time discrepancy hypothesis, manufacturing sector, Negative Binomial regression.
The impact of natural resources, market size, and quality of regulations, trade, inflation, and literacy.*

As expected, the general behaviour of the regressors is similar to the one of the hypothesis of time contingency, but the final solution is slightly negatively impacted by the reduced number of data. In the next section we conclude the analysis by exploring the service and primary sectors in the new time grouping scenario.

4.3.5 Time discrepancy hypothesis, other sectors, Negative Binomial regression

In the final step of the analysis, we decided to point our attention even more closely to the issue of natural resources: we want to have a further confirmation of their less crucial role to play as a determinant for the service sector, and analyse if new political regressors are significant.

As expected, the first test on natural resources only provides a non-significant solution, despite the sign of the regressor being correct (positive). The addition of the GDP variables confirms what has been argued for the previous scenarios: once again, two GDP indexes at the same time are not supported by the model, hence we keep the GDP per capita one, which is more widely utilised in literature (Asiedu, 2002; Asiedu, 2005; Fiodendji, 2013).

Surprisingly, the GDP per capita index is also not negatively affected by the reduction of observations coming from the exclusion of North Africa, despite the higher fragility of the data set. We can conclude that market size is confirmed a good predictor for FDI flows in Africa.

The singular tests of the five political factors provide results that are very similar to previous scenarios: the quality of regulations seems to be the only good predictor for the FDI count in the service and primary sectors.

However, the same test without the natural resources variable provides surprising results: government effectiveness, political stability, and quality of regulations appear significant. As expected, the addition of a second political index reveals to be inconsistent both in the case of keeping the natural resources index and by eliminating it. In other words, we have a confirmation that the model is not rich enough to keep two political regressors at the same time, despite they are both significant when added singularly.

The less relevant role of natural resources is also confirmed in the test of the trade variable: when eliminating natural resources, the addition of the trade variable not only improves the overall solution, but it works both for the case of quality of regulations and government effectiveness. The two solutions are set out in *Figure 22* and *Figure 23*.

nbreg other_avg_p2 log_GDP_cp_avg2_p1 reg_qual_avg_p1 trade_avg_p1 if butta_p1==0		Negative binomial regression		Number of obs	=	45
Dispersion = mean		Log likelihood = -219.2598		LR chi2(3)	=	26.06
				Prob > chi2	=	0.0000
				Pseudo R2	=	0.0561
other_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
log_GDP_cp_avg2_p1	.6704847	.2090355	3.21	0.001	.2607826	1.080187
reg_qual_avg_p1	.7928192	.32318	2.45	0.014	.1593981	1.42624
trade_avg_p1	-.0165177	.0081702	-2.02	0.043	-.032531	-.0005044
_cons	5.092704	.4614952	11.04	0.000	4.188191	5.997218
/lnalpha	.1112509	.1953414			-.2716113	.4941132
alpha	1.117675	.2183283			.7621505	1.639044
LR test of alpha=0: chibar2(01) = 2506.25				Prob >= chibar2 = 0.000		

Figure 22. Time discrepancy hypothesis, other sectors, Negative Binomial regression.
The impact of market size, quality of regulations, and trade.

nbreg other_avg_p2 log_GDP_cp_avg2_p1 gov_eff_avg_p1 trade_avg_p1 if butta_p1==0		Negative binomial regression		Number of obs	=	45
				LR chi2(3)	=	25.71
Dispersion = mean				Prob > chi2	=	0.0000
Log likelihood = -219.43429				Pseudo R2	=	0.0553

other_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
log_GDP_cp_avg2_p1	.571733	.2385367	2.40	0.017	.1042097	1.039256
gov_eff_avg_p1	.8675898	.3793251	2.29	0.022	.1241263	1.611053
trade_avg_p1	-.0169316	.0083782	-2.02	0.043	-.0333526	-.0005105
_cons	5.178969	.4830469	10.72	0.000	4.232214	6.125723
/lnalpha	.1179496	.1951009			-.2644412	.5003403
alpha	1.125187	.2195251			.7676348	1.649282

LR test of alpha=0: chibar2(01) = 2489.67	Prob >= chibar2 = 0.000
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Figure 23. Time discrepancy hypothesis, other sectors, Negative Binomial regression.
The impact of market size, government effectiveness, and trade.

On the other hand, we have an additional confirmation of the low quality of the infrastructure index, as once again it doesn't produce a good solution, neither by removing natural resources.

The final step of the scenario is the exploration of the inflation and literacy indexes: as expected, the addition of inflation improves the solution, as well as the subsequent addition of literacy, despite having a slight increase of the P-values of some of the variables (*Figure 24*).

nbreg other_avg_p2 natural_avg_p1 log_GDP_cp_avg2_p1 reg_qual_avg_p1 trade_avg_p1 infl_avg_p1 literacy_avg_p1 if butta_p1==0		Negative binomial regression		Number of obs	=	45
				LR chi2(6)	=	35.26
Dispersion = mean				Prob > chi2	=	0.0000
Log likelihood = -214.65865				Pseudo R2	=	0.0759

other_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
natural_avg_p1	.0115334	.0061879	1.86	0.062	-.0005947	.0236614
log_GDP_cp_avg2_p1	.5796383	.1859424	3.12	0.002	.215198	.9440787
reg_qual_avg_p1	1.120146	.3386592	3.31	0.001	.456386	1.783906
trade_avg_p1	-.0189696	.0071654	-2.65	0.008	-.0330135	-.0049258
infl_avg_p1	.0146221	.00861	1.70	0.089	-.0022531	.0314974
literacy_avg_p1	.1438758	.0947288	1.52	0.129	-.0417893	.3295409
_cons	3.75392	.8151796	4.61	0.000	2.156198	5.351643
/lnalpha	-.0614978	.2001753			-.4538343	.3308386
alpha	.940355	.1882359			.635188	1.392135

LR test of alpha=0: chibar2(01) = 2177.05	Prob >= chibar2 = 0.000
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Figure 24. Time discrepancy hypothesis, other sectors, Negative Binomial regression.
The impact of natural resources, market size, quality of regulations, trade, inflation, and literacy.

However, the importance of literacy is confirmed in an even stronger way than the time contingency scenario: when removing inflation, all the P-values are constant and the

regressors' signs stable. Moreover, when removing both inflation and natural resources, we obtain consistent solutions not only for the quality of regulations, but also for the government effectiveness. This stands as an additional confirmation of the greater effect of human capital as a determinants for FDI in the service sector: as a matter of fact, the literacy rate, which in the manufacturing sector wasn't a strong regressor, is able to explain significantly FDI flows even without the contribution of important determinants such as natural resources and inflation, regardless the political index utilised (*Figure 25*).

```
nbreg other_avg_p2 log_GDP_cp_avg2_p1 gov_eff_avg_p1 trade_avg_p1 literacy_avg_p1 if butta_p1==0
Negative binomial regression
```

		Number of obs	=	45
		LR $\chi^2(4)$	=	29.04
Dispersion	= mean	Prob > χ^2	=	0.0000
Log likelihood	= -217.77033	Pseudo R2	=	0.0625

other_avg_p2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
log_GDP_cp_avg2_p1	.5966948	.2344179	2.55	0.011	.1372441 1.056146
gov_eff_avg_p1	.7181265	.3741364	1.92	0.055	-.0151673 1.45142
trade_avg_p1	-.0184133	.008226	-2.24	0.025	-.034536 -.0022906
literacy_avg_p1	.1556782	.0903787	1.72	0.085	-.0214608 .3328172
_cons	4.011455	.8111948	4.95	0.000	2.421543 5.601368
/lnalpha	.056007	.1968897			-.3298897 .4419036
alpha	1.057605	.2082315			.7190031 1.555666


```
LR test of alpha=0: chibar2(01) = 2361.33      Prob >= chibar2 = 0.000
```

*Figure 25. Time discrepancy hypothesis, other sectors, Negative Binomial regression.
The impact of market size, government effectiveness, trade, and literacy.*

In the next section we summarize the results of the econometric model, highlighting the main findings and comparing them with existent literature of FDI in Africa. We eventually provide insights on possible policy implications.

4.4 Conclusion

The mathematical model has provided some findings that complete the literature analysis on FDI in Africa and provide insights on specific determinants for future work.

Finding 1: “Political factors matter”.

The analysis of literature of FDI determinants in the African continent resulted in a general growing interest for political and institutional host country factors: the excessive attention to market size and natural resources of the first literature works has been increasingly substituted by studies that focus on the political aspect as a leverage for FDI attraction and impact (Asiedu, 2005; Anyanwu, 2011; Fiodendji, 2013; Pérez-Villar and Seric, 2014; Farole and Winkler, 2014c; Dondashe and Phiri, 2018).

The econometric analysis has strongly highlighted the weight of political indexes as significant and positive determinants for FDI flows in the past 20 years: in particular, the quality of regulations (“*reg_qual_avg*”) resulted as the most solid indicator for institutional quality, better than widely used indexes such as control of corruption and political stability.

The finding is the same of Fiodendji, 2013, which suggests as a policy implication to keep in control the regulatory burden, to assure the correct development of the private sector and increase the chance of FDI. Moreover, the importance of the actions of governments is confirmed by government effectiveness index (“*gov_eff_avg*”) being the second political index by importance in the model: as a matter of fact, the two indexes represent different points of view of the same issue. The former captures the government’s attention and commitment to policies, the latter the utilization of such policies to support the development of the local private sector.

Another aspect that we aimed to capture in the econometric model is that a tailored approach towards sectors is needed when analysing FDI determinants, especially in a dynamic context such as Africa.

Finding 2: “The target sector matters”.

The econometric model showed that natural resources resulted a crucial determinant for the manufacturing sector, whereas they occupied a less central role in the service industry, despite the mild presence in the scenario of the primary sector (highly dependent on resources).

Moreover, not only natural resources resulted not as significant as in the manufacturing scenario, but they appeared to hinder the effect of political indexes: as matter of fact, when we removed “*natural_avg*” from the regressions, both in the time contingency and time discrepancy hypothesis, most of the political factors became significant when tested singularly.

Another aspect that emerged from the industry-specific analysis is the importance of the level of literacy for the service industry: if for the manufacturing sector the index was positively correlated with FDI flows but not always significant, in all the analysis concerning the service sector it revealed to be central. Eventually, the inflation index registered lower levels of significance with respect to the manufacturing sector.

As a consequence, despite the target country being the same, the different industries seem to require specific conditions to attract investors and to produce an impact in economic development, therefore governments should address policies to specific sector clusters that share a similar environment.

Another confirmation obtained with the econometric model is that the African country embraces an incredible variability of economic, political, and social conditions across the 54 countries: in particular, if North Africa is often discarded from the analysis in literature, South Africa is often included, belonging to the SSA area.

Finding 3: “South Africa is different”.

The decision of including variants in each econometric regression that excluded not only North Africa but also South Africa revealed its incredible weight in determining the set of determinants and their impact: for instance, the non-resource rich nature of South Africa often hindered the relevance of the natural resources index in determining FDI flows; moreover, the political stability of the country often hid the necessity of better governments and policies to attract FDI in the continent. We hence suggest to put more attention to South Africa when analysing the SSA region, as the country produces alone enough FDI flows to possibly bias results.

Eventually, the regression is generally consistent with literature in terms of set of variables and of the correlation signs with the dependent variable. However, a couple of exceptions shed light on aspects that may be underestimated in literature:

Finding 4: “Trade protection is to be taken in consideration”

Finding 5: “Inflation is not always negatively correlated with FDI”

The fourth finding is related with the consistently negative sign of the trade variable: FDI seem to be attracted to countries that don't have extensive exports. As mentioned several times throughout the dissertation, there is a phenomenon that explains the negative effect that trade often generates on FDI flows, called tariff jumping: when the target African country applies trade protection measures, the foreign firm is encouraged to invest and localize the production abroad to avoid them (Blonigen *et al.*, 2004). The phenomenon is often underestimated in literature, and it could be deeply explored in future works.

The fifth finding is also related with an unexpected regressor sign: inflation appears as a positive determinant mostly throughout all scenarios, which is not consistent with most literature on FDI, where it is argued to have a negative influence (Asiedu, 2002).

However, in Dondashe and Phiri, 2018 the macroeconomic instability of the target country is argued be greatly variable according to the timespan utilised: in particular, it seems to produce a short-term positive effect on FDI, but to be generally negative in the long run.

This finding is consistent to our econometric analysis: as a matter of fact, the relevance of inflation as a positive determinant greatly decreases from the time contingency to the time discrepancy scenarios. In other words, under the hypothesis of having the inflation rate as a determinant of FDI for the same time period, inflation revealed to be positively correlated, whereas the impact of the same variable on a subsequent period (namely the following 12 years) turned out to be lower. Therefore, possible policy implications on inflation rate must be cautious, since the index proxies macroeconomic instability in a way that depends on how the model is designed, and on the time span of the analysis.

Eventually, we draw some consideration on the structure of the econometric model, highlighting the points of strength and the major limitations.

The main point of strength of the model is the consistency of results registered across the various scenarios: as a matter of facts, the design of the data set, despite fragile due to the limited number of observations, proved to be consistent both across different type of regressions (namely Poisson and Negative Binomial) and on a strong hypothesis on the time grouping of the variables (namely time contingency and time discrepancy hypothesis).

As for the type of regressions, we registered a higher fragility for the Negative Binomial scenarios, since it eliminated the great variability of FDI flows, which attributed more weight to countries like South Africa, which registered very high level of FDI inflows. However, across all scenarios, all the regressors had the same sign and significance as the Poisson scenario, despite generating a lower value of pseudo- R^2 .

The same fragility emerged in the time discrepancy scenarios, which is justified by the great reduction of data from 21 years of observation to 9 for the case of regressors, and 12 for the case of the dependent variable. The fragility appeared even more evident in the variant that excluded both North Africa and South Africa, since the limited number of data spanned across a lower number of observations (39 instead of 45).

However, not only the scenarios were consistent with the previous ones, but they sometimes revealed trends of regressors that were less evident in the time contingency hypothesis. For instance, the positive impact of the literacy rate for the service sector was much more evident for the second analysis, as it is shown by a comparison of *Figure 21* and *Figure 25*.

The econometric model showed also several drawbacks, which limited the analysis and reduced the accuracy of results.

The first great drawback is the massive utilization of average values: the extensive number of missing values both for regressors and for the FDI count forced us to create average values, so that all the observations (namely the 54 African countries) could be represented.

Nonetheless, an additional work of data alignment forced us to reduce the number of observations to 45, to assure comparability over the different scenarios. Moreover, the presence of sporadic missing values brought us to modify the database not to lose further observations: once again, the missing values have been obtained with an average over the remaining observations, not to affect the overall average value of the regressor, but the decision may have further reduced the relevance of the data set.

Eventually, the database and the statistic distributions utilized generated great limitations in the number and type of regressors that could be added at the same time to the model: both political indexes (namely control of corruption, government effectiveness, political stability, rule of law, quality of regulations) and GDP-related indexes (GDP per capita, yearly GDP growth) couldn't be fully introduced in the regression, since their high correlation would hinder the overall result instead of generating an additional relevant effect. The limitation has been partly resolved with a different number of separated tests, that highlighted the weight of the variables singularly, even though they couldn't all appear in the final regressions.

The dissertation aimed at investigating the main determinants of foreign direct investments (FDI) for the particular environment of the African continent, and their impact on local economies.

We have provided an extensive literature review of the phenomenon, and drawn attention on particular aspects that could be useful for future works on the subject.

We believe that the issue will acquire more attention and produce an impact, since the African continent is in true need for investments that sustain the economic development of the country, and FDI have been shown to be one of the most effective means to pursue this objective.

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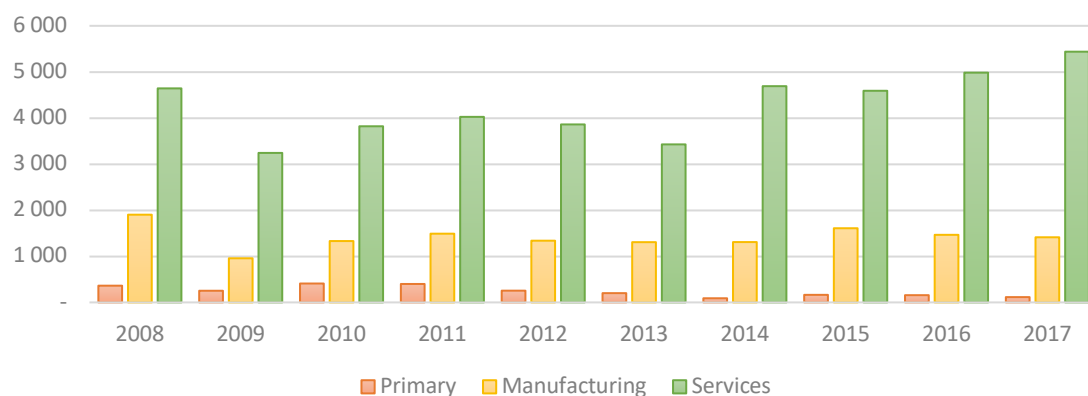
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Annex 1: World M&A purchases

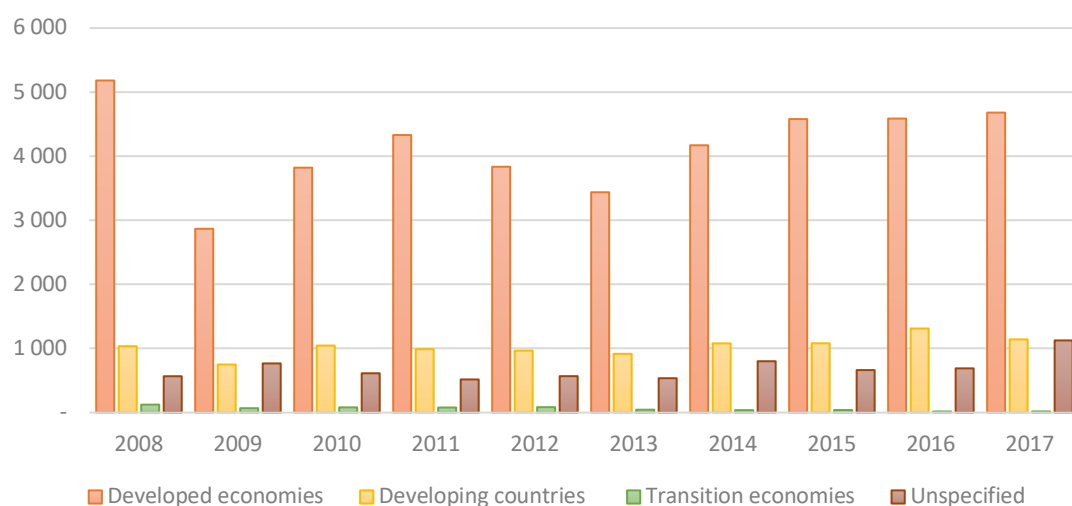
1. N° net M&A purchases by sector (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	363	253	410	400	255	201	90	164	157	115
Manufacturing	1 903	957	1 331	1 491	1 339	1 307	1 309	1 609	1 466	1 413
Services	4 643	3 243	3 821	4 025	3 861	3 428	4 691	4 591	4 984	5 439
Total	6 909	4 453	5 562	5 916	5 455	4 936	6 090	6 364	6 607	6 967



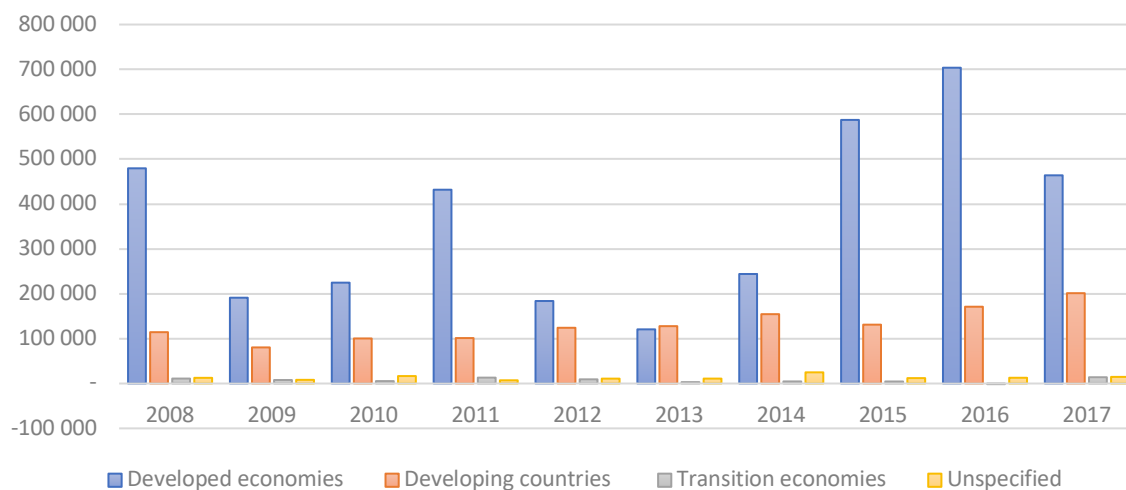
2. N° net M&A purchases by regions (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Developed economies	5 182	2 868	3 822	4 331	3 836	3 438	4 171	4 580	4 588	4 681
Developing countries	1 036	750	1 046	989	967	917	1 080	1 081	1 312	1 142
Transition economies	124	68	81	79	84	45	38	40	17	18
Unspecified	567	767	613	517	568	536	801	663	690	1 126
World	6 909	4 453	5 562	5 916	5 455	4 936	6 090	6 364	6 607	6 967



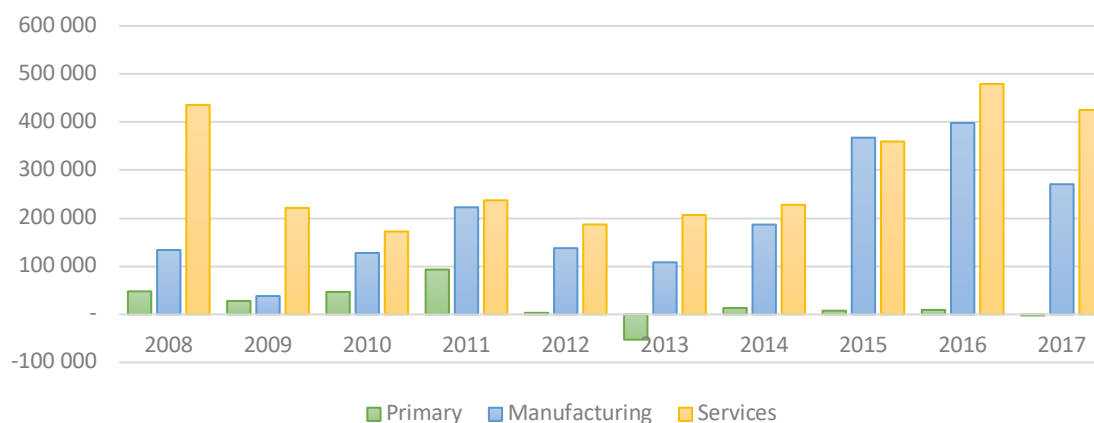
3. Value net M&A purchases by regions (\$ millions) (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Developed economies	479 590	191 214	224 759	431 899	183 858	120 683	244 077	587 455	703 781	463 956
Developing countries	114 408	80 445	100 378	101 277	124 198	127 824	154 536	131 153	171 139	201 302
Transition economies	11 005	7 789	5 378	13 108	9 296	3 074	4 636	4 501	- 809	13 948
Unspecified	12 645	8 170	16 580	7 158	10 872	10 936	24 877	12 017	12 791	14 755
World	617 649	287 617	347 094	553 442	328 224	262 517	428 126	735 126	886 901	693 962



4. Value net M&A purchases by sector (adapted from UNCTAD, 2018)

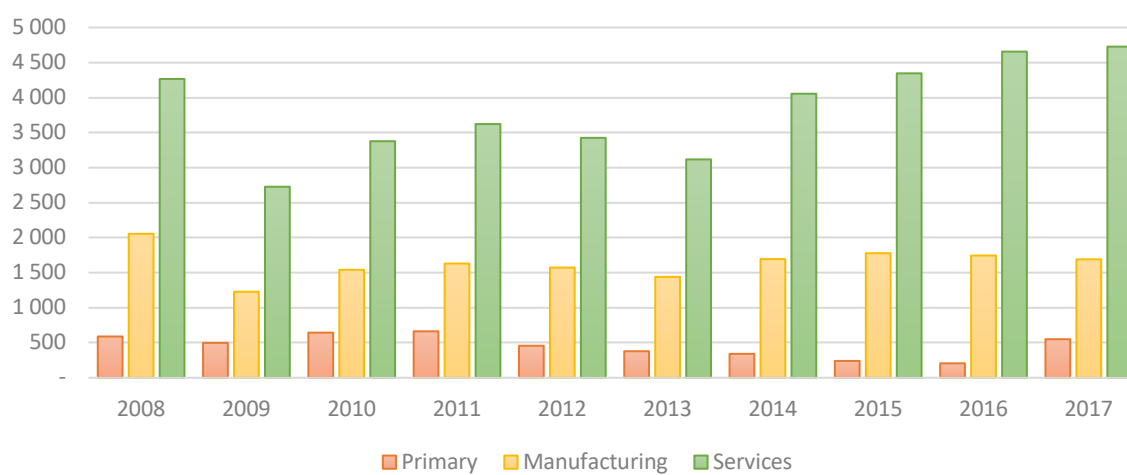
Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	47 927	27 914	46 838	93 254	3 309	-52 580	13 319	7 700	9 324	-2 174
Manufacturing	133 981	38 142	127 792	222 833	137 818	108 351	186 855	367 676	398 243	270 808
Services	435 741	221 562	172 464	237 355	187 097	206 746	227 952	359 750	479 334	425 328
Total	617 649	287 617	347 094	553 442	328 224	262 517	428 126	735 126	886 901	693 962



Annex 2: World M&A sales

1. N° net M&A sales by sector (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	589	498	644	663	457	379	341	240	206	550
Manufacturing	2 055	1 228	1 541	1 631	1 573	1 440	1 694	1 778	1 745	1 690
Services	4 265	2 727	3 377	3 622	3 425	3 117	4 055	4 346	4 656	4 727
Total	6 909	4 453	5 562	5 916	5 455	4 936	6 090	6 364	6 607	6 967



2. N° net M&A sales by regions (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Developed economies	4 952	3 067	3 782	4 163	3 918	3 561	4 500	4 837	5 210	5 655
Developing countries	1 589	997	1 286	1 441	1 289	1 197	1 414	1 349	1 233	1 172
Transition economies	368	389	494	312	248	178	176	178	164	140
World	6 909	4 453	5 562	5 916	5 455	4 936	6 090	6 364	6 607	6 967



3. Value net M&A sales by regions (\$ millions) (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Developed economies	474 067	236 784	259 926	436 926	266 773	230 122	293 062	640 762	806 398	568 909
Developing countries	117 713	43 899	83 072	83 551	54 626	87 239	129 357	84 364	75 485	112 350
Transition economies	25 868	6 934	4 095	32 966	6 825	-54 845	5 708	10 000	5 018	12 703

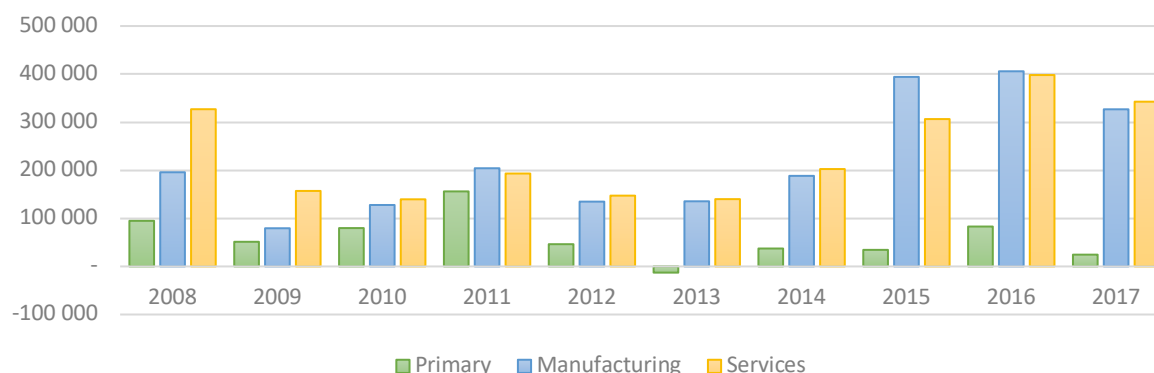
World	617 649	287 617	347 094	553 442	328 224	262 517	428 126	735 126	886 901	693 962
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4. Value net M&A sales by sector (adapted from UNCTAD, 2018)

Sector/industry	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	94 824	51 222	79 751	156 033	46 226	-12 887	37 247	34 432	82 965	24 482
Manufacturing	195 838	79 381	127 775	204 203	134 770	135 454	188 352	394 208	405 883	326 811
Services	326 987	157 014	139 568	193 206	147 228	139 949	202 527	306 486	398 054	342 669

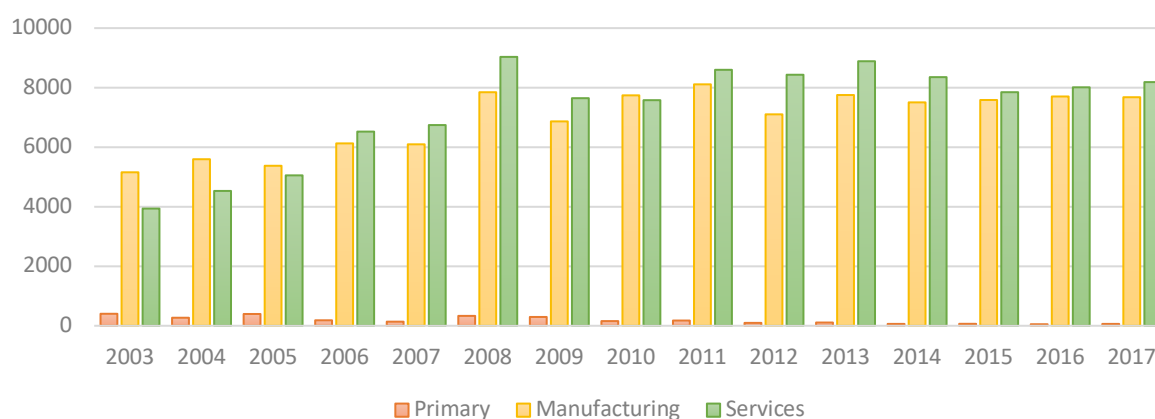
Total	617 649	287 617	347 094	553 442	328 224	262 517	428 126	735 126	886 901	693 962
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Annex 3: World announced greenfield investments

1. N° greenfield investments by sector (adapted from UNCTAD, 2018)

Sector/industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	403	270	396	184	138	332	296	157	176	97	109	63	66	52	63
Manufacturing	5156	5595	5375	6127	6096	7 846	6 866	7 741	8 111	7 103	7 752	7 505	7 585	7 703	7 678
Services	3937	4530	5053	6523	6743	9 033	7 646	7 579	8 599	8 433	8 887	8 353	7 847	8 011	8 186
Total	9496	10395	10824	12834	12977	17 211	14 808	15 477	16 886	15 633	16 748	15 921	15 498	15 766	15 927



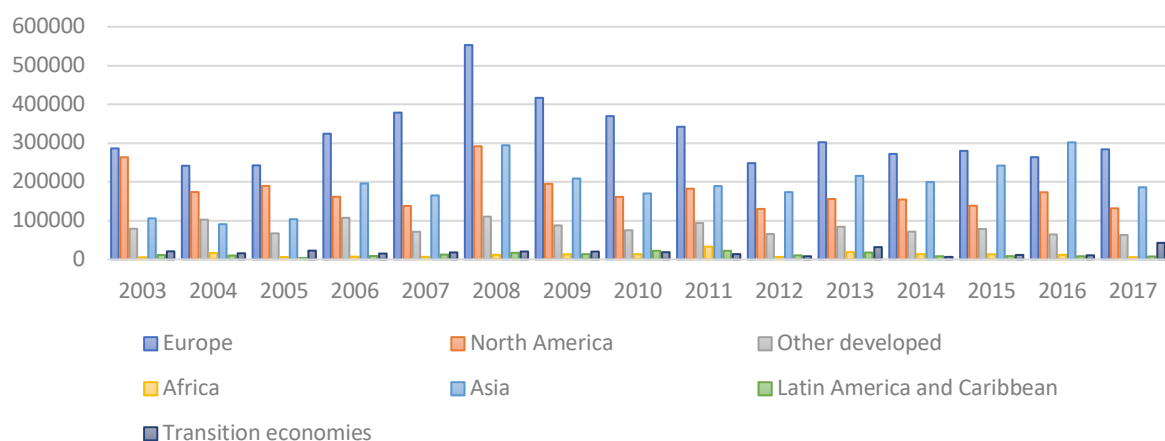
2. N° greenfield investments by regions (adapted from UNCTAD, 2018)

Sector/industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Developed economies	4239	4827	5350	6468	6776	7 994	7 031	7 700	8 041	7 640	8 311	8 412	8 633	8 770	9 296
Developing countries	4507	4894	4598	5604	5407	8 033	6 946	6 882	7 976	7 247	7 610	6 961	6 364	6 423	6 005
Transition economies	750	674	876	762	794	1 184	831	895	869	746	827	548	501	573	626
World	9496	10395	10824	12834	12977	17 211	14 808	15 477	16 886	15 633	16 748	15 921	15 498	15 766	15 927



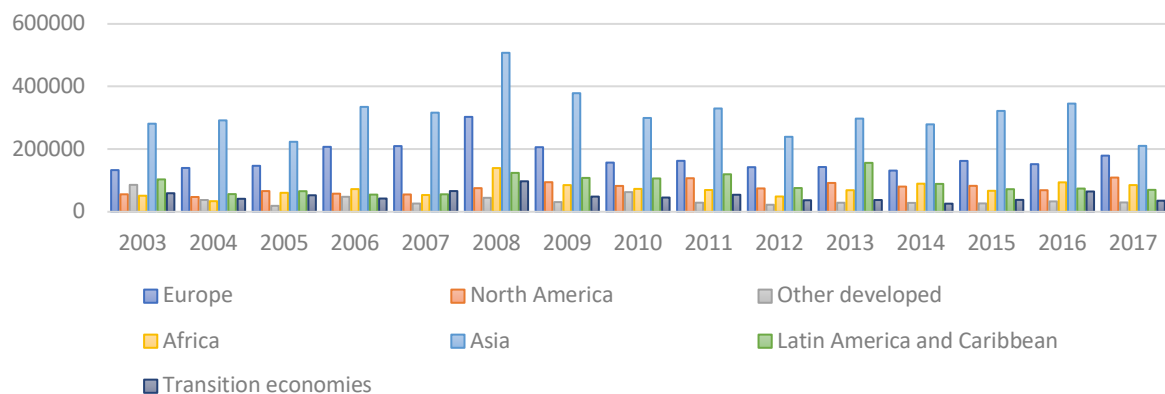
3. Value greenfield investments by source (\$ millions) (adapted from UNCTAD, 2018)

VALUE GREENFIELD INVESTMENTS BY SOURCE (\$ millions)																
Sector/industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
Europe	286278	241507	242483	324189	378632	552 885	416 776	369 543	342 140	248 268	302 261	272 126	279 877	263 674	283 883	
North America	263529	173734	189525	161394	137825	291 759	194 860	161 255	182 304	130 192	155 854	154 493	138 410	173 168	131 727	
Other developed	79021.8	102427	67084.8	107259	71252.1	110 315	87 551	75 024	93 709	65 334	84 195	71 565	78 442	64 376	62 749	
Africa	5319.7	16583.1	5965.09	6972.77	6575.31	11 877	13 274	13 395	32 910	6 413	18 576	13 594	13 279	11 772	5 796	
Asia	105794	90753.3	103608	195833	164972	294 291	208 705	170 019	189 089	173 472	215 430	199 503	241 982	301 857	186 027	
Latin America and Caribbean	11062.2	9920.37	3431.31	8701.34	12308.3	16 971	13 387	22 075	22 083	10 395	17 728	8 109	8 354	7 999	7 539	
Transition economies	20728.2	15653.6	22548.8	15084.4	17878.4	20 280	20 160	18 509	13 566	7 970	31 525	6 417	11 438	10 410	42 613	
World	771732	650579	634646	820044	789443	1298 447	954 799	829 836	875 999	642 045	825 569	725 808	771 989	833 286	720 334	



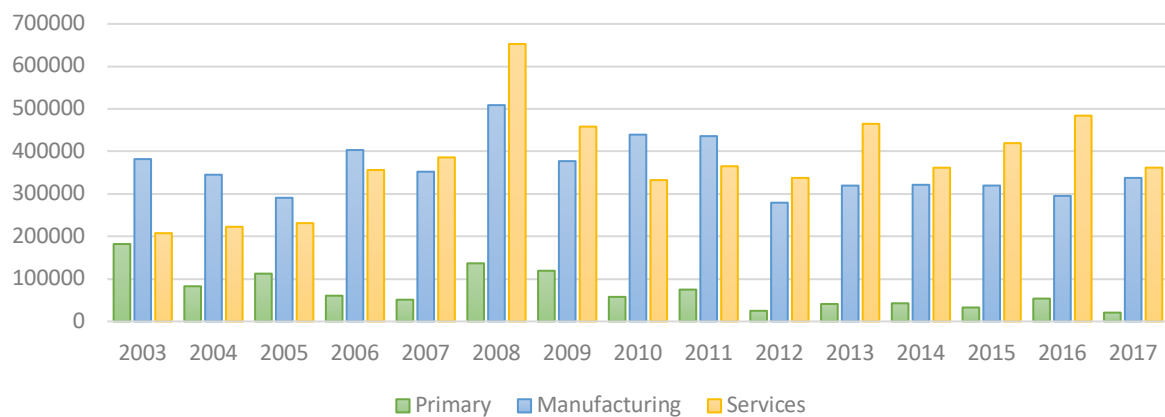
4. Value greenfield investments by destination (\$ millions) (adapted from UNCTAD, 2018)

Sector/industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
Europe	133098	139967	146840	207446	209861	303 098	206 292	157 133	162 753	142 469	142 981	131 592	162 511	152 087	179 297	
North America	55834.3	47252.8	66131.9	57859.5	55338.5	75 489	94 544	82 605	107 170	74 637	92 118	80 494	82 892	68 914	109 286	
Other developed	85994	37657	18973.3	47864.6	26324.6	44 609	30 965	62 823	29 045	22 449	28 914	28 425	26 701	33 185	29 823	
Africa	51297.2	33880	60604.3	72443.6	53554.3	139 616	85 267	73 130	69 592	48 849	68 924	89 774	67 053	94 039	85 305	
Asia	281343	291946	223534	334992	316570	507 727	378 738	299 627	329 945	239 482	297 601	279 244	322 143	345 532	210 540	
Latin America and Caribbean	103429	56453.7	65761.5	54891.7	55848.7	124 245	108 178	106 466	119 823	75 879	156 267	89 056	72 153	74 215	70 054	
Transition economies	59274.8	41527.2	52759.5	42372.9	66174.8	97 412	48 532	45 531	54 393	36 853	37 589	25 966	38 035	64 860	35 424	
World	771732	650579	634646	820044	789443	#####	954 799	829 836	875 999	642 045	825 569	725 808	771 989	833 286	720 334	



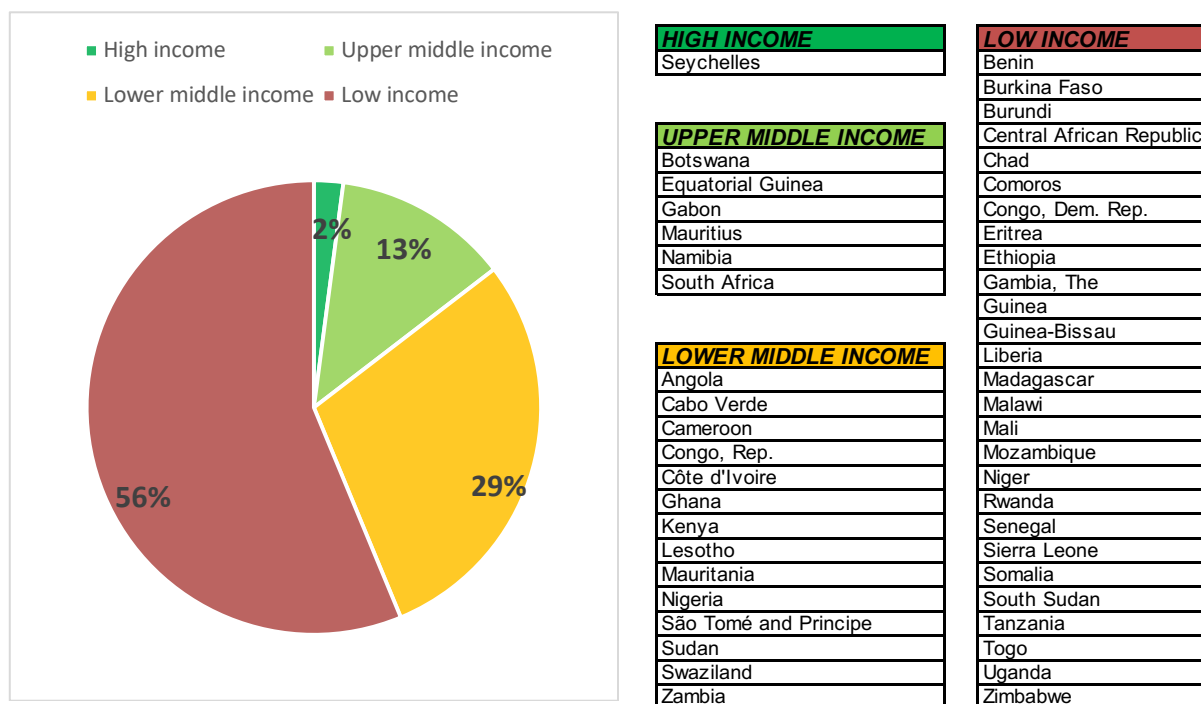
5. Value greenfield investments by sector (\$ million) (adapted from UNCTAD, 2018)

Sector/industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Primary	182129	82712.9	112468	60574.1	51154	136 716	119 272	57 837	74 924	25 013	41 053	42 683	32 836	53 788	20 750
Manufacturing	381927	345165	290919	403224	352316	508 897	377 182	439 448	436 000	279 369	319 592	321 443	319 712	295 365	337 729
Services	207677	222702	231260	356246	385973	652 834	458 346	332 551	365 075	337 663	464 924	361 682	419 442	484 132	361 856
Total	771732	650579	634646	820044	789443	#####	954 799	829 836	875 999	642 045	825 569	725 808	771 989	833 286	720 334



Annex 4: The African continent

1. World Bank list of economies, June 2018 (adapted from Wdi.worldbank.org, 2018a)

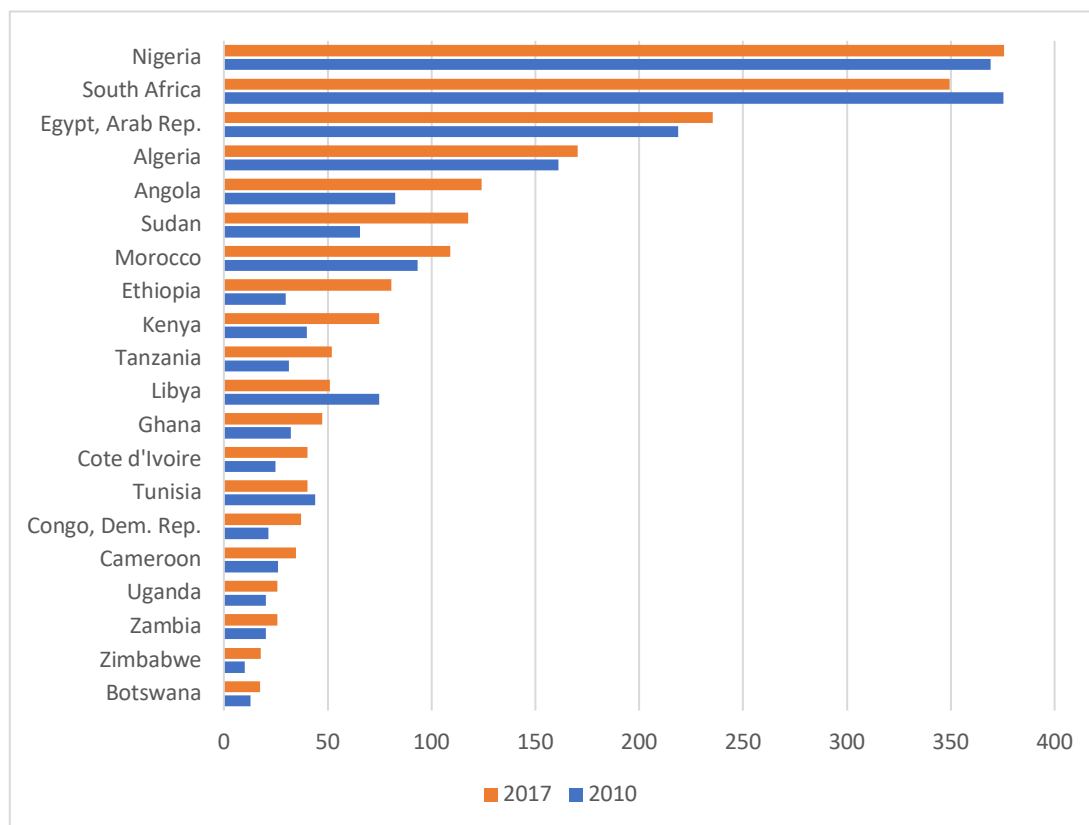


2. Fragile State Index, 2018: African ranking (adapted from Messner *et al.*, 2018)

3.

COUNTRY	FSI	RANGE	COUNTRY	FSI	RANGE
South Sudan	113.4		Mozambique	88.7	
Somalia	113.2		Swaziland	87.5	
Central African Republic	111.1		Zambia	87.2	
Congo Democratic Republic	110.7		Djibouti	87.1	
Sudan	108.7		Gambia	87.1	
Chad	108.3		Burkina Faso	86.5	
Zimbabwe	102.3		Malawi	85.5	
Guinea	101.6		Togo	85.2	
Nigeria	99.9		Madagascar	83.6	
Ethiopia	99.6		Equatorial Guinea	83.4	
Guinea Bissau	98.1		Comoros	82.6	
Kenya	97.4		Lesotho	80.1	
Burundi	97.4		Senegal	79.6	
Eritrea	97.2		Tanzania	79.4	
Niger	96.2		Algeria	75.8	
Cameroon	95.3		Benin	75.7	
Uganda	95.1		Morocco	74.0	
Libya	94.6		South Africa	72.9	
Cote d'Ivoire	94.6		Gabon	72.5	
Mali	93.6		Sao Tome and Principe	72.1	
Congo Republic	93.1		Tunisia	72.1	
Liberia	92.6		Namibia	68.8	
Mauritania	92.2		Ghana	68.1	
Angola	89.4		Cape Verde	68.0	
Rwanda	89.3		Botswana	62.0	
Sierra Leone	89.1		Seychelles	56.8	
Egypt	88.7		Mauritius	40.5	

Top 20 African economies \$ billion GDP 2010-2017 (adapted from Wdi.worldbank.org, 2018a)



4. Value added (% GDP) by industry 2010-2017 (adapted from Wdi.worldbank.org, 2018a)

	Value added (% of GDP)							
	Agriculture		Industry		Manufacturing		Services	
	2010	2017	2010	2017	2010	2017	2010	2017
World	4	4	27	25	16	16	63.3	65.1
Sub-Saharan Africa	17	16	26	23	10	10	51.7	53.2

5. Top 10 African countries by industry, value added (% GDP) 2010-2017 (adapted from Wdi.worldbank.org, 2018a)

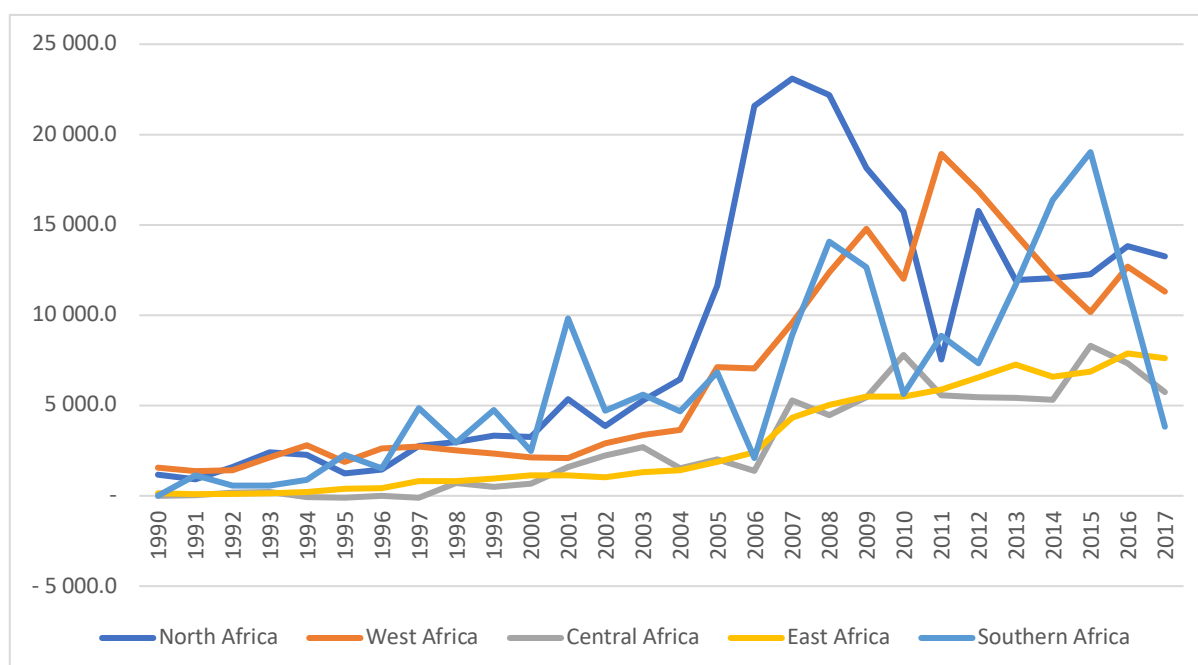
Value added (% of GDP)					
Agriculture			Industry		
	2010	2017		2010	2017
Sierra Leone	53	60	Equatorial Guinea	75	56
Chad	52	49	Congo, Rep.	75	54
Guinea-Bissau	45	49	Gabon	55	45
Togo	31	41	Congo, Dem. Rep.	39	42
Central African Republic	50	40	Algeria	50	36
Niger	41	40	Zambia	32	36
Mali	33	38	Swaziland	38	35
Burundi	37	36	Egypt, Arab Rep.	36	34
Ethiopia	41	34	Guinea	32	33
Liberia	45	34	Lesotho	30	33
Manufacturing			Services		
	2010	2017		2010	2017
Swaziland	33	31	Djibouti	..	71.9
Equatorial Guinea	21	25	Sao Tome and Princi	67.1	71.4
Congo, Dem. Rep.	16	20	Seychelles	68.5	71
Egypt, Arab Rep.	16	16	Mauritius	62.9	66.9
Lesotho	13	16	Gambia, The	53.1	65.8
Morocco	16	16	South Africa	61	61.5
Cameroon	14	15	Cabo Verde	61.2	61.3
Tunisia	17	15	Botswana	47.5	58.7
Cote d'Ivoire	13	13	Namibia	57.2	58.4
Suriname	21	12	Zimbabwe	50.3	56.3

6. Urbanization in the World and in SSA, 1990-2016 (adapted from Wdi.worldbank.org, 2018b)

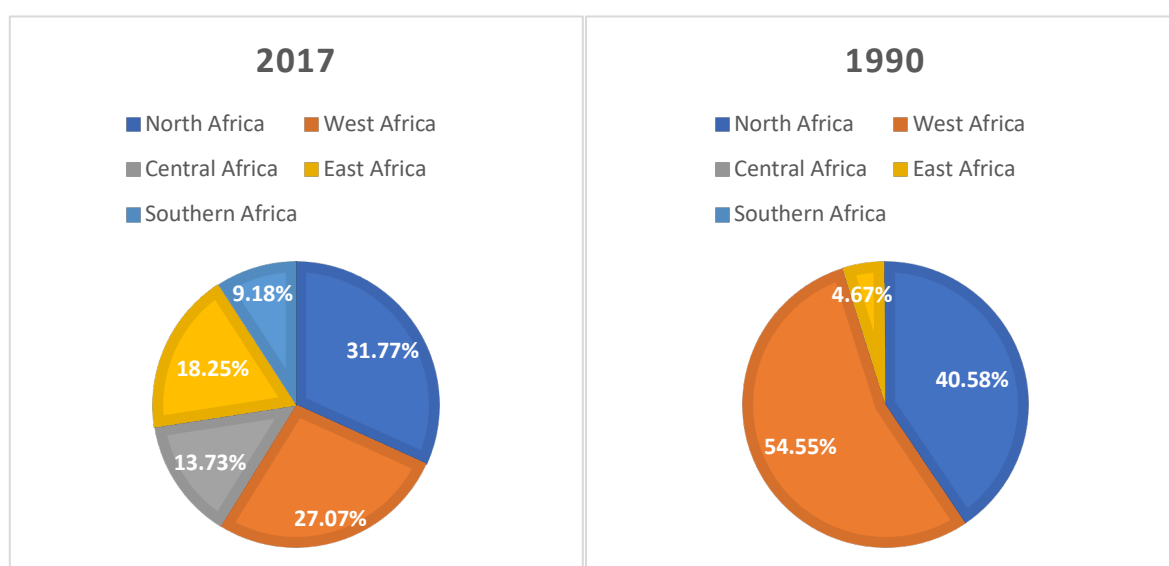
	Urban population					Population in more		People using at least basic sanitation services			
	thousands		% total pop.		% growth	% total pop.		% urban pop.		% rural pop.	
	1990	2016	1990	2016	2016	1990	2016	2000	2015	2000	2015
World	2,259,922	4,027,939	43	54	2	18	23	78.3	82	38.2	49.8
Sub-Saharan Africa	138,854	395,416	27	38	4.1	12	15	39	41.6	18	20.2

Annex 5: Africa FDI inflows

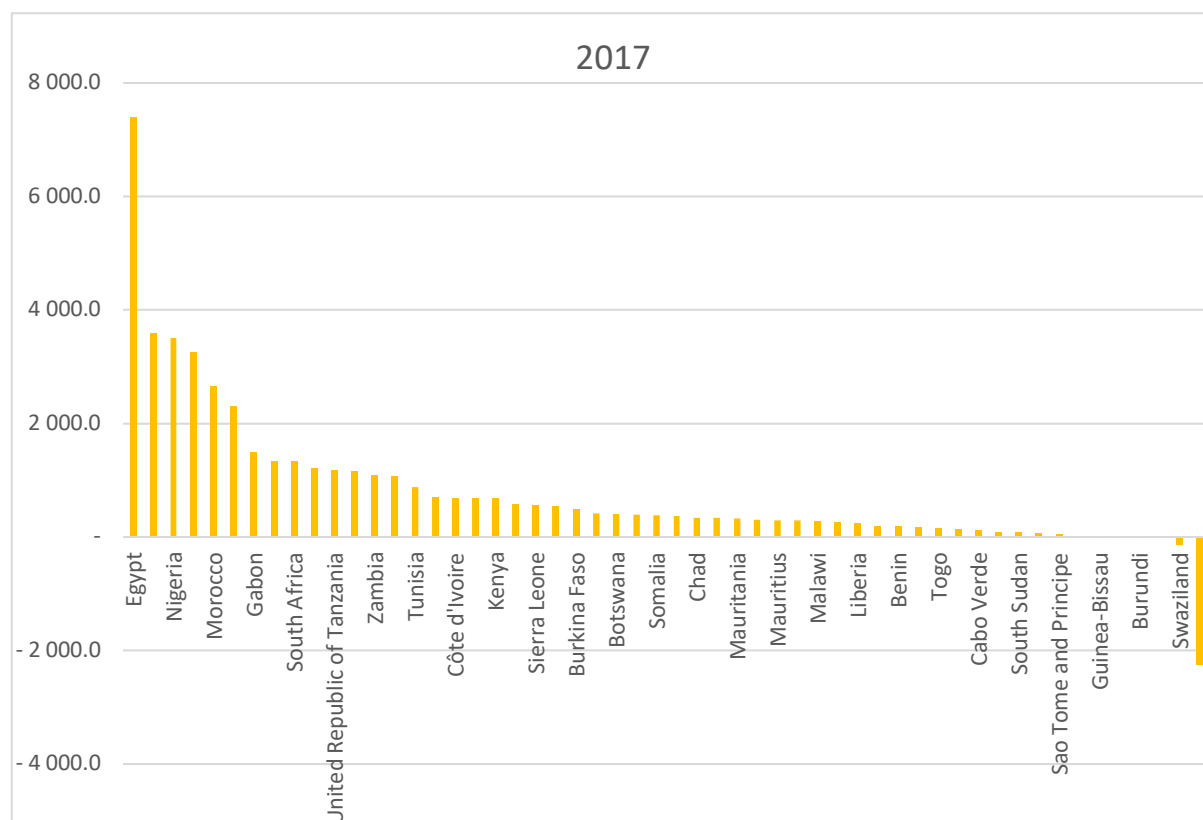
1. FDI inflows (million dollars) by regions from 1990 to 2017 (adapted from UNCTAD, 2018)



2. Share of FDI inflows by regions in 1990 and 2017 (adapted from UNCTAD, 2018)

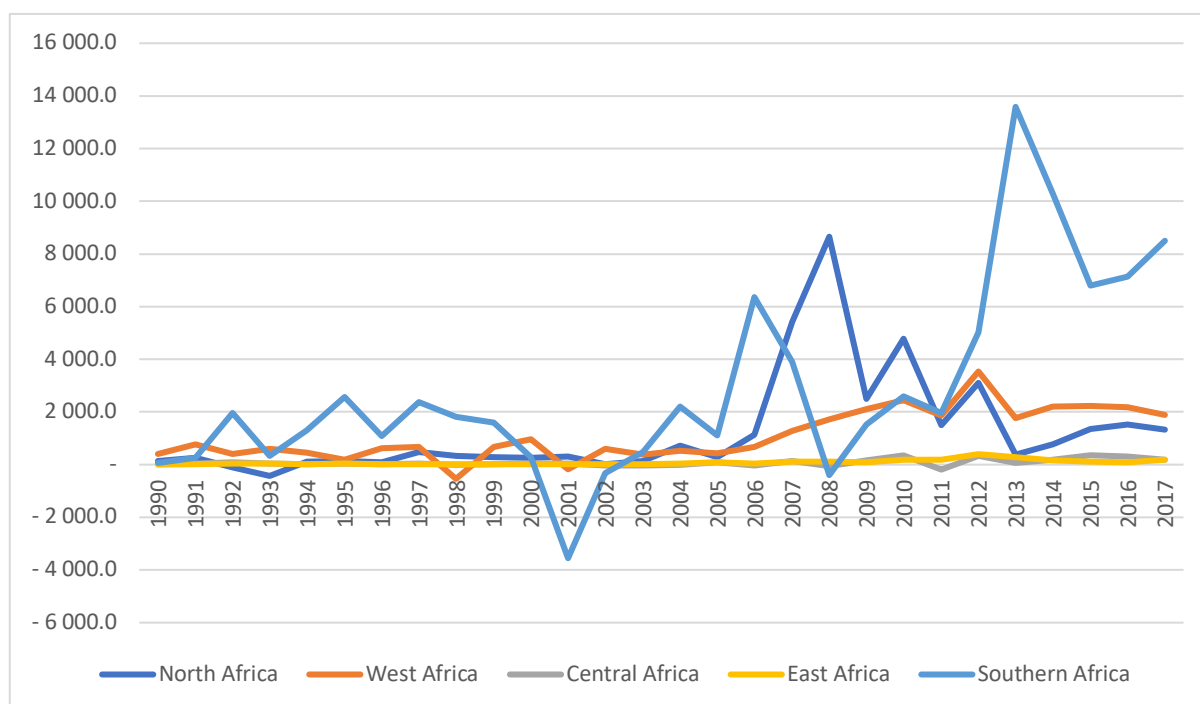


3. FDI inflows (million dollars) by country in 2017 (adapted from UNCTAD, 2018)

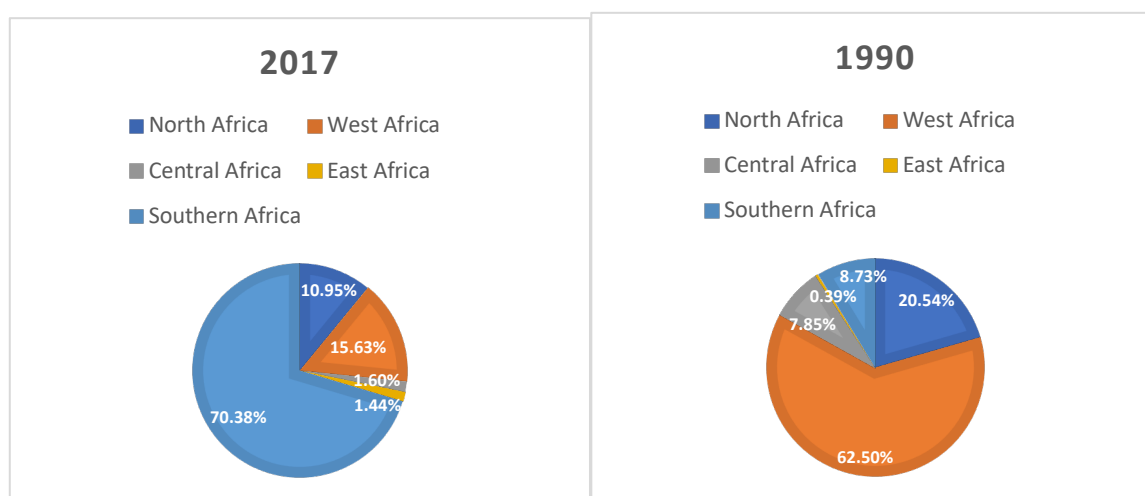


Annex 6: Africa FDI outflows

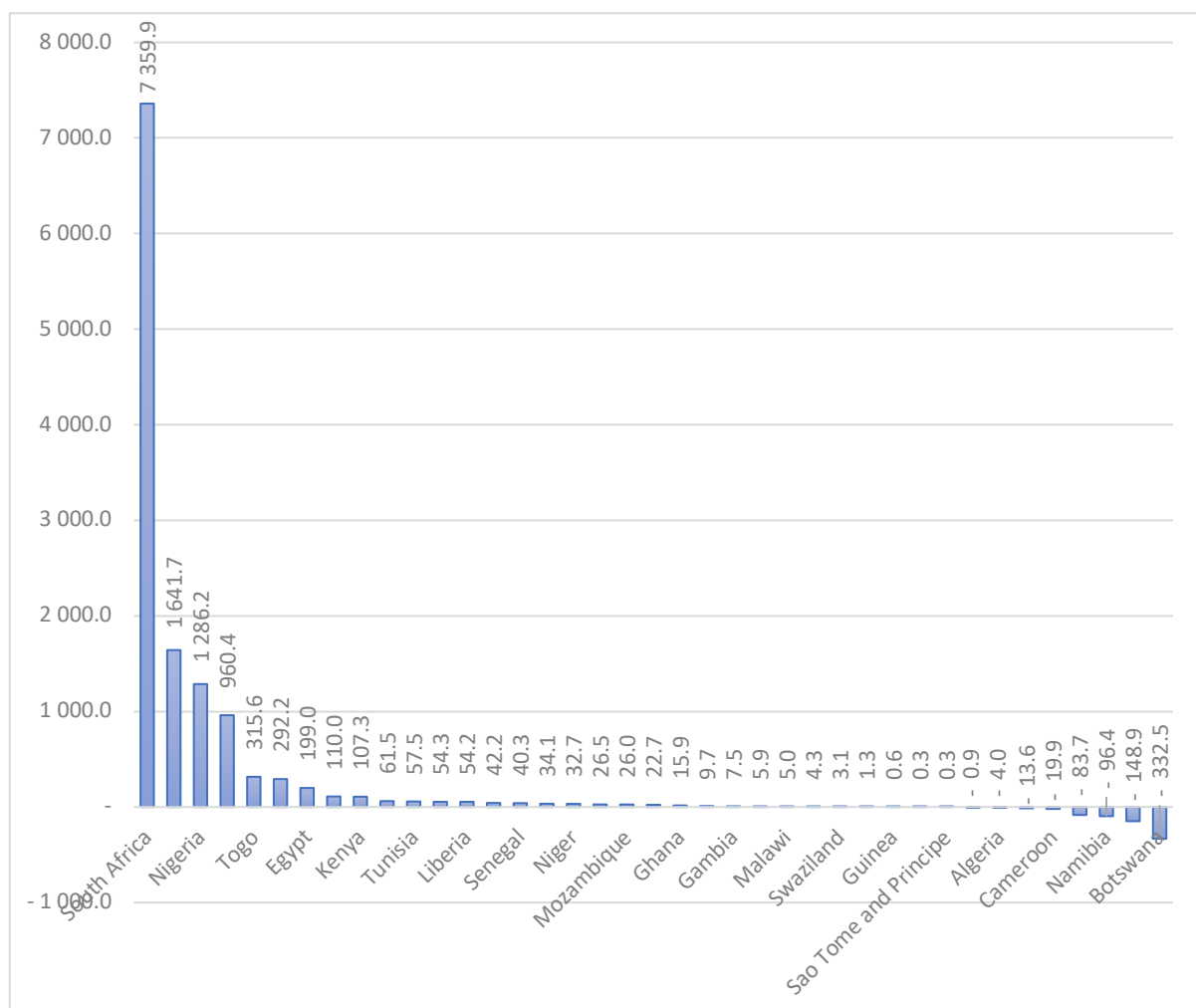
1. FDI outflows (million dollars) by regions from 1990 to 2017 (adapted from UNCTAD, 2018)



2. Share of FDI flows by regions in 1990 and 2017 (adapted from UNCTAD, 2018)

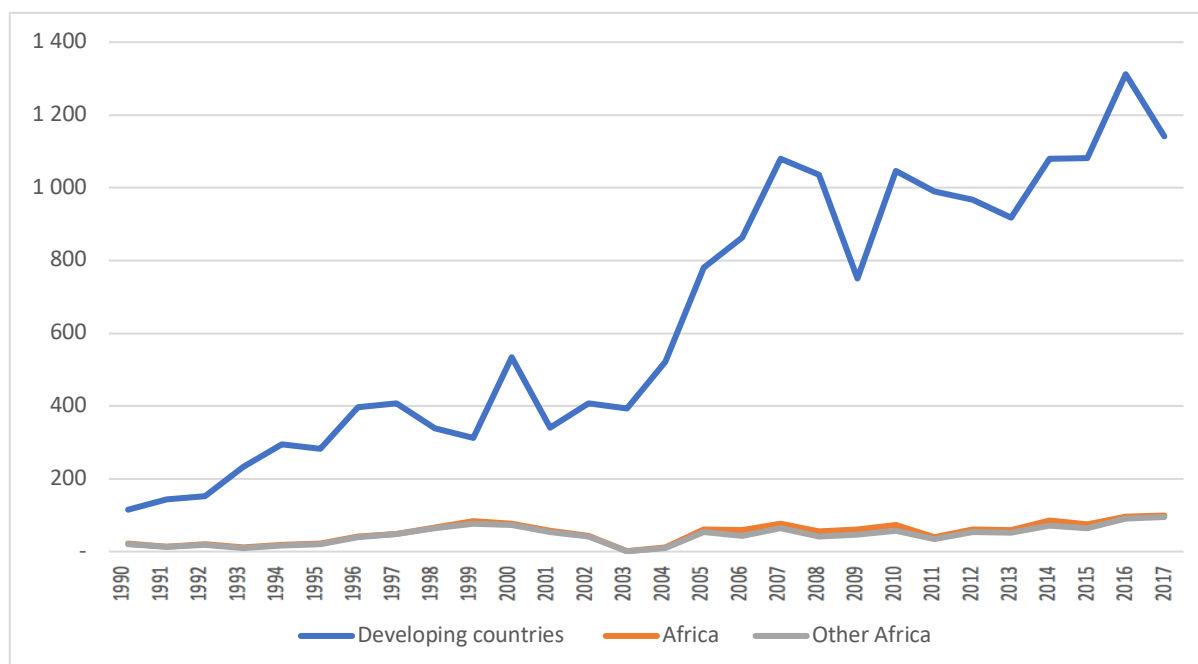


1. FDI outflows (million dollars) by country in 2017 (adapted from UNCTAD, 2018)

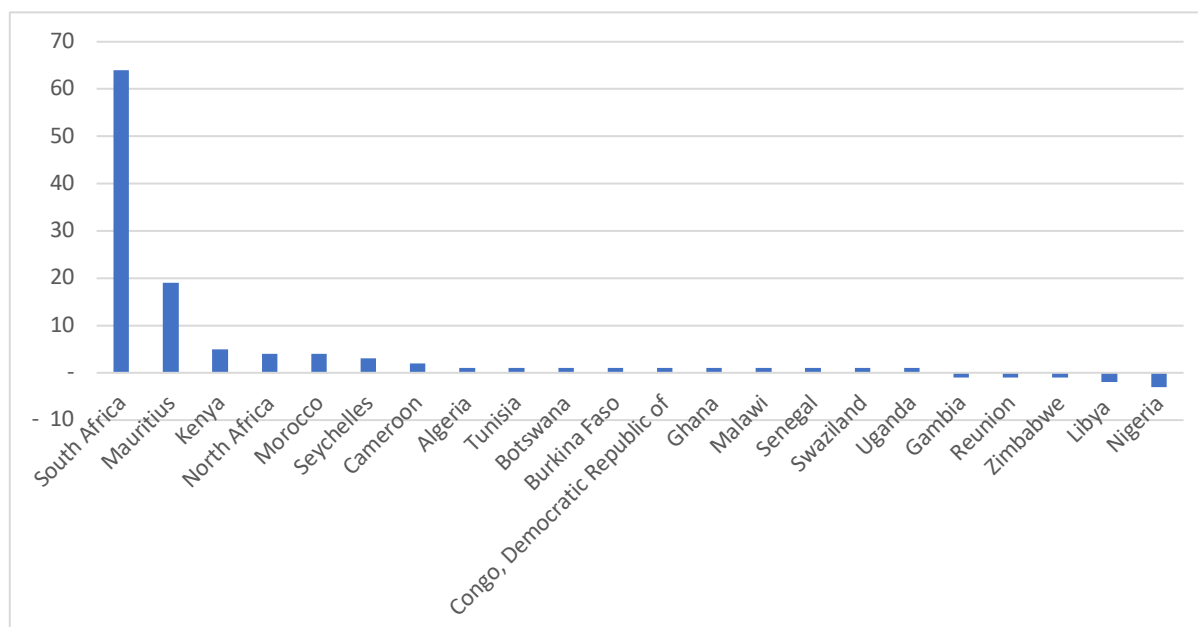


Annex 7: Africa M&A purchases

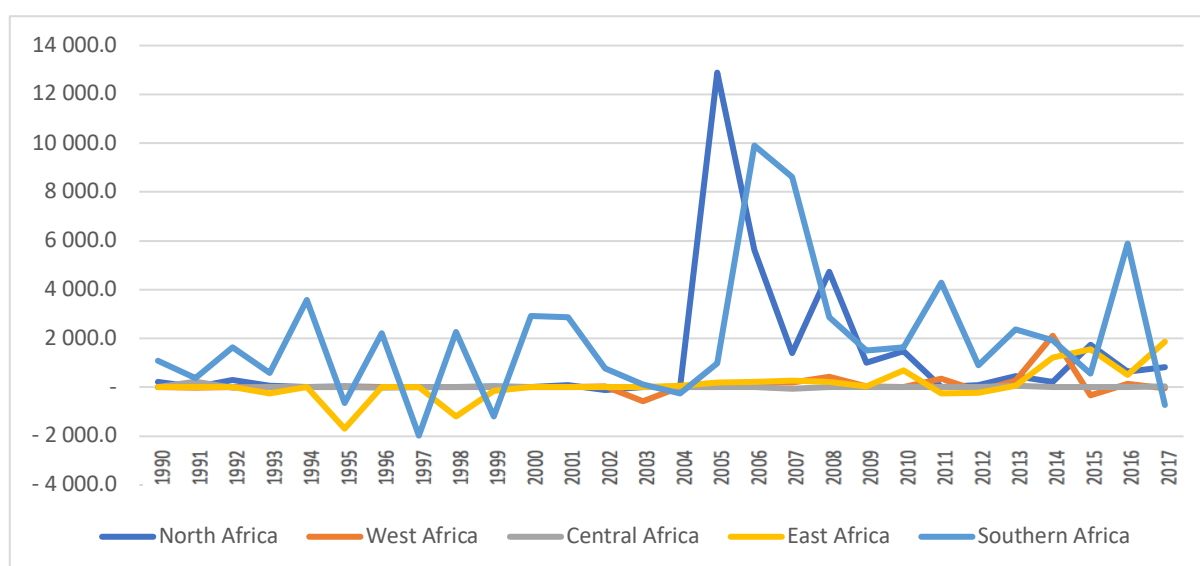
1. N° net M&A purchases by region, 1990-2017 (adapted from UNCTAD, 2018)



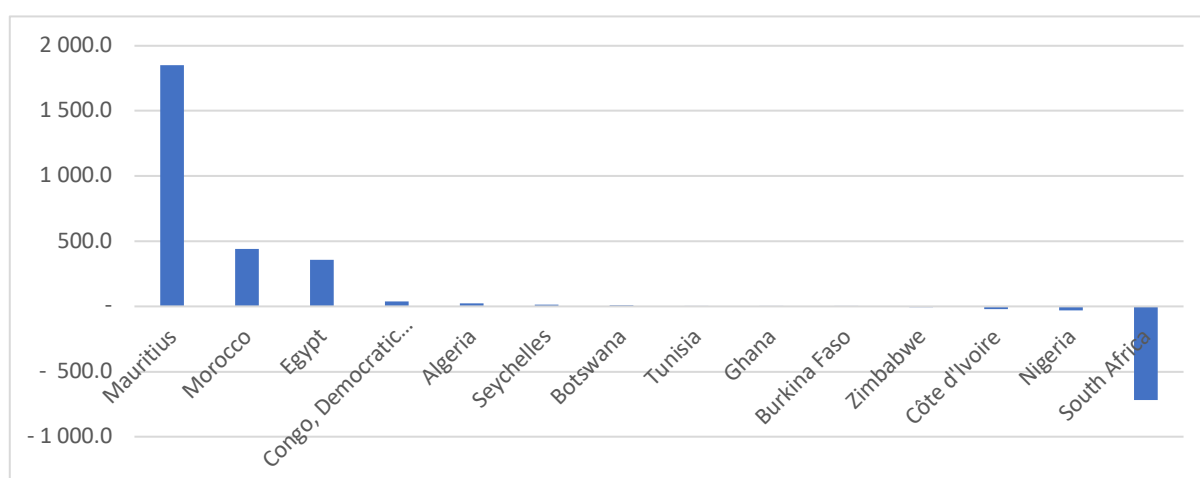
2. N° net M&A purchases by country, 2017 (adapted from UNCTAD, 2018)



3. Value net M&A purchases by region, 1990-2017 (adapted from UNCTAD, 2018)

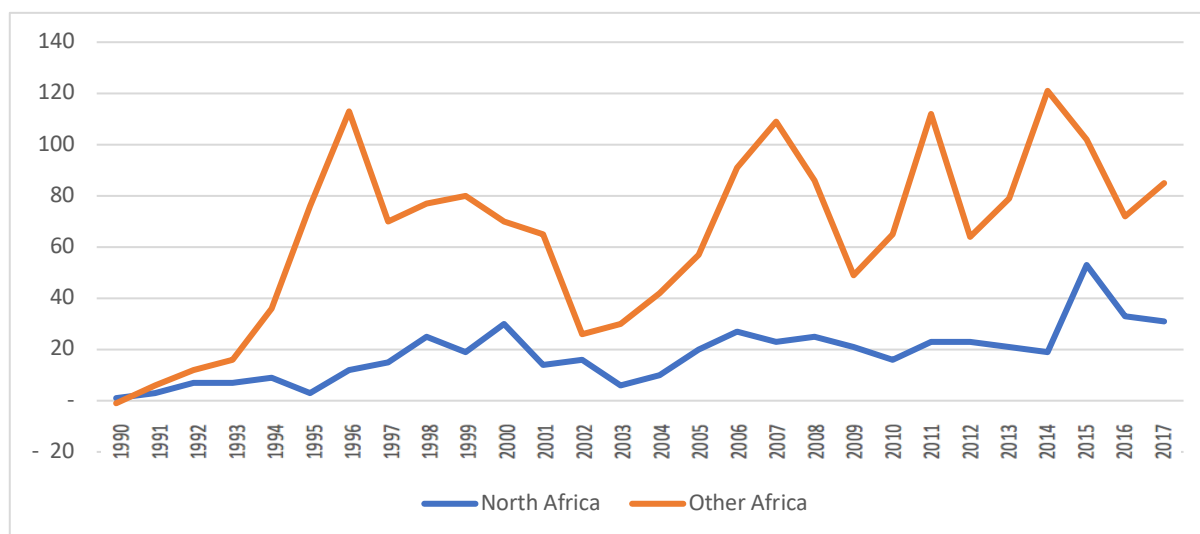


4. Value net M&A purchases by country, 2017 (adapted from UNCTAD, 2018)

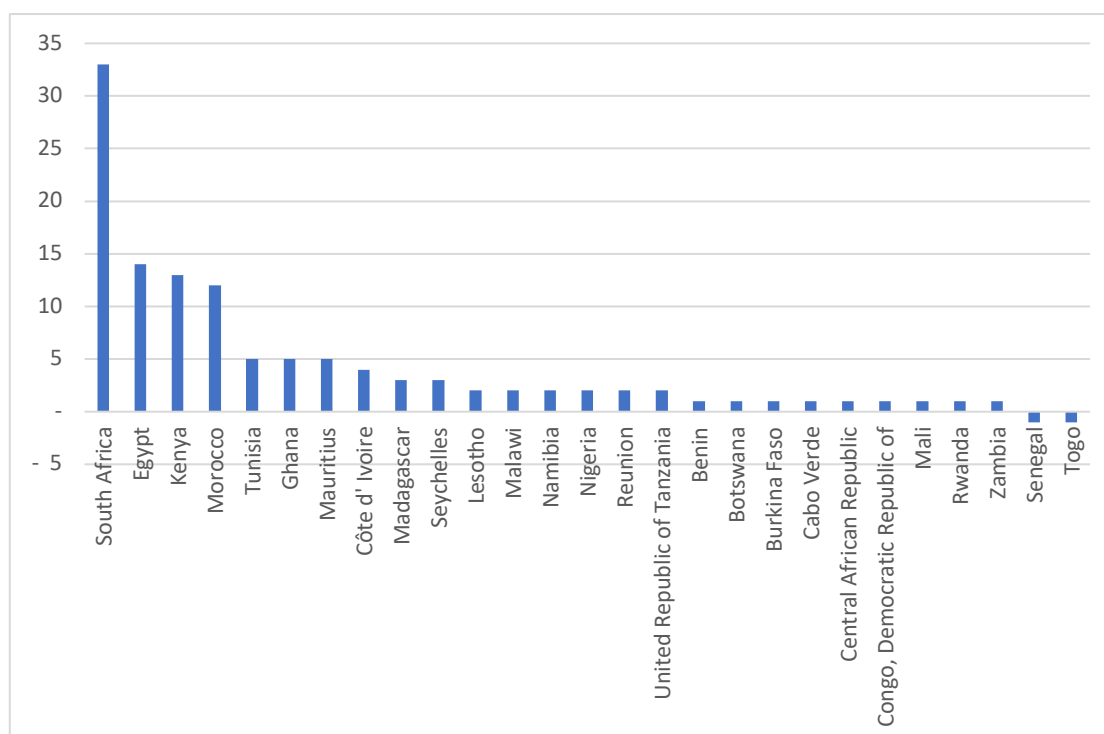


Annex 8: Africa M&A sales

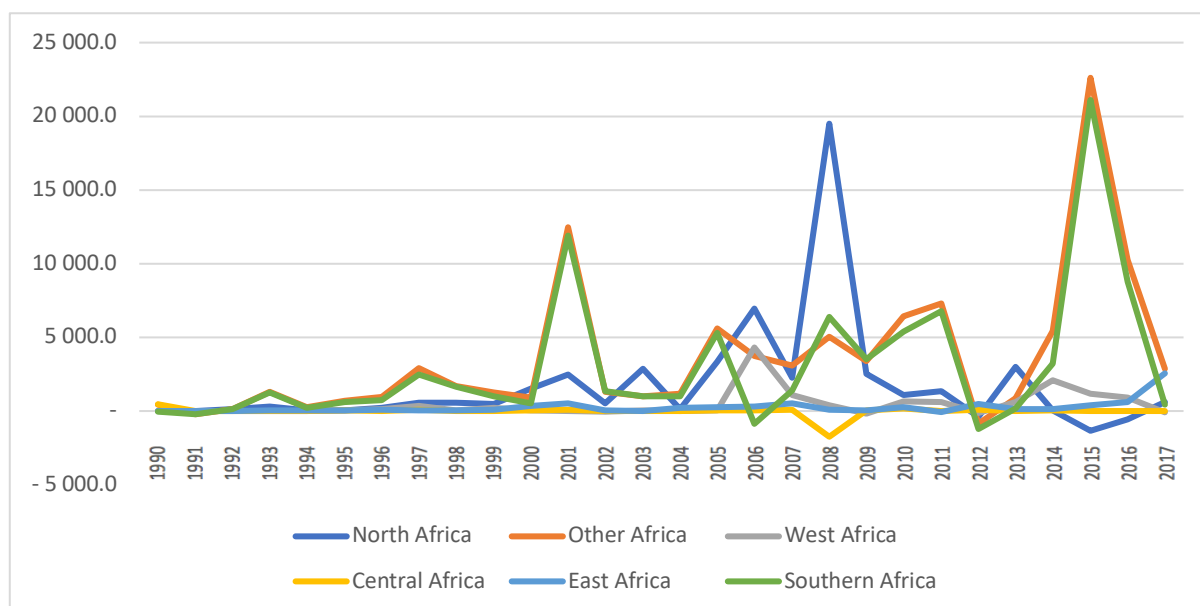
1. N° net M&A sales by region, 1990-2017 (adapted from UNCTAD, 2018)



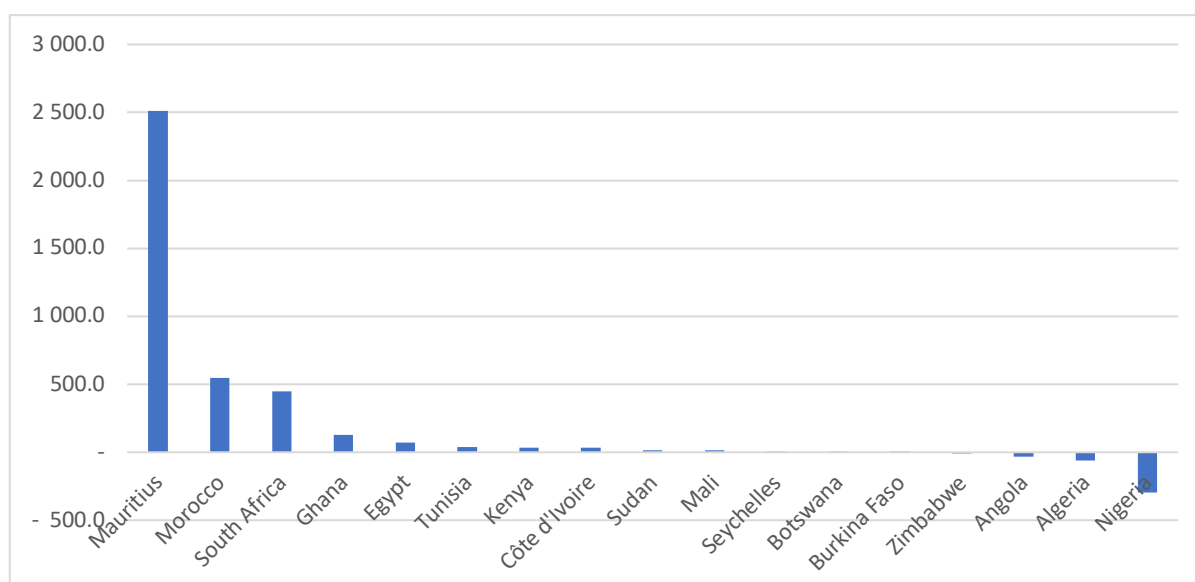
2. N° net M&A sales by country, 2017 (adapted from UNCTAD, 2018)



3. Value net M&A sales by region, 1990-2017 (adapted from UNCTAD, 2018)

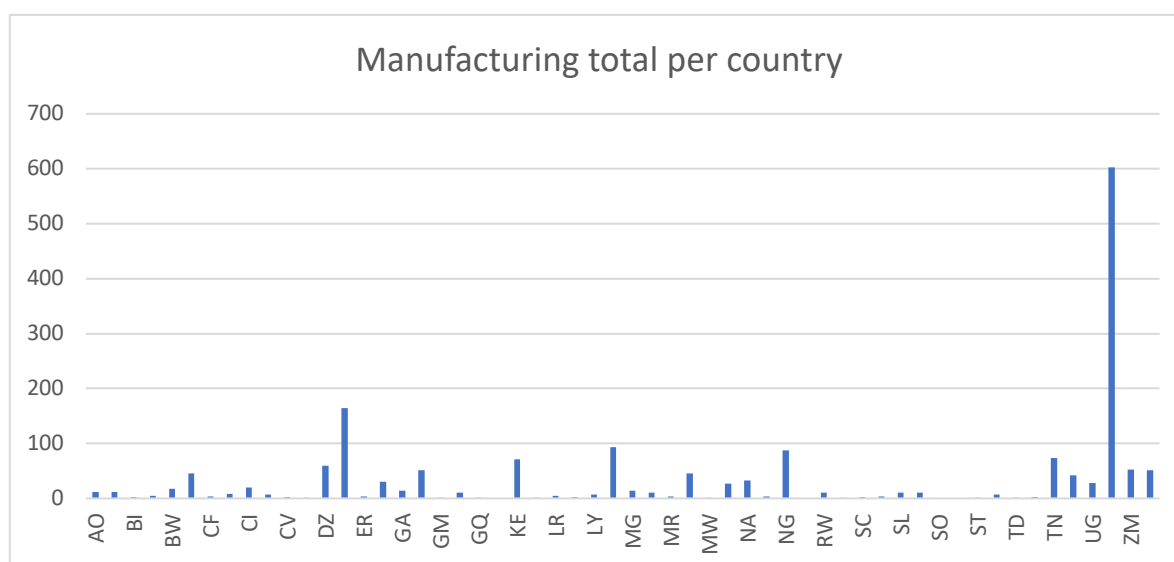


4. Value net M&A sales by country, 2017 (adapted from UNCTAD, 2018)

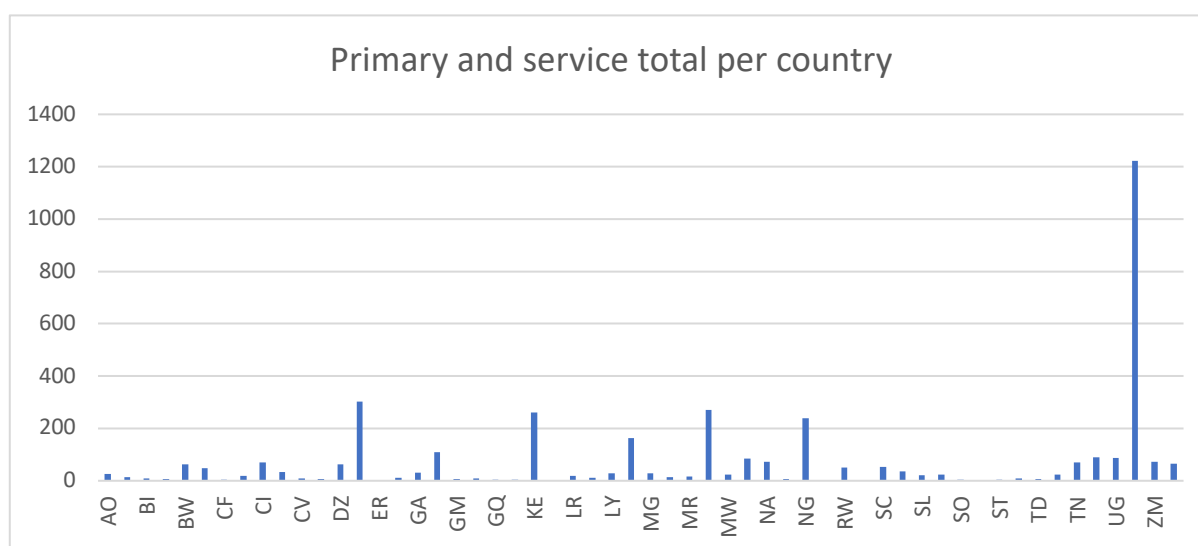


Annex 9: Zephyr database, FDI counts

1. Count of FDI completed projects in manufacturing industry by destination country, 1997-2017 (adapted from www.bvdinfo.com)



2. Count of FDI completed projects in primary and service sectors by destination country, 1997-2017 (adapted from www.bvdinfo.com)



3. Count of FDI completed projects by destination country, 1997-2017 (adapted from www.bvdinfo.com)

