

Institut für Lebensmittel- und Ressourcenökonomik der
Rheinischen Friedrich-Wilhelms-Universität zu Bonn

Foreign Direct Investment in the Agribusiness Sector

Inaugural-Dissertation
zur
Erlangung des Grades

Doktor der Agrarwissenschaften
(Dr.agr.)

der
Hohen Landwirtschaftlichen Fakultät
der
Rheinischen Friedrich-Wilhelms-Universität
zu Bonn

vorgelegt am 11. März 2011

von

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Tag der mündlichen Prüfung:	20. Mai 2011
Erscheinungsjahr:	2011

Acknowledgements

This study has been developed during my time as research assistant at the Institute for Food and Resource Economics (ILR), University of Bonn. Many people have accompanied me while working on it. They supported me in one way or the other for which I am very thankful. However, some people have provided a special input or advice.

First of all, I would like to thank Prof. Heckelei for letting me convince him that the subject of my dissertation is worthwhile analysing. He always encouraged me in my work and often clued me what to do.

I also would like to express my gratitude to Prof. Schiefer for taking over the co-reference of this thesis.

Furthermore, I want to thank the project partners of the EU-Med Agpol and EUMercoPol who supported me in the process of my topic finding and gave me a wonderful time in South-America.

I would like to thank all the colleagues from the ILR for helpful discussions both in small and in bigger rounds, for the friendly atmosphere and activities before, during and after concentrated work. My special gratitude goes to Arno Becker who listened to the numerous ideas I had in the last years with patience and constructive criticism.

Special thanks go to my friends and family who have supported me in the last five years and always believed in my success. I thank my mother for continuous motivation and assistance. Last but not least, I would like to thank my husband Marcel for making it possible for me to combine professional and private aims.

Kurzfassung der Dissertation
Ausländische Direktinvestitionen in der Agrarindustrie
Lucie Adenäuer

Seit 2003 ist weltweit ein deutlicher Anstieg ausländischer Direktinvestitionen (FDI) zu beobachten. Dies trifft vor allem für den Agrarsektor zu. Eine detaillierte Analyse dieser Entwicklung hat bislang in der wissenschaftlichen Literatur nur begrenzt stattgefunden. Aus diesem Grund beabsichtigt die folgende Arbeit, verschiedene Aspekte von FDI im Agrarsektor zu analysieren. Dabei wird unter anderem auf die verschiedenen Mechanismen, die zu einem verstärkten Auftreten von FDI im Agrarsektor führen, sowie die (sozio-)ökonomischen Effekte, welche diese in den Zielländern hervorrufen, eingegangen. Als Zielregionen im Agrarsektor werden Afrika und Südamerika identifiziert. Dem entgegen stellt sich die EU15 als einer der bedeutendsten Investoren im Agrarsektor dar. Die folgende Abhandlung ist in vier Abschnitte unterteilt.

Zu Beginn wird eine allgemeine Erläuterung zur globalen Entwicklung von FDI gegeben, welche durch eine theoretische Einordnung der Arbeit, deren Zielsetzung und der darin enthaltenen Analysen ergänzt wird. Abschließend werden die Ergebnisse der Arbeit und die zugrunde liegenden Einschränkungen der wissenschaftlichen Untersuchungsmethoden diskutiert.

Darauf folgend werden Eigenschaften europäischer Agrarunternehmen identifiziert, welche eine grundsätzliche Differenzierung zwischen Unternehmen, die FDI tätigen (multinationale Firmen) und solchen, die keine FDI tätigen, ermöglichen. Dabei wird gezeigt, dass multinationale Firmen durch eine höhere Produktivität und geringere Lohn- und Inputkosten gekennzeichnet sind. Des Weiteren sind sie größer und haben einen höheren Fremdkapitalanteil.

Die daran anschließende Analyse identifiziert die Eigenschaften verschiedener Zielregionen von FDI Strömen, welche den Anreiz für FDI geben (sowohl vertikal als auch horizontal). Dabei werden die Mittelmeer- und Mercosur-Länder als Zielregionen für FDI aus der EU15 untersucht. Die Ergebnisse der durchgeführten Regressionsanalyse weisen darauf hin, dass vor allem vertikale FDI Flüsse (efficiency seeking) zwischen der EU15 und den Mittelmeerländern stattfinden, wohingegen horizontale FDI Flüsse (market seeking) im Falle der Mercosur-Länder dominieren. Die Einflüsse auf den Handel zwischen den Ursprungs- und Zielregionen scheinen daher komplementär für die Mittelmeer-Länder und substitutional für die Mercosur-Länder zu sein.

Der letzte Analyseaspekt beleuchtet den Einfluss stark steigender FDI Ströme auf eine spezifische Zielregion: Äthiopien. Die zugrunde liegende Theorie deutet darauf hin, dass, abhängig von der Existenz von Transmissionsmechanismen, FDI zu ökonomischem Wachstum und dadurch zur Reduktion von Armut beitragen

können. Die detaillierte Betrachtung von Äthiopien bestätigt diese These. Armut kann durch FDI Ströme reduziert werden und die ökonomischen Effekte sind überwiegend positiv. Demgegenüber treten verstärkt Umweltkonflikte auf und werden sich weiter verstärken, falls kein entsprechendes politisches Rahmenwerk implementiert wird.

Schlüsselworte: Ausländische Direktinvestitionen, Agrarsektor, Multinationale Unternehmen, Vertikale vs. Horizontale Investitionen, Äthiopien

Abstract of the Dissertation
Foreign Direct Investment in the Agribusiness Sector
Lucie Adenäuer

Foreign Direct Investment (FDI) has increased strongly since 2003, especially into the agribusiness sector. This development has rarely been analysed in recent literature. Therefore, this thesis aims at analysing different aspect connected with FDI flows in the Agribusiness sector such as the different mechanisms that lead to the appearance of FDI flows and the impacts that they can have on host countries in particular on their agribusiness sector. Africa and South America are chosen as major host regions and the EU15 as a major region which invests abroad. The study is structured in four main parts.

First a general introduction on the global development of FDI flows and the theoretical placement of this study is given. The objectives of the thesis are stated and the three main analyses are shortly summarised regarding the motivation, the approach and the main results as well as the specific limitations. Key findings regarding the overall scope of the thesis are derived and general limitations identified. Finally, the perspectives for further research are stated.

Following, the specific performance characteristics of European agribusiness firms are identified through which a differentiation between firms that invest abroad and those that do not is possible. It is concluded that European Multinational Enterprises are characterised through a higher productivity and lower labour and input costs. Further, they are larger in size and have a higher debt to equity ratio.

The subsequent analysis identifies the host country characteristics necessary for attracting a certain form of FDI flows (either vertical or horizontal). Thereby, the Mediterranean and the Mercosur countries are chosen as host countries for EU15 investment flows. The regression results indicate that mainly vertical FDI flows (efficiency seeking) appear between the EU15 and the Mediterranean countries whereas horizontal FDI flows (market seeking) dominate into the Mercosur countries. The implications on the trade flows between the home and host countries seem to be complementary for the Mediterranean countries and substitutional for the Mercosur countries.

Finally, an analysis on the impact of highly increasing FDI inflows on a specific host country – Ethiopia – is carried out. Theory points out that depending on the existence of transmission mechanisms FDI flows can lead to economic growth and through this to the reduction of poverty. The economic and social impact of FDI inflows on Ethiopia is mainly positive. Poverty can be reduced through high FDI inflows. Existing environmental conflicts on land and water are bound to increase if no policy framework is implemented.

Keywords: Foreign Direct Investment, Agribusiness Sector, Multinational Enterprises, Vertical vs. Horizontal FDI, Ethiopia

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Abbreviations

AIC	Akaike Information Criterion
APT	Arbitrage-Pricing-Theory
BIT	Bilateral Investment Treaty
Bn	Billion
CAPM	Capital-Asset-Pricing-Model
COMESA	Common Market for Eastern and Southern Africa
EIA	Ethiopian Investment Agency
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FDI	Foreign Direct Investment
GAA	German Agro Action
GDP	Gross Domestic Product
GHI	Global Hunger Index
GPI	Gender Parity Index
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
Ha	Hectare
HO	Heckscher-Ohlin
ICSID	International Centre for Settlement of Investment Disputes
IFPRI	International Food Policy Research Institute
ILO	International Labour Organisation
IMF	International Monetary Fund

km ²	Square kilometre
KMO	Kaiser-Meyer-Olkin-Criterion
m	Metre
MDG	Millennium Development Goal
Mercosur	Mercado Común del Sur (Southern Common Market)
MIGA	Multilateral Investment Guarantee Agency
Mn	Million
MNE	Multinational Enterprise
MoFED	Ministry of Finance and Economic Development
NGO	Non-Governmental Organisation
OECD	Organisation of Economic Co-operation and Development
OLS	Ordinary Least Square
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
TFP	Total Factor Productivity
tsd	Thousand
UNCTAD	United Nations Conference on Trade and Development
WDI	World Development Indicators
WIPO	World Intellectual Property Organisation
WIR	World Investment Report

1 Context of the Research

“... a direct investment enterprise is defined as an [...] enterprise in which a foreign investor owns 10 per cent or more of the ordinary shares or voting power...” (OECD, 1999)

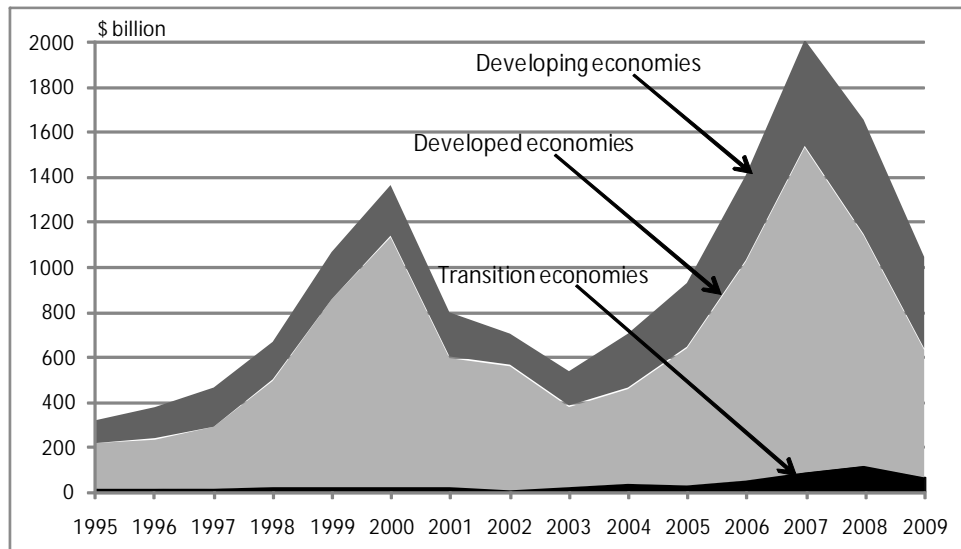
“..., approximately two-thirds of global trade is influenced [...] by past FDI decisions.” (Sauvant and Roffe, 1999)

“The growth of international investment also means that a country’s sustainable development outlook is increasingly influenced by multinational enterprises.” (OECD, 2001)

1.1 Problem background and general objective

Only since in 1961 the OECD was founded did investment flows increase at least between developed countries as a political framework like the OECD made an assessment of the occurring risk possible (Brainard, 1993). Up to 2000, the global Foreign Direct Investment (FDI) flows increased steadily reaching its temporary maximum in 2000 (Figure 1.1). After a strong decrease of global FDI flows between 2000 and 2002 flows slowly recovered again. In 2006, a high increase of FDI flows occurred because of the favourable influence of worldwide strong real GDP growth. Main host countries to benefit from the short-term increase were China and India. FDI in natural resources (e.g. land and agricultural production) picked up further. (UNCTAD, 2008)

Figure 1.1: Global FDI flows, 1995-2009

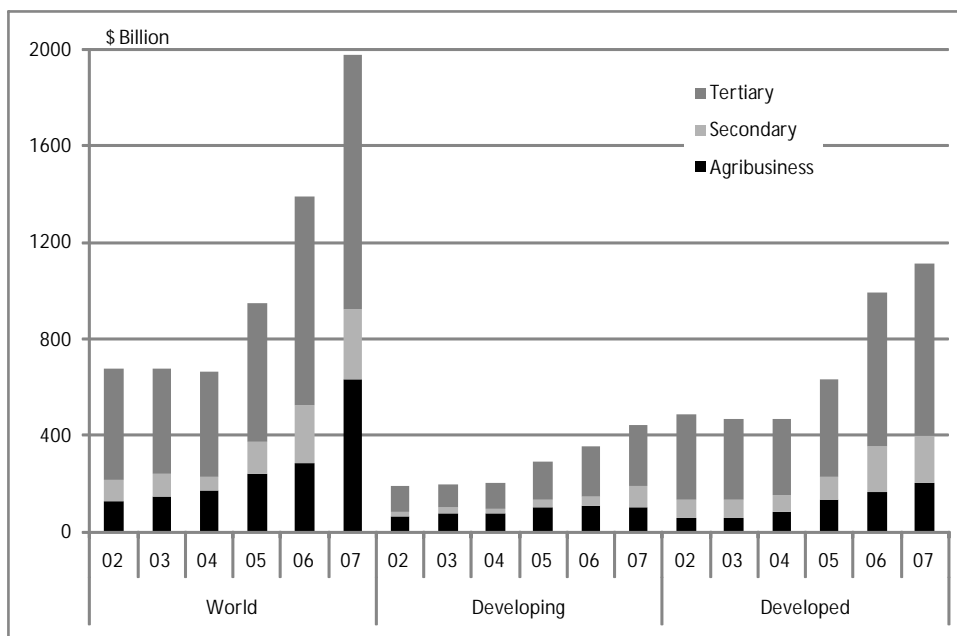


Source: UNCTAD (2010).

Now, 2010, after the global financial crisis and the price-hikes in food prices in 2007/08, worldwide future prospects on FDI flows have changed yet again. The high food prices in 2007 and 2008 revealed how dependent food importers are in such situations. Aiming to grow less dependent on food imports and the volatility of global food prices, food importing countries encouraged domestic firms to produce food abroad and invest in the agribusiness sector of foreign developing countries (GTZ, 2009). Hence, investment flows into the agribusiness sector have especially since then increased heavily (from 21% of total world FDI flows in 2006 up to 32% in 2007) (Figure 1.2). The financial crises starting in mid 2007 and reaching their climax at the end of 2008 through the collapse of Lehman Brothers¹ led to a reduction of total investment after 2008 with less impact on FDI in the agribusiness sector (UNCTAD, 2009).

¹ Lehman Brothers was one of the largest financial institutions in the United States. For more detail see http://de.wikipedia.org/wiki/Lehman_Brothers.

Figure 1.2: FDI flows by economic sectors, 2002-2007



Source: Own compilation based on the World Investment Reports.

Regarding FDI flows into developing countries in 2007, nearly 30% go into the agribusiness sector (Figure 1.2). Furthermore, those FDI inflows have increased by factor three since 2002.

As FDI flows react strongly to changes in global economy it is of interest to identify the mechanism behind the appearance of FDI flows. For this purpose, theories such as the theory on firm heterogeneity, trade theory, the theory of the firm, the international capital market theory and the economic growth theory are regarded in the different parts of this study and main developments, regarding the determinants of FDI, are identified. Considering the amount of theories involved in analysing the impacts of FDI flows on the firm's characteristics, its applied market strategy and the host country it becomes clear that no unified theory exists, yet. Although five different economic theories have to be considered when explaining FDI flows, they have in common, that they all try to explain foreign economic relationships. A major assumption thereby is the factor mobility (especially of capital). Therefore, former traditional trade models such as the Heckscher-Ohlin model (1933) or the exogenous growth model (Solow, 1956) had to be expanded by capital movements. This expansion had not been necessary before as foreign investments had been unusual because of high inaccessible risks. The "capital-chain" from the investor through to the recipient is pictured. The

different theories thereby provide the background on which the analyses are then based on.

Further, analyses on the agribusiness sector have only in the last few years increased slightly. Before, the majority of analyses were either on the economy in total or on the manufacturing sector. This was due to little FDI flows in the agribusiness sector up to the end of the nineties. In the past five years mainly developing countries have tried to attract investments in the agribusiness sector to achieve economic growth. As direct economic benefits such as land fees or additional taxation are low, non-governmental organisations (NGOs) engaged in development aid such as Misereor (2010), GTZ (2009) and the German Agro Action (2010) see a high potential for negative impacts resulting from the increased FDI flows. Main risks are thereby seen in missing poverty rights which may lead to a loss in livelihood as existing but not recorded 'land rights' are disrespected. Further, an increase in food insecurity is assumed as it is observed that main parts of the grown agricultural products by foreign investors are exported. In public discussion the impacts of the latest FDI flows are regarded negatively.

Existing empirical analyses on FDI may be divided into two main categories: those looking at the determinants of FDI and those looking at the impact of FDI on the domestic economy (Msuya, 2007). The aim of this dissertation is to analyse both, the different mechanisms that lead to the appearance of FDI flows in the agribusiness sector as well as over the impacts that increased FDI flows can have on host countries in the agribusiness sector. Due to little attention as well as the difficulty in receiving comprehensive firm level data of European firms, the appearance of European FDI flows (a major donor country) in the agribusiness sector have not been analysed deeply yet. As Africa and South America are identified as major host countries for FDI inflows in the agribusiness sector, the conducted analyses of this work will focus on these three groups of countries when analysing the stated research objectives. Through splitting the main objective of the dissertation into three superior objectives, it will be possible to include both identified research strings in one study. The objectives of the three superior analyses are:

1. Identification of performance characteristics that explain the appearance of European Multinational Enterprises (MNEs).
2. Detection of specific host country characteristics that are responsible for the appearance of European FDI flows and the derivation of the main strategy behind those FDI flows (vertical or horizontal).

3. Understanding of the implications of FDI flows on the sustainable development of a host economy.

In the following sections first the development of the FDI flows in the last 15 years will be pictured before each of the undertaken analyses will be outlined regarding the motivation, approach, main results and the specific limitations. This chapter concludes by stating main findings and general limitations regarding the overall scope. Finally, an outlook on further research steps will be given.

1.2 *Development of FDI flows*

Comprehensive data on global FDI flows are primarily found in the yearly World Investment Reports (WIR) provided by UNCTAD. The following survey of the global investment flows since 1995 will therefore be mainly based on those reports in particular WIR 2006, 2008, 2009 and 2010.

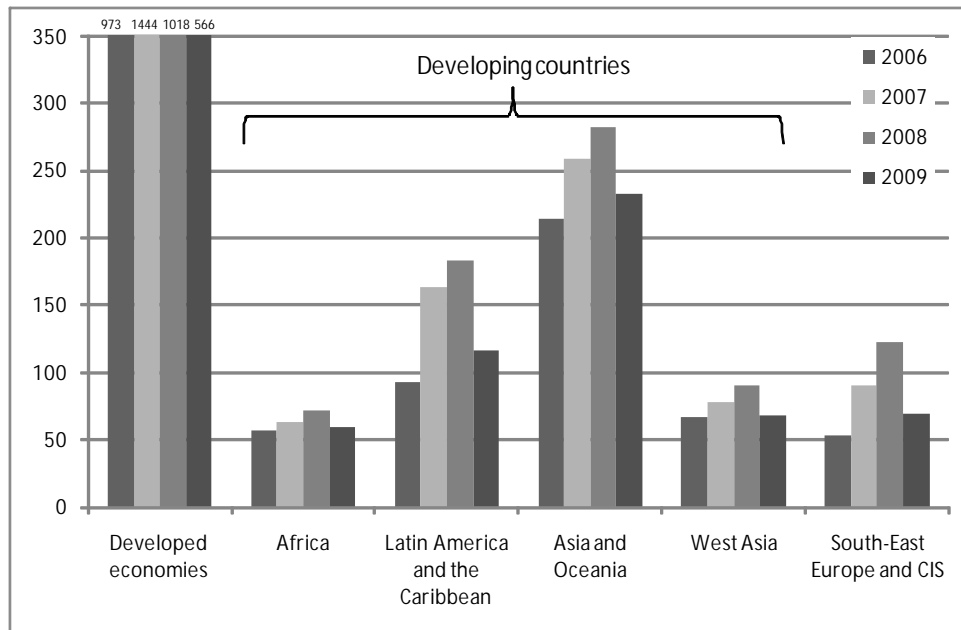
Global FDI flows increased uninterrupted between 2003 and 2007 with an annual growth of 30%. In 2007 they reached their maximum of \$1,833 billion (Figure 1.1). Through the global economic crises a slowdown of the global economic activity with an emphasis in the major developed countries occurred. This development is also mirrored with some time lag (particularly in developing countries) in the decline of global FDI flows since 2008 (Figure 1.1). Global FDI flows fell by 14% to \$1,697 billion in 2008 (Figure 1.1). Thereby, FDI inflows into developed countries reacted the most directly with a decrease of 29% down to \$962 billion. In contrast, developing² and transition economies saw FDI inflows still rise in 2008 to record levels, with their shares in global FDI inflows growing to 37% from 27% in the previous year for developing countries and to 7% from 5% for transition economies. In total, the share of developing and transition economies in global FDI flows surges to 44% in 2008 (Figure 1.1). In 2009, global FDI inflows fell a further 37% to \$1,101 billion. Thereby, now all three major groups (developed, developing and transition economies) experienced reductions in FDI flows. FDI flows to developed countries shrank the most with 44%. FDI flows to developing and transition economies declined for the first time by 24% after six years of uninterrupted growth. Still, developing and transition economies account for nearly half of global FDI inflows in 2009. In 2000 it was less than 20%. This demonstrates the increasing importance of these economies as hosts for FDI during crises especially as their financial systems are less closely interlinked with the banking systems of the United States or Europe.

It is estimated that in 2010 global FDI flows will slightly recover to reach over \$1.2 trillion, before picking up further to \$1.3 – \$1.5 trillion in 2011. Only in 2012 FDI is expected to regain its pre-crisis level, with a range estimated at \$1.6 – \$ 2 trillion. The modest recovery of FDI inflows in 2010 is expected to be stronger in developing countries than in developed ones as they have appeared to be more immune against global crises. Hence, the shift of FDI inflows towards developing countries is expected to accelerate further. Motivated by this observed

² Developing countries incorporate all countries from Africa, Latin America and the Caribbean as well as Asia and Oceania (UNCTAD, 2010).

shift in FDI, this study will concentrate on developing countries as host countries, who are claimed to especially benefit from FDI flows making up for the domestic capital shortfalls (Klein et al., 2001).

Figure 1.3: FDI inflows by region, 2006 to 2009 (\$ billions)



Note: FDI inflows into developed economies range above \$500 billion.

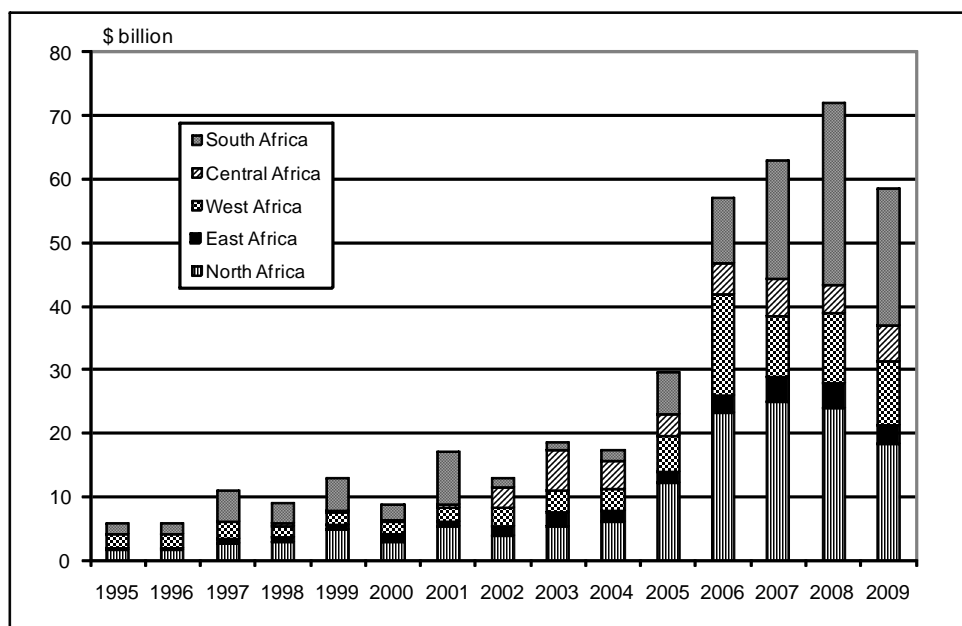
Source: UNCTAD (2010).

Among the developing countries, Asia and Oceania are together the largest recipient. These regions account for almost half of the total inflows of developing economies. Next to them, Africa and South America (major recipient in the group of the Latin American countries) are the ones that experienced the highest increases between 2006 and 2008. Up to 2008, FDI inflows into Africa rose continuously reaching its largest relative increase of 27% in 2008 (Figure 1.3). South Americas FDI inflows also increased continuously whereby their largest increase was reached in 2007 with 63% additional FDI inflows. In 2008 the increase amounted to 28%. Over this period of time, these are the strongest relative increases of FDI inflows within the developing countries. This thesis will focus on Africa and South America as major host regions.

Development of FDI flows into Africa

Before 2005, the overall FDI inflows into Africa increased steadily but reached no more than \$20 billion a year (Figure 1.4). After 2005 up to 2008, the overall FDI inflows grew from \$29 billion to reach \$88 billion. This development occurs mainly through European and Asian MNEs whereby European MNEs increased their activity strongly in the last years (up to \$30 billion or 34% of the total African FDI inflows in 2008). The record rise of FDI inflows is partly due to favourable global commodity markets and good returns on investment related to the high commodity prices. Africa is highly endowed with natural-, especially land resources. Over the past few years investing in land has particularly become interesting for foreign investors against the background of the high global food prices to secure food at low prices. MNEs expand their regional operations, opening a variety of exploration projects in new locations and injecting large volumes of capital into the host countries.

Figure 1.4: African FDI inflows, 1995-2009



Source: UNCTAD, 2010.

Figure 1.4 shows the development of total African FDI inflows between 1995 and 2009 including the regional distribution among the five main sub-regions. The strong growth since 2005 can be explained as a consequence of the booming global commodities market, rising profitability of investment and an increasingly FDI-friendly environment (UNCTAD, 2009). In 2009, FDI inflows decreased

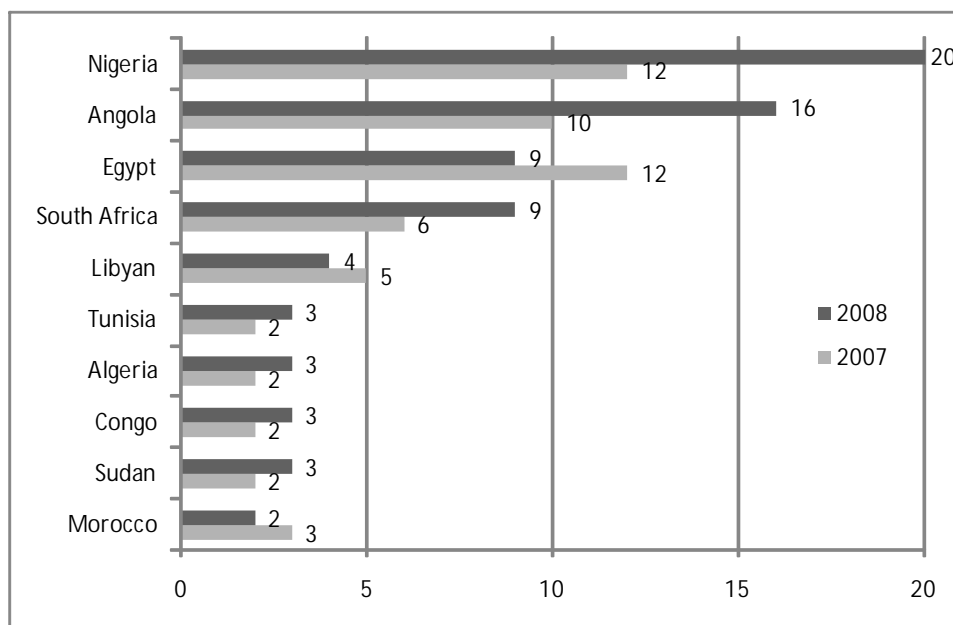
down to \$59 billion following the slowdown in global economic growth in the second half of 2008. FDI inflows to the five sub-regions of Africa differed with respect to their level, growth and geographic distribution.

North Africa attracts most of the total FDI inflows into Africa. Thereby, they receive their maximum amount in 2007 with 36%. The major industries that attracted FDI in North Africa were the processing industry and the financial sector. West Africa experiences a boom in the primary sector³ and in the telecommunication sector, leading to large inflows after 2005 (\$5.6 billion in 2005 and \$16.1 billion in 2006). The sub-region with the lowest FDI inflows is East Africa (including Ethiopia) with the exception of Madagascar, Uganda or United Republic of Tanzania. FDI inflows only amount to \$4 billion in 2008 representing 6% of total inflows into Africa. The main sector that attracts FDI is the primary sector. Central Africa receives FDI inflows predominantly from Asian investors in the primary and services sector. Its total in 2008 is at \$4 billion also a 6% share total FDI inflows into Africa. The last sub-region is Southern Africa. Next to North Africa, Southern Africa has attracted a main part of the total African FDI inflows. Increased FDI inflows to Angola and South Africa brought the FDI inflows to their highest level ever: \$27 billion in 2008 accounting for 31% of the inflows to Africa. Its main investors are from Asia (China) in the finance sector and processing industry. Except for 2008, the distribution among the regions has remained nearly unchanged over time.

The ten leading FDI host countries in Africa account for over 82% of the African inflows (Figure 1.5). In 2008, they receive in total \$71 billion. Each of the top 10 attracts inflows in excess of \$1 billion. They share a number of common features: large reserves of natural resources and/or active privatization programmes, liberalised FDI policies and active investment promotion activities.

³ The primary sector includes the agricultural and the mining sector in the World Investment Reports by UNCTAD (2006).

Figure 1.5: Top 10 recipients of FDI inflows, 2007-2008 (\$ billions)



Source: UNCTAD, 2009.

Regarding the policy environment, quite a few African governments demonstrate commitments to FDI-friendly environments in 2008. They signed 12 new bilateral investment treaties (BITs) in 2008 (8 of which are concluded with the European Union⁴), bringing the total number of BITs involving African countries to 715 by the end of 2008. African countries are now part of 27% of all BITs.

In the medium term future FDI inflows to Africa are supposed to increase again and by the end of 2011 to reach the former level of FDI inflows. Investments are expected to flow mainly into the agribusiness sector.

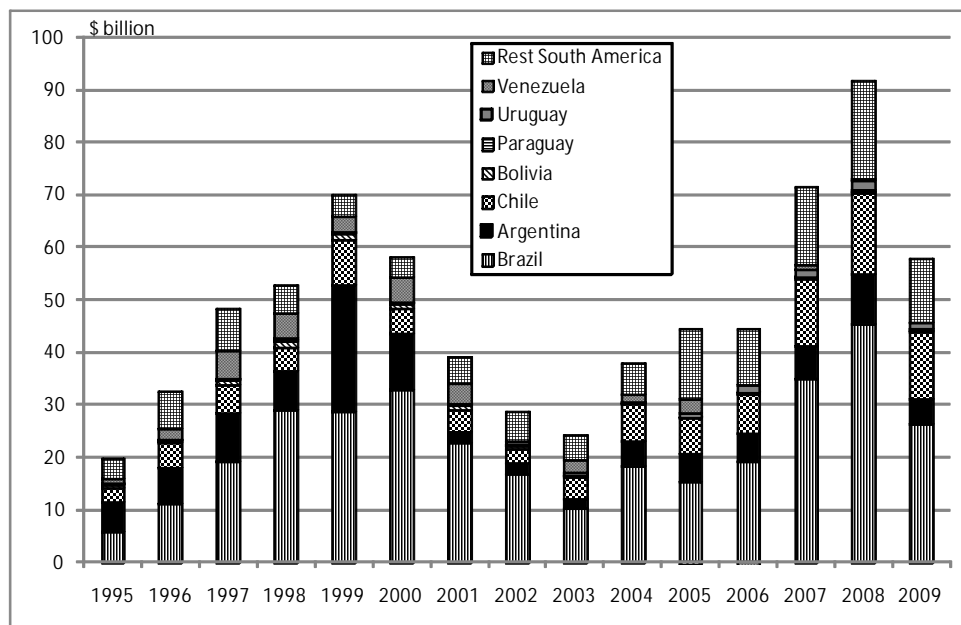
Development of FDI flows into South America

Regarding the development of FDI inflows into South America it appears that the course of the inflows is quite similar to the global FDI flows over time. Up to 2000, FDI inflows increased continuously to a maximum level of \$70 billion before the flows decreased down to below \$30 billion in 2003. Since then, FDI

⁴ For continuous comparability of the time series only the EU15 is considered as the enlargements to become the EU27 only exists since 2007.

inflows slowly increased again. In 2008, despite the spreading financial crisis and world economic slowdown, FDI inflows increased significantly by 29% up to \$92 billion from \$71 billion in 2007 (Figure 1.6). Natural resources and related activities were the main attraction for FDI inflows. South America has attracted most of the FDI in the agribusiness sector. The strong increase of total FDI in 2008 is due to the sharp rise of inflows to the top four recipient countries: Brazil (by 30%), Chile (by 33%), Colombia (by 17%) and Argentina (by 37%). Together they represent 89% of the total South American FDI inflows. South America did not experience decreases in its FDI inflows as its economies were bolstered by robust domestic and global demand and high prices for commodities such as oil and gas, copper, gold and soya beans.

Figure 1.6: South American FDI inflows, 1995-2009



Source: UNCTAD (2010)

Brazil, part of the Mercosur countries⁵, with a record \$45 billion in investments, accounts for half of the region's total inflows in 2008. The rise of FDI to this

⁵ Mercosur was founded in 1991. It is an economic and political agreement between Argentina, Brazil, Paraguay and Uruguay. Bolivia and Chile currently have associate member status. Its purpose is to promote free trade and the fluid movement of goods, people, and currency. For more details see <http://www.mercosur.int/>.

country resulted from a more than threefold increase of inflows into the primary sector afterwards representing 34% of total inward FDI to Brazil. The manufacturing sector receives around \$13 billion (or 35%) of the Brazilian FDI inflows, most of them (80%) go into the agribusiness sector. Strong increases in inflows are also registered in countries such as Bolivia, Venezuela, Paraguay and Uruguay, but starting from a lower level. A significant share (40%) of the Uruguay FDI inflows goes into the food sector (e.g. pulp mills).

FDI-related policies have moved towards more state control following a nationalization policy. This trend has already been reckoned in previous years (since 2000). Thereby, the single states regulate FDI through national policies without setting up a BIT. Hence, the number of BITs does not increase that highly. This is a slightly different trend compared to other developing countries who try to attract FDI not only through national policies but also through regional agreements on investment.

In 2009, FDI flows to South America have decreased by over 50% following the global trend. However, positive developments in commodity prices can have a favourable impact on medium-term prospects (after 2010) for natural-resource-related FDI for which South America has prospects comparable to those in Africa.

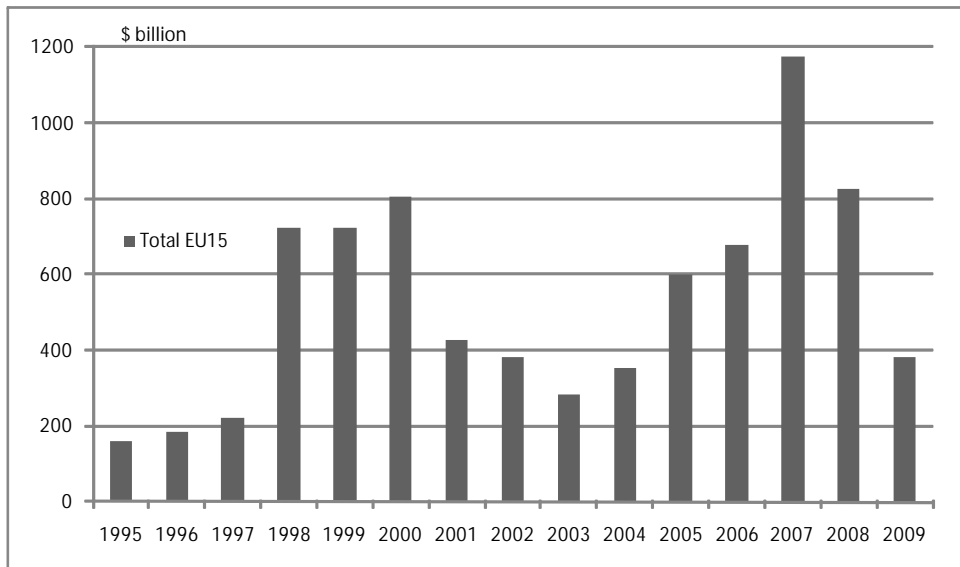
European FDI outflows

Global FDI outflows mainly originate in developed countries. Next to the U.S. and Japan this always included countries of the EU15. In the following the focus will only be on the EU15 as a home country as it is the major investor country regarding FDI flows into Africa and South America (UNCTAD, 2009).

Over time the EU15 FDI outflows follow the development of the global FDI flows. After reaching a record of \$1,175 billion in 2007 after years of increasing FDI outflows, EU15 outward FDI fell to \$383 billion in 2009, representing a sharp decline of 67% (Figure 1.7). As a result, the EU countries' share in total outward FDI from developed countries dropped disproportionately high compared to global FDI flows from 66% in 2007 down to 47% in 2009. The decrease in FDI outflows again shows the direct impact which the global financial crisis has on the decision of EU MNEs to invest abroad.

The United Kingdom lost its position as the largest EU source country of FDI as the country's MNEs cut their new investments abroad to \$18 billion, compared to \$275 billion in 2007. In 2009, France ranked first among countries in Europe in terms of outward FDI, with investments amounting to \$147 billion – slightly lower than in 2007. In contrast, outward FDI of the other larger economies such as Germany, Italy and Spain, was strongly hit by the deteriorating economic climate falling considerably by 65%, 52% and 83%, respectively.

Figure 1.7: Total EU15 FDI outflows, 1995-2009



Source: UNCTAD (2009)

The percentage of EU15 FDI outflows that went into the agribusiness sector varies between 4% to 8% with an increasing tendency in the last few years.

1.3 *Performance characteristics of European MNEs*

Through a comprehensive literature review in *Chapter 2*, theoretical differences between MNEs and domestic firms are identified. From the theory on firm heterogeneity, which is part of the New Trade Theory and identifies firm heterogeneity as an additional factor for driving trade (Krugman, 1979), general firm characteristics are derived. In first studies, firms were only divided into domestic firms and exporters before a further differentiation led to the identification of performance characteristics responsible for the appearance of MNEs. Thereby, two groups of characteristics can be distinguished which lead to the decision of becoming a MNE. The first one includes variables that indicate the size of a firm and the second one, variables that mirror the productivity (factor and labour productivity). A theoretical model where a certain productivity level has to be realised from a firm to become a MNE is generated by Merlitz (2003). Not all firms according to theory have the requirement of becoming international investors (Yeaple, 2008). The derived performance characteristics were tested up to now mainly for U.S. companies and verified as being determinants when differentiating between domestic U.S. firms and MNEs (e.g. Bernard and Jensen, 1995; Doms and Jensen, 1998).

Regarding European MNEs in the agribusiness sector the question occurs of whether these in general identified performance characteristics also account for them. An understanding of the underlying investor behaviour of European MNEs will show how relevant internal (firm specific) characteristics are for the decision of whether to invest or not. Hereby, specific firm characteristics are identified that appear to be responsible for the occurrence of MNEs and hence FDI flows.

The theoretical background based on the theory of firm heterogeneity is stated in its major development steps for setting up hypotheses on European MNEs in the agribusiness sector. Further, a model is set up for stating the theoretical background. Through using a comprehensive firm-level database ('Amadeus database' generated by Bureau van Dijk⁶), these theoretically derived key differences were tested for European MNEs in the agribusiness sector. Due to the data availability, more variables than in former empirical studies are included in the undertaken analysis indicating the size and the productivity of a firm. Further, the former empirical analyses were extended by including liquidity measures which show the efficiency of capital allocation for the single firms. They are

⁶ The database covers public and private European firms of all industries. In total, the database contains over 9 million firms across Europe. For more details see <http://eps.bvdep.com/pdf/brochure/Amadeus.pdf>.

tested regarding its efficiency in differentiating between domestic firms and MNEs. The hypothesis for the new performance characteristic is that MNEs have higher liquidity than domestic firms. After describing the used data and the applied methodologies (factor analysis, descriptive statistics and binary choice model) the results occurring from the different analyses are discussed.

The factor analysis confirms that the 20 variables chosen can be grouped according to the four major performance characteristics (size, productivity, liquidity and labour performance) that are supposed to differ between MNEs and domestic firms. Through the descriptive statistical analysis, the occurrence of the difference in the performance characteristics between the two groups of firms is identified. It appears that European MNEs follow the theoretically derived characteristics concerning the size and the productivity. The received results on labour performance differ to former studies. The analysis on European firms in the agribusiness sector shows that European MNEs and domestic firms do not differ highly when regarding the labour performance. In contrast, U.S. Multinationals differ significantly to domestic firms. The newly included variables on the liquidity of firms as a specific performance characteristic leads to the conclusions, that both type of firms in the European agribusiness sector are solvent and therefore do not differ highly for this characteristic. Still, as a new outcome, the capital strategy of the two group of firms could be derived. Obviously, European MNEs base their capital strategy on external capital while domestic firms operate mainly with equity. By undertaking a binary choice analysis as a last step it is possible to quantify the relationship between firm characteristics and the decision to become engaged in foreign investment. The analysis confirmed previous results regarding the necessity of being large in size and highly productive for becoming a MNE. Further, it becomes clear that the gap between domestic firms and MNEs in the European agribusiness sector is rather high making it difficult for domestic firms to become engaged in foreign investment.

Especially missing data on export flows or on affiliate sales has restricted the potential of the undertaken analysis. A further differentiation between domestic firms and exporters that also play a major role in theory and in the trade relations between two countries would have given an even clearer picture of the different performance characteristics which appears possible for U.S. firms. Further, limitations appear as the dimension 'time' is not included in the analysis. Through the usage of cross section data time influenced variables will be underestimated. The strategic aspect behind the investment flows regarding vertical or horizontal FDI could not be considered.

1.4 *Determinants of European FDI*

Through combining in *Chapter 3* the theory of trade, the theory of the firm and the theory of international capital markets, firm external (host country) characteristics can be identified necessary for the analysis on the objective of MNEs to invest in a certain host country. Especially for developing countries, which see FDI inflows as an important factor for their economic development, the analysis can help to align their political framework for generating a FDI-friendly environment. Thereby, the theory of trade regards the optimal international allocation of production taking the Heckscher-Ohlin model as a starting point and including factor mobility for explaining the appearance of FDI (Mundell, 1957). The theory of the firm tries to explain the optimal size and structure of an MNE with Dunning (1977) summarising the motives in his OLI-Paradigm. The theory of international capital markets focuses on the origins of finance. Thereby, the theory comprises two main models (the Capital-Asset-Pricing-model and the Arbitrage-Pricing-theory) which explain the appearance of capital generation through the calculability of risk (Loistl, 1990). Regarding all three theory strings, it is concluded that next to other determinants the availability of resources, the market growth rate, the market size, the per capita income, the degree of market inefficiency and the exchange rate are major factors that lead to the appearance of FDI in host countries. The theory thereby distinguishes between market seeking investments (*horizontal FDI*) and those undertaken through MNEs that target to become more efficient in production (*vertical FDI*). The derivation of a theoretical model ('Knowledge-Capital-Model' by Markusen and Venables, 1998) pictures which kind of determinants lead to the appearance of a certain kind of investment flow (horizontal or vertical). Hence, aspects of all three main theories are considered. Former empirical studies mainly on U.S. MNEs in the manufacturing and food-processing sector verified these variables as the major host country characteristics (regardless of the host country chosen) for causing horizontal FDI flows in most cases (e.g. Gopinath et al., 1999; Awokuse, 2006). Only recently (since 2000) analysis also come to the conclusion that efficiency seeking (vertical FDI) can be an important objective for a firm to invest abroad (Markusen, 2002).

The specific analysis will indicate which of the theoretically detected determinants are relevant for the appearance of the European FDI flows in the agribusiness sector and what type of FDI is thereby undertaken. Therefore, the Mediterranean and Mercosur countries are used as specific host countries for European FDI flows in the agribusiness sector, as these two host country groups receive not only high investment flows from Europe but are also major trading partners.

For deriving these host country determinants, a comprehensive literature review on the three essential theories (theory of trade, theory of the firm and theory of international capital markets) is done. The knowledge-capital model on which the empirical analysis is based is stated thereafter. Regarding former empirical analyses, the theoretically derived determinants can be grouped according to the underlying objective of MNEs (market-seeking/efficiency-seeking). After depicting the general model which forms the base for the specific estimations, the necessary preparation of the raw data for the following regression analysis is pictured. Hereby, data is taken from the 'World Development Indicators' (World Bank, 2007) and 'FDI country profiles' (UNCTAD, 2009b). Through applying the Akaike Information Criterion to the general estimation model, two host country specific models (one for the Mediterranean countries and one for the Mercosur countries) are defined and estimated. The emanating results are described and exemplified.

It appears that host country characteristics differ between the Mediterranean and the Mercosur countries as host countries for EU15 FDI flows into the agribusiness sector. Main determinants that attract FDI flows significantly for the Mediterranean countries are the size of the total host country economy, a high consumer price in the EU15 and last period FDI inflows undertaken by European MNEs. The size of the joint agribusiness market as well as possible high investment costs occurring in the Mediterranean countries will lead to a significant reduction of European FDI inflows. Changes in the exchange rate do not have any additional explanatory value for the appearance of European FDI flows into the Mediterranean countries and therefore were not included in the specific model. For the Mercosur countries main determinants to attract FDI inflows significantly are the size of the total host country economy, the exchange rate between the Mercosur countries and the EU15 and foregoing FDI flows into the agribusiness sector. Next to the size of the joint agricultural market, a high difference in skilled labour as well as high last period trading costs would lead to a significant reduction of FDI flows into the Mercosur countries.

Connecting the results received from the estimation with the underlying theory, it appears that the identified determinants differ between the two host countries and lead to different objectives that European MNEs have for undertaking FDI flows. European MNEs that invest in the Mediterranean countries appear to be mainly interested in reducing production costs and becoming more efficient against other competitors either in the EU itself or in third country markets. Entering in a new market seems not to be the main target when investing in the Mediterranean agribusiness sector. In contrast to those findings are the results for the Mercosur countries. Here horizontal FDI inflows are mainly carried out in the agribusiness sector, meaning that the objective of European MNEs appears to be the

development of new markets. This appears possible for MNEs as they are more productive than domestic firms. For the implications on the existing trade flows this means that investments into the agribusiness sector of the Mediterranean countries will increase trade with the EU15 (complementarity) while for the Mercosur countries it is possible that trade between them and the EU15 will be reduced (substitution).

Limitations occur mainly due to a lack of data availability. Trade and investment costs have only been included through an index. Thereby, political intervention through trade, investment and competition policy is reckoned as being relevant for the appearance of FDI. The inclusion of specific trade and investment barriers would differentiate the analysis further.

1.5 *FDI in Ethiopia*

Analysing the occurring investment flows from the perspective of a host country in *Chapter 4* gives the possibility of discussing positive and negative impacts on the sustainability of the development for these countries. The long-term political direction on how to deal with FDI inflows regarding regulations or privileges for the investors can be derived from these kind of studies. Ethiopia is chosen due to the good data availability especially regarding the FDI flows into the different parts of the agribusiness sectors. As the agribusiness sector appears to be the base of the Ethiopian economy high increases of the FDI inflows as it was observed since 2000 are supposed to have great impact on the total economy. This includes not only an analysis on the economic development but also on the social and ecological development. The usage of a case study is sensible as it can give a detailed view of the development in a certain country for a specific sector. General databases as the World Development Indicators from the World Bank or the FDI statistics generated by the UNCTAD only provide data on the development of e.g. developing countries in the agribusiness sector. A further disaggregation of the data into the single developing countries and into the sub-sectors of the agricultural sector that receive the foreign investments is not comprehensively available.

Various empirical studies and in particular the endogenous economic growth theory find that FDI flows are highly important for the economic performance of a country as they can make up for the domestic capital shortfall (e.g. UNCTAD, 2009; Klein et al., 2001; Ikara, 2003). Thereby, FDIs do not affect economic growth directly but through the appearance of transmission mechanisms such as technological spillovers (Barro and Sala-i-Martin, 2004). Impacts on environment depend on the governmental policies as the superficial objective of MNEs is not the increase of environmental conditions but rather the reduction of production costs. Hence, a strong regulatory framework can lead to an environmental improvement (OECD, 2001). Although not a sufficient condition, poverty reduction is enhanced through economic growth. As poverty reduction is a main target of the Millennium Development Goals (United Nations, 2009) which have been agreed on in 2000, it has to be analysed to which extent FDI may affect achieving those goals. As the agribusiness sector is the main economic sector on which many developing countries base their economy (UNCTAD, 2010), investment flows into this sector have a high impact on those economies.

A literature review on the existing growth theory and on previous empirical case studies of various developing countries mainly regarding the agribusiness sector lead to the deviation of the following hypotheses: 1) FDI stimulates economic growth through transmission mechanisms and 2) FDI has a positive impact on

poverty reduction through the increase of economic growth. For being able to derive future implications of the FDI inflows on the sustainable development main country facts regarding general economic figures, the land and water usage and the political investment climate are pointed out. Stating the FDI inflows into the agribusiness sector of Ethiopia have increased heavily between 2000 and 2008, a short overview concerning the main investors, the main agribusiness sub-sectors and the main regions receiving investments will be given. After achieving a comprehensive overview over Ethiopia's latest development, the effects of the recent FDI inflows on the sustainability of Ethiopia's development are analysed by distinguishing between economic and social development, the ecologic development and poverty reduction. Through comparing main economic and social indicators such as the GDP per capita, the human capital development or the GPI with former case studies on developing host countries, the impact of FDIs on the future development of Ethiopia is derived.

The undertaken analysis leads to the conclusion that the future economic development can be regarded as very positive in the medium term. The annual growth rate of the GDP is prospected to remain stable at the identified level, employment will be increased further and a further integration in international markets appears to be appropriate. For the social development, all these aspects will also have a positive impact but in contrast to the pure economic development the possibility of negative impacts also exists. Smallholder farmers may be driven out of business, reducing agribusiness employment, and poverty reduction may not appear to such a high extent as no or little redistribution of wealth may appear. Still some major Millennium Development Goals will be achieved at least to some extent by 2015 showing that poverty in Ethiopia is reduced. Environmental development seems to lead into increasing conflicts regarding land and water endowments if no additional agricultural production ways are found and no strong regulatory framework is implemented. Overall, keeping the negative impacts in mind, great investments are necessary in the agricultural sector to achieve a medium term sustainable development in Ethiopia.

As FDI flows have increased only recently to such an high amount per year, impact on host countries cannot be analysed through quantitative models as the data necessary for future projections is not available yet. Therefore, possible developments to be seen in a medium term prospect are based on former empirical work partly dealing with other host countries. This approach can lead to an overestimation of possible future development if past development characteristics are considered. Further, the analyses are based on today's observed high FDI flows assuming that they remain stable. Serious reductions can change the estimated development strongly.

1.6 Conclusion

“Size and productivity are larger for multinationals relative to domestic firms. Furthermore, European Multinationals are characterised by a larger debt to equity ratio and show lower labour costs.” (Chapter 2)

“The analysis of Mediterranean countries [...] reveals [...] some more evidence for vertical type FDI. [...] for the Mercosur countries [...] some more evidence for horizontal type FDI.” (Chapter 3)

“... high FDI inflows [...] will have a positive impact on the economic growth and poverty reduction [...] conflicts on land and water are to increase” (Chapter 4) in Ethiopia.

Caused through the strong increase of global FDI flows over the last 15 years and their increasing influence on global economic development, the thesis attempted to provide an understanding of the different mechanisms that lead to the appearance of FDI flows in the agribusiness sector. Further, the impacts that this kind of FDI flows can have on the sustainable development of host countries were analysed. Regarding the existing empirical analyses, Africa and South America as major host regions especially with respect to the agribusiness sector and the EU15 a major investor not yet considered highly in empirical analyses, were taken to conduct the analyses. The results will be discussed regarding the aim of the dissertation. Limitations of the work will be pointed out and further potential research work will be identified.

Main findings

Regarding the aim of the dissertation, the main finding can be summarized for the agribusiness sector as follows:

- European Multinational Enterprises appear to be larger in size and more productive than their domestic competitors which make it possible for them to become engaged in Foreign Direct Investment. Higher-than-average performance characteristics lead to the appearance of Multinational Enterprises.

- Depending on the objective of the European Multinational Enterprise (market-seeking/efficiency-seeking) the appropriate host country according to specific country characteristics is chosen.
- High investment flows into the agribusiness sector are important for a sustainable development of developing countries but a strong political framework regarding the redistribution of income and ecological aspects has to be in place to achieve poverty reduction and a healthy environment.

It appears that for the agribusiness sector and especially for the European one, the mechanisms that lead to the appearance of FDI differ slightly from other sectors and investor countries when regarding former empirical studies. Historically, the European agribusiness sector has been and still is very heterogeneous in its structure occurring from the formerly self-contained Member States and their specific political position regarding the agribusiness sector. Hence, when analysing the characteristics and objectives of European MNEs this heterogeneity is mirrored in the results which are not that ambiguous as for example the results on U.S. firms. Performance characteristics distinguish MNEs from domestic firms, but not for all of the characteristics in such a clear manner. Further, European MNEs do not show over all the same objective of why they invest abroad. Some invest for market-seeking reasons, others for becoming more efficient in their production. Host countries are then chosen regarding their country characteristics that fit best to the underlying objective. Still, major theoretical assumptions also apply for European MNEs in the agribusiness sector as the higher-than-average performance of European MNEs and the different host country characteristics that lead to the occurrence of vertical or horizontal FDI in the single host country. In comparison to that, U.S. Multinationals appear to be more homogenous when regarding former studies in a way that they mostly undertake FDI with the objective to enter into a new market (horizontal FDI) independent of the host country.

The derived impact of FDI inflows on Ethiopia's economy views the position of host countries facing these investment flows. The conclusion can be drawn that especially for developing countries FDI inflows are important for the economic and social development. FDI flows can make up for the host country's capital shortfall very efficiently and therefore incentives should be provided to attract FDI inflows. The negative impacts especially on the environment such as water shortage and reduction of agricultural land through erosion should thereby not be unconsidered. For reducing environmental problems favourable political regulations need to be in place.

Limitations

The analysis of FDI flows in the agribusiness sector has its limitations mainly in two respects when regarding general limitations not specific to the single analysis. The first one are gaps in data availability, the second one is that only certain aspects of the broad field on FDI analysis has been viewed.

- Lack of data availability

Analysing FDI flows a major limitation is the data availability given by the host or home country itself, which are mainly general figures and only sporadic disaggregated data. Data disaggregated for single sub-sectors of the agribusiness sector comprehensively for single countries are not generally available. Database such as the World Development Indicators (World Bank, 2010) do not go beyond the country level regarding FDI flows. Already data on flows between specific home and host countries are hardly available. Especially in the case of European MNEs which appear to be very heterogeneous in the agribusiness sector, the analysis of single sub-sectors could lead to the possibility of drawing clearer conclusions on the mechanism leading to the appearance of FDI flows. Secondly, the completeness of the yearly data is not continuously given, which can lead to an over or underestimation of the impact of certain factors (e.g. GDP of the host country, TFP) on FDI flows. Additionally, data on important variables such as e.g. trade or investment barriers may not be available wherefore proxies have to be found. These may mirror the impact of the variable on FDI flows only to a certain degree.

- Focus on single aspects of the broad field of analysis on FDI

As the focus is on FDI flows in the agribusiness sector, a generalisation on other sectors is not possible. Conclusions draw on the economy of a host country were possible to a certain extent as they base their economy mainly on the agribusiness sector. Further, as only specific host and home countries are regarded, the received results only apply for these countries. For generalising the received results, it would have been necessary to take more countries into account.

Regarding only specific aspects of the research field on FDI flows it is not possible to draw general conclusions for specific results received. All results only stand for the specific problem analysed. Analysing an aspect in more detail would have made it possible to generalise in this specific area but would not have given a complete picture of the different aspects affected through FDI flows.

Outlook

Through the broadness of the research area a number of further research steps occur from the analyses carried out.

Looking at current theories used, it appears that especially the impact of political variables such as trade and investment barriers or incentives are not or only partly included in theory. A first effort of including these kind of measurements was carried out by Schiff (2006) for trade barriers but not investment barriers. This gives the possibility of deriving the existing theoretical models further by including these kinds of political variables.

When regarding the analysis on the characteristics of European MNEs the usage of a more comprehensive database for undertaking a panel analysis could strengthen the drawn conclusions. In the analysis only cross sectional data was used as a comprehensive panel database was not achievable at a 10% level. Next to the usage of time series data, further information on when the firms became MNEs and whether they have been exporters before, would also make the received results more robust. Because of missing data a comparison between exporters and MNEs was not possible as well as a comparison of the productivity development over time of MNEs.

Additionally, as detailed data is available in the case of European agribusiness firms, it would be of interest to look at a specific sub-sector and analyse whether structures in one sub-sector are more homogeneous than on the aggregated level. This could then be compared between different European Member States.

Deeper analysis on the relationship between trade and FDI flows were not regarded in this dissertation, as the mechanisms behind the appearance of FDI flows were the main aim of this study. As high relations between FDI and trade flows are reckoned in theory, it is of further interest to analyse the existing linkage. Therefore, it appears necessary in further research to develop a simultaneous model with FDI and trade occurring as independent variables.

Regarding the impact of FDI flows in host countries (especially developing countries) future development of Ethiopia's economy has only been derived from existing theory and former empirical studies. For verifying the received conclusions the generation of a quantitative model would be sensible. Because of little data availability such an analysis will only be possible in a few years time.

This study in its broadness has hopefully contributed to understanding the appearance of European FDI flows in the agribusiness sector in order to point out how important these FDI flows are and will be in the future for global economic and trade development in a world becoming more and more globalised.

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2 Foreign Direct Investment and the Performance of European Agribusiness Firms¹

Abstract

This paper analyses the relationship between foreign direct investment and the performance of European agribusiness firms. Motivated by the role of heterogeneous firms in new trade theory and using a firm-level data set, statistical analyses identify key differences between firms investing in foreign economies and those that do not. A binary choice model quantifies the relationship between firm characteristics and the decision to engage in foreign investment. Size and – less strongly – productivity are greater for multinationals relative to domestic firms. Furthermore, European Multinationals are characterised by a larger debt to equity ratio and show lower labour and input costs.

Keywords: European agribusiness firms; foreign direct investment; performance characteristics.

JEL Classification: D22, F23, L25, L66, Q13

¹ This paper is published together with Prof. Dr. Thomas Heckeley in the *Journal of Agricultural Economic* online on the 15 April 2011 and scheduled to be published in Volume 62.3, September 2011.

2.1 Introduction

New Trade Theory identifies firm heterogeneity as an additional factor driving trade in addition to differences in factor endowment or technology. This link, identified by Krugman (1979), reflects economies of scale and therefore greater competitiveness and productivity for some firms. Since the mid '90s empirical studies have addressed the derived hypothesis by analysing firm-level data.

A very detailed overview on the existing empirical literature is given by Arnold and Hussinger (2006) and by Wagner (2007). They divide the extensive research into two groups. The first is based on theory developed by Melitz (2003), who concludes that exporters are more productive than non-exporters. These empirical studies investigate productivity patterns across exporting and non-exporting firms with the focus on the US manufacturing sector or the economy in total. The main contributions are by Bernard and Jensen (1995, 1999 and 2004) and Bernard and Wagner (1997) who are one of the first to use firm-level rather than country or industry level data for their analysis. The general outcome of these studies is that exporters tend to outperform non-exporting firms. Main characteristics of exporting firms relative to non-exporters are higher levels of total employment, shipments, value-added per worker, total factor productivity (TFP), average wage, non-production wage and total investment per worker.

The second group (e.g. Yeaple, 2008 and Doms and Jensen, 1998) investigates performance differences between multinational and domestic companies based on the theory derived by Helpman et al. (2004) including the hypothesis that multinational enterprises are the most productive firms. These studies come to similar conclusions: Multinational Enterprises (MNEs)² outperform exporters as well as non-exporters with respect to similar measures identified for the comparison between exporters and non-exporters.

In this paper, firm characteristics of European agribusiness enterprises operating in only the domestic market are compared with those also operating in foreign markets using detailed firm-level data. To our knowledge, the agribusiness sector has not been analysed in this way. We address the question of whether the agribusiness sector shows similar characteristics to those identified in past studies for the manufacturing sector or the economy as a whole. Furthermore, previous studies have either focused on U.S. companies (mainly in the manufacturing sector) or on single European countries but not on the EU-15 in total. We test the

² Throughout this paper, the terms “Multinational Enterprises”, “multinational companies” and “FDI firms” will be freely interchanged.

general hypothesis that firms investing in foreign economies are more productive and that they differ significantly in performance measures from firms that only produce in the domestic market. To do so, firm-level data for EU-15 countries from the database Amadeus³ (Bureau van Dijck, 2008) is used to capture the heterogeneity across establishments, which are otherwise undetectable using sectoral data (Doms and Jensen, 1998). A combination of descriptive statistics, factor analysis and a binary choice model is used to identify and quantify the differences between multinational and domestic firms.

In the next section (2.2), hypotheses for European MNEs in the agribusiness sector are derived from existing theory. This model highlights the important role of within-sector firm heterogeneity in explaining foreign direct investment. Section 2.3 describes the used data and explains the methodology. Section 2.4 discusses results and section 2.5 concludes with the main findings.

³ This database has been recently used in the context of non-agribusiness studies: see Helpman et al. (2004) who analyse the question why U.S. firms export or undertake FDI. Leshner and Miroudot (2008) analyse the spillovers of FDI decisions undertaken by European MNEs out of 15 Western and Eastern European countries on trade flows.

2.2 *Firm heterogeneity and FDI*

Until the New Trade Theory explicitly introduced firm heterogeneity, observed trade was mainly explained by country differences with respect to factor endowments and technology leading to comparative advantages. Krugman (1979) was one of the first to include the assumption of heterogeneous firms into a trade model. He concludes that trade may simply be a way of allowing scale economies in firms under monopolistic competition. Consequently, the structure of an industry, especially number and size, matters when analysing the firm's international competitiveness.

Melitz (2003) embeds his model of firm heterogeneity within Krugman's model. Firms differ with respect to productivity and this explains why some firms engage in exports and others do not. Only the more productive firms enter the export market and, simultaneously, least productive firms are forced to exit. Hence, exporters are more productive, i.e. they will have larger output and revenues, charge a lower price and earn higher profits than domestic firms.

Melitz's model was extended by Helpman et al. (2004) through linking the degree of intra-industry firm heterogeneity and the prevalence of subsidiary sales (due to FDI) relative to export sales. Relying on the existing literature, they recognise that firms can service foreign buyers through a variety of channels in a substitutional way. The results are that the most productive firms undertake FDI, less productive firms are engaged in exports and that the least productive firms remain in the domestic markets. This hypothesis is tested by Yeaple (2008). He analyses the differences in productivity between U.S. exporters and U.S. multinational enterprises and concludes that firms undertaking FDI are more productive than exporters.

Summarising, Krugman (1979), Melitz (2003) and Helpman et al. (2004) show that domestic, exporting and multinational firms are likely distinguished by size and productivity, the latter resulting in systematic differences regarding profits, return to investments, and performance of employees. In the subsequent more formal model presentation and the subsequent empirical analysis we focus on comparing FDI with domestic firms given the limitations of the available data.

The preferences across varieties of products of a representative consumer have the standard CES form, with an elasticity of substitution σ . These preferences generate demand x for variety ω in country j , denoted as $x_j(\omega)$, of the form

$$x_j(\omega) = \beta E_j (P_j)^{\sigma-1} p_j(\omega)^{-\sigma}, \quad (2.1)$$

where β is a share parameter, E_j is gross national expenditure in country j , P_j is the price index in country j , and $p_j(\omega)$ is the price of variety ω in country j . There is a continuum of firms, each choosing to produce a different variety ω using a single input factor ‘labour’. The wage w_j is determined in the homogenous-good industry Y . All firms are heterogeneous in terms of their productivity φ .⁴

If a firm from country h chooses to build up an affiliate in the foreign country j it faces additional fixed costs f_j and pays local labour costs w_j . To guarantee that the firm’s productivity is the same in every country, it is assumed that the technology transfer is perfect. The firm’s revenue in country h and j can be expressed by

$$r_d(\varphi) = \left[A_h (w_h)^{1-\sigma} \right] \varphi^{\sigma-1} \quad \text{and} \quad r_f(\varphi) = \left[A_j (w_j)^{1-\sigma} \right] \varphi^{\sigma-1} \quad (2.2)$$

where A_h and A_j are the mark-up adjusted demand levels in country h and j , respectively.⁵

A firm of productivity φ generates gross profit on sales in a country that are proportional to its revenues in that market $r(\varphi)/\sigma$. Since no firm will ever undertake FDI and not also produce for its domestic market, each firm’s profit can be separated into two parts related to domestic sales, $\pi_d(\varphi)$, and foreign affiliate sales per country, $\pi_f(\varphi)$. Using equation (2.2) it follows that the net profit of a firm is

$$\pi_d(\varphi) = \left(\frac{A_h w_h^{1-\sigma}}{\sigma} \right) \varphi^{\sigma-1} - f_d, \quad \pi_f(\varphi) = \left(\frac{A_j w_j^{1-\sigma}}{\sigma} \right) \varphi^{\sigma-1} - f_f. \quad (2.3)$$

$\pi_d(\varphi)$ and $\pi_f(\varphi)$ are linear and increasing in a firm’s productivity index $\varphi^{\sigma-1}$. Profits from FDI are lower, since the fixed costs of FDI, f_f , arising from the establishment of distribution and servicing networks and establishing a subsidiary in a foreign country, are higher than the domestic fixed costs, f_d .

Each firm’s combined profit can then be written as

$$\pi(\varphi) = \pi_d(\varphi) + \max \{ 0, \pi_f(\varphi) \}. \quad (2.4)$$

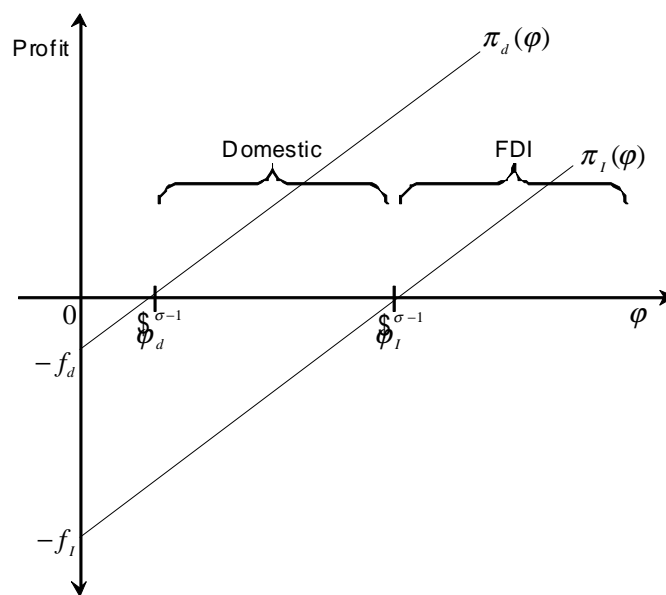
⁴ Higher productivity is modelled according to Melitz (2003) as producing a symmetric variety of output at lower marginal costs whereby resources are reallocated more efficiently and economies of scale are realised.

⁵ A firm facing demand curve (2.1) will optimally charge a price in a country of $p(\varphi) = c(\varphi) / \rho$ with $c(\varphi)$ being the marginal cost of supplying a country for a firm with productivity φ . This generates revenues of $r(\varphi) = A c(\varphi)^{1-\sigma}$. Marginal costs are then $c(\varphi) = w / \varphi$.

As $\pi_f(\varphi) < \pi_d(\varphi)$ it follows that there exists a specific cut-off productivity level $\varphi_d^{\sigma-1}$ for FDI activity. Some firms then produce exclusively in the domestic country while others also invest in foreign countries.

Figure 2.1 illustrates that firms with $\varphi^{\sigma-1} \geq \varphi_f^{\sigma-1}$ earn positive profits from domestic and foreign affiliates and therefore undertake FDI. If the productivity level is smaller than the domestic cut-off productivity level $\varphi_d^{\sigma-1}$, a firm does not earn any profits and therefore does not produce at all.

Figure 2.1: Productivity levels for domestic firms and MNEs



Source: modified from Helpman et al. (2004).

This theoretical background generates hypotheses for European Multinational Enterprises in the agribusiness sector:

1. Firms engaged in FDI are larger than domestic firms.
2. Firms engaged in FDI show higher productivity than domestic firms.

The theory explicitly focuses on firm characteristics which differentiate between FDI and domestic firms. Strategic aspects such as resource availability, distance to input and consumer markets etc. are not considered. These aspects are typically treated by a different theoretical approach dealing with the appearance of FDI and the strategy behind those flows (see for example Mundell, 1957, and Markusen

and Venables, 1998). Neglecting these factors limits our ability to explain FDI activity for specialised firms in the agribusiness sector, but does not invalidate the fundamental relationship between size and productivity on the one hand and FDI on the other. Size and productivity are connected if economies of scale exist. Especially relevant for the agribusiness sector, productivity gains with increasing size might also relate to quality improvements associated with large firms' ability to adhere to higher product standards at lower per unit cost.

2.3 *Empirical approach*

The data used in this analysis is a sample of firms extracted from the Amadeus database of the Bureau van Dijck (2008). The database covers public and private European firms of all industries. In total, the database contains over 9 million firms in 41 European countries. Amadeus searches, analyses and combines data from over 30 specialist sources.⁶ Standardised annual accounts, financial ratios and ownership structure of foreign affiliates are provided. To obtain an extensive data structure for the agribusiness firms extracted for our analysis, a minimum level of completeness of a single firm's data is determined (80% of the data in 3 consecutive years has to exist). Furthermore, minimum thresholds for revenues (> €900 tsd⁷), equity (> €400 tsd) and number of employees (> 19) are specified according to that of the smallest MNE. The legal form of the MNEs is mainly a public limited company. The group of domestic firms comprises all kinds of legal forms. As no role of the legal form is derived in the relevant theory, it has not been included in the analysis. The same holds true for firm specialisation. After this selection we obtained data on 2001 firms from the EU15 for the years 2004 to 2006. These firms cover nearly all sub-sectors in the agribusiness sector. The part of the supply chain to which the company belongs cannot be identified, since many firms have internalised several levels or linkages in the relevant supply chains.

A cross sectional analysis is performed on the three year averages. Using a longer time period was not sensible as the completeness of the data would have been under 10%.

From the variables available for each firm we chose those for further analysis that bear a relationship with the theory outlined above, i.e. those which are expected to differ between Multinationals and domestic firms. These include variables related to size and productivity. Apart from productivity measures that are directly included in the Amadeus database such as return on equity, yield on investment, return on assets and profit margin, the ratio revenue/cost is included as a proxy for

⁶ For more detail see <http://www.bvdep.com/pdf/brochure/AMADEUS%20BROCHURE%20FINAL.pdf>.

⁷ In the following tsd is the abbreviation for thousand.

total factor productivity (TFP).⁸ Table 2.1 provides an overview and definition of all measures considered here.

Table 2.1: Included Variables

Variable	Definition
Revenue	Ln (Sales that a company receives from its normal business activities, usually from the sale of goods and services to customers, tsd €)
Equity	Ln of the owners' interest on the assets of the enterprise after deducting all its liabilities, tsd €
Profit before tax	Ln (Sales of the firm less costs such as wages, rent, fuel, raw materials, interest on loans and depreciation, tsd €)
Fixed asset	Ln (Assets and property which cannot easily be converted into cash, tsd €)
Tax	Ln {Tax paid in a certain year (2004, 2005, 2006), tsd €}
Number of employees	Ln of the average number of employees in a year
Input costs	Ln of the company-related consumption of raw materials and energy, tsd €
Return on equity	Measures the rate of return on the ownership interest of the common stock owners. It measures a firm's efficiency at generating profits from shareholders' equity in percent
Return on invested capital	Quantifies how well a company generates cash flow relative to the capital it has invested in its business in percent
Return on assets	Shows how profitable a company's assets are in generating revenue in percent
Profit margin	Ln (Ratio of profitability calculated as net profits divided by sales. It measures how much out of every dollar of sales a company actually keeps in earnings in percent)

⁸ Depending on the data used, previous empirical studies (Bernard and Jensen, 2004; Girma et al. (2004); Arnold and Hussinger, 2006; Yeaple, 2008) have used different reflections of TFP. When using panel data most of the studies have estimated TFP from a production function. For the cross sectional data the applied measure seems appropriate even though its inaccuracy will increase with the extent of cross sectional price differences.

Cont. Table 2.1: Included Variables

Variable	Definition
Total Factor Productivity (TFP)	Ln (TFP = Revenue/Cost with Cost = Revenue – Profit before tax)
Solvency Ratio	Capital-liability-ratio in percent
Current Ratio	Ln of whether or not a firm has enough resources to pay debts over the next 12 months. It compares a firm's current assets to its current liabilities
Cash flow per revenue €	Ln of the revenue that has flown back liquidity-related to the company as profit in percent. The higher the percentage the higher is the financial surplus of the period
Equity ratio	Ln (Relative proportion of equity to all used capital to finance a company's assets, in percent = Owners Equity / Total Assets)
Net working capital	Is calculated as current assets minus current liabilities, it represents operating liquidity available to a business, tsd €
Revenue per employee	Ln (Revenue divided by number of employees, tsd €)
Labour costs per employee	Total labour costs divided by the total number of employees, tsd €
Profit per employee	Profit before tax divided by number of employees, tsd €

Source: Gräfer et al. (2001), Bureau van Dijk (2008).

We extend former empirical studies by also looking at liquidity measures which shed light on short term competitiveness. In total 20 variables are included. The variables are standardised to mean zero and standard deviation of one, and transformed as necessary,⁹ to facilitate a comparison across all variables independent of scale and to simplify the interpretation of results. In addition, outliers over all variables and for the single variables have been identified through

⁹ Since all variables need to be normally distributed for z-standardisation, they have been tested for normality following Backhaus et al., 2003. Those variables for which the normal distribution was rejected have been transformed by using the natural log. Normality was accepted for all the transformed variables, marked by "ln" in the second column of Table 2.1.

the single linkage method (Backhaus et al., 2003). In total 2.3 % (50 firms) of all firms were identified as outliers.

The selected data is then divided into two groups. This first includes firms that are only seated in a member state of the EU 15, i.e. production plants are also seated in the same member state. Firms of this group are referred to as domestic firms. According to the Amadeus database, which gives information on the location of existing subsidiaries and affiliates in the same market as their home base, these firms only operate in the domestic market. In total this group includes 1687 firms. The second group includes firms that are based in the EU15 but also have production plants either in other EU15 member states or outside the EU15. This group is referred to as FDI firms, and comprises 314 firms.

To analyse the two groups, an initial factor analysis is carried out to identify clusters of correlated variables to ease interpretation. The sensibility of the factor analysis is tested with the Kaiser-Meyer-Olkin-Criterion (KMO), to check for sufficient correlation within the identified groups. A KMO value lower than 0.5 is considered to be insufficient for a factor analysis. The number of factors is chosen such that any additional factor would not lead to a significant increase of explained variance of the included variables (Backhaus et al., 2003).

Following the factor analysis, a more detailed look at the difference of firm characteristics between multinational and domestic firms is done with descriptive statistical analysis. For this purpose the firms are grouped and tested for differences in mean of selected variables.

Finally, the probability to engage in FDI or not, conditional on firm characteristics, is analysed using a binary-choice regression model¹⁰. The analysis is undertaken to detect the influence of each of the single characteristics on the decision to invest (and thus operate) abroad. The dependent variable can take the value 0 (producing exclusively in the domestic market) or 1 (investing in a foreign country). Derived from the outlined theoretical model, a firm k invests ($Y_k=1$) if the additional foreign profit (π_{fk}) is greater than 0:

$$Y_k = \begin{cases} 1 & \text{if } \pi_{fk}(\varphi) > 0 \\ 0 & \text{otherwise} \end{cases} \quad (2.5)$$

where

¹⁰ The choice of the model is based on previous empirical studies such as Helpman et al. (2004), Bernard and Jensen (2004) and Roberts and Tybout (1997) who use binary-choice models to identify and quantify factors that increase the probability of exporting.

$$\pi_i(\varphi) = r(\varphi) / \sigma - f_i \quad (2.6)$$

Given that the productivity of firms reflects a combination of firm characteristics, according to Melitz (2003), the model can be estimated by using a binary choice approach of the form

$$Y_k = \begin{cases} 1 & \text{if } \beta X_k + \varepsilon_k > 0 \\ 0 & \text{otherwise} \end{cases} \quad \forall k = 1, \dots, n \quad (2.7)$$

where β is a $M \times 1$ vector of parameters to be estimated, X_k an $1 \times M$ vector of firm k 's characteristics, and the ε_k are i.i.d. random disturbances with constant variance. The model is estimated using a logit maximum likelihood approach.

2.4 Results

Factor analysis

The factor analysis identified four factors which together explain 61.8% of the variance of the included variables. The variables are structured in a way that those with similar explanatory value (i.e. highly correlated with a single factor) are grouped together. According to the KMO-value of 0.717 the factor analysis is sensible. Through the assignment of the single variables to the different factors according to their factor value (Table 2.2) the factors identified may be characterized as 'size', 'productivity', 'liquidity' and 'input productivity' of the firms. Some variables, especially TFP, Net working capital, Cash flow per revenue € and Profit per employee, cannot be assigned easily to single factors. Because the TFP variable is generated as the ratio between revenue and total cost it also contributes to explaining the firms' liquidity. Net working capital is not only relevant for the liquidity of a firm but also correlated with the factor 'size' indicating the potential of a firm to expand further.

Table 2.2: Identified factor loading

	Size	Productivity	Liquidity	Input productivity
Equity	.920			
Fixed asset	.864			
Revenue	.831			
Number of employees	.841			
Profit before tax	.418			
Tax	.236			
Return on assets		.885		
Return on equity		.872		
Return on invested capital		.857		
Profit margin		.739		
Total factor productivity (TFP)		.567	.414	
Solvency ratio			.854	
Current ratio			.787	
Equity ratio			.570	
Cash Flow per revenue €		.568	.414	
Net working capital	.376		.337	
Revenue per employee				.876
Labour costs per employee				.698
Input costs				.504
Profit per employee		.625	.372	.367

Most of the factor values are high showing that the relationships between the variables and the identified factors are rather close. Hence, the factors are good proxies for the underlying variables and characterise the firms well.

The distribution of factor values for the two groups (Table 2.3) allows a first check on the derived hypotheses regarding the impact of the firm characteristics on the probability of investing abroad. The descriptive statistics indicate differences in the distribution of the four factors within the two groups (Table 2.3).

Table 2.3: Descriptive statistics of the factors (z-values)

Variable		Mean	Median	Variance	Min Value	Max Value
Size **	FDI	0.74	0.38	2.05	-1.66	7.91
	Domestic	-0.14	-0.32	0.68	-3.15	4.31
Productivity ***	FDI	0.08	-0.10	1.49	-5.03	9.71
	Domestic	-0.02	-0.11	0.91	-5.67	5.73
Liquidity ***	FDI	-0.22	-0.34	1.22	-5.42	4.38
	Domestic	0.04	-0.12	0.95	-3.00	5.05
Input productivity **	FDI	-0.19	-0.07	1.30	-7.17	4.19
	Domestic	0.04	0.01	0.94	-4.82	5.65

Notes: significance level '**' 10%, '***' 5% and '****' 1%

Source: Own compilation.

All factor means are significantly different between FDI and domestic firms at either a 1% or 5% level. The median for 'size' and 'productivity' is higher for FDI firms than for domestic firms. On average, 'liquidity' of domestic firms is lower and 'input productivity' about equal between the two groups (Table 2.3).

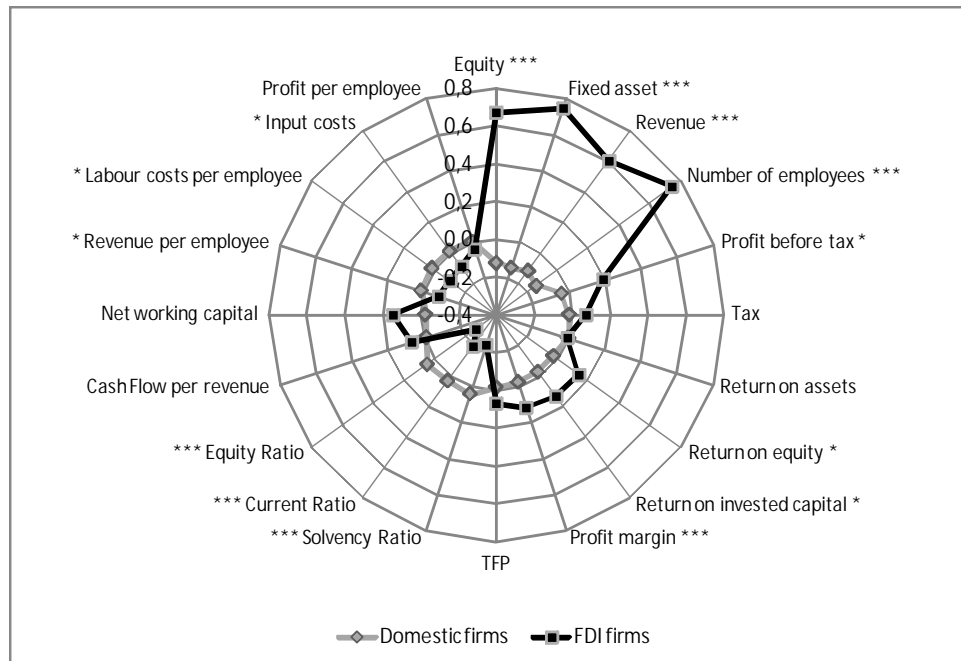
As a first overview over the data set it appears that 'size' and 'productivity' can be identified as characteristics for FDI firms which differ in a positive manner from domestic firms. On the other hand, the similar distribution for 'input productivity' and the lower mean for FDI firms regarding 'liquidity' need a more detailed analysis.

Detailed analysis of group differences

Figure 2.2 presents a spider diagram – differentiated by domestic and FDI firms – of the variable means underlying the above factor analysis.¹¹

¹¹ Descriptive statistics of the unscaled variables are given in Appendix 2.1

Figure 2.2: Performance characteristics of domestic and FDI firms



Notes: significance level '*' 10%, '**' 5% and '***' 1%

Source: Own compilation.

Comparing the two groups, the means of 8 of the 20 chosen variables are significantly different at a 1% level between multinational and domestic firms. FDI firms are clearly larger: their equity, fixed assets, revenue, and number of employees differ very significantly from the domestic firms.

Although FDI firms are not necessarily more successful than domestic firms, FDI firms significantly outperform domestic firms with respect to revenue, profit before tax, and profit margin. It appears that FDI firms not only have a larger output and earn more in total but also earn more per output unit than domestic firms. Some measures related to productivity, such as return on equity and return on invested capital, are significantly higher for FDI firms than for their domestic counterparts. TFP shows a slightly larger but insignificantly different value for FDI firms, while no difference is observed here for the return on assets.

The results for TFP correspond to previous empirical studies by Baldwin and Gu (2003) (analysing the Canadian manufacturing sector) and Doms and Jensen (1998) (analysing the U.S manufacturing sector). These studies compare the mean TFP (measured by a production function approach) for the two groups and find small but insignificant differences. On the other hand, Castellani and Zanfei

(2007) (analysing the Italian manufacturing sector) and Greenaway and Kneller (2004) (analysing the UK whole economy) find small significant differences between the two groups.

Previous research (Helpman et al., 2004; Doms and Jensen, 1998) have only considered capital-labour ratios. As the inclusion of liquidity ratios in this disaggregated form is new in the analysis of firm characteristics, the following discussion of the results is a first step in connecting these ratios with the existing theory. The liquidity variables as grouped by the factor analysis are the current ratio, net working capital, cash flow per revenue, the solvency ratio and the equity ratio. Here significant differences between FDI and domestic firms exist for the equity ratio, current ratio, and the solvency ratio.

The current ratio and the net working capital are classical liquidity ratios. They both indicate the firm's ability of discharging all payment obligations (Gräfer et al., 2001). Appendix 2.1 shows that for both firm groups the current ratio is positive but according to Figure 2.2 the significantly higher mean of the current ratio for domestic firms indicates higher liquidity compared to FDI firms. Net working capital and cash flow per revenue do not differ statistically between the groups. Overall, the results of these liquidity ratios suggest that domestic firms are less liquidity constrained. Regarding a higher expansion potential as measured by the net working capital, the data do not allow a firm conclusion as the difference is not significant.

The solvency ratio is not an explicit liquidity ratio but it describes the capital structure of a firm. FDI firms have significantly higher liabilities relative to their equity, which reduces their liquidity. Furthermore, combined with the equity ratio results, it appears that the capital structure of FDI firms relies to a larger extent on external capital than domestic firms (as would be expected, given their definition).

The input productivity between the two groups differs not strongly but significantly except for profit per employee. FDI firms have slightly lower labour and input cost but receive a profit per employee comparable to the domestic firms. On the other hand, the revenue per employee is slightly lower for FDI firms than for domestic firms. It appears that the labour performance (profit per employee and revenue per employee) is not strongly related to FDI activity. These findings do not confirm the results from previous studies where labour performance was often included as a proxy for productivity (see Helpman et al., 2004; Doms and Jensen, 1998). In most studies it was found that labour performance was significantly better for MNEs than for domestic firms. It may be concluded that labour productivity in the agribusiness sector has less relevance for the distinction between a domestic and a FDI firm than in the manufacturing sector. Lower labour and input costs may be more relevant.

The above analysis has shown significant differences in the characteristics between FDI firms and domestic firms. The joint influence of a firm's characteristics on the probability of investing in foreign countries is analysed in the next section.

Multiple firm characteristics and the probability to invest

The results of the maximum-likelihood logit model are shown in Table 2.4. The regression should not be interpreted as a model of investment behaviour but rather be seen as a quantitative relationship between multiple firm characteristics and FDI. It simply indicates the probability of selecting an FDI firm, on the basis of the firm's particular mix of measured characteristics, from a random drawing from the sample population of all firms.

The general logit model includes all 20 variables defined above. Based on backward stepwise exclusion, which is the most appropriate method according to the Hosmer-Lemeshow test¹² (also called the chi-square test), the final model contains the variables: equity; number of employees; input costs; equity ratio; revenue per employee; labour costs per employee. The ability of the estimated model to distinguish the two groups (0 = no investment, 1 = investment) can be evaluated by Pseudo R² statistics. The generalised R² (also called Nagelkerke-R² and most commonly used Pseudo R²) is 0.2 for the estimated model which is reasonable for this type of a cross-section analysis.

Since the β -coefficients in Table 2.4 cannot be interpreted as in a linear regression the $\exp(\beta)$ and the marginal effects on the probabilities provide information of the impact of the included variables on the classification of the firms into the two groups. The $\exp(\beta)$ shows the extent to which the probability ratio

$$\frac{P(Y = 1|X)}{P(Y = 0|X)}$$

changes if the respective variable increases by one unit and all other remain constant.

The included variables significantly contribute to the classification of the firms at the 1% level, except for 'input costs', which is significant at the 5% level (Table 2.4).

¹² The Hosmer-Lemeshow test is a significance test for binary logistic regressions and measures the goodness-of-fit for the estimated model comparable with the Akaike Information Criterion or the Bayesian Information Criterion (Hosmer and Lemeshow, 2000).

Table 2.4: Firm characteristics that influence the decision to invest abroad¹³

		β	Standard Error	Wald	Sig.	Exp(β)	Marginal Effect %
FDI firms Average probability 15.7%	Equity	.347	.089	15.068	.000	1.415	6.515
	Number of employees	.565	.100	31.968	.000	1.759	11.916
	Input costs	-.151	.062	5.949	.015	.860	-2.198
	Equity ratio	-.287	.083	12.021	.001	.751	-3.909
	Revenue per employee	.246	.089	7.701	.006	1.279	4.380
	Labour costs per employee	-.272	.085	10.250	.001	.762	-3.736
	Constant term	-1.932	.074	689.162	.000	.145	

Notes: The standard deviation of the single non-standardised variables can be found under Appendix 2.1.

Source: Own compilation.

The size of a firm is a strongly relevant characteristic in distinguishing between FDI and a domestic firm. Equity and the number of employees have the highest positive effect on the probability and are both highly significant.

Liquidity is represented through the equity ratio. Here a negative significant impact is estimated, suggesting as above that FDI firms base their financial strategy on external capital.

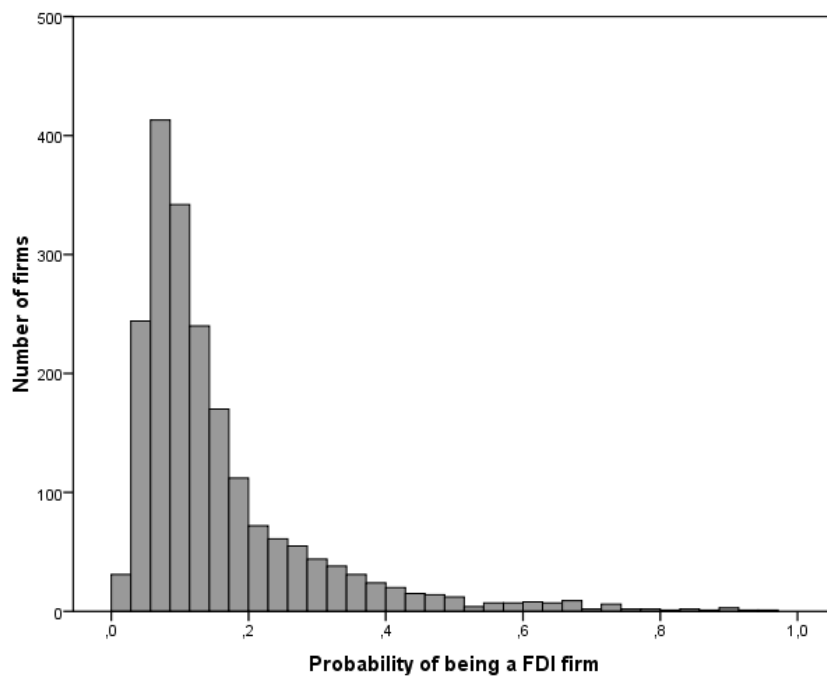
Productivity measures did not enter our final specification. This has some precedence in former studies for other sectors where characteristics such as the TFP were positive but not significant (e.g. Bernard and Jensen, 2004; Arnold and Hussinger, 2006). Most interestingly, however, revenue per employee, labour and input costs (identified in the factor ‘input productivity’) turn out to be relevant for identifying FDI firms in this multivariate setting. These variables have been used as productivity indicators previously (e.g. Baldwin and Gu, 2003; Greenaway and Kneller, 2004). Larger input costs and increasing labour costs per employee both reduce the probability of being an FDI firm, following the results of the descriptive analysis. However, the conditionality of the results here changes the direction of the effect of revenue per employee. This is a classical example of single versus multiple factors of influence. When other influences are controlled for, as here, then relationships between two variables can change in direction and strength. Apart from this, the regression generally confirms the nature of the relationships derived above from the group’s differences in variable means but additionally is able to simultaneously select the most relevant firm characteristics

¹³ The marginal effects for continuous variables (i.e., the marginal changes in expected probability $\partial E[y] / \partial x$) are equal to $\partial E[y|x] / \partial x = f(\beta'x)\beta$ where y is a choice variable, x is a vector of explanatory variables, β a vector of parameter estimates and f is the corresponding probability density function (Greene, 2003).

distinguishing multinational from domestic European Agribusiness firms. These results confirm the theoretical hypotheses, showing that FDI firms are larger and – less strongly – also more productive than domestic firms.

When considering the distribution of the estimated probabilities to invest among the whole sample (Figure 2.3) it becomes clear that most of the firms have rather low probabilities of investing, but that there is a rather long tail towards higher probabilities. Consequently, the difference in performance characteristics and probabilities to invest between the two groups is rather high and many agribusiness firms in our sample appear to be rather far away from becoming a FDI firm.

Figure 2.3: Distribution of the probability to invest



Source: Own compilation.

2.5 *Conclusion*

Based on new trade theory, Multinational Enterprises are hypothesised to be more productive, more efficient in resource allocation and larger in size than domestic firms. A growing quantity of empirical studies - mainly for the manufacturing sector - has confirmed these hypotheses.

The paper investigates the relevance of this theory for the European agribusiness sector comparing MNEs with domestically operating firms. The data is taken from the Amadeus database which – to our knowledge - has not been used before for this analysis.

A total of 20 variables on about 2000 firms were included and first subjected to a factor analysis, resulting in four groups of variables called ‘size’, ‘productivity’, ‘liquidity’ and ‘input productivity’. The distribution of factor values with domestic and FDI firms revealed larger average size and productivity, lower liquidity and similar input productivity for FDI firms compared with domestic firms.

A more detailed analysis of the group’s differences reveals that size and productivity indicators are significantly larger for FDI compared to domestic agribusiness firms. These results confirm previous empirical studies (e.g. Yeaple, 2008; Doms and Jensen, 1998) for the manufacturing sector. Our results differ, however, from previous empirical studies regarding labour performance. In most of the studies, labour in FDI firms significantly and strongly outperformed domestic firms (e.g. Helpman et al., 2004; Baldwin and Gu, 2003). This result is not replicated here for the agribusiness sector. Although some indicators show significant differences, the difference is not large. We conclude that the productivity of agribusiness FDI firms exceeds domestic firms, but that this superior performance is not related to greater (partial) labour productivity.

Liquidity measures have not previously been considered in this context. We draw conclusions in this respect mainly based on financial business studies. Our main findings on the liquidity ratios show that domestic and FDI firms are generally solvent, but FDI firms show a stronger reliance on external capital so that some liquidity measures are significantly smaller compared to the domestic firm. Overall, one could argue that FDI firms in our sample appear more competitive in the long run but somewhat more vulnerable in the short run.

A binary choice model, estimating the probability that a firm invests in foreign countries, allows a joint consideration of multiple firm characteristics. Starting from a general specification with all firm characteristics considered, the final statistically superior model reveals that the probability increases with an increase

of the equity of a firm, its number of employees, and the revenue per employee, and decreases with an increase of the input costs, the equity ratio and the labour costs per employee per year. The relevance of labour costs may suggest the possibility that a reason for undertaking FDI is to exploit wage differences. A test of this hypothesis would require a richer data source and analysis. The distribution of the estimated probabilities to engage in foreign investments across the whole sample shows a strong skew towards low probabilities and a long thin tail to probabilities closer to one.

Overall, we conclude that European MNEs in the agribusiness sector to some extent follow new trade theory, showing larger size and productivity compared to domestic firms. Labour performance, however, is not a distinguishing feature thereby showing some difference to results from previous studies for other sectors. The additional consideration of liquidity measures shows a stronger reliance of FDI firms on external capital.

Some limitations apply to our study mainly due to restrictions on data availability. Time varying information, which would allow development of a meaningful investment model with the potential to shed some light on the dynamic interaction of firm characteristics in European agribusiness, could not be considered. A measure on how innovative the firms are and a differentiation of the group of domestic firms into exporting and non-exporting firms was not available. Finally, determinants related to strategic aspects of FDI activities (e.g. access to markets and resources) could not be considered. These would all be useful extensions to further differentiate between different types of firms for a more complete explanation of FDI by European agribusiness firms.

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2.7 Appendix

Appendix 2.1 Unscaled descriptive statistic of the variables

Variable	FDI firms N=314		Domestic firms N=1687	
	Mean	Standard deviation	Mean	Standard deviation
Equity (tsd €)	163625	464923	42077	64534
Revenue (tsd €)	414456	953732	122388	210661
Fixed assets (tsd €)	261781	935512	34503	65213
Number of employees	1872	5462	351	614
Profit before tax (tsd €)	97334	74970	80969	15469
Tax (tsd €)	49210	20288	45176	4365
Return on assets (%)	33.4	7.5	33.4	7.4
Return on equity (%)	158.7	30.6	155.2	18.4
Return on invested capital (%)	115.4	20.2	113.1	13.0
Profit margin (%)	35.8	7.6	34.8	7.4
TFP (x)	2.77	.56	2.74	.14
Solvency ratio (%)	42.3	18.6	47.7	19.7
Current ratio (x)	2.6	1.3	2.9	1.6
Equity ratio (%)	24.7	123.3	61.8	331.5
Cash Flow per revenue €(%)	29.4	8.2	28.7	7.3
Net working capital (tsd €)	1636839	176467	1623416	43245
Revenue per employee (tsd €)	391.5	349.9	443.8	578.2
Labour costs per employee (tsd €)	34.6	17.6	36.7	18.4
Input costs (tsd €)	115703	325068	47814	107162
Profit per employee (tsd €)	290.4	35.3	292.3	39.1

Notes: Variables are neither normalised nor z-standardised

Source: Own compilation.

3 Determinants of European FDI into the Mediterranean and Mercosur agribusiness sector¹

Abstract

Foreign direct investment (FDI) is known as a relevant driver of economic growth and has found increased attention in recent empirical research as a consequence of the increased global FDI flows over the last years. Existing theories find various host country characteristics influencing FDI inflows through which it becomes possible to draw conclusions on the appearing type of FDI inflows (vertical or horizontal). Theory further derives from the identified type of FDI flows the kind of their impact on the trade flows between the home and the host country. This paper offers an empirical analysis of the determinants decisive for European FDI in the agribusiness sector of two different host country blocks – Mediterranean and Mercosur countries. It contributes to the limited literature in this area by providing a survey of relevant theories. Determinants implied by the single theories are identified and reasonable proxies are derived for the subsequent econometric analysis. The empirical analysis shows mixed evidence on whether vertical or horizontal FDI flows exist. Still it appears that mainly vertical FDI flows occur between the EU15 and the Mediterranean countries and horizontal FDI flows to the Mercosur countries. For the implications regarding the linkage between FDI and trade flows the tendency of a complementary relationship can be derived for the Mediterranean countries and a substitutional relationship for the Mercosur countries.

Keywords: Determinants of FDI, Vertical versus horizontal FDI, Agribusiness sector.

¹ This paper was written together with Prof. Dr. Thomas Heckelei and presented as Selected Paper at the XIIth Congress of the EAAE “People, Food and Environments: Global Trend and European Strategies” in Gent, 26 – 29 August 2008.

3.1 Introduction

The role of Foreign Direct Investment (FDI) for international trade in general has long been recognised. “..., approximately two-thirds of global trade is influenced [...] by past FDI decisions” (Sauvant and Roffe, 1999). Especially in the last few years FDI inflows have reached a total annual amount of \$ 1,833 billion (UNCTAD, 2008).

The definition of FDI used in this article follows the OECD definition and is related to the degree of control over foreign business activities: If the investor owns at least 10% of the foreign enterprise then the investment is called a FDI. If less than 10% is controlled, a portfolio investment is in place (OECD, 1999). FDI is considered to have a positive impact on economic growth of host countries (see Blomström and Kokko, 2003 and Ikara, 2003) and its consideration may alter conclusions on traditional trade analyses as trade flows and FDI can either be positively or negatively interlinked according to the underlying objective which Multinational Enterprises (MNEs) pursue. A substitutional (negative) relationship appears mainly when horizontal (market seeking) FDI is undertaken, i.e. to serve customers in the foreign market. Vertical FDI (efficiency seeking) locates parts of the production chain in foreign countries to reduce production costs but serves the home market. This leads in general to a complementary (positive) relationship with trade flows as competition in the host country is not increased (Head and Ries, 2004; Eurostat, 2005).

EU15² investments in the agribusiness sector (agricultural and food industry) are an important activity: In 2003 the overall amount of EU15 FDI in this sector was 4.4 Bn € in 2006 already 30 Bn € (Eurostat, 2009). Outside of the European Union, significant shares of these investments go to Mediterranean³ (approx. 14%) and Mercosur countries⁴ (approx. 2%). EU-based MNEs are thereby the major foreign investors in these regions accounting for 57% of agribusiness FDI in the Mediterranean and 23% in the Mercosur countries (Quefelec, 2003). Figure 3.1 outlines the development of the European

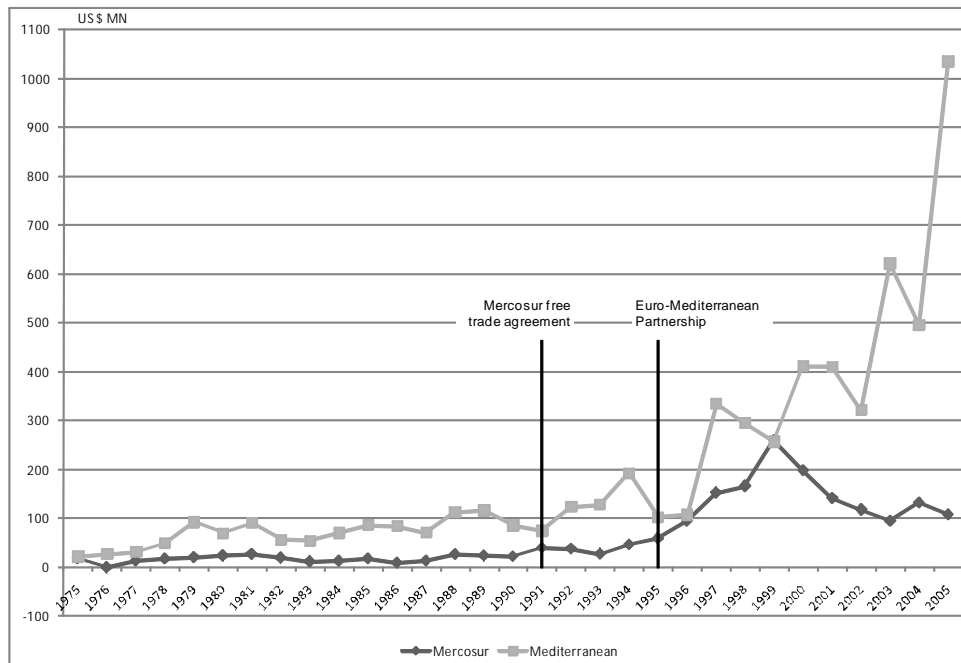
² EU15 is considered because comprehensive panel data is not available for the EU27 as the enlargement only appeared recently.

³ The Mediterranean countries are partner countries with the EU who signed the Barcelona Convention. Included are Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syrian, Tunisia and Turkey.

⁴ Mercosur was founded in 1991. It is an economic and political agreement between Argentina, Brazil, Paraguay and Uruguay. Bolivia and Chile currently have associate member status. Its purpose is to promote free trade and the fluid movement of goods, people, and currency. For more details see <http://www.mercosur.int/>.

agribusiness FDI flows into the Mediterranean and Mercosur countries between 1975 and 2005 based on the World Development Indicators (World Bank, 2007).

Figure 3.1: EU15 agribusiness FDI inflows into the host countries



Source: Own compilation based on the WDI (2007).

Over time FDI flows from the EU15 to the different host country blocks have increased steadily. It appears that since the regional trade agreements in both cases are in place FDI flows have increased even more steeply⁵. Apart from the high FDI inflows for both, the EU15 is a major agricultural trade partner for the Mediterranean as well as the Mercosur countries⁶.

⁵ Compared to FDI flows into the Mediterranean countries, those into the Mercosur countries follow stronger the development of global FDI flows which decreased strongly between 2001 and 2003 because of global financial crises and only afterwards recovered up to a new overall maximum level (UNCTAD, 2008)

⁶ According to the CAPRI database (version December 2010, http://www.ilr1.uni-bonn.de/agpo/rsrch/capri/capri_e.htm), Mediterranean countries (not including Turkey) export 84% of their agricultural export value to the EU15 in 2004. For Mercosur countries this share amounts to 22%. Import value shares of the EU15 reach 23% for imports from Mercosur countries and only 3% for those stemming from the Mediterranean ones. Regarding export value shares of the EU in the two countries, they only amount to 2% each.

An analysis on the determining factors for FDI flows between the EU15 and the two host country blocks will therefore entail the question on how the host country characteristics influence the height of FDI inflows and derived from this, what type of FDI is undertaken by the European MNEs. Implications on how this will influence the trade between the EU15 and the host countries will be given. This paper intends to serve as a base for in-depth empirical analyses of FDI in the agribusiness sector by trying to combine different strands of the theoretical literature. Furthermore, only few researchers have focused on the agricultural and food sector and even less have empirically analysed European FDI outflows to single host countries. The empirical analysis on major determinants of European FDI flows into the Mediterranean and Mercosur countries will be carried out by a multiple regression model.

The structure of the paper is as follows: in section 3.2, an overview on the main theories identifying relevant determinants for FDI is given whereby the type of FDI flow – vertical/horizontal – following from the specific determinants is derived. Section 3.3 will give a short overview on the knowledge-capital model on which the successive analysis will be based. A summary on existing empirical analyses in this area is given in the fourth section (3.4). In section 3.5, the determinants relevant for European FDI flows into the Mediterranean and Mercosur countries are derived analytically and the data used is described in detail. Next, from the identified determinants the type of FDI undertaken is concluded in Section 3.6. The last section (3.7) summarises the results of the econometric analysis and further research needs are identified.

3.2 Theoretical Background

In order to analyse the decisive determinants relevant for the type of FDI flows between the EU15 and the Mediterranean and Mercosur countries, it is important to understand the theory behind the appearance of FDI flows. Table 3.1 gives an overview over the relevant theories and the derived determinants influencing FDI. The theory on FDI is not unified but rather distributed among three different branches: (1) the theory of international trade mainly dealing with origin and destination of goods as well as returns to factors; (2) the theory of the firm explaining the structure of firms also across borders; and (3) the theory of international capital markets targeted at explaining international financing and risk-sharing arrangements. Only the combination of these three strings of literature allows for a satisfying identification of the relevant determinants for the occurrence and type of FDI as well as a derivation of the possible relation between FDI and trade. Each of the three strings offers a certain perspective contributing to the overall picture and providing specific determinants.

Table 3.1 Overview on theories relevant to FDI

Relevant theory	Major targeted dimension	Determinants of FDI
International trade theory	International allocation of production	- Availability of resources (raw materials, labour, capital)
	- Comparative advantages	- Productivity level
	- Consumer tastes	- so far no specific studies on the consumer preferences
Theory of the firm	Optimal size of an MNE	- Degree of market inefficiencies
	- Transaction costs	- Ability to overcome market inefficiencies
	- Internalisation of imperfect markets	- Market growth rate
	- Ownership & location-specific advantages	- Market size and per capita income
	Ideal structure of an MNE	- Productivity level
Theory of international capital markets	Origin of funds	- Risk diversification
	- Flow of Funds - Risk-bearing	- Risk of sales
		- Risks of equity
		- Interest rate
		- Exchange rate

Source: Own compilation.

Theory of international trade

The focus of the theory of international trade lies on the optimal international allocation of production and the resulting directions of trade flows. This implies optimal location of each type of asset used in production. In this theory capital assets are treated as a factor influencing trade, whereas the theory of international capital markets focuses on the mechanism behind capital flows.

Most models trying to analyse the appearance of FDI are based on the Heckscher-Ohlin (HO) model distinguishing two countries, two goods and two factors where trade is driven by differences in factor endowments. The basic assumptions of the HO model are constant returns to scale, identical technologies across countries, identical and homothetic tastes, free trade in goods (but not in factors) (Feenstra, 2004). Investigating the role of capital mobility in the two-sector HO model, Mundell (1957) sets up an extreme case where capital is perfectly mobile and labour completely immobile. He concludes that FDI and exports are substitutes as capital moves to the country where capital-intensive production serves the market in the most efficient way. This indicates horizontal FDI flows. Secondly, efficiency in world production is achieved if either goods or factors move freely. A main problem of Mundell's approach is that the model is non-monetary and static. Monopolistic competition as well as multiple factors, goods and countries are not taken into account (Mundell, 1957). The main determinant for FDI is the availability of resources in specific countries (factor endowments). Therefore, it can be derived that the more similar two countries become the more appropriate it is that horizontal FDI is undertaken. Market size and the proximity of two markets identify horizontal FDI. According to Mundell, FDI and trade flows are linked in a substitutional way. Contrary to Mundell, Markusen (1983) finds empirical evidence for the hypothesis that FDI and exports have a complementary relationship. In his HO based analysis he considers the elimination of barriers to factor movements between countries in the absence of protection of goods. Vertical FDI is positively related to the difference in labour endowments between and negatively to the similarity of the markets (e.g. regarding the size, the demand and supply structure) of two countries. Exports and FDI appear in a complementary way if differences in production technology, product market distortion (production taxes, monopoly, increasing returns to scale) or factor market distortion exist.

With the appearance of the New Trade Theory the assumption of constant returns to scale is eliminated and the firm starts to play a major role as considered actor. One of the first who introduced this generalisation formally was Krugman (1979) by considering market structure as an important parameter for firms' decisions on FDI. The varieties of the products are both imported and exported and thereby vertical FDI is addressed (Feenstra, 2004). Brainard (1993) introduces

transportation costs and economies of scale at the plant level. He concludes that the substitutional relationship of exports and FDI depends on the trade-off between the proximity advantages (e.g. reduction of transaction costs) and scale advantages from concentrating production in a single location (Brainard, 1993). Regarding trade costs as a proxy for transaction costs in an international context it becomes apparent that horizontal FDI is enforced if trade costs increase. To consider the decision to set up an overseas affiliate, Helpman et al. (2004) linked the degree of intra-industry firm heterogeneity and the prevalence of subsidiary sales (due to FDI) relative to export sales. Relying on the existing literature they recognise that firms can service foreign buyers through a variety of channels in a substitutional way. The determinants for horizontal FDI are expanded by adding the firm heterogeneity in productivity at an intra-industry level (Helpman et al., 2004).

Theory of the firm

A major objective of this theory is the identification of the optimum size and structure of firms within an international environment as described by Casson (1982). The main determinant for placing affiliates abroad and getting involved in FDI are existing market inefficiencies (time-lags between initiation and completion of activities, monopolistic market structures and asymmetric information) and their overcoming⁷. Certain costs of internalisation (e.g. resource cost of fragmentation, communication cost and administrative cost) appear which may outweigh the potential benefits. The more transactions are characterised through bounded rationality, uncertainty, opportunism, and specific investments the more preferable it gets to integrate the transactions into the firm (Williamson, 1975). Across borders this leads to horizontal FDI identifying a substitutional relationship between exports and FDI. Trade costs as a proxy for transaction costs again can identify horizontal FDI in the same way as already derived through the theory of trade. Dunning (1977) considers the same substitutional relationship when supplementing the internalisation advantage by two more dimensions – ownership and location-specific advantage – in his OLI-Paradigm (ownership, location, internalisation). This paradigm states that FDI will only occur if all three dimensions appear. Head and Ries (2004) identify an empirical pattern showing that both types of FDI flows (vertical and horizontal) can appear depending on the firm specific productivity level. This determinant for possible relationships (substitution and complementarity) between trade and FDI links the theory of trade again with the theory of the firm.

⁷ Externalities are not taken into account as they cannot be overcome by private actors.

Theory of international capital markets

Capital has already been addressed in the trade theory as a relevant factor explaining trade. The theory of international capital markets rather focuses on how capital flows are generated. Especially when looking at dynamic trade models the reaction of capital markets become an important determinant for FDI.

The relevant theory comprises two main models: (1) Up to the 70ies the Capital-Asset-Pricing-Model (CAPM) dominated the theory (Nowak, 1994). It explains the value of individual investments taking risk into account. Risk is distinguished by market risk, as general sensitivity of any asset (non-diversifiable risk) and the specific risk of each investment (diversifiable risk). The market risk includes all risks for the value of an investment due to changes in market determinants (interest rate, exchange rate, consumer prices, the usual risk of sales and equity risk). The specific risk of an investment focuses more on firm and product specific risks like the product life cycle or labour strikes in certain sectors. Both the market and the specific risk characteristics are determinants for horizontal FDI. The relationship between FDI and exports implied in the CAPM is substitutional.

(2) The Arbitrage-Pricing-theory (APT) is a more general approach than the CAPM as the individual risk for undertaking investments can be considered here in a multidimensional way: The APT focuses on the international allocation of relevant investment risks between firms and thereby defines the investment flows between countries. A main part of the theory is the complexity of decisions under uncertainty and risk (Loistl, 1990). According to Casson (1982), it distinguishes between three economic activities involved in the creation and exploitation of foreign assets: funding, ownership and utilisation. To fund an asset the consumption has to be postponed in order to produce the asset. Ownership includes risks as changes in the economic environment can alter the future value of the asset. Utilisation (hiring) bears risks as the productivity of the asset can be subject to transitory changes. As in the CAPM model, the APT implies risk diversification incentives as well as interest rates and the exchange rate as determinants for horizontal FDI. Again a substitutional relationship between exports and FDI follows from this model.

Towards a unified theory

Up to 1996 the two branches of literature focusing either on vertical or on horizontal FDI remained separate. One branch saw multinationals as only undertaking horizontal FDI which is known to be relevant for investments between developed countries. The other assumed multinationals to only undertake vertical FDI which according to empirical studies mainly appears for investments

into developing economies (Markusen, 2002). Markusen and Venables (1998) developed a knowledge-capital model which tried to include all the different aspects of FDI theory in one model. Hence, multinationals are allowed to undertake investments that are either horizontal or vertical and not all firms in the model do the same kind of FDI. It can be shown that vertical FDI dominates when the countries differ significantly in relative factor endowments (such as labour endowments) and in size. In contrast to that, horizontal FDI occurs when countries are similar in size and relative endowments. Furthermore, for vertical FDI to appear, trade costs should be moderate to high (Markusen and Venables, 1998). In subsequent work (Carr et al., 2001), this model has been specified further, by taking the theoretical predictions of recent theory and subject them to an econometric test. The identified types of MNEs in Markusen and Venables (1998) are operationalised with observable country characteristics. The impact of determinants on either vertical or horizontal FDI is determined.

3.3 Knowledge-capital model

As the estimation carried out in section 3.6 is based on the latest theoretical derivations concerning motives for vertical and horizontal FDI the next step is to describe shortly the main points of the theoretical model, which was first derived by Markusen and Venables (1998).

The model assumes the existence of two countries (i and j), two homogenous goods (X and Y) and two input factors, labour (L) and resources (R)⁸. Both factors are mobile between sectors but not between countries. Y is used as numeraire in the model. R is specific for the production of Y . Y is produced in both countries, hence no transportation costs appear, and the output of Y is described by a CES function – identical for both countries. Good X can either be produced in both countries or traded. It is produced with increasing returns to scale.

From these basic model assumptions three different type of firms in each country can occur for Good X :

Type m_i (m_j) – horizontal multinationals that maintain plants in both countries with an headquarter located in country i (j); they do not trade

Type n_i (n_j) – national firms that maintain a single plant and headquarter in country i (j); they may trade

Type v_i (v_j) – vertical multinationals that maintain a single plant in country j (i) and a headquarter in country i (j); they trade

For all firms the following costs appear.

- variable costs cX_{ii}^n for production and sale in country i
- fixed costs G at plant level
- fixed costs F at firm level

Further, for those that trade additional variable costs $(c+\tau)X_{ij}^n$ occur.

From these assumptions the factor market clearing for country i for L (labour) is⁹:

⁸ The factor capital is not included explicitly in the model but it is implicitly treated through the types of firms defined.

⁹ The full set of equations of the model is given in Markusen and Venables (1998) and Gast (2007).

$$\bar{L}_i = L_{iy} + n_i(cX_{ii}^n + (c + \tau)X_{ij}^n + G_i + F_i) + m_j(cX_{ji}^m + G_{ji} + F_j) + v_j(cX_{ji}^v + G_i) \quad (3.8)$$

with $i \neq j$.

As free market entry is assumed sector X makes no profit in the equilibrium. Therefore, the national income of country i , denoted M_i , is

$$M_i = w_i L_i + r_i R_i \quad (3.9)$$

where w_i and r_i are the factor prices of the specific input factors.

Derived from the Cobb-Douglas utility function of a representative consumer

$$U_i = X_{ic}^\beta Y_{ic}^{1-\beta} \quad (3.10)$$

with

$$X_{ic} = n_i X_{ii}^n + n_j X_{ji}^n + m_i X_{ii}^m + m_j X_{ji}^m + v_i X_{ii}^v + v_j X_{ji}^v \quad (3.11)$$

where X_{ic} and Y_{ic} are the demand of good X and Y in each country and β being the share of good X (Y) in the consumers utility, the following demand functions arise

$$X_{ic} = \beta M_i / p_i \quad \text{and} \quad Y_{ic} = (1 - \beta) M_i \quad (3.12)$$

where p_i is the price of good X in country i .

Equilibrium for sector X occurs if for all firms the marginal revenues equal the marginal costs. Considering the market shares and the demand for good X the following profit functions for the different type of firms can be derived after various transformations:

$$\Pi_i^n = \left(\frac{p_i - w_i c}{p_i} \right)^2 M_i + \left(\frac{p_j - w_j (c + \tau)}{p_j} \right)^2 M_j - G_i - F_i \leq 0 \quad (3.13)$$

$$\Pi_i^m = \left(\frac{p_i - w_i c}{p_i} \right)^2 M_i + \left(\frac{p_j - w_j c}{p_j} \right)^2 M_j - G_i - F_i - G_j - F_j \leq 0 \quad (3.14)$$

$$\Pi_i^v = \left(\frac{p_i - w_j (c + \tau)}{p_i} \right)^2 M_i + \left(\frac{p_j - w_j c}{p_j} \right)^2 M_j - G_i - F_i - F_j \leq 0 \quad (3.15)$$

with $i \neq j$.

From the equation (3.13), (3.14) and (3.15), it is possible to observe that different country characteristics favour various firm types as changes in national income, factor prices, fixed costs and transport costs favour or disfavour the specific type of firm. It can be inferred from the model that for country i type n firms will be dominant if (1) country i has a high national income relative to country j and is labour-abundant, or (2) both countries are similar in their national income and relative endowments and transport costs are low. Type m firms will be the dominant type of firm in country i if the two countries are similar in their national income and relative endowments and transport costs are high. In contrast type v firms will be dominant in country i if the country has a small national income relative to country j , is labour-abundant and trade costs from the host country back to the parent country are not excessive.

Consequently, the knowledge-capital model provides motives for both vertical and horizontal FDI as well as for the existence of national firms.

3.4 Empirical Studies on FDI

Based on the previously described theoretical framework, studies have been undertaken to empirically verify the impact of the determinants identified in theory on FDI flows. An overview of past studies on the estimation of FDI determinants which either focus on the agribusiness sector (marked grey) or do not have a sectoral focus, shows the estimated results for the different determinants used (Table 3.2). Only significant determinants which are found in at least two studies are stated as determinants vary in the single papers according to the case studies analysed. A possible domination of the market through national firms as derived from the knowledge-capital model is thereby disregarded. The analyses only focus on the appearance of either horizontal or vertical FDI. Nearly all of the studies use simple, least squares linear regressions. Few use a double log functional form, but without any apparent relevant influence on the results.

Table 3.2: Overview of existing empirical analysis of FDI determinants

	Singh & Jun (1995)	Barrell & Pain (1996)	Brainard (1997)	Burnham & Epperson (1998)	Gopinath et al. (1999)	Carr et al. (2001)	Marchant et al. (2002)	Bouoiyour (2003)	Egger & Pfaffermayr (2004)	Awokuse (2006)	Gast (2007)
SUMGDP	+	+		+	+	+	+	+	+	+	+
DISGDP											+
TCOST home			+			-				-	
TCOST host			+			+				+	
CONPRI home					+						-
CONPRI host		+								+	+
SKILLDIFF		+			+	+	-	+	-	-	+
ER	-				-		+	-		-	+
InvestLib										+/-	+
Vertical FDI	+					+	+				
Horizontal FDI			+	+	+	+		+		+	+

Note: cross indicates a positive, significant determinant of FDI; dash indicates a negative, significant determinant of FDI; no sign means not significant or not applicable.

Source: Own compilation.

The identified determinants can be grouped according to whether they indicate horizontal or vertical FDI.

Horizontal FDI dominates according to the above described theoretical framework if countries are relatively similar in size (measured through the national income) and relative factor endowment and if they face high trade costs. The theoretical findings are mirrored in the empirical findings.

The sum of home and host country GDP (*SUMGDP*), one of the dominating determinants used stands as a proxy for the common market size. It identifies the impact of the common market on FDI flows (Awokuse, 2006). The predicted

effect on FDI is positive as an increase in income leads to an increase of demand for variety of goods according to the theory of international trade. This gives the opportunity for new enterprises to enter the market. Hence, market seeking (horizontal FDI) is undertaken.

The distribution index (*DISGDP*) should have a positive effect on FDI flows as the similarity of two markets facilitates investing in the host countries for foreign investors. Gast (2007) uses a distribution index according to Egger and Pfaffermayr (2004) while Carr et al. (2001) use the squared difference in real GDP between parent country and host country. Following the theory of the firm it becomes clear that the more similar two countries are the lower the implementation costs when producing in the host country as the structures are already known.

With the inclusion of the consumer price index (*CONPRI*) of the host and the home country the internal price differences are reflected (Gast, 2007). According to international trade theory, increasing FDI flows through increasing consumer prices in the host countries identify horizontal FDI seeking opportunities for higher profits.

In contrast to horizontal FDI, vertical FDI dominates if the countries differ in size and relative factor endowment and trade costs from the host country back to the home country are low. In the empirical studies this is mainly indicated through the determinants trade costs (*TCOST*) and difference in education (*SKILLDIFF*).

The trade costs of both the host as well as the home country are used to measure the degree of protectionism applied to discourage imports of competitive products (Carr et al., 2001). They include costs appearing from applied trade barriers as well as transaction costs. As described in the theory of international trade, national protectionism has a negative impact on trade. An estimated negative impact on FDI flows therefore indicates a complementary relationship between trade and FDI. Hence, FDI is undertaken to seek efficiency (vertical FDI).

According to international trade theory, the impact of the difference in the education of the employees between the host and the home country (*SKILLDIFF*) can either be positive or negative. It stands as proxy for the different heights of wages paid wherefore the level of education is positively correlated with the wages. A significant positive effect provides empirical evidence for vertical FDI, as differences in education translate to difference in wages paid encouraging vertical MNEs behaviour in search of lower production costs (Gast, 2007). A significant negative effect on FDI would indicate a horizontal behaviour of the MNEs as the target is not to reduce production costs relative to the ones in the home country.

Further, commonly used variables, that influence the amount of FDI flows, but cannot indicate whether vertical or horizontal FDI appear, are the exchange rate (*ER*) and the degree of investment liberalisation in the host countries (*InvestLib*).

The exchange rate (*ER*) captures changes in the relative currency value between home and host country over time and is frequently considered (Marchant et al., 2002). It theoretically influences relevant prices for goods as well as capital cost with positive impact on FDI.

In the latest studies the degree of investment liberalisation in the host countries (*InvestLib*) is newly included. The influence mainly appears to be positive on FDI flows meaning that a higher liberalisation of the investment policy of a host country leads to higher FDI flows. The costs include costs appearing from applied investment barriers as well as transaction costs appearing through the investment. It is therefore indicated whether FDI flows react to changes in the investment environment of the host countries.

3.5 Empirical Methodology

The empirical model is primarily based on the knowledge-capital-model (Carr et al., 2001). It serves as a starting point as the method and the resulting influences of the determinants are well known. From there, further development of the economic analysis is taken into account. The regression analysis is undertaken by looking at two host country groups: a) Mediterranean countries and b) Mercosur countries. This differentiation between the host countries aims at identifying the correlation between the behaviour of European MNEs and the characteristics of the different host countries.

Determinants of FDI flows

The general model includes the main determinants of the former empirical analyses outlined above and the focus in this subsection is on variations and additions.

The general model used in the successional analysis is given by

$$FDI_{i,j,k} = f(GDP_{j,k}, SUMGDP_AGR_{i,j,k}, DISGDP_{i,j,k}, TCOST_{i,k}, TCOST_{j,k}, CONPRI_{i,k}, CONPRI_{j,k}, SKILLDIFF_{i,j}, DISGDP_{i,j,k} * SKILLDIFF_{i,j}, ER_{j,k}, InvestCost_{j,k}, FDI_{i,j,k-1}, Dummy_{j,k}, TCOST_{i,k-1}, TCOST_{j,k-1}) \quad (3.16)$$

The subscripts i and j index the home and host countries, k stands for the year of investment. The dependent variable ($FDI_{i,j,k}$) is the flow of foreign direct investment out of the home country i into the host countries j in a certain year k .

Changes compared to former studies appear for the $SUMGDP$ as the EU15 market is so huge and partly already very homogenous compared to the host countries that the total common market would not reflect changes in opportunities for market seeking activities over time. Hence, only the size of the new market is taken into account ($GDP_{j,k}$). Furthermore, new variables considered are the size of the joint agribusiness market size ($SUMGDP_AGR$) and FDI flows lagged by one period. The latter is included to pick up the dynamic nature of FDI flows ($FDI_{i,j,k-1}$). Previous FDI flows may positively affect future flows due to lower information and transaction costs.

The interaction term $DISGDP_{i,j,k} * SKILLDIFF_{i,j}$ is expected to negatively affect FDI flows as it captures horizontal FDI saying that similarities in markets with differences in factor endowments appear. Consequently, a positive impact would strongly indicate vertical FDI.

Additionally, a dummy variable $Dummy_{j,k}$ is included that mirrors the effects of the implementation of the regional trade agreements (a) European Mediterranean

Partnership in 1995 and b) the Mercosur free trade agreement in 1991) and with them the appearance of possible positive liberalisation effects on FDI flows other than trade and investment cost (e.g. governmental stabilisation, etc.) as they are already indicated through single variables in the model.

Lagged trade costs ($TCOST_{i,k-l}$, $TCOST_{j,k-l}$) are also included as they reflect the impact of last year's trade flows on FDI flows which mirrors the long-term strategy of MNEs.

For choosing the variables included in the specific models the Akaike Information Criterion (AIC) is used. It measures the goodness-of-fit of an estimated model corrected for the number of variables included (Auer, 2005). The AIC is applied by checking all combinations of variables considered. The specific model is according to this criterion individually chosen for the two host country groups. Hence, it then only includes those variables that determine the FDI flows from the EU15 into one of the host country blocks the most for the agribusiness sector.

Data

The data set used is a panel of eighteen countries (one home country and seventeen host countries) covering the period from 1960 up to 2005. The home country is Europe (EU15). The host countries of the Mediterranean group are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syrian, Tunisia and Turkey. For the Mercosur group, the host countries are Argentina, Brazil, Paraguay, Uruguay, Venezuela, Chile and Bolivia.

Except for the exchange rate data which is obtained from the United Nations Statistics Division (2007), the data is taken from the "World Development Indicators" (World Bank, 2007)¹⁰. As the FDI flows in this source are not disaggregated according to the sector and the origin, more information on the level of disaggregation necessary for the empirical analysis was received through the FDI country profiles generated by the UNCTAD (2009). Through the usage of these two data sources it was possible to estimate the yearly average percentage of EU15 FDI flows in the agribusiness sector for the single host countries.

The data is filtered as to leave in only those observations for which all considered variables are included. Hence, the number of observations for the Mediterranean countries is reduced to 179 and to 187 for the Mercosur countries (Table 3.3).

¹⁰ The World Development Indicators include more than 800 development indicators with time series for 209 countries and 18 county groups from 1960 to 2008, where data is available (World Bank, 2007).

The dependent variable, FDI level, can be measured in three different ways: by FDI stock, FDI flow or by level of affiliate sales. Following Gast (2007), FDI is measured in terms of FDI flows (in constant 2000 U.S. Dollars) from the home into the host country. The use of FDI flows seems preferable given that price changes, exchange rate variation or debt restructuring can lead to significant divergences of the stocks (Groht, 2005, p.60). The level of affiliate sales are not used regarding the small amount of data available.

The $GDP_{j,k}$ is the GDP of the single host countries in a specific year. For calculating the variable $SUMGDP_AGR_{i,j,k}$, the rate of the total GDP generated through the agribusiness sector (agricultural plus food sector) in home and host countries is used. All GDP measures are in constant 2000 U.S. Dollars.

In this study the distribution index by Egger and Pfaffermayr (2004) is applied to the agricultural share of GDP of the home and host countries for indicating the similarity of the regarded home and host country market. The index can range from 0 to 0.5. The nearer the index is to 0.5 the more similar the market of the two countries.

$$DISGDP_{i,j,k} = 1 - \left(\frac{AgrGDP_{i,k}^2}{AgrGDP_{i,k} + AgrGDP_{j,k}} \right) - \left(\frac{AgrGDP_{j,k}^2}{AgrGDP_{i,k} + AgrGDP_{j,k}} \right) \quad (3.17)$$

Trade costs as well as the lagged trade costs are constructed as an index of 100 minus the agricultural GDP share of the sum of imports and exports of the food and agricultural sector. This is consistent with (Awokuse, 2006). Trade costs are assessed for all trading partners. The closer the index is to 100 the higher the trade costs as the share of imports and exports are low.

The skilled-labour variable is measured as the average level of education¹¹ in a certain year of the home country minus the average level of education in the same year of the host country. This kind of measurement was chosen due to restricted data availability over time. Since the level of education should change only slowly over time, this variable is expected to reflect country differences over the period of analysis appropriately.

$$SkillDiff_{i,j} = \frac{\sum_k Skill_{i,k}}{k} - \frac{\sum_k Skill_{j,k}}{k} \quad (3.18)$$

¹¹ The level of education is measured as the ratio of secondary school enrollment on total enrollment in the specific country (World Bank, 2007).

The exchange rate of the host countries over time is expressed as an index with base year 2000.

A proxy for investment costs is included by taking the negative share of FDI inflows on the agricultural GDP of the host countries. The predicted sign is negative as higher investment costs in the host country should lead to a decrease of FDI.

3.6 Estimation Results

Following previous studies in this area, the ordinary least squares (OLS) estimator was chosen. It is known to be the Best Linear Unbiased Estimator (BLUE) under certain conditions. One of these conditions is the absence of autocorrelation as it can lead to an upward bias in the estimation of the statistical significance of coefficient estimates when panel data are used in a regression analysis. The Breusch-Godfrey-Test shows no significant autocorrelation for both regressions (Verbeek, 2004)¹².

After applying the AIC to the general model, the specific model for the estimation of the Mediterranean countries is as follows:

$$FDI_{i,j,k} = f(GDP_{j,k}, SUMDGDGDP_AGR_{i,j,k}, DISGDP_{i,j,k}, TCOST_{j,k}, CONPRI_{i,k}, SKILLDIFF_{i,j}, DISGDP_{i,j,k} * SKILLDIFF_{i,j}, InvestCost_{j,k}, FDI_{i,j,k-1}) \quad (3.19)$$

The estimation includes most of the variables given in the general model except the exchange rate and the previous year's trade cost of the home and host country, as the influence of the excluded variables on FDI inflows into the Mediterranean countries was not strong enough. The regression on the Mercosur countries includes the following variables:

$$FDI_{i,j,k} = f(GDP_{j,k}, SUMDGDGDP_AGR_{i,j,k}, DISGDP_{i,j,k}, CONPRI_{i,k}, SKILLDIFF_{i,j}, ER_{i,j}, TCOST_{j,k-1}, FDI_{i,j,k-1}) \quad (3.20)$$

In this specific model the variables current trade costs for the home and host country ($TCOST_{i,k}$, $TCOST_{j,k}$), the combined distribution index ($DISGDP_{i,j,k} * SKILLDIFF_{i,j}$) and the costs of investment barriers arising in the host country ($InvestCost_{j,k}$) are not included as they do not add any additional explanation.

The regional trade dummy ($Dummy_{j,k}$) included in the general model for detecting possible effects of regional trade agreements on FDI flows turned out to be not significant for both models and therefore is not included. Although this might be surprising, it indicates that other variables such as the trade costs or the investment costs already capture the main liberalisation effects.

¹² Another condition is homoscedasticity which is likely to be hurt in a panel dataset where different groups (here different countries) appear. The error terms of countries receiving high FDI inflows might be higher than those of countries receiving less FDI. Nonetheless, heteroscedasticity does not result in biased parameter estimates. However, OLS does not provide the estimate with the smallest variance wherefore the significance test might be too high or low. This problem is disregarded here.

The estimation results on how specific country characteristics influence FDI inflows (direction and strength) are presented in Table 3.3. For a better comparison, the predicted signs found in theory of the single variable coefficients are shown as well. Standard errors are stated underneath the single results of the estimated coefficient. As the single variable coefficients indicate whether the occurring type of FDI inflows are vertically or horizontally motivated according to theory, an additional column is included which states the type of FDI flow.

Table 3.3: Empirical results

Variable	Predicted Sign	Mediterranean countries			Mercosur countries		
$GDP_{j,k}$	+	0.589 0.101	***	horizontal	0.771 0.114	***	horizontal
$SUMGDP_AGR_{i,j,k}$	+	-0.468 0.118	***	vertical	-0.395 0.147	***	vertical
$DISGDP_{i,j,k}$	+	0.152 0.127		horizontal	-0.139 0.101		vertical
$TCOST_{j,k}$	+	-0.031 0.021		vertical	~ ~	~	~
$CONPRI_{i,k}$	-	0.029 0.014	**	vertical	-0.017 0.041		horizontal
$SKILLDIFF_{ij}$	+/-	0.023 0.026		vertical	-0.006 0.031	*	horizontal
$DISGDP_{i,j,k}$ * $SKILLDIFF_{ij}$	-	0.003 0.095		vertical	~ ~	~	~
$ER_{j,k}$	+	~ ~	~	~	0.095 0.048	**	
$InvestCost_{j,k}$	-	-0.159 0.031	***		~ ~	~	~
$TCOST_{j,k-1}$	+/-	~ ~	~	~	-0.107 0.022	***	vertical
$FDI_{i,j,k-1}$	+	0.216 0.026	***		0.411 0.061	***	

Observations

179

187

R²

0.617

0.691

Adjusted R²

0.596

0.676

Note: ~ Variable not included in the estimation, Significant level: '*' 10%, '**' 5%, '***' 1%

Source: Own compilation.

It appears that most of the determinants follow the predicted sign. The majority of the determinants are significant at a 5 percent level for both host country blocks. R-squared and adjusted R-squared are high (Table 3.3).

For both country groups the market size of the host country ($GDP_{j,k}$), the size of the common agribusiness market ($SUMGDP_AGR_{i,j,k}$), and the lagged FDI flows

$(FDI_{i,j,k-1})$ impact in the same direction on FDI flows. The market size of the host country affects FDI inflows positively and significant at a one percent level, indicating horizontal FDI according to the knowledge-capital-model. The size of the common agribusiness market on the contrary occurs to influence FDI inflows negatively at a one percent significance level for the Mediterranean and Mercosur host countries. This then provides evidence that European MNEs also aim at reducing production cost and seek efficiency in the agribusiness sector. According to Awokuse (2006), efficiency seeking appears if vertical FDI is undertaken. The lagged FDI flows shows the estimated positive sign as predicted for both analyses and the estimate is highly significant. This indicates for both host country blocks that last year's FDI flows lead effectively to a reduction of the information and transaction costs and hence eases further FDI flows.

Similarity in the structure of the economy of the two countries ($DISGDP_{i,j,k}$) has a positive impact on FDI inflows for the Mediterranean countries and a negative impact for the Mercosur countries, but for both country groups this determinant is not significant. Further, differences regarding the sign of the coefficient estimates appear for the trade cost of the host country ($TCOST_{j,k}$), the consumer price index of the home country ($CONPRI_{i,k}$), the difference in education ($SKILLDIFF_{i,j}$), the interaction term $DISGDP_{i,j,k} * SKILLDIFF_{i,j}$, the exchange rate of the host country ($ER_{j,k}$), the investment costs of the host country ($InvestCost_{j,k}$) and the lagged trade costs ($TCOST_{j,k-1}$).

For the Mediterranean countries a general tendency for vertical FDI can be concluded through the trade cost of the host country and the consumer price index of the home country. Trade costs show a negative sign. Considering Carr et al. (2001) inferring that increasing trade costs lead to a decrease of trade flows, FDI flows are complementary, i.e. vertical. Furthermore, the impact of the consumer price index of the home country is positive at a five percent level pointing at the search for efficiency by MNE's, meaning vertical FDI appears (Gast, 2007). Vertical FDI flows are furthermore underlined by the positive coefficients of $SKILLDIFF_{i,j}$ and $DISGDP_{i,j,k} * SKILLDIFF_{i,j}$. However, no robust evidence can be derived from these two determinants as they are not significant. Investment cost impact negatively and significantly at a one percent level. This finding is consistent with previous studies (e.g. Awokuse, 2006; Gast, 2007) as high investment costs reduce the size of FDI flows.

If the target of the home country is to seek new markets (horizontal FDI), the consumer prices should have a negative effect on the investment flows as for the Mercosur countries, although the coefficient is not significant. The included variable $SKILLDIFF_{i,j}$ is significant and indicates horizontal FDI given the negative sign. The European MNEs apparently need labour structures similar to their home country to implement plants in the host country to seek with their

products for a new market. Contrary to the results for the Mediterranean countries, lagged trade cost negatively impact European FDI flows into Mercosur countries at a one percent significance level. Assuming that increasing trade costs also reduce trade flows, a complementary relationship is implied. The coefficient of the exchange rate of the host country is significant at a five percent level showing that the cost for capital are relevant for European MNEs investing into the Mercosur countries (Gast, 2007).

From the results presented in Table 3.3, it appears that agribusiness EU15 FDI flows into the Mediterranean as well as into the Mercosur countries cannot be clearly identified to belong to one type of FDI flow only. Still, given the identified determinants and their impact on the specific FDI flows it can be derived that EU15 FDI flows into the Mediterranean countries tend to be more vertically motivated while FDI flows into the Mercosur countries tend to be more horizontally motivated. Consequently, European FDI inflows in the agribusiness sector in the Mediterranean countries (mainly vertical) encourage trade (complementary relationship) while European FDI inflows to the Mercosur countries (mainly horizontal) are linked with trade flows in a substitutional way.

3.7 *Conclusions*

This paper offers a review of the relevant literature regarding determinants of FDI and drawing conclusion on what type of FDI flow (vertical or horizontal) is existent. Further, from the identified type of FDI flow implications regarding the existing relationship between FDI and trade in goods are derived. The theory on FDI is developed widely, but is spread among international trade theory, the theory of the firm, and the theory of international capital markets. The empirical literature focuses on the general economy and results show that either substitutional or complementary relationships between FDI and trade in goods exist. Depending on the case study, the type of FDI flow is either a reflection of firms' vertical integration strategies (complementarity) or targets foreign markets for the firms' products (substitution).

The analysed regression model for EU15 FDI flows into the agribusiness sector of the two host country groups (Mediterranean and Mercosur countries) shows, that the impact of the size of the total host country market is positive and highly significant on FDI inflows. FDI flows decrease, however, with the joint size of the agribusiness sector. Investment costs (included as a new variable) prove to be relevant only for the Mediterranean countries, whereas (lagged) trade cost significantly decrease FDI flows only to the Mercosur group. No significant influence of trade agreements on FDI flows other than trade and investment cost reduction already indicated through individual variables in the specific models could be detected. For the Mercosur countries, the similarity in the factor labour with the home country EU15 seems to increase FDI flows to these host countries.

The analysis of Mediterranean countries as host countries reveals the significance of determinants indicating both, horizontal (market seeking) and vertical (efficiency oriented) investments, still with some more evidence for vertical type FDI. The same is generally true for the Mercosur countries, but with some more evidence for horizontal type FDI. The mixed evidence on vertical and horizontal FDI between the EU15 and the host countries leaves open if the overall relationship between FDI and trade is complementary (vertical) or substitutional (horizontal). It is likely that both types of flows exist with a different weight.

In this analysis the political influence is only reflected in a very general way by including an index for trade and investment costs as well as a dummy variable for the implementation of trade agreements in order to keep the model as simple as possible. However, as political interventions like trade, investment and competition policy supposedly have an influence on FDI, the inclusion of such political aspects in more depth should be carried out in further research. Specific impacts of different trade and investment barrier levels may then be inferred from

such a refined analysis. Furthermore the regression model could be reestimated in a next step, using different estimators e.g. the Generalised Least Squares method which corrects for heteroscedasticity.

The analysis on the existing relationship between FDI and trade has merely been touched upon here by concluding from the estimated type of appearing FDI flows occurring in the different host countries whether a substitutional or complementary relationship exists. In a further analysis, the joint determination of trade flows and FDI could be analysed through the development of a simultaneous model with FDI and trade being independent variables.

3.8 *References*

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4 The impact of Foreign Direct Investment on the future sustainable development of Ethiopia

Abstract

In line with strong global increases of Foreign Direct Investments (FDI), Ethiopia is one of the developing countries having received high FDI inflows in its agribusiness sector especially since 2006. As the agribusiness sector is the base of the Ethiopian economy these increases may considerably influence the total economy. This paper aims at giving a first insight of possible midterm impacts of the FDI inflows on the sustainable development of Ethiopia. By analysing former empirical studies, likely future trends of development are derived. It is estimated that the high FDI inflows currently have and in the future continue to have a positive impact on the economic growth and poverty reduction. However, scarcity of agricultural land and water and corresponding environmental problems are bound to increase if no new production technologies and sufficiently strong regulatory frameworks are implemented.

Keywords: Foreign Direct Investment, Ethiopia, Sustainable development, Agribusiness sector

4.1 Introduction

Global Foreign Direct Investment (FDI) flows rose in 2007, after four consecutive years of growth, by 30% to reach \$1,833 billion with FDI flows into developing countries reaching their highest level ever (\$500 billion a 21% increase over 2006) (UNCTAD¹, 2008). Caused by the global financial crisis, global FDI flows are decreasing, especially into developed countries. FDI flows into developing countries are lagging behind this trend as FDI flows increased further in 2008 by 17%. Hence, in 2009, developing and transition economies are now absorbing half of global FDI inflows. For 2010 global FDI flows into developing countries are expected to increase again (UNCTAD, 2010).

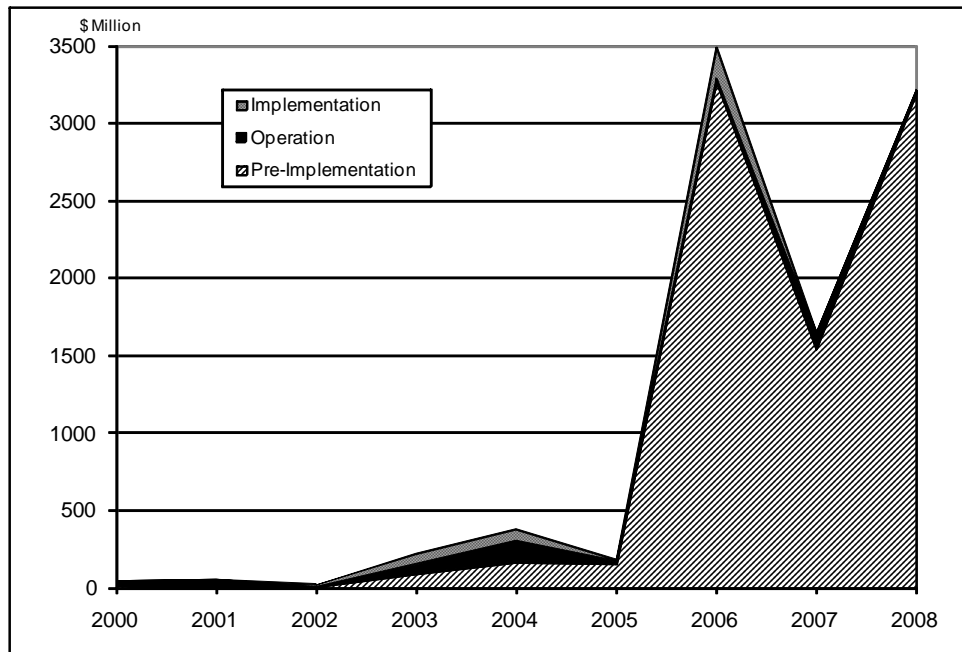
To a large extent these investments into developing countries appear in the agribusiness sector as, through the high global food prices and the global financial crises, investment in this sector becomes more attractive. Profits have increased due to scarcity in land and water limiting food production and rising demand for agricultural commodities (GTZ, 2009). Ethiopia is thereby one of the developing countries which has strongly evoked the interest of foreign investors when regarding the development of the latest FDI flows into its major economic sector (Figure 4.1) – agribusiness accounting for 44.5% of the total GDP in 2008 (World Bank², 2010). Direct economic benefits such as land fees and additional tax revenues are rather low, as foreign investors are mainly exempted from them (Cotula et al., 2009). Against this background, the impact of increasing FDI flows on the economies of host countries has to be analysed.

A study by Weissleder in 2009 showed that Ethiopia's FDI inflows in the agribusiness sector had increased heavily since 2006. Up to 2005 the level of FDI inflows ranged under \$ 500 million each year. Total agribusiness FDI inflows now reach about \$ 3500 million each year (Figure 4.1).

¹ For the general overview over the latest trend of world-wide investment flows in the last years the World Investment Reports (WIRs) generated by the UNCTAD is chosen. These reports are classified by different regions, countries and sectors depending on the data available. They include developments of FDI flows and stocks over the last years and summarise the main changes appearing from year to year. Further, indices like the FDI performance and a potential index are generated by the UNCTAD to develop a basis on which different countries can be compared to each other.

² Data on the economic and social development of Ethiopia is taken from the World Development Indicators which are generated by the World Bank. They include more than 800 development indicators with time series for 209 countries and 18 country groups from 1960 to 2008, where data is available.

Figure 4.1: FDI inflows into the agribusiness sector³



Source: Federal Investment Bureau of Ethiopia (2009).⁴

As the agribusiness sector is the significant economic driver for developing countries (UNCTAD, 2009) such a development has the potential to affect the Ethiopian economy strongly. Former empirical studies (e.g. Dollar and Kraay, 2002 and Klein et al., 2001) indicate that an increase of FDI inflows has the potential to advance a country's economic growth and reduce poverty. As most of the economies of developing countries depend highly on the agribusiness sector, they conclude that growth in the agribusiness sector and its productivity are essential in achieving sustainable growth and significant reduction in poverty in developing countries (Rao et al., 2004). Since 2000, the target of achieving a

³ Three different forms of FDI inflows appear: 1) Implementation = the production plant is being built, 2) Operation = the production plant is already in use, 3) Pre-Implementation = Up to now land, machines, building materials etc. have been bought (Federal Investment Bureau of Ethiopia, 2009)

⁴ All investments need to be registered at the Federal Investment Bureau of Ethiopia before they get licensed to operate in Ethiopia. Based on these registrations, the bureau prepares data spreadsheets including information on the name of the company investing, its home country, the Ethiopian region in which it invests, the agricultural sub-sector, the investment year (2000 - 2008) and what form the investment is of (implementation, operation, pre-implementation).

sustainable development⁵ has gained weight as developing countries, including Ethiopia, agreed on the Millennium Development Goals (MDGs) which are to be reached by 2015 (Appendix 4.1)⁶. These goals heavily stress the sustainability of a country's development.

This paper aims at identifying possible impacts on the future sustainable development of Ethiopia. As sustainable development goes beyond the traditional concerns for economic growth, environmental concerns about available resources as well as social ones regarding poverty reduction and increase of labour standards will also play an important role in the analysis. To the authors knowledge such an analysis has not been carried out for Ethiopia, yet. Taking into account that the changes in the FDI inflow trend have only appeared recently and disaggregated data especially firm level data often used to identify possible impacts of FDI on host country economies (e.g. Aitken and Harrison, 1999, and Borensztein et al., 1998) is not available for a comprehensive econometric analysis, a comparative case study is sensible. Taking into account that the main part of FDI inflows into Ethiopia's agricultural sector are pre-implementation inflows (Figure 4.1), meaning that up to now only the possibility of producing in a certain agricultural sector is secured, possible effects on Ethiopia's economy will only occur in a future period. By taking former case studies of other host countries and theoretical approaches into account, possible future development can be derived. As the MDGs include main targets for the poverty reduction of developing countries the analysis will further incorporate whether the possible future development initiated through present FDI flows may lead to the achievement of specific MDGs to a certain extent.

Section 4.2 derives the hypotheses by giving a literature overview. For being able to analyse the effect of FDI inflows on the Ethiopian economy, the economic and social situation of Ethiopia as well as the development of the FDI inflows in the agribusiness sector between 2000 and 2008 are described in section 4.3. Possible future impacts of the FDI inflows on the sustainable development of Ethiopia and the achievement of MDGs will be analysed in section 4.4. Section 4.5 concludes with the main findings.

⁵ The concept of sustainable development like it is used in this paper was defined in the Brundtland Report by the United Nations World Commission on Environment and Development (WCED) in 1987. For more details see <http://worldinbalance.net/intagreements/1987-brundtland.php>.

⁶ The primary vehicle for achieving the MDGs is the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (MoFED, 2007).

4.2 *Theory and current empirical knowledge*

According to the endogenous growth theory, the growth rate of GDP per capita becomes endogenous as diminishing returns to capital are absent and factor accumulation accounts for growth (Barro and Sala-i-Martin, 2004). The generation of human capital, increasing returns to scale and spill-over effects (externalities) form the essential base for economic growth. The factor accumulation produces a competitive equilibrium that is not Pareto optimal but the outcome of a well-behaved positive model (Romer, 1986).

In contrast, the long-run rate of growth in the neoclassical growth theory is exogenously determined. The growth rate depends only on the rate of technological progress and the rate of labour force growth. An economy will therefore always converge towards a steady state rate of growth (Solow, 1956). A one-time change in the level of technology, the saving rate, the rate of population growth, and the depreciation rate do not affect the long term growth rates of per capita output. For this reason, the model will not provide explanations of the determinants of long-run per capita growth (Barro and Sala-i-Martin, 2004).

New growth theory provides support for the thesis that FDI can be a potent factor in promoting growth, as FDI is a major source of technology and know-how transfer to the host country. The increase of firm's capital stock results in an increase of its stock of knowledge (Barro and Sala-i-Martin, 2004). The transfer of not only production know-how but also management skills distinguishes FDI from all other forms of investment (Balasubramanyam et al., 1996). The creation of new knowledge by one firm is assumed to have a positive external effect on the production possibilities of other firms as knowledge is not exclusive to one firm. The production of goods as a function of the stock of knowledge and other inputs exhibits increasing returns (Romer, 1986). As FDI initiates the promotion of growth factors it can thus encourage economic growth. The exploitation of this potential requires a conducive economic climate which means trade regimes that promote export and investment (Balasubramanyam et al., 1996). It therefore appears that many countries actively try to attract foreign investors through a set of incentives in order to promote the economic development (Blomström and Kokko, 2003; FAO, 2001).

Empirical studies (e.g. Blomström and Kokko, 2003; Borensztein et al., 1998; Blomström et al., 1992) have specified the general growth factors by finding that FDI enhances economic growth if technological transfer to affiliates as well as other spillovers appear, human capital is generated, international trade integration is increased as well as a competitive business environment and environmental and social conditions are improved.

Therefore, rather than inducing automatic developments, FDI affects the economic development in an indirect manner through transmission mechanisms (OECD, 2008). Together with an increased competitive environment the technology transfer by Multinational Enterprises (MNEs) to their affiliates leads to raising efficiency of resource usage and technological spillovers (such as introducing new know-how or transferring techniques for inventory and quality control) in the recipient economy (Dupasquier and Osakwe, 2006; Ikara, 2003; Blomstöm and Kokko, 2003)⁷. Economies of scale are realised and total factor productivity increases (Barro and Sala-i-Martin, 2004; OECD, 2001).

Especially for developing countries the economic growth rates are to a high extent caused through a 'catch-up' process in the level of technology. Thereby, MNEs are considered through their investment in these economies as a major channel for accessing advanced technologies (Balasubramanyam et al., 1996). The MNEs appear to be among the most productive firms (Weissleder, 2009) wherefore they can compete with the advantage of domestic firms such as the knowledge of the domestic market (Aitken and Harrison, 1999). It is likely that the higher efficiency of MNEs results from a combination of advanced management skills and more modern technology. Still, such technological spillovers only seem to be realised if the available human capital stock is large enough to absorb the improvement (Borensztein et al., 1998)⁸. The integration into international trade appears through MNEs as they trade by definition and thereby provide access to external markets (Ikara, 2003). Further, they provide the necessary ingredients for increasing agricultural competitiveness by inducing competitive pressure which leads to competitive advantages of host country firms against other trading partners and hence contributes to international trade integration (UNCTAD, 2009; Blomström, 1986).

Environmental impacts from FDI are also mainly indirect and can either be positive or negative depending on the government environmental policies. But especially the agricultural sector and the natural environment are closely intertwined. Is there a strong regulatory framework in place then FDI can improve the efficiency of existing environmental structures and lead to new investments in environmental protection. Further through the increased per capita income the society's demand for a healthier environment increases. Is no strong regulatory framework in place then the environmental impacts are mainly negative

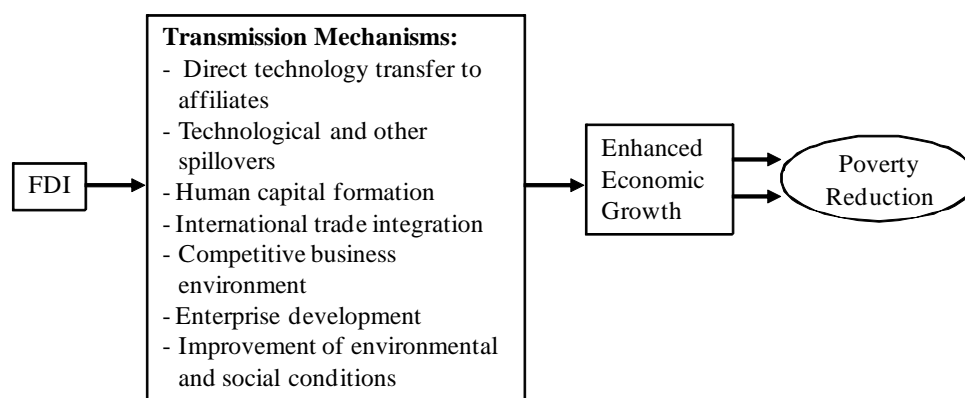
⁷ Aitken and Harrison (1999) as well as Blömström and Kokko (2003) give a very detailed analysis on possible spillovers caused by FDI and their effect on firm productivity.

⁸ Nelson and Phelps (1966) and Romer (1993) find similar results regarding the complementarity between economic growth, effected though FDI, and human capital availability.

incorporating an increase in pollution, the over-usage of resources, rapid urbanisation and the damage of protected areas (OECD, 2001).

Figure 4.2 sums up through what type of transition mechanisms FDI enhance growth.

Figure 4.2: Transmission mechanisms between FDI, economic growth and poverty reduction



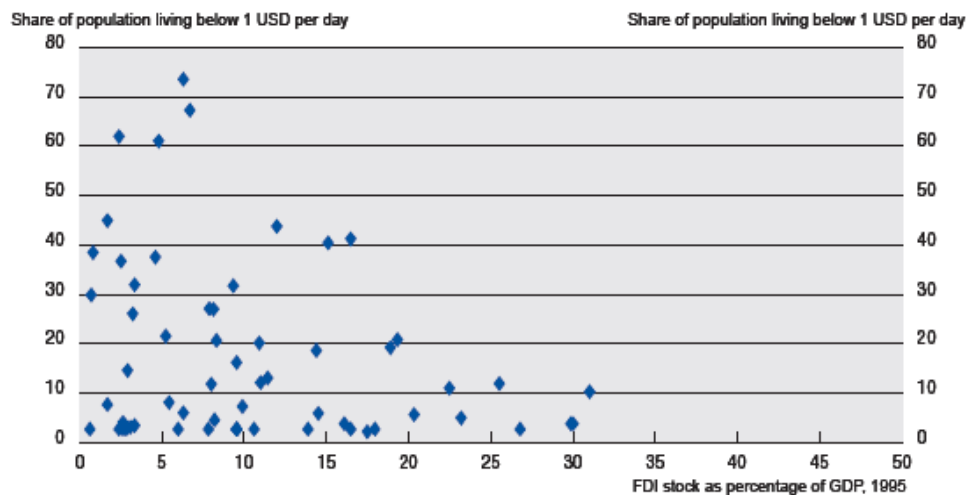
Source: Ikara (2003).

Economic growth alone is not a sufficient condition for poverty reduction, but still there is evidence that higher income in developing countries benefit also the poorest fifth of society (OECD, 2002; Dollar and Kraay⁹, 2002). Poverty rates have been cut by a factor of 3 between 1970 and 2000. Whereas 20% of the world's citizens were poor in 1970, only 7% were in 2000. This achievement is even more remarkable if it is taken into account that overall population increased by more than 1.6 billion people during this period (Barro and Sals-i-Martin, 2004). It appears that rapid economic growth (7-8% per year) is absolutely necessary (although not sufficient) for poverty reduction and investment is a critical requirement for that growth (Ikara, 2003). FDI is a key vehicle to generate growth as it can make up for the domestic capital shortfalls (UNCTAD, 2009) and thus is an important ingredient for poverty reduction (Klein et al., 2001). Still, there is no direct linkage between FDI and poverty reduction and the derived relationship is mainly indirect through the occurrence of the transmission

⁹ The study of Dollar and Kraay (2002) includes 92 countries (developed and developing countries) over the last four decades.

mechanisms (Aaron, 1999). Figure 4.3 shows how the share of the poorest decreases the higher the FDI stock in a developing country.

Figure 4.3: Poverty and inward FDI stock (in 60 developing countries)

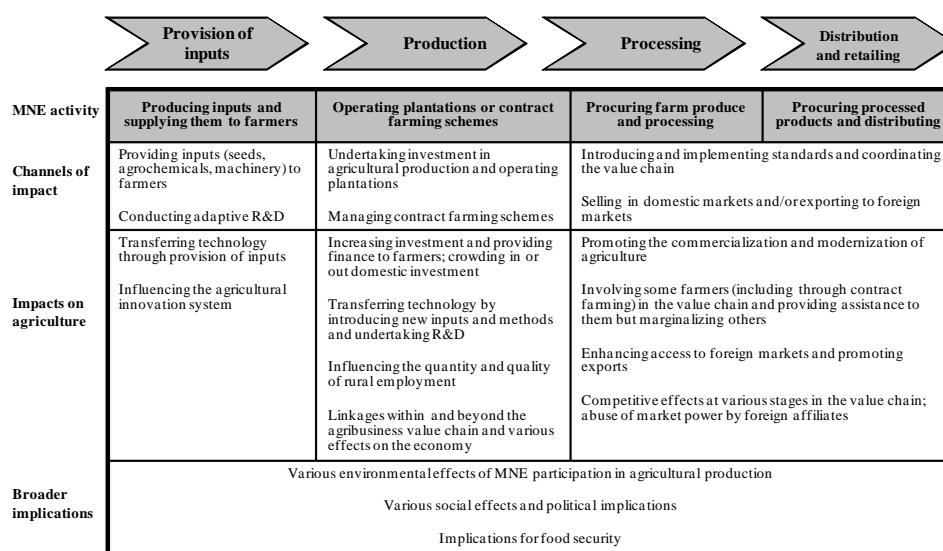


Source: OECD (2002), World Bank (2007).

The analysed transmission mechanism relevant for economic growth and poverty reduction do not consider a possible sequencing in which the rich get richer first and benefits only eventually trickle down to the poor. Klein et al. (2001) indicate that in a first step greater FDI inflows will raise wages of relatively well-skilled workers in developing countries. But over time, as economic improvements spread in the recipient economy, FDI helps to improve income growth also for the poorest (Klein et al., 2001). It therefore has to be considered for the successive analysis that the impact of FDI flows on poverty reduction appears delayed due to the dynamic process involved. Further, the sector of investment needs to be one of the main economic sectors to achieve poverty reduction (Ikara, 2003). Therefore, high investments in developing countries in most cases should take place in the agribusiness sector (as one of the major sector for developing economies, measured as share of GDP; World Bank, 2010) to generate more and better jobs and by this reach rural development and poverty alleviation (ILO, 2008).

As this study deals with the agribusiness sector, the effects of MNEs through transmission mechanism are of special interest. UNCTAD (2009) developed a scheme which shows how MNEs can affect the agribusiness sector along its value chain through the transmission mechanisms (such as technological transfer and integration into international trade) and what kind of economic impacts occur from these activities for host developing countries (Figure 4.4).

Figure 4.4: MNE activities along agribusiness value chain and types of impact in host developing countries



Source: UNCTAD (2009).

From Figure 4.4 it becomes apparent how diversified the impacts of FDI inflows in the agribusiness sector can be depending on where in the value chain MNEs invest in. As the economy of many developing countries (at least for Ethiopia, see Table 4.1) depends highly on the agribusiness sector, the implications go way beyond this specific sector in these cases. The described effects are specific for the agribusiness sector and therefore do not have to occur for other economic sectors.

From the above discussed theory and literature review the following hypotheses are derived for Ethiopia:

1. FDI stimulates economic growth through transmission mechanisms
2. Through the increase of economic growth FDI has a positive impact on poverty reduction

These hypotheses will be tested for the Ethiopian economy and in detail for its agribusiness sector in section 4.5. But first an overview on the current economic situation in Ethiopia and the developments of FDI in the agribusiness sector between 2000 and 2008 are given in the next sections.

4.3 Facts on Ethiopia

Ethiopia is the oldest independent country in Africa, officially with a federal parliamentary republic since 1995. It consists of 11 administrative regions (Afar, Amhara, Benishangul-Gumuz, Gambella, Harar, Oromia, Somali, Southern Peoples, Nations & Nationalities, Tigray, Addis Abeda, Dire Dawa) and is landlocked, thereby surrounded by Somalia, Kenya, Sudan, Eritrea and Djibouti (Figure 4.5).

Figure 4.5: Ethiopia and its three climatic zones



Source: modified from CIA (2009)

Ethiopia is endowed with a lot of fertile land and in most regions with a sufficient amount of rainfall. Still, almost 40% of the total population lives below the poverty line thereby more in urban areas than in rural (Table 4.1). Between 1990 and 2007 the proportion of undernourished population has decreased from 74.7% down to 46%, while the absolute number has remained stable in that time (IFPRI, 2009). Between 1995 and 2006 the share of food aid in total consumption ranked around 4.7% up to 7.1% letting 4 to 6 million people depend on international food assistance (FAO, 2010). In 2006, 42% of the total population has access to improved drinking water sources and only 11% access to improved sanitation facilities (World Bank, 2010). A summary of key figures can be found in Table 4.1 which also includes figures from Germany as a reference.

Table 4.1: Country profile

Economic situation	
Total Population (2008)	80.7 Million Germany 82 Million
Population growth rate (2008)	2.6% Germany -0.2%
Median age (2008)	16.9 years Germany 43.8 years
Life expectancy at birth (total population) (2008)	55.2 years Germany 79.26 years
Population below poverty line (2008)	38.7% Rural area 35.1% Urban area 39.3%
GDP per capita (current international dollar)	\$ 869 (2008) \$ 459 (2000) \$ 390 (1995) Germany \$ 37 140 (2008)
GDP composition by sector (2008)	Agriculture 44.5% Industry 13.2% Services 42.4%
Export partners (2009) (% of total export value)	China (10.87%), Germany (9.75%), Saudi Arabia (7.39%), USA (7.21%), Netherlands (6.38%), Switzerland (5.33%), Sudan (4.35%), Belgium (4%)
Import partners (2009) (% of total import value)	China (14.73%), Saudi Arabia (8.41%), India (7.65%), USA (4.3%)
Food security	
Global Hunger Index (GHI) ¹⁰ in 2009	30.8
GHI-Ranking (out of 84 countries)	79 (2009) 82 (2008)
Share of undernourished population	46% (2000-2007)
Food aid ('000 t)	674.7 (2004-06) -> 5.2% of total consumption 873.6 (2000-02) -> 7.1% of total consumption

¹⁰ The GHI ranks on a 100-point scale and with this tries to describe the state of global hunger. ≤ 4.9 is low, 5.0-9.9 is moderate, 10.0-19.9 is serious, 20.0-29.9 alarming and ≥ 30.0 is extremely alarming

Cont. Table 4.1: Country profile

Pattern of FDI in land	
Main investors (average investment between 2000 and 2008)	EU (21.22%), India (32.43%), USA (11.54%), Israel (7.18%), Saudi Arabia (3.10%)
Major agribusiness sectors	Flower Production (dominant), Meat Production, Biofuel Production

Source: CIA (2010), FAOSTAT (2010), Federal Investment Bureau of Ethiopia (2009), IFPRI (2009), World Bank (2010).

Ethiopia's poverty-stricken economy is based on agriculture, accounting for almost half of GDP (Table 4.1), 60% of exports and 80% of total employment (World Bank, 2010), giving the agricultural sector an enormous importance.

Land use – agricultural sector

The land use in Ethiopia is highly affected through the development of the agricultural sector.

Even though the rural-urban migration rate lays by 16.3% in 2007, still, 84% of the population lives in rural areas. On average, 83% of the rural households cultivate less than 2 ha per household and 52% less than 1 ha (FAOSTAT, 2010). Hence, the agricultural sector is characterised by small-scaled farmers. Under Ethiopia's constitution, the state owns all land and provides long-term leases to the tenants. The lease period ranges between 20 and 45 years (Weissleder, 2009). The non-existence of land tenure leads to a consolidation of the current form of government (Misereor, 2010). The occurrence of the specific agricultural production systems are affected through the three major agroclimatic zones in which Ethiopia can be divided. The eastern areas (marked yellow in Figure 4.5) are areas without a significant growing period because of little or no rainfall. The second zone covers the western half of the country (marked orange in Figure 4.5) and has a single growing period and one rainy season. In the lowlands of the south and southeast (marked green in Figure 4.5) there is an area with a double growing period and two rainy seasons (AQUASTAT¹¹, 2005). Five main agricultural production systems can be distinguished (Table 4.2).

¹¹ For the analysis of the environmental development especially for the resource "water" AQUASTAT is used. This database is a FAO's global information system on water and agriculture developed by the Land and Water Division. It collects, analyses and disseminates data and information by country and by region. Its aim is to provide users interested in global, regional and

Table 4.2: Characteristics of Ethiopian Agricultural production systems

Agricultural production systems	Characteristics
Highland mixed farming system	Low level of specialisation Livestock production is an integral part Practised by 80% of the country's population on about 45% of the total land mass Mainly above 1500 m in the south and southwest
Lowland mixed agricultural production system	Comparable with the first system but practised in low-lying plains mainly in the northern parts (less than 1500 m) Off-farm activities (sale of firewood and charcoal) are widely practised
Pastoral complex	Only 10% of the total population make a living on it Livestock (camels) is the major livelihood basis They are highly mobile in search of water and grazing Mainly in eastern areas
Shifting cultivation	Fields are usually left idle after short periods of cultivation to revegetate Nearly no livestock production Mainly in the southern and western part
Commercial agriculture	This system has only emerged in the 90s

Source: AQUASTAT (2005).

Since 1990 the cultivated area (arable land plus permanent cropland) has increased from 10% to 15% in 2007 of the total available land (World Bank, 2010). At the same time the total agricultural land has decreased by nearly 40% mainly through soil erosion (Taddese and Peden, 2006). The main consequence from this development over the last 15 years is that the permanent pasture has decreased by 50% keeping the available arable land stable (Appendix 4.1). The reduction of the permanent pasture in favour of large-scale agricultural production systems in Ethiopia (e.g. industrial crops and flower production) has led to a crowding out of the pastoral complex and highland mixed farming system. As livestock production is an important secured asset for the poor farmers the reduction of permanent pasture leads to an increased livestock density and at the same time puts pressure on the rural-urban migration¹². The associated overgrazing on both arable and grazing land has serious impacts on land and its vegetative cover. Ethiopia loses about 400 tons/ha per annum topsoil. The rate of deforestation is estimated at 80,000 to 200,000 hectares of land per year. Due to

national analyses with comprehensive information related to water resources and agricultural water management.

¹² Since 1995 the urban population has increased from 13.9% up to 16.3% of the total population in 2007 which is an increase of the urban population of 50% (World Bank, 2010).

water erosion, which is severe in the Ethiopian highlands, about 30,000 hectares of productive land are lost every year, while two million hectares are irreversibly damaged. Wind erosion is becoming increasingly severe in the semi-arid and Rift Valley areas of the country (Taddese and Peden, 2006).

In 2007 the main products especially regarding small scale productions are cattle meat, roots and tubers, cow milk, maize, chillies and peppers, cereals, wheat, coffee, sorghum and sheep meat (FAOSTAT, 2010)¹³.

Coffee is the major agricultural product with respect to export values. It accounts for 3% of the GDP and a quarter of the total population make a living from this sector. Further, main export products in 2006 following coffee are oilseeds, chat, leather, gold, pulses, live animals, flowers, meat and fruit/vegetables (IMF, 2007)¹⁴. The flower sector has only recently become an important sub-sector in the agribusiness for Ethiopia when regarding the export potential. It is a relatively new but at the same time very dynamic sector. 2006 the production value of flowers in Ethiopia laid by US\$ 114 Mn (AIPH Union Fleurs, 2008) and with 50% of all flowers exported via the two main Dutch import auctions (i.e. FloraHolland and Aalsmeer Flower Auction VBA) (Joosten, 2007).

Water usage

The average rainfall is around 848 mm/year which is a substantial amount of rainfall compared to Germany with 710 mm/year. The major problem with the annual rainfall for Ethiopia is the extreme spatial and temporal variability. Therefore, the risk of annual droughts and intra-seasonal dry spells is considerably high.

2007, the agricultural sector used 93.63% of the total water withdrawal. This is about 5.2 km³ per year. In comparison the industrial sector only withdraws 0.02 km³ which is 0.38% (World Bank, 2010). This leads to a growing conflict between the environment and agriculture as total base flows are diverted for irrigation without releasing water for ecological conservation. Irrigation is undertaken by the use of surface water as the usage of groundwater is very cost intensive. 1.6% of the cropland corresponding to 164 320 ha are irrigated in

¹³ The production values of the single commodities in 2007 are: cattle meat (US\$ 810 Mn), roots and tubers (US\$ 584 Mn), maize (US\$ 452 Mn), cow milk (US\$ 447 Mn), wheat (US\$ 417 Mn), cereals (US\$ 320 Mn), chillies and peppers (US\$ 302 Mn), sorghum (US\$ 278 Mn), coffee (US\$ 197 Mn), sheep meat (US\$ 156 Mn)

¹⁴ The export values of the single commodities in 2007 are: coffee (US\$ 354 Mn), oilseeds (US\$ 211 Mn), chat (US\$ 89 Mn), leather (US\$ 75 Mn), gold (US\$ 65 Mn), pulses (US\$ 37 Mn), live animals (US\$ 28 Mn), flowers (US\$ 22 Mn), meat (US\$ 19 Mn), fruit and vegetables (US\$ 13 Mn)

Ethiopia which equals an increase from 1990 till 2007 by 75% (Appendix 4.1). The irrigation potential is estimated by 2 700 000 ha (AQUASTAT, 2005).

Both irrigated and rainfed agriculture is important in the Ethiopian economy. Virtually all food crops in Ethiopia come from rainfed agriculture. Export crops such as coffee, oilseed, and pulses are mostly rainfed, but industrial crops such as sugar cane, cotton, fruits and newly flowers are irrigated. Rainfed farming has always been the main livelihood for most Ethiopian people and it is supported by traditional water harvesting practices (AQUASTAT, 2005).

Regarding the high population growth rate (3.208% in 2008) and the land restriction more efficient ways of producing agricultural products have to be used rather than rainfed farming to keep up with the increasing domestic food demand. Conflicts between shrinking pasture and water resources have made Ethiopia one of the most food insecure regions in the world with respect to other regions dependent on food aid such as Zimbabwe or Angola (Taddese and Peden, 2006).

Political Investment Climate

In 1991/92 an incisive reform process on regulations of foreign investments started. The regulatory regime governing FDI and privileges provided to FDI in Ethiopia underwent significant changes¹⁵. Especially the agribusiness sector has many privileges with little restrictions for foreign investors. Ethiopian FDI policy does not require foreign investors to meet specific performance goals or guidelines in terms of export, foreign exchange restrictions for imports, minimum local content levels in manufactured goods, or employment limits on expatriate staff anymore. FDI in the agribusiness sector is eligible for all kind of tax exemptions. They are exempted from the payment of custom duties and other taxes levied on imports of all capital goods (machinery, equipment and accessories) and construction materials necessary for the establishment of new projects or expansion/upgrading of the existing one. Income tax exemption differs in its length (2 – 8 years) according to the type of investment (especially how export orientated it is) and in what regions of Ethiopia (developed/underdeveloped) the investment takes place. In addition to all these incentives, FDI in all sectors are exempted from the payment of sales and excise taxes for export commodities (Weissleder, 2009). Furthermore, the Ethiopian government has tried to provide investment guarantee and protection by becoming

¹⁵ The key proclamations and regulations of these changes are Investment Proclamation No. 7/1996, 37/1996, 35/1998, 36/1998, 116/1998, 168/1999, 280/2002, 84/2003, 373/2003, and 146/2008.

a member of various agencies and organizations such as MIGA, ICSID, and WIPO¹⁶ (Weissleder, 2009).

Additionally, in May 2007, COMESA (Common market for Eastern and Southern Africa¹⁷) adopted an agreement for a Common Investment Area, which envisages a free investment area by 2010. The Agreement aims at attracting and promoting sustainable FDI by gradually eliminating restrictions and conditions relating to investment and operation of projects (COMESA, 2009). Ethiopia on its own established bilateral investment treaties with China, Denmark, Italy, Kuwait, Malaysia, Netherlands, Russia, Sudan, Switzerland, Tunisia, Turkey, Yemen and only recently with Djibouti. Furthermore, double taxation treaties¹⁸ are implemented between Ethiopia and Italy, Kuwait, Romania, Russia, Tunisia, Yemen, Israel and South Africa. An investment agreement with the whole EU does not exist yet. The USA has bilateral investment protection agreements with Ethiopia (Weissleder, 2009).

FDI inflows into the agribusiness sector

It appears that the political reform process has resulted in an increase of the FDI performance as Ethiopia has developed from an under-performer (low FDI potential and low FDI performance) to an above performer (low FDI potential but high FDI performance) between 1990 and 2007¹⁹ (UNCTAD, 2008).

Main investors between 2000 and 2008 are EU²⁰, India, USA, Israel and Saudi Arabia (Table 4.1). Between 2006 and 2008, other countries increase their FDI inflows, wherefore the percentage of the “rest” increases as well. This occurs mainly through single countries that invest only in one year of this period (e.g. in 2008 Sudan 40% and Malaysia 14.5% of the year’s investment sum).

¹⁶ MIGA stands for Multilateral Investment Guarantee Agency which issues guarantees against non-commercial risks to enterprise that invests in signatory countries. ICSID for International Centre for Settlement of Investment Disputes between States and National of other States, and WIPO for World Intellectual Property Organisations.

¹⁷ Ethiopia is one of the member states. For more details on COMESA see <http://www.comesa.int/>.

¹⁸ Double taxation treaties exist between many countries on a bilateral basis to prevent double taxation (taxes levied twice on the same income, profit, capital gain, inheritance or other item) therefore also called Double Taxation Avoidance Treaties. For details in Ethiopia see EIA (2008:10).

¹⁹ Whether a country in general has the potential of attracting FDI inflows and whether the performance fits the potential can be estimated through the Inward FDI Performance and Potential Index ranking over time generated by the UNCTAD in the World Investment Reports.

²⁰ Only investing EU member states are considered under the EU aggregate. It consists of the following EU countries: Germany, Netherlands, Italy, Britain, Greece, Cyprus, Ireland, Norway, Finland, Sweden, Austria, Ukraine, Denmark, Czech Republic, France and Belgium.

Disaggregating the EU, only few member states are highly engaged in FDI. These states are Britain (especially from 2000-2005), the Netherlands (continuously over the total time period), Germany (especially after 2005) and Italy (see Appendix 4.3).

As according to the investment climate in Ethiopia especially FDI projects are favoured that are highly export-orientated it is of interest to know whether the incentives set, led to the results that foreign investors mainly invest in those agribusiness sub-sectors that have a high export value (such as coffee, oilseeds, chat, meat and freshly cut flowers).

Between 2000 and 2005 the main investment flows occur in the flori/horticulture sector²¹. The EU, India and Israel invest more than 60% of their total FDI inflows in this sector. For Saudi Arabia and USA the same sector is important but they also have high investment flows in further agribusiness sectors. Regarding the EU in more detail, the main investor countries in the flower productions sector between 2000 and 2005 are the Netherlands (US\$ 56.98 Mn, 58% of sectoral FDI inflow) and Britain (US\$ 13.47 Mn, 14% of sectoral FDI inflow) (Appendix 4.3). After 2005, FDI's into flower production still appear and in absolute value increase continuously over time but investments also in meat production and biofuel have increased highly. All of these agricultural sub-sectors are highly export orientated. When having a closer look at the EU Member States, again in the flower production sector the Netherlands remain the main investor (US\$ 179 Mn, 74% of sectoral FDI inflow). This is equal with FDI flows from Israel and only topped by the FDI inflows of the USA in the flower production sector in this period. Investments in the meat sector appear mainly from Germany (US\$ 410 Mn, 68% of sectoral FDI inflow). Germany is further a big investor in the biofuel sector (US\$ 140 Mn, 29% of sectoral FDI inflow) next to Sweden (US\$ 168 Mn, 34% of sectoral FDI inflow) (Appendix 4.3).

Reasons for this change in the major investment sector were reckoned in the study by Weissleder (2009) to be changes in the objective of investing. Before 2006 mainly the reduction of production costs was the main pull-factor for investing. After 2006 other objectives such as food security and secure financial returns become important factors for deciding on where to invest.

Not only has the number of firms increased but also the average investment sum per firm in the different sub-sectors. Between 2000 and 2003 the average sum in the different sectors has varied between US\$ 4 Mn down to zero investment.

²¹ Investments in the flori/horticultural sector are to 90% investments in the flower production. Therefore this sector will be referred to as flower production sector from now on.

From 2004 on the average investment sum over all sectors has increased continuously from around US\$ 4 Mn up to a sum between US\$ 13 Mn and US\$ 7 Mn. From the development of these two key figures a FDI-friendly environment can be derived that attracts FDIs highly.

When regarding the target regions of FDI inflows, investments in the flower production take mainly place in the third agroclimatic zone (Figure 4.5) with an average temperature of around 20°C where the climatic conditions are optimal for flower production. Investments in the meat, food and biofuel sector are not that focused on one region as they are not so highly bound to climatic conditions. Therefore, regions in the first and second agroclimatic zone like Amhara, Tigrary and SNNPR also receive main parts of the FDI inflows since 2006 (Weissleder, 2009).

4.4 *Effects of FDI inflows on Ethiopia's economy*

As sustainable development contains three constituent parts: the economy, the environment and the social framework (WCED, 1987); this chapter will distinguish them to show the possible effects the recently increasing FDI inflows may have on the single aspects in the medium term (3 to 5 years). Further, a possible positive impact of FDI inflows on reaching the targets of the MDGs will also be investigated, as they are supposed to be reached by 2015. A comparative analysis regarding theory and former empirical studies will be carried out as the available data does not show the possible impacts yet, and therefore does not allow for statistical analysis. Before 2006, FDI inflows were at such a low level that they did not affect Ethiopia's economy. Thereafter, the investment flows increased sevenfold leading to a sudden capital accumulation. As FDI flows impact host economies through transmission mechanisms the economic effect of FDI flows will appear time delayed.

Impact on economic and social development

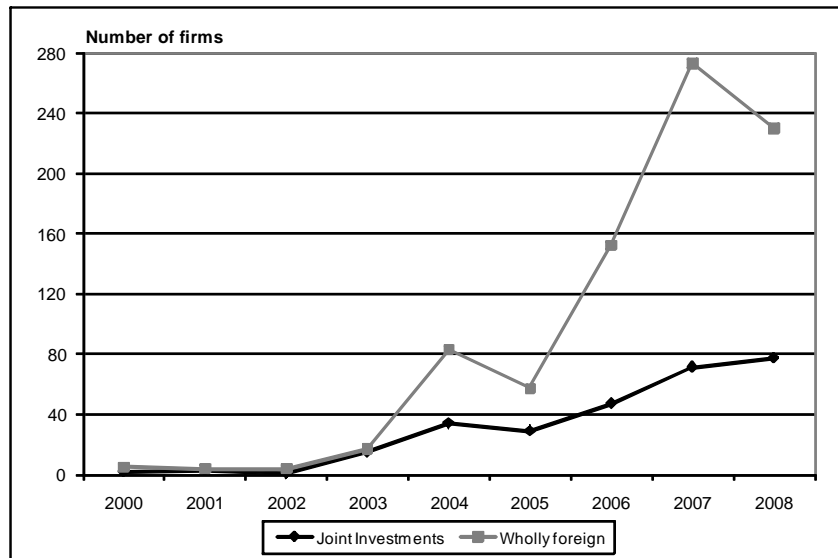
As shown in section 4.3 the regulations on FDI inflows are very FDI-friendly in Ethiopia. Hence, it depends on the foreign firms themselves how intensive the economic integration along the value chain will be.

The study carried out by Weissleder (2009) concludes that the objectives of foreign firms behind the investment flows are mainly to reduce production costs and to achieve home country food security. The interest of wholly foreign investment projects to strengthen the economic and social development in Ethiopia may therefore be lower than in joint investment projects²² (OECD, 2001).

In economical terms, Ethiopian investors should be more interested in keeping the profit in the country as well as educating local employees to work in the firms. Through higher network activities with domestic firms, technological spillovers are likely to be more efficient. Hence, a low ratio of joint investments would suggest a lower impact of FDI inflows on the economic and social development of Ethiopia (UNCTAD, 2009). Figure 4.6 shows the development of joint and wholly foreign investment projects between 2000 and 2008.

²² A FDI inflow is counted as a joint investment project if one of the investors comes from Ethiopia.

Figure 4.6: Joint projects versus wholly foreign ones. 2000-2008



Source: Federal Investment Bureau of Ethiopia (2009).

It becomes apparent that about one third of the investments are undertaken as joint projects. The number of joint projects increases from only 2 projects in 2000 up to 77 in 2008. The average sum of investment per firm between the two groups is nearly identical. The same appears for the main sectors of investment. As on average, the main agribusiness sub-sectors targeted by wholly foreign investments are meat, floriculture, food processing and biofuel, but in contrast to this, joint investments also occur proportionally high in the fruit sector. From this general development, it can be concluded that a high impact of FDI inflows on the economic and social development in Ethiopia is likely to appear as a considerable percentage of joint projects exists.

For testing the hypotheses regarding the economic and social impact derived from the literature (see section 4.2), Ethiopia's main economic growth rates and indicators for social changes are stated in Table 4.3. As the high increase in agricultural FDI inflows has only appeared since 2006, the given data on economic indicators acts as a base to derive possible future trends.

Table 4.3: Ethiopian Economic Indicators, 1995-2008

	GDP constant 2000 US \$	GDP per capita - constant 2000 US \$	Agriculture, value added	Total Population	Rural Population	Human capital
	US\$ Bn	US\$	% of GDP	Million	% of total	average years of schooling
1995	6.55	115.00	57.20	56.53	86.10	0.37
1996	7.36	125.00	56.71	58.23	85.90	..
1997	7.59	126.00	55.41	59.75	85.70	..
1998	7.33	118.00	50.59	61.27	85.50	..
1999	7.71	121.00	47.39	62.78	85.30	0.48
2000	8.17	125.00	47.41	64.30	85.10	0.53
2001	8.85	132.00	45.74	65.78	84.88	0.65
2002	8.99	130.00	41.95	67.22	84.66	0.73
2003	8.79	124.00	41.20	68.61	84.44	0.76
2004	9.99	137.00	43.43	69.96	84.22	0.81
2005	11.17	150.00	46.95	74.66	84.00	..
2006	12.38	162.00	48.09	76.63	83.72	1.02
2007	13.76	175.00	46.00	78.65	83.30	1.08
2008	15.32	190.00	44.00	80.71	83.00	..

Note: As GDP and GDP per capita are measured in constant 2000 US \$ inflation can be disregarded.

Source: World Bank (2010)

Since the beginning of 2000, the annual GDP growth rate has remained quite stable around 10% with an exception in the years 2002 and 2003 where they were lower (Table 4.3). According the IMF (2008), Ethiopia has the fastest growing economy in Africa among the non-oil exporting countries. The data indicates that the GDP growth in 2007 amounts to 10.5% which is well above the average for Sub-Saharan Africa (6.1%). To halve the poverty in Africa by 2015 UNCTAD estimates that its economies need to grow by 7-8% annually in real terms, which is a major challenge considering that most of the African economies grew by only 2% annually between 1991 and 1997 (Ikara, 2003). According to Dupasquier and Osakwe (2006) an increase in FDI is imperative to attain economic growth in Africa. Regarding former empirical case studies as well as the theoretical literature, high increases in FDI inflows in the last years for Ethiopia can keep this GDP growth rate stable or even increasing if transmission mechanisms are in place.

Transmission mechanisms have been derived as necessary conditions for the existence of this economic coherency. It is therefore important to analyse whether these mechanisms occur in Ethiopia to draw the conclusion that the GDP growth viewed in the last years is driven by the increased FDI inflows.

One indicator for the existence of transmission mechanisms is the increase of the total factor productivity. An increase correlated with an increase of the FDI

inflows suggests that transmission mechanisms (especially technological progress and spillovers) are in place and that FDI inflows influence the total factor productivity. As the agribusiness sector is the base of the Ethiopian economy, it is essential that the productivity growth appears here to achieve sustainable growth and furthermore reduce poverty (UNCTAD, 2009; Rao et al., 2004). Msuya (2007) finds evidence for this interdependence for the agricultural sector in Tanzania. Further, Moss et al. (2004) indicate that foreign enterprises in Tanzania, Uganda and Kenya are more productive than domestic ones and by this increase the overall factor productivity of these countries. Still, benefits reaped from technology transfer can be significantly limited through the fact that: 1) R&D by MNEs tends to focus on commercial crops with relatively large markets which may not be useful for the domestic diet, and 2) technologies created by developed-country firms may not be suitable or beneficial to developing countries, as their utilization is often constrained by geographical and climatic conditions (UNCTAD, 2009). According to the report of MoFED (2007) the productivity of the factor land in Ethiopia stated through the yield per hectare has increased between 2004/2005 and 2006/2007 on average by 16%. Before, the average increase lay by 4 to 5% (World Bank, 2010). As the high increase appears at the same time as the increase of the FDI inflows, it is likely to conclude that FDI inflows in Ethiopia are positively correlated with agricultural productivity of the factor land which in turn indicates that technological spillovers (new adaptive farming methods, knowledge for enhancing production) and a more efficient use of resources have appeared through MNEs.

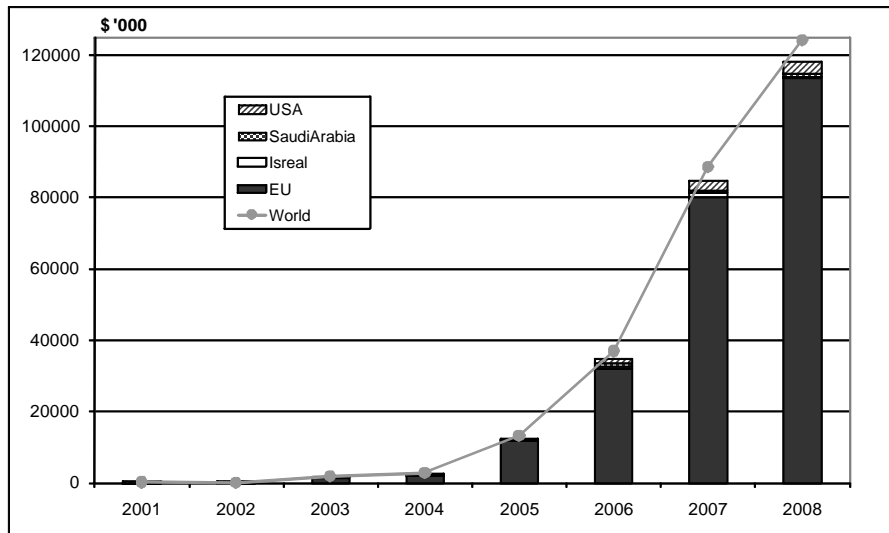
For absorbing technological spillovers caused by FDI human capital is necessary as a transmission mechanism. According to Borenszstein et al. (1998), who have estimated the effects of FDI on economic growth by taking the stock of human capital into account, a country with secondary school attainment above 0.52 will benefit positively from FDI²³. FDI will then lead to an increase of GDP (Borenszstein et al., 1998). Although MNEs appear to create more skilled employment as they increase the human capital, smallholder farmers who represent the major agricultural production system in Ethiopia may be driven out of business during the process of commercialization and modernization in agriculture which is enhanced by MNEs (UNCTAD, 2009). This change in farming system has already been reckoned for Ethiopia (see section 4.3) and may as a negative consequence of the increased FDI inflows in the last years increase in the future. Through this, total agricultural employment may even decrease in a

²³ Meaning a total population above 25 years with an average of 0.52 years of secondary schooling (Borenszstein et al., 1998).

short-term prospect (UNCTAD, 2009). From Table 4.3 it becomes clear for Ethiopia that the human capital stock is large enough to absorb technological spillovers and further that the human capital has increased further especially since 2006. A negative impact on the agricultural employment through structural changes cannot be found as the share of total employment in the agricultural sector has increased from 77.9% (1999) up to 86% in 2006 (World Bank, 2010).

A further transmission mechanism is the increased integration into international trade (Figure 4.2). By providing know-how and their existing market access channels MNEs encourage the integration in international trade. Next to the positive effects of the increased international integration it has to be borne in mind that becoming over-dependent on the MNEs can lead to the creation of high market power. The occurrence of market power encourages unequal distribution of economic benefits which would reduce the possible benefits for the domestic market occurring from FDI inflows (UNCTAD, 2009) As the productivity and with it the competitiveness of the agricultural production increased through MNEs in Ethiopia it is reasonable to conclude that the comparative advantage of Ethiopia (based on factor endowments and cost advantages) against other trading partners is exploited leading to a higher integration in exports (UNCTAD, 2009). This development can be seen from the increasing export flows in the floriculture and horticultural and meat sector (Figure 4.7 and Figure 4.8) which are two sub-sectors where foreign investors are strongly engaged, since 2000.

Figure 4.7: Total Export flows of Flori/Horticulture and their main destination

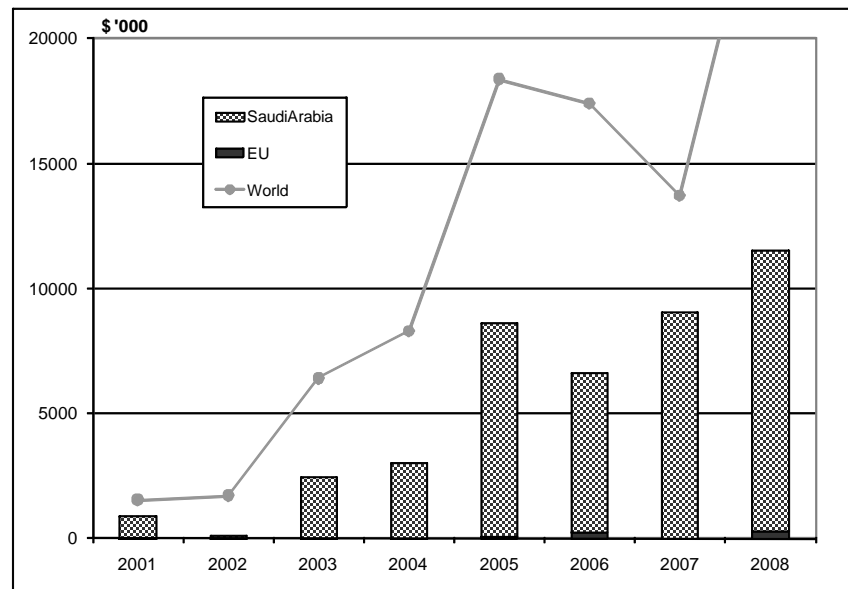


Source: UNComtrade (2010).

In 2006, Ethiopia increased its export flows of flowers so strongly that it became the second largest exporter of large roses to the Dutch auctions (after Kenya) and the third largest supplier for small roses (after Kenya and Uganda) (Joosten, 2007). Since 2001 up to 2007 the export value of flowers has increased from US\$ 0.305 Mn up to US\$ 113 Mn (Joosten, 2007) which accounts for 7.8% of the total export value in 2007.

Export flows in the meat sector have quadrupled between 2001 and 2005 and remain at a high level since then. This increase occurs synchronal with the increase of the FDI inflows into this agribusiness sub-sector.

Figure 4.8: Total Export flows of meat and their main destination



Note: World Export flows amount to \$28 Mn in 2008.

Source: UNComtrade (2010).

Regarding Figure 4.7 and Figure 4.8, Ethiopia's agribusiness sector appears to become more and more export orientated. Therefore, it can be argued that an integration in the international trade has occurred through the newly FDI inflows. This shows that a main interest of foreign investors appears to be vertically motivated. Production is transferred to Ethiopia to become more efficient against competitors²⁴. As this is a further transmission mechanism the linkage between increasing FDI inflows and increasing GDP growth in Ethiopia is even strengthened.

Through the identification of an increased total factor productivity caused by FDI inflows and the existence of transmission mechanisms it is possible to conclude that FDI can and will have a positive impact on Ethiopia's recent and future development of the total GDP.

²⁴ Chapter 3 gives a detailed analysis on the appearance and motivation of vertical or horizontal FDI flows.

Environmental development

Through the raised FDI inflows into the agribusiness sector, especially since 2006, the demand for agricultural land has increased rapidly. As Ethiopia loses about 30,000 hectares of agricultural land every year due to soil and water erosion (Taddese and Peden, 2006), it was common to reduce permanent pasture to gain new agricultural land. Traditional farming systems depend on the permanent pasture for keeping their livestock. Hence, conflicts of the factor land between traditional farming systems and the industrial agricultural production have already appeared. The additional land demand caused by FDI projects will increase this conflict even further. Although FDI in the agribusiness sector mainly appears in low populated areas of Ethiopia (44 – 94 people/km²) an investment of 1,000 hectares would still involve the translocation of 440 – 940 people (= ~ 70 – 150 households). Further, traditional farming systems occur mainly in these regions. (GAA, 2010). The crowding out of the pastoral complex and the highland mixed farming system will therefore be accelerated. An unavoidable outcome of this trend will be an increased rural-urban migration rate and a structural change towards large-scale farms regarding the common farm systems. This emigration of local farmers can increase urban poverty (GTZ, 2009).

Caused through the climatic conditions, Ethiopia is further characterised through water shortage. As mentioned above most of the water is used for the agricultural production but still 4 – 6 million people depend on food aid. The usage of irrigation leads to an increase of the achieved yield in comparison with rainfed crops (AQUASTAT, 2005) which could reduce the problem of insufficient food supply. Irrigation increases the yield of all general crops produced.

Depending on the regarded sub-sector the necessity of irrigating increases as well for foreign producers. Here, especially the flower production sector (highly export-orientated see Figure 4.7 and highly growing since 2000) depends on irrigation as most of the flower production is carried out under greenhouses. The area under flower production (roses, cutting, and summer flowers) amounts to 519 ha in 2005/06. For 2009/10 it is estimated that 2 000 ha will be under flower production (Joosten, 2007). Only for this sector this would mean an increase of irrigated area by 300% in 4 years. As most of the flower producers (70%) are foreign investors (Joosten, 2007) this increase occurs mainly through FDI inflows.

This high increase of demand on irrigation from foreign investors leads to a further reduction of the available water for domestic food production. Remaining future FDI inflows could increase this conflict even further. Additionally, as no regulations are in place at the moment to release water for ecological

conservation, irrigation is a major factor that causes soil erosion. Environmental effects through FDI inflows appear to be mostly negative.

A possible way to reduce the conflict on water could be the usage of groundwater for irrigation which has a high potential (can amount to 85% of the current irrigation area) but is very costly (Taddese and Peden, 2006). The conflict on land could be reduced by trying to adapt the livestock population to the irrigation production system. This would mean a change in the livestock production system but as in Ethiopia the role of livestock in poverty reduction is fairly high (livestock is an important secured asset for the poor farmers) such an integration of the two production systems could reduce the pressure on the perennial pastures and rangelands (Taddesse and Peden, 2006). Case studies show that MNEs have the potential to bring environmentally sound technologies, but only if national environmental standards and certifications are in place (UNCTAD, 2009). High FDI inflows may therefore affect Ethiopia's environment negatively in the medium term if no regulations are put in place.

4.5 *Poverty reduction*

As MDGs are set to decrease poverty, it is sensible to take them into account when deriving possible developments initiated through increasing FDI inflows. Thereby, only those MDGs are regarded which are directly affected through appearing transmission mechanisms in Ethiopia.

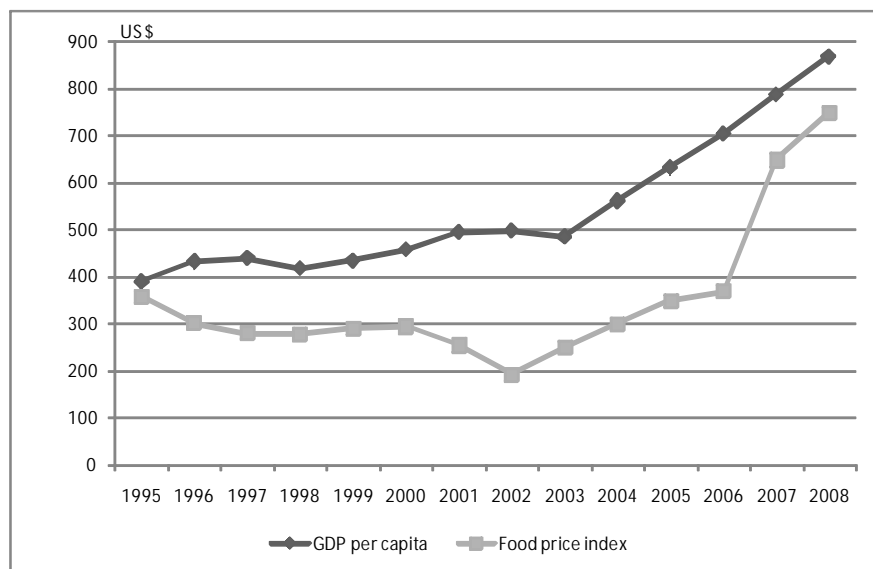
MDG-1: Eradicate extreme poverty and hunger

Derived from theory, the identified growth in GDP is supposed to have a positive impact on poverty reduction even though it is not a sufficient condition (see section 4.2). Although, the GDP as well as the GDP per capita has increased steadily over the last decade it has to be discussed whether the food price index in Ethiopia has increased even more. A higher increase in the food price index than the GDP per capita would indicate that even though the GDP per capita is growing the proportion of undernourished will remain stable or even increase as food becomes more expensive over time (IFPRI, 2009).

Regarding the development of the two indicators in Figure 4.9 it can be derived all though the food prices increased highly after 2006 due to the high world market prices the growth rate of GDP per capita was able to compensate this rise. Therefore, in Ethiopia the increase in GDP per capita has lead to an absolute increase of per capita income and hence may have the potential of reducing the proportion of undernourished population.

This would mean that a reduction in overall poverty of Ethiopia should appear and indeed, since 1996 (total 45.5%, rural 47%, urban 33.3%) poverty has been reduced by 5.5% up to 2006 (total 38.7, rural 35.1, urban 39.3). This development obviously has increased in speed after 2000 (total 44.2%, rural 45%, urban 37%) where the poverty was nearly the same as in 1996 (World Bank, 2010). The increase of poverty in the urban areas appears through the high rural-urban migration wherefore more people live in urban areas without an increase in available jobs. As FDI is responsible for a certain part of the increase of the GDP then it can be derived that FDI has also a positive impact on the reduction of undernourished.

Figure 4.9: GDP per capita and Food price index, 1995-2008



Note: The Food price index is calculated individually by taking the main products essential for the domestic diet.

Source: World Bank (2010) and FAOSTAT (2010)

According to the MDGs the proportion of people living below the poverty line is supposed to be halved by 2015. Taking the trend of the poverty development between 2000 and 2006 and the high FDI inflows in the last 3 years into account it seems possible that Ethiopia can reach this target by 2015. When regarding the development of poverty also the annual population growth rate has to be considered. A high population growth rate as can be seen for Ethiopia (Table 4.3) can lead to a reduction of poverty in percentage terms but not in absolute terms. This has happened in Ethiopia. Even though the development in percentage terms shows a reduction of nearly 6%, poverty has even increased up to 2000 and only

decreased slightly since then in absolute terms. This trend can also be seen when regarding the global hunger index (GHI) generated by IFPRI. In 1997, the GHI for Ethiopia was 41.72 points and has only decreased down to 30.8 points in 2009. Even though this is a reduction of 26%, Ethiopia's GHI indicates still an extremely alarming situation (IFPRI, 2009). As the reduction in absolute terms for both indicators appeared at the time when FDI inflows slowly started to increase it is likely that the FDI inflows are in parts responsible for this development and will lead to a further future poverty reduction.

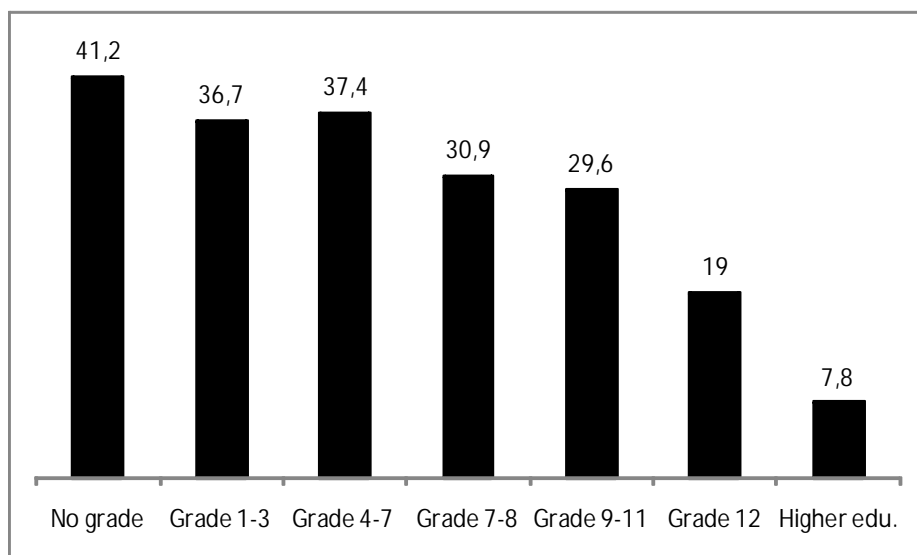
An additional point that hinders poverty reduction is unequal income redistribution. This depends heavily on the governmental regime. Although a federal parliamentary republic is in place, Ethiopia is ranked in the Democracy Index generated by The Economist (2007) as one of the countries which are highly undemocratic (105 out of 167). It appears to be more a hybrid regime situated between a flawed democracy and an authoritarian regime. Especially in the case of poverty reduction, which can be forced through good politics on the redistribution of income, such an instable political surrounding potentially slows down the reduction of poverty. Further, the increase in export flows of especially industrial crops such as flowers can increase food insecurity, as industrial crop production decrease the available area for domestic food production (UNCTAD, 2009).

In the case of Ethiopia, it is therefore reasonable to assume that poverty reduction will appear all though less than estimated before and that the MDG-1 (Appendix 4.1) will not be reached by 2015.

MDG-2+3: Promote gender equality

Goal 2 and 3 are stated to achieve equal educational chances. As women are one of the main population groups that suffer from extreme poverty, the increase of education and work for women is essential for poverty reduction (United Nations, 2009). For Ethiopia, poverty decreases consistently as the level of education increases as shown in Figure 4.10 (MoFED, 2007).

Figure 4.10: Poverty by level of education, 2004/05

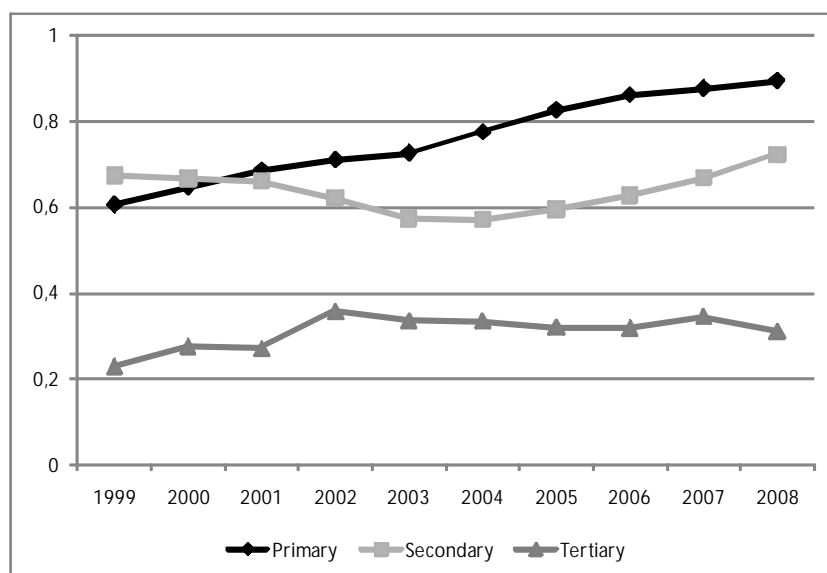


Source: MoFED (2007).

The Gender Parity Index (GPI)²⁵ measures the relative access to education of males and females (World Bank, 2010). Between 1999 and 2008 the GPI over all education steps has increased showing that the disparity between men and women is shrinking for Ethiopia (Figure 4.11). The disparity for the primary education is nearly eliminated. In comparison, Germany has a GPI of 0.98 over all educational steps. It is therefore sensible to conclude that MDG 2 and 3 are nearly reached for Ethiopia. As the GPI increased especially for the secondary education after 2005 a possible encouragement through the increased FDI flows can be derived. Especially the high FDI inflows in the flower production sector of Ethiopia, where mainly women are employed (64.4% females workers, see Joosten, 2008), contribute to the conclusion that this development can be seen as ongoing.

²⁵ The Gender Parity Index is a socioeconomic index measured as the quotient of the number of females by the number of males enrolled in a given stage of education (World Bank, 2010).

Figure 4.11: Gender Parity Index, 1999-2008



Source: UNESCO Institute for Statistics in EdStats (2010).

MDG-7: Ensure environmental sustainability

The target of MDG 7 is to reduce the rate of population without sustainable access to safe drinking water and basic sanitation (Appendix 4.1). In Ethiopia, the proportion of the population with access to safe drinking water has increased from 20% in 1995 up to 42% in 2006. Especially after 2000, this development has accelerated as up to 2000 the proportion was still below 30% (World Bank, 2010). It appears that since the FDI inflows have increased highly the living conditions as measured by the safe drinking water access have increased. The access to sanitation facilities only increases slowly from 5% in 1995 up to 11% in 2006 (World Bank, 2010). Still this is a doubling in 10 years.

If the observed development is ongoing it can be concluded that for the water access the MDG is to be reached but for the access with basic sanitation the development is too slow to be reached by 2015.

Living standards as well as the level of education throughout Ethiopia's population have increased especially since FDI inflows have risen after 2005. Some MDGs have by now already been achieved; others will surely not be achieved until 2015. Still, poverty reduction has increased in speed since 2006. Ongoing FDI inflows may therefore lead to an ongoing increased poverty reduction.

4.6 *Conclusions*

Based on the high increase of FDI inflows in Ethiopia between 2000 and 2008 this paper aimed at giving a first insight in the possible impact of these FDI inflows on the future sustainable development of Ethiopia. Thereby, the MDGs from 2000 are additionally considered as they are decided on to reduce poverty. From theory and former empirical case studies hypotheses were derived stating that FDI leads to economic growth and by this to poverty reduction through transmission mechanisms.

As the transmission mechanisms cannot be measured directly, the development of the productivity of the agricultural sector and the development of human capital were regarded as proxies. Both have increased significantly since 2000, therefore it was concluded that the transmission mechanisms necessary to generate economic growth caused by FDI inflows are in place. Further, Ethiopia has become more integrated in international trade through the investment of MNEs, which also stimulates GDP growth. Negative consequences of FDI inflows on the economic growth such as the crowding out of small farmers through the modernisation of the agribusiness sector will mainly lead to a slowing down of the GDP growth rate in the short term prospect but will not stop the midterm economic growth caused by the FDI inflows. Therefore, parts of the economic growth in Ethiopia appear through FDI inflows. For the future prospective it is possible to derive that should the FDI inflows remain at the current level, the GDP growth rate will remain stable.

For the environmental development the picture drawn is different. As no strong regulatory framework is in place and the emphasis of the last years was to attract as much FDI inflows as possible the conflict on land and water resources is about to increase further if no changes appear.

Poverty reduction, the main target of the MDGs, can mainly be seen after 2000. The rate of population with sustainable access to safe drinking water and basic sanitation has increased. Further, equal opportunity for women regarding education is nearly achieved. This development goes along with the high increase of FDI inflows. It can be concluded that FDI inflows in Ethiopia will have a positive impact on poverty reduction defined according to the MDGs even though slowed down through the current government in place. The negative consequence of an unequal distribution of economic benefits will make it more difficult to see the underlying correlation but will in the midterm prospect at the most lead to a lagging of the poverty reduction.

The results found indicate that the impact of FDI inflows on the economic and social development has been positive in the last years and it can be derived that in

the medium term this affect will remain positive. This positive effect of the FDI inflows is also pictured through the regarded potential of achieving parts of the MDGs.

This mainly positive development of Ethiopia's economy may be slowed down through the newly occurred global financial and economic crisis. At this point of time it cannot be forecast how strong the FDI inflows will decline or whether they will decline at all. Although the prospects for FDI inflows into the agricultural sector of developing countries sees only a reduction in the next two years it should be concluded that Ethiopia's estimated positive development will be slightly lower in its eventual outcome than if the global economic conditions would have remained stable.

As only the agricultural market has been regarded, conclusions can only be drawn to a certain extent on the development of Ethiopia's economy. Different influence factors as well as the analysis of the other existing sectors are left out which will certainly impact Ethiopia's economy, too. Further, no *ceteris paribus* conditions exist in an *ex-post* analysis. Therefore, the positive development of the MDGs may occur through other measures such as development aid, which are not linked with the high increase of FDI inflows in the past few years. Regarding existing case studies on other host countries, it seems appropriate to derive the existence of this linkage.

Further, it has to be mentioned that as the FDI inflows only increased recently to such a high level, no data such as firm level data is available yet for proving the derived conclusions through an analytical framework. The received results only base on regarded trends in the past and on case studies of other developing countries that have already experienced high FDI inflows. Therefore it would be sensible in a further step to gather primary data through a survey in Ethiopia to receive robust data for undertaking an econometric analysis proving the received results.

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4.8 *Appendix*

Appendix 4.1: Major Millennium Development Goals

Goal 1: Eradicate extreme poverty and hunger

Target -> Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day

Goal 2: Achieve universal primary education

Goal 3: Promote gender equality and empower women

Target -> Eliminate gender disparity in primary and secondary education, preferable by 2005, and in all levels of education no later than 2015

Goal 4: Reduce child mortality

Goal 5: Improve maternal health

Goal 6: Combat HIV/AIDS, malaria and other diseases

Goal 7: Ensure environmental sustainability

Target -> Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation

Goal 8: Develop a global partnership for development

Source: United Nations (2009).

Appendix 4.2: Land development between 1990 and 2007

	Land area	Agricultural land		Arable land		Arable land under cereal production	Permanent cropland		Permanent pastures		Irrigated land
	km ²	km ²	% of land area	km ²	% of arbi land	km ²	km ²	% of agri land	km ²	% of agri land	% of cropland
1990	1 101 000	563 120	51.15	107 500	19.09	4 957	6 620	1.18	449 000	79.73	1.42
1991	1 101 000	561 580	51.01	106 500	18.96	4 444	6 580	1.17	448 500	79.86	1.43
1992	1 101 000	561 050	50.96	106 500	18.98	4 356	6 550	1.17	448 000	79.85	1.46
1993	1 000 000	305 600	30.56	100 000	32.72	4 035	5 600	1.83	200 000	65.45	2.75
1994	1 000 000	304 720	30.47	98 780	32.42	5 393	5 940	1.95	200 000	65.63	2.77
1995	1 000 000	305 000	30.50	98 900	32.43	6 533	6 100	2.00	200 000	65.57	2.76
1996	1 000 000	305 000	30.50	98 697	32.36	7 737	6 300	2.07	200 003	65.57	2.76
1997	1 000 000	305 510	30.55	99 000	32.40	7 505	6 510	2.13	200 000	65.46	2.75
1998	1 000 000	305 640	30.56	99 500	32.55	6 320	6 140	2.01	200 000	65.44	2.75
1999	1 000 000	307 100	30.71	100 000	32.56	7 463	7 100	2.31	200 000	65.13	2.71
2000	1 000 000	306 950	30.70	100 000	32.58	7 184	6 950	2.26	200 000	65.16	2.71
2001	1 000 000	314 440	31.44	107 120	34.07	8 002	7 320	2.33	200 000	63.61	2.53
2002	1 000 000	306 370	30.64	99 360	32.43	6 663	7 010	2.29	200 000	65.28	2.73
2003	1 000 000	317 690	31.77	110 560	34.80	8 499	7 130	2.24	200 000	62.95	2.46
2004	1 000 000	334 460	33.45	123 600	36.95	8 803	7 400	2.21	216 770	64.81	1.67
2005	1 000 000	336 910	33.69	129 200	38.35	9 812	7 700	2.28	221 480	65.29	1.92
2006	1 000 000	342 190	34.22	134 000	39.16	8 106	8 200	2.39	199 990	58.44	1.63
2007	1 000 000	350 770	35.08	140 400	40.02	8 510	10 400	2.96	199 970	57.01	1.58

Note: Agricultural land includes arable land, permanent crops and permanent pastures; Arable land includes annual crops, temporary fallow and temporary meadows; 1km² is equal to 100 ha.

Source: World Bank (2010).

Appendix 4.3: EU disaggregation of the investment flows (2000 – 2008)

Year	Total EU investment sum US\$	Main Investor	Main Sector	Number of firms
2000	11.6 Mn	Britain (100%)	Other (100%)	1
2001	3.9 Mn	Britain (89.3%)	Flori/Horti (100%)	1
2002	0.9 Mn	Italy (100%)	Food (100%)	1
2003	24.1 Mn	Netherlands (37.9%)	Flori/Horti (98%)	2
		Britain (26.1%)	Flori/Horti (38%)	1
			Food (36%)	1
			Meat (18%)	1
Germany (13.3%)	Other (85%)	1		
		Flori/Horti (15%)	1	
2004	63.9 Mn	Netherlands (63%)	Flori/Horti (96%)	10
2005	34.5 Mn	Netherlands (31.1%)	Flori/Horti (87%)	6
			Coffee (7%)	1
			Honey (6%)	1
		Britain (27.2%)	Flori/Horti (81%)	4
	Meat (18%)	1		
	Food (1%)	1		
Austria (26.3%)	Flori/Horti (100%)	1		
2006	378.5 Mn	Germany (67.6%)	Meat (100%)	2
		Cyprus (17.1%)	Biofuel (100%)	1
2007	752.3 Mn	Germany (37.6%)	Meat (57%)	3
			Biofuel (25%)	1
			Vegetables (16%)	1
Sweden (30.2%)	Biofuel (74%)	1		
	Food (24%)	1		
Netherlands (24.8%)	Flori/Horti (96%)	6		
2008	434.8 Mn	Germany (61.5%)	Meat (58%)	4
			Biofuel (26%)	1
			Food (16%)	2
		Italy (25%)	Biofuel (64%)	1
	Palm Oil (22%)	1		
	Flori/Horti (12%)	1		

Source: Federal Investment Bureau of Ethiopia (2009).