Aid – Trade Linkages
Analysis of the Trading Costs in the Least Developed Countries

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Abstract

Foreign aid is the subject in development economics that created controversies about its influences on the economy of the recipient countries. This study is an attempt to explain the effects that aid may have on trade, with a focus on the trade costs associated with the creation of business ties. Tied aid creates incentives for the developing countries to keep positive trading relationships with their donors, mainly because of the diminishing trading costs associated with long term contacts. Subsequently, programs related to infrastructure and trade enforcement have been launched, that work towards the integration of the Least Developing Countries into the world economy.

This study includes the analysis of the trade flows and foreign aid disbursement between the “Group of Seven” countries (G7) and the Least Developing Countries, for a time span of 22 years (1988-2009). The results show that aid does have a significant effect on the trade flows between the developed and developing countries. The explanation to this is related to the trading costs and the infrastructure development that tends to diminish the costs linked to distance- and border-related issues, and the sunk costs of market research and entry. In accordance, the distance coefficient is smaller after 1997, as result of decreased trade costs and increased export flows from recipients to donors.
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1 Introduction

“Foreign aid might be defined as a transfer of money from poor people in rich countries to rich people in poor countries.”

Douglas Casey (2011)

Foreign aid, or Official Development Assistance, represents the financial transfers from developed countries – donors, to developing countries – recipients, with the purpose of economic development (Finn, 2008). The Millennium Development Goals (MDGs) are the foremost important objectives that have to be accomplished in due time, but aid has not yet proven its expected impact on the economy. The Least Developed Countries (LDCs) got the largest amounts of aid but still remain much behind the rest of the world (OECD, 2006).

Foreign aid includes a series of norms and restrictions and the three types of aid have different levels of binding. Tied aid obliges the recipient country to spend the grant on goods and services from the donor country or a specific region, or entail spending restrictions (Osei B., 2004). Partially tied aid is very close to tied aid, but it includes a broader list of import suppliers (Wagner, 2003). Untied aid does not have any trading requirement and the recipient has free choice. (Wagner, 2003). Previous research studies done on the subject of foreign aid and its effects show that these financial inflows can both benefit and worsen the economic stability in the recipient countries.

Aid raised strong criticism over the way it works, because of the missing effects on the economic performance of the recipients and it was recently condemned for the selfish interests of the donors, because of the tied aid disbursement. The foreign aid tied to the donor’s exports was described in a paper of Tajoli (1999) as a channel for the donors to promote their own goods and get advantage of market access. But contradictorily, researchers as Johansson & Pettersson (2008), argue that tied aid - although being blamed for immiserizing the economic growth of the recipients and provoking a Transfer Paradox¹, created long-term collaborations and overcame the costs associated with exporters’ search and study. Previous collaborations established working platforms that were more expensive to change for lower supply prices than to keep under the definite conditions (Wagner, 2003). A developing country does not have the resources to invest in new technologies and promote Research and Development (R&D); therefore, trade is a source of knowledge spill-over and increased industrial productivity (Nowak-Lehmann D. et al, 2009). The advantages associated with keeping the same supplier imply mainly the financial savings from sunk costs and trade costs related to finding a new supplier, communication difficulties and legal disparities (Andersson, Loof, & Johansson, 2008). The conditionality attached to aid also forced the Sub-Saharan African countries (SSAs) to reform trade; for example, Tanzania did not get any aid inflow

¹ The paradox’s meaning is that foreign aid may increase poverty instead of eradicating it. Read more about the Transfer Paradox in Kemp & Kojma (1985), Tajoli (1999) and Suwa-Eisenmann & Verdier (2007)
until it did not implement the reforms required by the IMF\textsuperscript{2}, and aid was used to diminish the crisis’ effects during reformation in Senegal (Ancharaz, 2003).

By the end of the 1990s, the tied aid share decreased due to the negative criticism and trade enhancing programs were launched. The Aid-for-Trade (AfT) and Everything-but-Arms (EBA) programs lead aid towards infrastructure development and trade facilitation. Trade is considered as the motor for economic development and in order to increase trade the trading costs should go down. According to Krugman (1995), Feenstra (1998) and Baier & Bergstrand (2001), trade growth is determined by trade liberalization, lower transportation costs, economic convergence and increased outsourcing. This thesis will therefore develop the subject of the influence of tied aid and trade programs in overcoming the difficulties and trading costs associated with the trade prospectives of the LDCs.

1.1 Purpose of study

The purpose of this thesis is to explore the side effects of bilateral aid on the terms of trade between donor and recipient countries, under the circumstance of aid tying exclusion and trade facilitation agreements (AfT and EBA). It is believed that the terms of trade of the Least Developed Countries experience a continuous development, initially by receiving tied aid and decreasing the trading costs due to gained trade experience, and subsequently, by benefiting from trade markets’ liberalization and infrastructure enhancement due to the Everything But Arms and Aid-for-Trade programs.

The research questions are:

1. How does aid tying decrease the trade costs between the donor and the recipient?
2. How do trade-oriented aid programs decrease the trade costs?
3. Do recipient countries tend to import more from their donors? Why?
4. Do recipient countries tend to export more to their donors? Why?
5. Does the aid’s effect change in different time frames (1988-1996 and 1997-2009)?

The rest of this paper is organized as follows: Section 2 is a literature review on the subject of tied aid disbursement, the aid programs with focus on infrastructure and trade, and the implied trading costs. Section 3 presents the model used for the analysis and the data collection strategy. Section 4 analyses the data set, presents the results and evaluates the main findings. Section 5 is the concluding module and summarizes the results of the study.

\textsuperscript{2}International Monetary Fund
2 Theoretical Background

The theoretical background consists of two sections. First, a trade model that defines the conditions of trade patterns and the influence of the trading costs on customizing these patterns. And second, the aid disbursement and the impact that it has on diminishing the costs of trade between donor and recipient countries. This part contains the tied aid disbursement consequences, and two trade-developing programs: Aid-for-Trade development process and the Everything But Arms initiative.

2.1 The Ricardian Model of Trade

Trade is determined by technology differences and comparative advantages in production, based on countries’ factor endowments of labour and capital (Redding, 2008). The Ricardian model of trade suggests that countries’ exports are generated by their comparative advantage of production in the specific sector (Deardorff, 2004). Eaton & Kortum (2002) developed a similar study about the Ricardian model, including variables of geographic characteristics, thus combining the forces that create patterns of trade. Since studies have shown that trade relationships are more sensitive to trading costs and barriers to export, comparative advantage alone fails to predict trade patterns (Deardorff, 2004).

The ability of a country to gain from its comparative advantage is determined by its barriers to trade (Eaton & Kortum, 2002). Bougeas et al. (1999) suggests that infrastructure determines the transportation costs, that consequently limit the competitiveness of the country on the global market. Hence, a decrease in trading costs allows countries to gain from their comparative advantage and compete on an international level.

2.2 Trading Costs and Opportunities

Trading costs are a determinant of efficiency, and low costs enhance competitiveness on the market. Consequently, bilateral aid targets the infrastructure, communication and economic training – trade principles and facilities for market access.

Trade costs are the added costs that the consumer pays beyond the production costs (Bergstrand, 2008). The ability of a developing country to participate in the global economy and its share of the market is determined by its trading costs, namely: transportation, infrastructure requirements, communication facilities, information costs, tariffs, and other policy barriers (Limao & Venables, 2001; Bergstrand, 2008).

Previous treaties granted market access for the LDCs in the European market, but the lack of infrastructure and facilities disabled a constant economic evolvement. A study of Hoekman & Nicita (2010) develops the idea that the impact of a reduction in trade costs is larger than a favourable market access modification. Previous trade negotiations (i.e. Doha Round, Uruguay Round) did not exercise a major role in trade and several industrial fields are still locked by poor infrastructure and barriers to improve (Hoekman &
The last negotiation round recognizes the need for financial assistance in infrastructure and productivity enhancement, as the global market becomes overcrowded and competitive (Hoekman & Nicita, 2010). The negotiable factors of trade costs (i.e. tariffs, protectionism, and market access) appear to have a smaller share than geographical and infrastructural issues, and the cultural and linguistic ties do (Olper & Raimondi, 2009; Anderson & van Wincoop, Trade Costs, 2004).

Aside from the current economic integration, trading costs are large, and are estimated to 170% ad-valorem tax equivalent for the developed countries and approximately twice higher for the LDCs [see Figure 1] (Anderson & van Wincoop, Trade Costs, 2004). Similar studies show that the African countries have the highest trade costs in the world [see Figure 8 in Appendix] (Portugal-Perez & Wilson, 2009). This tax is approximately distributed for the transportation, production and trade barriers (Anderson & van Wincoop, Trade Costs, 2004).

Figure 1 Ad-valorem tax structure on imported goods

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Importing implies sunk costs that are not avoidable, like the costs from “the searching processes for potential customers or suppliers, inspection of goods, negotiation, and contract formulation” (Andersson, Loof, & Johansson, p.777, 2008). Additional to this, there are costs associated with habit formation and knowledge gaining (Vogel & Wagner, 2010).

“The death of distance is exaggerated” (Anderson & van Wincoop, Trade Costs, p.1, 2004). Studies show that half of the total trade is between countries located at farthest 3000 km from each other (Huchet-Bourdon et al., 2009). The gravity model specifies that the amount of trade between two countries decreases, as the distance between them...
increases, and the opposite (Krugman & Obstfeld, 2009). Distance is considered an equivalent for the trade costs, since it often includes difficulties associated with cultural and linguistic differences (Baier & Bergstrand, 2001).

Almost 50% of the African population live in inland countries, fact that creates a dependency of the neighbour countries with a seaside for maritime freight transit (Portugal-Perez & Wilson, 2009). An AfT - Trade and Transport Facilitation Project, concerning the landlocked countries in East Africa, decreased the transport costs and the delivery times and increased the cargo volumes through a strategic corridor in the East (The World Bank Group, 2011). Uganda’s trade rose by 24% in imports and 22.7% in exports during 2006-2009, and along with Uganda, other landlocked countries benefit from the improved seaport in Mombasa, Kenya (The World Bank Group, 2011). Customs clearance also implies trade costs associated with verification for prohibited imports and goods conformity; these delays are estimated to be strong enough to affect the long-run terms of trade of the country (Portugal-Perez & Wilson, 2009).

As trading costs have an impact on the export flows and these costs are very high for the LDCs, it is vital to decrease them in order to enhance the terms of trade. Tied aid and infrastructure development projects work in favour of overcoming the sunk and border-related costs and integrate the LDCs in the world arena.

2.3 Foreign aid

Foreign aid did not yet accomplish its scope in eradicating poverty, but instantaneously aid has other effects on the trade relationships of the country with the donors. Hence, foreign aid may influence the trading costs and improve the global competitiveness of the country on the market.

“Foreign aid [...] began as an instrument of Cold War diplomacy” (Lancaster, p.5, 2006) and a symbol of altruism and humanitarian support. In the nineteenth century, it was an unacceptable thing for some to use public resources for helping people beyond the own borders, but it continued to be a temporary solution for that period. It was never planned as a long-term growth scheme, but as the gap between the rich and the poor became larger, it was an indispensable solution at that time (Lancaster, 2006). The number of aid donors has increased significantly, humanitarian organisations, rich Western European and North American countries continue to raise the donated amounts, but many critics still look for a sign that would acknowledge aid’s effectiveness nowadays (Morrissey, 2006).

The UNDP\(^3\) evaluates foreign aid as the most effective tool to fight poverty, but contradictorily continues with the statement that this tool is “underused, inefficiently targeted and in need of repair” (Easterly, 2008). Other international organizations tend to follow the same thoughts and nourish the idea of an improved poverty eradication plan.

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\(^3\) United Nations Development Program
(Easterly, 2008). Aid had an initial aim – development, but with years, these purposes have changed, and self-interest dictates most of the aid’s settings, as one of the several principles (Martinez-Zarzoso et al, 2009). Ultimately, it remains a “political decision” and it has been strongly agreed that it is also a strategy driven by egoism (Riddell, 2007). An American senator made a declaration that stated that even though there is an altruistic feature of the American foreign aid, this is mainly done to “serve US security and economic interests” and if foreign aid does not benefit the US, then this type of spending will be reduced (Wagner, p.154, 2003).

The efficiency of foreign aid is also disturbed by the high level of corruption and ineffective institutions that manage the aid inflows (Alesina & Dollar, 2000). Recently, aid disbursement is more selective, being directed towards countries with developed democracies and institutions, with the scope of increased effectiveness and economic growth (Dollar & Levin, 2006).

Tied aid cannot be blamed just because it benefits the trade flows of the donor, while it is unknown what effects it has on the recipient’s market. Economist and researchers consider that the self-interest part of the foreign aid giving has nothing to blame for, as long as these transfers benefit both parts (Macdonald & Hoddinott, 2004).

### 2.3.1 Trade Implication under Tied Aid Disbursement

Tied aid is equivalent to the donor’s exports (Suwa-Eisenmann & Verdier, 2007; Helble, Mann, & Wilson, 2009). This conditionality worked in the donor’s interest to extend their exports’ market; it is considered to limit the recipients’ options and affect the economic growth of the country (Lloyd et al, 2000). As a result, donor countries get a higher return on the money they gave for humanitarian reasons (Wagner, 2003). Both Wagner (2003) and Tajoli (1999) consider that donors use foreign aid to promote their own exports that are usually overpriced by 10-40% (Suwa-Eisenmann & Verdier, 2007). Tied aid is considered to be the wrong link in the development chain, and international organizations fight for a reduced level of tying (Tajoli, 1999). Inconsistent with the previous statement, Miquel-Florensa (2007) suggests that tied aid may stabilise a poor economy by using a well-targeted contract. Thus, poor and overpopulated countries tend to have a higher share of tied aid, contradictorily to the stable countries that get a high share of untied aid.

In the 1990s, half of the aid was tied or partially tied to exports (Wagner, 2003). In the beginning of the third millennium, the amount of tied aid decreased drastically, hence equalling 10-20% of the world aid [see Figure 6 in Appendix]. Even though aid is not tied anymore to the specific exporter, their trade patterns remain unchanged. According to Wagner (2003), aid and trade are highly linked as long as the donor gives aid, and the recipient spends it on imports from the recipient. There is an implicit or explicit contract between the two countries, also called an “informal tying” (Tajoli, 1999). The aid beneficiary wants to keep the good relationships with the donor, and continues to improve the commercial link with them in their favour.
2.3.2 Consequences of Tied Aid Disbursement on Trade

Trade, as a replacement for development aid, has created an informal contract between the exporters in the donor country and the recipient. When there is no formal tying, the causality of aid and trade can still be explained by (1) the increased demand for imports from the recipients’ side and (2) other principles of economic, social and political aspect that will be further discussed (Nelson & Silva, 2007). Tied aid improves the contact between the countries and the exposure of the donors’ market, fact that influences the recipient’s decision for continuous orders, even outside the tying contract (Osei et al, 2004).

The productivity of a firm/market improves when it participates in the global market and imports foreign goods, under the condition that the quality of the imported goods is higher than the one of the domestic goods and there are no perfect substitutes for them (Halpern et al, 2006). Previous studies showed that higher quality and goods’ variety are two principles that raise welfare by 2.4% (Broda & Weinstein, 2004).

Vogel & Wagner (2010) developed the theory of “learning-by-importing”, that explicitly says that imports enhance productivity. Imports lead to the use of “inputs from the forefront of knowledge and technology” and consequently – to specialization (Andersson et al, p.778, 2008). Imports from industrialised countries influence the local market by spreading technological progress and enforcing imitations since a developing country does not have the resources to invest in R&D (Eaton & Kortum, 2002; Choudhri & Hakura, 2000). Strong contact with the foreign exporter is regarded as a channel for technology transfer; accordingly, tied aid played a major role in promoting this process (Choudhri & Hakura, 2000).

Nowak-Lehmann D. et al. (2009) consolidates the idea that aid and trade can become a favourable collaboration for both countries, when the recipient country spends the grant on imported capital goods from the donor. There are four ways through which the developing country gains by importing capital intensive products: “forward linkages, embedded technologies, learning effects and stimulation of imitation” (Nowak-Lehmann D. et al, p. 1185, 2009).

Studies have proved that in the presence of “learning-by-doing” conditions, a country prefers to export than to get aid (Adam & O’Connell, 2004). It is a win-win situation when aid develops the donor’s exports and the economy of the recipient (Nowak-Lehmann et al, 2009). The fixed costs that business cooperation implies have a decreasing margin for extensive periods of time, therefore long-time cooperation reduces trade expenses (Halpern et al, 2006).

2.3.3 Aid and Trade – Costs, Circumstances and Conditions

Until the 1990s, colonial past was a used criterion for aid allocation, but current studies found evidence that despite its historical economic importance, this factor has a declining significance and economic performance is evaluated when disbursing aid (Alesina
& Dollar, 2000; Berthelemy & Tichit, 2004). A stable and enriched global economy is a new niche for trade opportunities, therefore, if a developing country’s GDP increases, it’s expected that the country’s demand for imported goods will rise (Nowak-Lehmann et al, 2009).

Trade costs, especially transportation costs, are an important segment of trade and there is evidence that countries will trade more if the costs are low, consequently countries will trade more with their appropriate neighbours and respectively less with the countries located far enough to consider trade unprofitable (Berthelon & Freund, 2008). Distance is a barrier to trade and is able to restrain exports even under the circumstances of free trade agreements (Eaton & Kortum, 2002).

Aid, even when not formally tied, is judged to be harmful for the recipient because of the aid’s positive effect on the donor’s terms of trade. Contradictorily, studies of Johansson & Pettersson (2008) argue that it is a natural occurrence, because if the created links and trade is reciprocally beneficial, there is no reason to interrupt it. The long-run relation has also a reverse effect - improving the exports of the recipient in the donor’s market, as consequence of previous favourable collaboration (Johansson & Pettersson, 2008).

Aid has the ability to educate the recipient in managing the global trade and improve its performance to adapt to the international market environment (Johansson & Pettersson, 2008). Furthermore, the imports from the donor improve the recipient’s reputation and serves as source for additional cooperation through the exporters’ channels (Johansson & Pettersson, 2008).

2.4 Development Programs and Trade Agreements

The poor infrastructure and high tariffs and quotas are an impediment to trade and entrance on the international market. Hence, development programs are focused on the improvement of infrastructure and exclusion of any tariffs and quotas for the LDCs.

The LDCs have recorded a vast exports’ increase during the last decades, but these countries still fall much behind the developed countries in terms of competitiveness and high trading costs (Huchet-Bourdon, Lipchitz, & Rousson, 2009). The world trade share of the Sub-Saharan African countries, which represent most of the LDCs, dropped by 3% from year 1960 to 2004, currently equalling 1.5% (Huchet-Bourdon et al, 2009). The large gap between the developing and the developed countries has raised concerns about the LDCs ability to keep up with the continuous development towards trade facilitations in the USA and EU countries.

2.4.1 Aid-for-Trade

The Aid-for-Trade project (AfT) targets the infrastructure development of the LDCs and the improvement of their ability to participate in the global market (European Comission Trade, 2009). The goal is to build up an economy that is able to become
competitive and productive in the long-run, namely being done through assistance directed towards industrialization, communication and transportation facilities, and competent institutions (Hoekman & Wilson, 2010). AfT aims to help LDCs and developing countries take advantage of trade opportunities that are often offset because of transportation and knowledge deficiencies (Raihan, 2007). Since the 1990s, the technical assistance for the LDCs has doubled, with some reductions during the financial crisis in 2007-'09, but on the way to recovery [see Figure 2].

AfT targets similar problems that were earlier discussed as the advantages of aid tying. Because aid is often misused and corrupted, AfT directly assists projects and sectors that are crucial for the integration of the country in the global economy (Hoekman & Wilson, 2010). This plan seeks to regulate, develop and establish a trade concept and strengthen the economic performance (Raihan, 2007).

Figure 2 Total Technical Assistance (mln USD)

Source: OECD Statistics

Productivity and competitiveness are principles of a growing economy and diversified market of goods; since the diversity of a market works as an insurance during crises and promotes long-term development (Hoekman & Wilson, 2010). A favourable economic environment attracts investments and international financial cooperation, which leads to the creation of economies of scale and “macroeconomic convergence” (Hoekman & Wilson, 2010; Huchet-Bourdon et al, 2009). Recent studies of Cali & te Velde (2011) suggest that there are significant reductions in the costs of both importing and exporting when AfT facilitations are implemented. Additionally, the World Trade Organizations shows similar results: that there are robust reductions in trading costs, namely: a 1% increase in AfT, decreases the export costs of a 20-foot container by 0.11% (OECD/WTO, 2011).
2.4.2 Everything but Arms (EBA)

The effects of trade on a country’s economy were examined by Krugman, and the positive result of trade have a focus on liberalisation and tariffs removal that make the developing countries attractive for the industrialised importers (European Comission Trade, 2009). Aside from the previous trade agreements, like the “Generalised System Tariff of Preferences” (1968), that implied preferential trade for all developing countries (DC), arrangements with a focus on the LDCs were essential in order to extend the market share (European Comission Trade, 2009). Trade liberalization leads to a long-term economic growth, mainly due to exposure to the global market and technologies that raise economic efficiency (Winters, 2004).

In tendency with the MDGs\(^4\), in the beginning of the 2000s, the EU institutions decided that the LDCs should get a more favourable position in the global trade and enjoy a totally liberalised access to the EU market, thus creating the “Everything but Arms” programme (European Comission Trade, 2009). This plan favours the access of Duty Free and Quota Free exports to the EU countries’ market without any quantitative restrictions, this way encouraging productivity and diversification (European Comission Trade, 2009; Cernat et al., 2003). The EBA programme is also directed towards the export of agricultural products, that is the main industry in the LDCs and represent a comparative advantage opportunity that is currently undertaken (Cernat et al., 2003).

The EBA initiative got a positive criticism from the EU and WTO institutions for being an important step towards development, but it is also argued that the possibilities of EBA are restricted and there has been no considerable trade expansion (Faber & Orbie, 2009). The limitations are judged to be an outcome of bad governance and lack of experience in taking the opportunity (Faber & Orbie, 2009). Despite the negative opinions, EBA does show a modest welfare and terms of trade improvement, but there is still place for policy upgrading (Cernat et al., 2003).

\(^4\) Millenium Development Goals
3 Method

This thesis is an empirical study of the current trading relationship between the donor and the recipient countries and is based on a working framework including a three-dimensional panel study: recipient-year-donor (Berthelemy & Tichit, 2004). The donors’ sample includes the Group of Seven (G7) countries: France, Germany, Italy, United Kingdom, United States, Canada and Japan, since these countries give the biggest aid share from the total global aid (>70%) [see Figure 3 and Figure 4 in Appendix]. The study covers a period of 22 years (1988-2009) and this expose the aid changing in the mid-1990s, when the amount of tied aid decreased considerably in the favour of untied aid [see Figure 5 and Figure 6 in Appendix]. Since the tying degree of aid is often underrated, the high number of observations is high enough to solve and increase the trustworthiness of the data and the results will be further carefully analysed (Tajoli, 1999).

Figure 3 Total Bilateral Commitments of the G7 countries and other Donor countries (mln USD)

Source: OECD Statistics

3.1 Data Collection

The analysis is based on a dataset that includes the industrialised countries of the Group of Seven (G7) and the Least Developed Countries, for the period 1988-2009 [see Appendix for countries’ complete lists]. The data used in the analysis was collected from the databases: World Bank Online Databases, OECD iLibrary and the OECD Statistics, and the UN Comtrade. The economic indicators – Gross Domestic Product and Gross National Income per capita data were gathered from the World Bank Database and Aid data from the OECD iLibrary. The Exports statistics were retrieved from the UN Comtrade records. The distance between countries was calculated in kilometres, using
the capital cities as reference points. [See Table 1 for systematic interpretation of the variables and expected signs.]

Table 1 Variables interpretation

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Source</th>
<th>Expected sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP_{DR}</td>
<td>The exports from the Donor (D) to the Recipient (R)</td>
<td>United Nations Comtrade</td>
</tr>
<tr>
<td>EXP_{RD}</td>
<td>The exports from the Recipient (R) to the Donor (D)</td>
<td>United Nations Comtrade</td>
</tr>
<tr>
<td>AID_{DR}</td>
<td>The amount of Aid given by the Donor to the Recipient country</td>
<td>OECD iLibrary</td>
</tr>
<tr>
<td>GDP</td>
<td>The Gross Domestic Product in the Donor and the Recipient countries</td>
<td>World Bank Data</td>
</tr>
<tr>
<td>GNI\text{per}Capita</td>
<td>The Gross National Income per capita in the Recipient and Donor countries</td>
<td>World Bank Data</td>
</tr>
<tr>
<td>DIST_{DR}</td>
<td>The distance between the Donor and the Recipient country, using the capital cities as reference points</td>
<td>timeanddate.com</td>
</tr>
<tr>
<td>Language</td>
<td>Dummy variable that takes the value 1 if the Donor and the Recipient have the same official language and 0 in the opposite case.</td>
<td>BBC – Country Profiles</td>
</tr>
<tr>
<td>C</td>
<td>Constant</td>
<td>-</td>
</tr>
<tr>
<td>\varepsilon</td>
<td>Error term</td>
<td>-</td>
</tr>
</tbody>
</table>

3.2 Model

In relation to previous research studies of international trade, the gravity equation is the most suitable for this type of economic studies of trade (Anderson & van Wincoop, 2003). The gravity equation is a successful method that has been used to analyse the trade’s relationship with income and other arbitrary variables i.e. distance, cultural ties, economic relationships (Sanso, Cuairan, & Sanz, 1993).

The main independent variable that needs to be highlighted is AID. The share of aid that donors give to the LDCs is significant to affect their trade relationship, and studies of Wagner (2003) suggest that there is a positive and significant correlation between these variables. A research done on the Sub-Saharan African countries also argues that larger aid flows enhance the possibility of trade reformation and consequently - enhanced trade flows (Ancharaz, 2003).

The Gross Domestic Product is a variable that highlights the economic size of a country, and countries with higher income tend to trade more and call for product diversifi-
cation. Also, the services sector in developed countries has a larger share of the economy, therefore the import of industrial and agricultural goods is major (Filippini & Molini, 2003).

The model includes both the GNI per capita in the donor country and the recipient country, with the purpose of analysing the capacity of a country to export, the size of the economy and the capacity to absorb imports.

Two dummy variables: \( \gamma_{DR} \) and \( \delta_t \), control for country-specific and period-fixed effects. These variables check for particular effects that would otherwise be lost (Hausman & Taylor, 1981).

The model analysis contains the control for fixed cross-section effects and fixed period effects Consequently, it was not possible to include in the model the distance variable and the language dummy variable, since they are not subject to variation over time. A colonial past variable was not included since this will lead to biasedness, because not all the G7 countries were colonizers [see the Further Research suggestions on this matter on page 22].

Model (1):

\[
\ln \text{EXP}_{DRt} = C + \beta_1 \ln \text{AID}_{DRt} + \beta_2 \ln \text{GDP}_{Dt} + \beta_3 \ln \text{GDP}_{Rt} + \beta_4 \ln \text{GNI per Capita}_{Dt} + \beta_5 \ln \text{GNI per Capita}_{Rt} + \gamma_{DR} + \delta_t + \epsilon
\]

Model (2):

\[
\ln \text{EXP}_{RDt} = C + \beta_1 \ln \text{AID}_{DRt} + \beta_2 \ln \text{GDP}_{Dt} + \beta_3 \ln \text{GDP}_{Rt} + \beta_4 \ln \text{GNI per Capita}_{Dt} + \beta_5 \ln \text{GNI per Capita}_{Rt} + \gamma_{DR} + \delta_t + \epsilon
\]
4 Empirical results

The results are statistically significant and the signs of the estimates do synchronize with the predictions made earlier. A simple model of trade was used for a better understanding of the aid’s effect on the export flows, and with the purpose of excluding multicollinearity and autocorrelation problems. The number of observations is large enough to predict trustworthy result. The t-statistic results are presented in the parentheses for every coefficient estimate. The estimate is considered significant to influence the dependent variable only if it has a p-value ≤0.05. The time spans: 1988-1996 and 1997-2009 are further called the first and the second period of time. The division of data into two periods proves to be efficient since some variables show significant result for the complete time frame or/and one or both time periods.

Table 2 Regression results of the Exports from Donors to Recipients and the explanatory variables

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*** - significant at 1%
** - significant at 5%
* - significant at 10%

Theory and previous research studies shows that the trade relationship between donors and recipients is stronger due to the financial support from the developed economies. Fact that further lead to increased preference for the donors’ market in the decision-making process of the recipients. Previous research suggests that donors have a higher return on the aid disbursements since the recipient country increases the share of imports from the donors’ producers. This statement may prove to be correct for certain years and countries, but the evidence of this study confirm the opposite. If a donor country increases its aid share by 1%, then their exports to the recipient increase by
0.03%. Yet, the results for the two time frames, once with the decrease in the share of tied aid, show unpredicted coefficients. Hence, a 1% increase in aid disbursements, decrease the imports from the donor by 0.05% before 1997 and increase them by 0.05% after the decreased conditionality of aid. This result partly contradicts the theory due to the negative coefficient in the first period, but studies show that the Cold War period\(^5\) and the following years had a negative impact on aid’s disbursement and efficiency in the recipient countries (Headey, 2008). This may lead to the fact that the trade flows between countries also experienced a decline due to the slow economic growth and political instability. Additionally, the tied aid share was approximately 50% of the total, fact that suggests that more than half of the financial assistance was used for imports from the donor country, and not compulsory the rest of the aid. Consistent with previous studies of Osei et al. (2004), tied aid does not generate trade flows in the short run for the years 1969-1995.

The economic indicators show significant alterations throughout the years. The GDP of the recipient country is significant and a 1% increase leads to a 0.29% increase in the trade flow in the recipient country. During the two time frames, there is large increase in the demand for foreign imports in the recipient country, thus, the exports from donors to recipients increases from 0.28% to 0.66% for a 1% increase in the GDP. The infrastructure development and technological enhancement requires innovative technologies and goods, hence the developed economies are a upfront provider of exports. The demand for diversified goods as result of increased economic power is justified by the fast economic growth rate in the late 1990s and inflow of capital goods. Infrastructure development tends to eliminate income inequality and have a positive relation with GDP growth, and furthermore, former tests have proven the effectiveness of infrastructure in eliminating poverty (Calderon & Serven, 2004). The GDP of the donor country is significant for the whole timeframe and for the second period. The decrease in the second period may be related to the diminished exports’ share to the LDCs in comparison to the rest of the world, under the circumstance of booming global trade in the late 1990s and beginning of the 21st century.

Likewise the GDP, the GNI per capita shows analogous results, this variable being significant for the complete period in the donor country and for the first period in the recipient country. The high coefficient estimate for the donor country is due to the lower GNI per capita growth rates that have a comparatively high effect on the exports share to smaller economies such as the LDCs.

The aid-trade linkage has a two-way connection, hence exports from recipients to donors are also influenced by the business patterns that aid disbursement created.

\(^5\) The Cold War (1945-1991) perturbed the international economic and political stability since it involved the United States, the Soviet Union and other leading countries of the world. This period affected the global economic powers and also the Third World countries that regained their independence from the colonialists (Painter, 1999).
Table 3 Regression results of the Exports from Recipients to Donors and the explanatory variables

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<td><strong>No. of obs.</strong></td>
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*** - significant at 1%
**  - significant at 5%
*   - significant at 10%

Previous research suggests that foreign aid has bilateral effects on trade flows by improving the exports from the recipient country to the donor’s market. As a result of the business ties and improved infrastructure, LDCs tend to export more to the countries where they have established trading relationships. The period aggregated coefficient estimate of AID is not significant. Thus the disaggregation into periods contribute to the evaluation of the change throughout the years, since the results show significant coefficients for the two periods. During the first period, the exports to the donor country have a negative coefficient, hence a 1% increase in foreign aid, decreases the export flows by 0.06%. The negative coefficient may be an indices of low productivity due to inefficient infrastructure and high trading costs that reduced exports. As there is a shift from tied to untied and technical aid during the mid-1990s, the aid coefficient also becomes positive during the second period. If aid increases by 1%, then the exports of the LDCs to the donors increase by ≈0.08%. The result indicates the efficiency of the AfT and EBA programs in improving the countries’ competitiveness on the international market and creating facilities for trade development.

The total GDP variable is insignificant for the donor country, and significant for the recipient country. The LDCs, as producers and exporters to the donor countries, export by 0.23% more for a 1% increase in their GDP. Disaggregating for the two time frames, in the first period the GDP is the main variable that influences exporting, and a 1% increase in GDP, increased the exports by 0.24%. The income per capita variable shows a similar trend, being significant only for the recipient country. For the whole time span, a
1% increase in GNI per capita, leads to an increase of 0.11% in exports to the donor countries. For the first period, the increase is 0.19% in exports for a 1% increase in GNI per capita and in the second period the coefficient drops to a negative level of 2.6%. There is a major change in the GDP and GNI per capita coefficients that the recipient countries experience in the second period, when the GDP is not significant and the GNI per capita has a negative value. A valid explanation may be the increased share of exports to other countries as consequence of trade liberalization and trade facilitation due to infrastructure and transportation. Therefore, regional trade would be preferred over the trade with countries that require higher trading costs due to geographical dissimilarities.

4.1 Analysis

Tied aid was a mutually beneficial financial flow, because it increased the exports flow from the developed countries to the developing countries, while the last ones took advantage of integration into the world economy and trade know-how (Eaton & Kortum, 2002). Additionally, the costs associated with the search of a supplier and market research is overcome (Andersson, Loof, & Johansson, 2008). In the same manner, AfT and EBA raised infrastructure and eliminated the tariffs on the EU market, in hopes of diminishing the trading costs.

If there continues to be a significant link between the donor and the recipient, even under no tying contract, then it can be argued that the historical collaboration is strong enough to maintain a business relationship nowadays (Ghemawat, 2001). The main hypothesis is that the trading costs in the long run tend to decrease and importers are reluctant to spend resources in finding new suppliers, hence, tied aid was reciprocally beneficial in setting trade deals. The second hypothesis is that AfT and EBA programs did have an influence on decreasing the trading costs through infrastructure enhancement.

The outcome of the study concludes that aid does have an influence in creating bilateral trade incentives, but it goes against the hypothesis that tied aid determines higher returns for the donor country. Inconsistent with the studies of Tajoli (1999), Suwa-Eisenmann & Verdier (2007), tied aid does not increase the share of the donors’ exports to the recipient countries. The bilateral trade flow between the donors and the recipients increase as more aid is devoted to infrastructure development and trading costs reduction. The market access and trade liberalisation lead to an increased share of the LDCs goods into the developed countries’ markets, but still accounting for a comparatively low segment of the world trade.

The positive estimate coefficient for the recipient’s exports in the donor country is associated with previous collaboration and knowledge about the market. Also, the high-income countries do not have an agricultural sector and are mostly services oriented, and contradictorily, the low-income countries’ economy is focused on agriculture, fact that creates a demand-supply relation [see Figure 4].
The economic distance between countries is described by their income and resource dissimilarities, i.e. human capital, infrastructure and economic expertise (Ghemawat, 2001). Aid works in favour of these differences and integrates the LDCs into the world economy, through the decrease in trading costs that are twice larger for LDCs than they are for developed economies (Portugal-Perez & Wilson, 2009).

The distance and language variables were not included in the empirical analysis, however, this does not exclude their importance for the following analysis. By running a simple OLS regression, the distance explanatory variable has the expected sign and is statistically significant for the t-statistic and p-statistic. Hence, a 1% increase in the distance between two countries would decrease the trading flow by 1.25 - 1.75%. This result confirms the theories stated in the sections above, that distance continues to be a strong barrier to trade and it is the most substantial determinant of exports. During the two time frames, the distance coefficient has a decreasing trend, since in the first period a 1% increase in distance decreases the distance impact from 1.52% to 1.07% in the second period. This shift may be due to the decreased trading costs related to infrastructure and natural barriers. On the other side, the distance coefficient for the exports from donors to recipients has increased from 1.52% to 1.89% for 1% increase in the distance between the countries. [for complete results of the regressions, see Table 4 and Table 5 in Appendix]

The language dummy variable is not statistically significant for this model. But in concordance with the fact that most of the countries listed as LDCs were colonies of the G7 countries, points to the fact that language might not be as important for this group of
countries as the protectionist attitude is. Additionally, studies have argued that aid is mainly disbursed based on common culture and history, but this is specific to each country and its specific colonial past (Alesina & Dollar, 2000). For example, France is considered to direct the biggest share of its foreign aid to previous colonies and the francophone world, meanwhile, Japan assists mostly countries that are their active trading partners (Schraeder et al, 1998).

5 Conclusion

The results of this analysis reconfirm the significant effect that aid has on the economic performance and the terms of trade of the recipient country. Although tied aid does not improve the exports of the donor countries, it created the strings between the developing and the developed countries. It assisted the LDCs to enhance their trade performance on a global level. Tied aid worked on the reduction of the trading costs, and increased the knowledge about the markets and trade demands. Since aid tying was blamed for the perverse effects on the recipients’ imports, it was lately replaced by technical assistance, namely – infrastructure support and development. The decreased level of tying and technical support, in combination with the knowledge about previous business practices, worked toward an active trade pattern between donors and recipients. The analysis’ results show that aid has a positive effect on creating trading relationships between countries and the distance parameter has a diminishing coefficient after 1996. This leading to the conclusion that infrastructure and distance-related difficulties have a lower impact on creating trade patterns and will be overcome thorough correct targeting of foreign aid.

5.1 Further research

The subject of aid and its implications of economic growth and trade are vast and it can be further developed by using more variables that are associated with the trade flows. Infrastructure is a characteristic difficult to calculate, and the rare data on this subject creates difficulties on undertaking this type of research, thus, the ability to include several variables about infrastructure would yield better results. It would be curious to proceed with an analysis about the types of goods that are traded and whether there are changes in preferences over specific time frames. And lastly, the sample of recipient countries may be increased, for a better perspective about the subject of aid and trade. For the reason that the majority of the LDCs are located far away from the economic centres of the world, and in comparison with other developing countries, i.e. lower-middle income and upper-middle income countries, the LDCs have an unfavourable geographic position, the middle income countries may have a higher coefficient estimate of aid on trade.

A study about the specific characteristic of each country, based on its colonial past would improve the analysis of the trading patterns between donors and recipients of foreign aid.
6 Bibliography


7 Appendix

Figure 5 Total Foreign Aid (mln USD)

Source: OECD Statistics

Figure 6 Tied Aid Shares (%)

Source: OECD Statistics
Figure 7 Total Aid Disbursement in 2009 (mln USD)

Source: OECD Statistics

Figure 8 Export and Import Costs

Source: Portugal-Perez & Wilson (2009)
G7 countries:

1. Italy
2. Germany
3. France
4. Great Britain
5. United States
6. Japan
7. Canada

Least Developed Countries:

1. Angola
2. Benin
3. Burkina Faso
4. Burundi
5. Central African Republic
6. Chad
7. Comoros
8. Congo, Dem. Republic
9. Djibouti
10. Equatorial Guinea
11. Eritrea
12. Ethiopia
13. Gambia
14. Guinea
15. Guinea-Bissau
16. Lesotho
17. Liberia
18. Madagascar
19. Malawi
20. Mali
21. Mauritania
22. Mozambique
23. Niger
24. Rwanda
25. Senegal
26. Sierra Leone
27. Sudan
28. Togo
29. Tanzania
30. Uganda
31. Zambia
32. Bangladesh
33. Bhutan
34. Cambodia
35. Laos
36. Nepal
37. Yemen
38. Kiribati
39. Samoa
40. Solomon Islands
41. Vanuatu
Table 4 Regression results of the Exports from Recipients to Donors and the Distance variable

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Table 5 Regression results of the Exports from Donors to Recipients and the Distance variable

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