Assessing the Trade Effects of Being Graduated from Non-Reciprocal Trade Preferences

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August 2012

Abstract

The term graduation is applied when an industrialized country withdraws a sector or a country from non-reciprocal trade preferences. Sectors and countries are graduated when they supposedly can compete at world market level, but surprisingly little research has explored what effect on export flows graduation actually has.

This thesis thoroughly identifies and explains the graduation mechanism, collects data of all cases of sector graduation within the EU's GSP scheme and offers a detailed empirical overview. The effect on export flows for graduated sectors is assessed econometrically. Based on panel data through the gravity model, a regression analysis is performed to investigate whether graduation from trade preferences affects developing countries' exports to the EU. The results indicate that graduation impose no significant effect on trade for graduated sectors exports to the EU over the whole sample. However, graduated sectors from poorer developing countries are affected negatively which adds validity to the graduation mechanism but also suggests that it may be poorly designed.

Keywords: *Graduation, Trade Preferences, Trade Effects, European Union, GSP, Gravity model.*

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List of abbreviations

ACP -   African, Caribbean, and Pacific Group of States

BRICT -   Brazil, Russia, India, China and Thailand

CN -   Combined Nomenclature

EU -   European Union[1]

EBA -   Everything but Arms

GDP -   Gross Domestic Product

GSP -   Generalized System of Preferences

LDC -   Least Developed Country

MFN -   Most Favored Nation

PPML -   Poisson Pseudo Maximum Likelihood

RoW -   Rest of the World

UN -   United Nations

UNCTAD -   United Nations Conference on Trade and Development

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[1] The EU will be used for simplification although the correct term can vary between the European Union and the European Communities. The ambiguity will not affect the results and hopefully not lead to any misunderstandings.

1. Introduction

The European Union, as well as industrialized countries, grants non-reciprocal trade preferences towards developing countries in order to promote and increase growth in their exporting sectors. The term graduation is applied when an industrialized country withdraws a sector or a country from these non-reciprocal trade preferences. The reasons to graduate relatively well performing countries and sectors are firstly that the benefit of decreased tariffs should be directed towards poorer performing countries, but also that the graduated countries and sectors should be able to compete at world market level without the extra benefit (European Union, 1994:1). Sectors and countries are graduated when they should be able to compete at world level but surprisingly little research has explored what effect on trade graduation actually has.

This paper has two main purposes; *i)* to collect data about all cases of graduation of sectors within the EU's Generalized System of Preferences (GSP) scheme in order to offer a detailed empirical overview of the policy and *ii)* to make an empirical assessment of whether export flows are affected when countries or sectors are graduated.

This study is important because the magnitude of the policy and tha effect on export flows after countries and sectors are graduated is currently unknown while policy makers are under the assumption that countries and sectors graduated do not need the benefit of GSP. In 2015, major changes in the design of the GSP will be made and due to these changes approximately 94 of the currently 176 countries will no longer be eligible to the GSP (European Commission 2011). This paper provides an indication of how the export flows for these countries to the EU might be affected after being graduated.

To assess whether graduation has any effect on trade, a gravity model is estimated which has been augmented with a variable to capture the effect of graduation. The latest contribution to the econometric assessment of the model by Santos and Tenreyro (2006) is applied to minimize potential bias.

This paper will add to literature by using first-hand sources; all cases of sector graduation from the EU's GSP scheme are collected from the Council Regulations (the legislative documents) of the EU; this in order to present all cases of graduation in a detailed empirical overview and further explain the graduation mechanism. Moreover, this study also provides an empirical assessment through the gravity model of whether export flows are affected when countries or sectors are

graduated. Applying the gravity model is an important contribution to literature since previous research of graduation performed either ex ante or comparative studies.

The results indicate that graduation does not have any significant effect on trade compared to the control group. This could be due to lack of an initial trade effect from the GSP, but could also be an indication that the graduated countries and sectors are ready to compete at the world market level. The latter argument is supported by further estimations, suggesting that export flows from developing countries with lower GDP per capita are affected negatively from being graduated while graduated sectors from developing countries with higher GDP per capita still perform better than non-graduated sectors. Hence some sectors are ready to be graduated but the graduation mechanism may be poorly designed.

This paper starts by briefly describing the different non-reciprocal trade preferences offered by the EU. Since the GSP is the only preferential scheme where graduation occurs, more focus is put into that scheme. The following chapter examines the graduation mechanism, the reason for its existence and presents data of all cases of sector graduation from the EU's GSP scheme. This is followed by previous research and theoretical considerations while the econometric assessment is preformed in the chapter '*Empirical assessment of graduation*'. Conclusions and a summary are provided in the final chapter.

2. Non-reciprocal trade preferences

Industrialized countries offer lower tariffs toward developing countries in order to promote their economic growth and trade. Such schedule of reduced tariffs is generally called '*trade preferences*' and the trade preferences offered towards developing countries are at a non-reciprocal basis in order to benefit the developing countries. This chapter will offer an overview of the different trade preferences offered by the EU and finish with an examination of the EU's GSP.

Throughout the years, the EU has offered five different systems of trade preferences to developing countries. These countries are granted access to the different systems of preferences based on historical ties to the EU or geographical position. These preferential agreements are:

- **The African, Caribbean and Pacific group of states (ACP)**. This was first a set of colonies and has gradually widened to cover the whole Sub-Saharan Africa, Caribbean and the Pacific.
- **The Mediterranean preferences.** The EU first signed non-reciprocal trade preferences with four Mediterranean countries but they have been widened and now cover 16 partner countries, excluding the EU.
- **Generalized system of preferences (GSP).** This is the universal system of trade preferences offered to all developing countries.
- **GSP+.** GSP+ contributes to a further reduction of tariffs compared to the GSP, but the countries need to fulfill conditions on human rights and labor laws to be eligible.
- **Everything but arms (EBA).** Least Developed Countries (LDCs) are offered free trade access for all products through the GSP framework.

Countries can be eligible for more than one system of preferences and the administrative procedure to receive the reduced tariff can at times be decisive for whether a company will apply or not. The utilization rate is not 100% which indicate that companies do not always bother to apply (European Commission, 2010).

2.1   African, Caribbean and Pacific Group of States

ACP is an outcome of the Association of Overseas Countries and Territories included in the European Treaty of Rome in 1957. This was a group of French and Belgian colonies that the EU wanted to strengthen their bonds with. Following the independence of these colonies, the cooperation was sealed in conventions and the First Yaoundé Convention was signed in 1963. At this time only African countries participated but the convention was later extended to include former United Kingdom (UK) colonies once the UK joined the EU in 1973. However, when the Lomé I convention was signed in 1975 also other countries than those with former colonial ties participated. At present almost all Caribbean, Pacific and sub Saharan countries are part of the organization. ACP is not only an economic collaboration but also contributes to "peace and stability in a free and democratic society" (Eurpean commission 2012) and is considered to be the most favorable trade preferences available to developing countries, with the exception of complete duty free preferences (Persson and Wilhelmsson 2007).

2.2   Mediterranean preferences

The historical ties of trade partnership between the EU and the countries surrounding the Mediterranean Sea started with Egypt, Israel, Morocco and Tunisia signing non-reciprocal trade preferences with the EU in the late 1960s and early 1970s. A few years later, more countries became involved through the Cooperation Agreements which consisted of the Maghreb countries and Mashreq countries (Persson and Wilhelmsson, 2007). The Barcelona Declaration signed in 1995 was a rather comprehensive agreement and was introduced as a framework designated to deal with both bilateral and regional relations with the objective to include all countries around the Mediterranean Sea. There are three dimensions to the declaration consisting of political, economical and social partnership. Jointly, these seek to create peace, security and shared prosperity within the region. The aim was also to create a free trade area before 2010 but is yet to be achieved.

2.3   GSP, GSP+ and EBA

GSP is the universal system of preferences that the EU offers to all developing countries. When the GSP was initially agreed upon in 1969, it violated the Most Favored Nation (MFN) rule which had brought equality to multilateral trade. A ten year exception was made before GSP became compatible to GATT through the enabling clause signed in the Tokyo round of GATT in 1979. MFN is a non-discriminatory rule meaning that all countries shall enjoy the same tariffs when exporting to a specific country. The tariff applied to the already most favored partner should be

the tariff applied to all countries. Throughout the years, a few exceptions to the MFN rule have been established:

- Countries are allowed to set up mutual free trade agreements.
- Countries may allow developing countries special access to their domestic market provided that countries are treated equally. Poorer developing countries may however receive a further reduction on tariffs.

GSP falls under the latter of these two.

In addition to the GSP, there are also the GSP+ and the EBA schemes. The GSP+ is an extension and offers a further tariff reduction to the general GSP. It is offered to countries considered to be vulnerable, but at the same time '*ratify and implement standards in the fields of human rights, core labour standards, sustainable development and good governance*' (European Commission 2009). The GSP+ was implemented in 2006 and two requirements are needed to be fulfilled for three consecutive years in order to be considered vulnerable, first a country needs to not classified by the World Bank as a high income country and five sectors, covered by GSP, comprise more than 75% of that country's total GSP export to the EU and secondly, no country enjoying the GSP should export more than 1% of the total GSP covered imports to the EU. Considering the requirements, the EU offers GSP+ to developing countries with a few larger sectors in the hope their exports industry diversify. A special arrangement (commonly called *drug regime)* was previously offered to countries subject to producing and trafficking illicit drugs and can be seen as the precursor to the GSP+[2].

EBA is offered to countries that the UN defines as the Least Developed Countries[3] (LDCs). When a country is excluded from the UN list of the LDC, that country will subsequently be removed from the EBA agreement as well. The EBA Regulation was adopted in February 2001 but already before that, the LDCs were granted more beneficial market access (Persson and Wilhelmsson, 2007). There are 48 countries enjoying EBA which grant duty free access to the European market for all products excluding arms and ammunition (European Commission 2009).

What are the benefits of GSP compared to the MFN tariffs? The goods in the GSP scheme are divided into different categories and enjoy a reduction in custom tariffs of 15- 100 percent. Between 1971– 2001 the EU divided goods into four categories to determine what tariff reduction

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[2] See Persson and Wilhelmsson (2007) for an exact list of countries that were eligible to the drug regime.
[3] The definition of a LDC is given by the UN and the criteria from 2003 can be seen at
http://www.un.org/special-rep/ohrlls/ldc/ldc%20criteria.htm

each specific good would receive. Since 2002 the three classifications of sensitive products are combined into just one group of sensitive products which can be viewed in table 1. Changing classification was one of many steps aiming to increase transparency in the GSP during this period. An up to date list of sensitive and non-sensitive products can be viewed in European Union (2008). About 3200 products are classified as "non sensitive products" and enjoy duty free access and about 3050 products are classified as "sensitive products"

2.4   Pyramid of privilege

Comparing preferential systems with regards to which one is more favorable is complex since different aspects of the systems need to be considered. Persson and Wilhelmsson (2007) have compiled a pyramid of privilege to describe increasing quality of preferences based on preference margin, commodity cover, unilateral/contractual, rules of origin and safeguard clauses.

According to the pyramid in Figure 1, the ACP preferences are the most favorable followed by the Mediterranean preferences. The GSP offered to all developing countries is at the bottom of the pyramid. EBA and GSP+ are not present in the pyramid but compared to the GSP, the EBA arrangement is the most favorable, followed by GSP+.

Figure 1. Pyramid of privilege
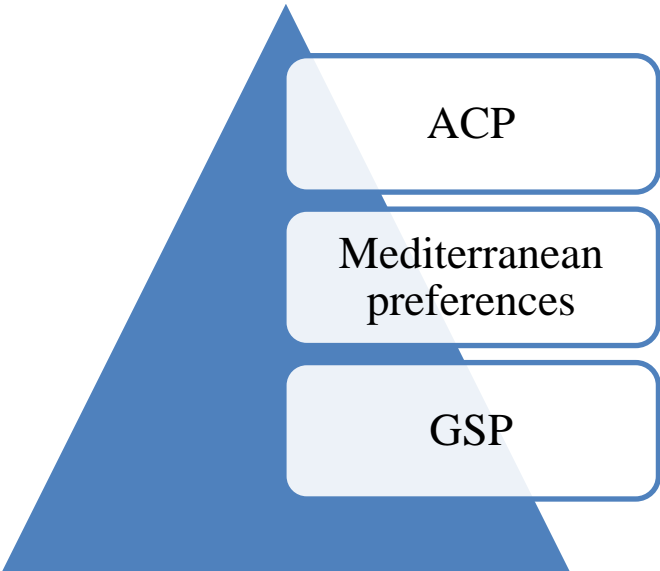
Source: Persson and Wilhelmsson (2007)

Although the EU offers GSP to 176 countries, 77 of those countries are eligible for ACP preferences (European Commission, 2012). In addition, some countries are also applicable for the

Mediterranean preferences, EBA preferences and the GSP+. Only 81 of the 176 countries where GSP is offered by the EU have no other preferences more favorable than the GSP (European Commission 2009a; European Commission 2012). It is worth noting that although countries are eligible for more than one scheme, companies do not always apply for the most preferable scheme due to lack of information and/or too complicated and expensive procedures (European Commission, 2010).

2.5   Main elements of the EU's GSP

The EU adopted the GSP in 1971, and was at that time the first industrialized country/area to offer a universal scheme of trade preferences to all developing countries. The scheme was first implemented for a ten-year period from 1971 to 1980 and subsequently renewed for a new ten-year period from 1981 to 1990 (UNCTAD, 2002). With respect to ongoing negotiations in the Uruguay-round, where the results came into force in 1995, only yearly extensions were made until 1 of January 1996 and from that point it has been prolonged for ten year periods at a time (European Union 1994, 2005). The EU's GSP is currently at an interval stretching from the 1st of January 2006 until 31st of December 2015, and discussions are now being held about the future design of the GSP (European Union, 2005).

The EU is the largest importer of goods under a GSP scheme, conducting trade worth EUR 40 billion in 2004 with developing countries compared to the US who is the second largest with EUR 22 billion (Gasiorek et al., 2010:16). This number has steadily increased over the last couple of years from EUR 40 billion in 2004 to EUR 68.6 billion in 2008 (European Union 2010) which can be seen in the Diagram 1 below.
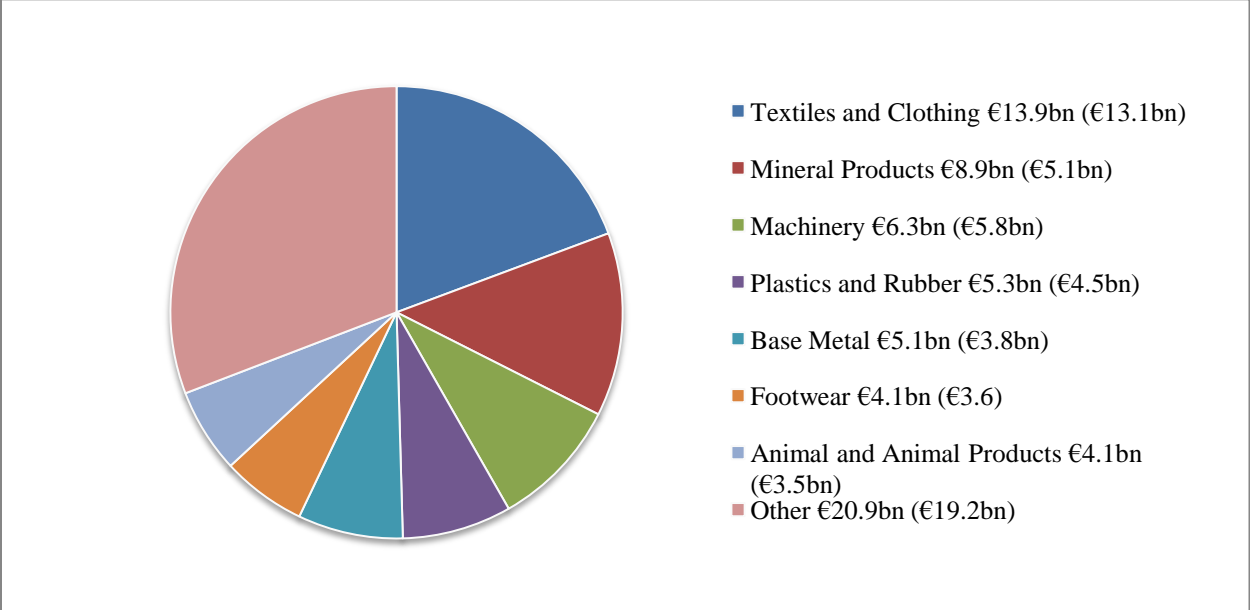
Diagram 1. Total GSP covered import to the union during 2004 – 2008 expressed in EUR billion
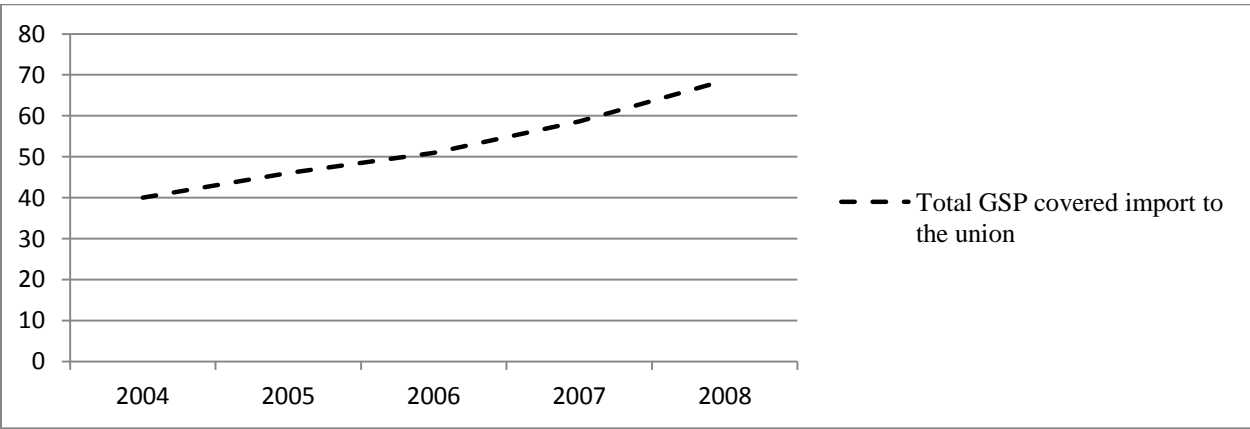
Source: European Commission (2010)

The largest section of GSP covered imports is textiles and clothing which can be seen in Figure 2. The same seven sections that were the largest during 2007 were also the largest in 2008. Less complex products and sections that historically have been associated with developing countries such as textile, mineral products, plastic, rubber, base metal etc. are the sections dominating the GSP covered trade.

Figure 2. GSP covered import to the EU by sector during 2008 (2007 values in parenthesis)

Pie chart legend:
- Textiles and Clothing €13.9bn (€13.1bn)
- Mineral Products €8.9bn (€5.1bn)
- Machinery €6.3bn (€5.8bn)
- Plastics and Rubber €5.3bn (€4.5bn)
- Base Metal €5.1bn (€3.8bn)
- Footwear €4.1bn (€3.6)
- Animal and Animal Products €4.1bn (€3.5bn)
- Other €20.9bn (€19.2bn)

Source: European Commission (2010)

2.6   Summary

The universal non-reciprocal trade preferences were introduced in the early 1970s through GSP. Over the years, other preferential agreements have been signed and today developing countries are eligible for different schemes. The EU offers ACP, GSP+, EBA and the Mediterranean preferences to specific countries while GSP is the universal set of preferences offered to all developing countries. Trade through the GSP schedule has increased over the last years and in 2008 summed up to a total of EUR 68.6 billion (European Commission 2010).

3. Graduation

The term graduation is applied when an industrialized country withdraws the reduced tariffs granted through the GSP for a sector in a developing country or a developing country as a whole. A graduated country or sector will thus lose the benefit of decreased tariffs, in this case to the EU, which other developing countries enjoy compared to industrialized countries. Graduation will hence not give the graduated country or sector a comparative disadvantage towards industrialized countries but towards other developing countries. This chapter will first briefly view the background of graduation before looking into the graduation mechanism used by the EU. The graduation mechanism changed in 2006 and both regimes will be thoroughly investigated. A discussion about the graduation mechanism is held before empirics of graduation from the EU's GSP are mapped out.

Graduation has two purposes (European Union, 1994):

1. The graduated sector or country performs well enough to compete at world market level without the need of the special preferences.
2. Graduation ensures that beneficiaries that really need the GSP will benefit without being outcompeted by efficient sectors in other developing countries.

The mechanism of graduation was, according to Langhammer and Sapir (1987), submitted into the enabling clause of GATT in paragraph 7, with the following statement: "with progressive development of their [the developing countries] economies… participate more fully in the framework of rights and obligations under the General Agreement" (Enabling Clause 1979). Langhammer and Sapir (1987) claim that this can be interpreted as motive for graduation as development in economies occurs. This was in accordance to demands held by the industrialized countries that were to grant the GSP. The industrialized countries needed an insurance outlining that they would not need to grant GSP to countries that could be considered to have successfully developed (Kirkman 1989). The US was the first to implement the graduation mechanism and fully graduated four countries in 1989.

When the EU first implemented the graduation mechanism in 1995, there were three different mechanisms that could be violated to graduate a country or a sector and one exception to guarantee the country not to be graduated. The graduation mechanism changed in 2006 to be more transparent and predictable because of the difficulty for developing countries to foresee whether they risked being graduated (European Commission, 2004). The unpredictability was due to

complex rules and the rules only needed to be met for one year, hence one year of exceptional export would get a sector graduated.

Graduation within the EU's GSP scheme was first applied on a four year basis stretching from 1995 to 1998[4] (European Union, 1994). This has since been prolonged 4 times; 1999-2001 (European Union, 1998), 2002-2005 (European Union, 2001, 2003)[5], 2006-2008 (European Union, 2005) and 2009-2011 (European Union, 2008). The change in graduated sectors in the different periods will be thorough evaluated in further chapters.

3.1 The graduation mechanism in the EU's GSP

The EU first incorporated graduation from the GSP in the Council Regulation 1994 where Article 4 stated '*A graduation mechanism shall be set up*' (European Union, 1994) and then further laid down the graduation mechanism. The initial graduation mechanism was applied for a ten year period from 1996 to 2005 before being changed in 2006. The graduation mechanism applied in 2006 will not be reviewed until 2015, when major changes are expected in the whole design of the GSP (European Commission, 2011).

3.1.1 Initial graduation mechanism

There were initially three different mechanisms that could be violated to graduate a country or a sector. In addition, there was one examption rule for countries with low overall exports to the EU that neither the country in question nor sectors of that country would be graduated. The criteria to be graduated needed to be met for one year and once graduated, a sector or a country was never reintroduced to the GSP.

The first of the two criteria to graduate a sector is to calculate a development index for each country and a specialisation index for each sector within each country. This procedure is rather complicated and turned out to not be transparent for developing countries. Developing countries did not understand how the development and specialisation indices were designed or if they were about to become graduated. This part will explain how to calculate the indices. The official explanation on how to calculate the development and specialisation indices is presented in Annex II. Graduation through the development- and specialisation indices is a three step procedure.

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[4] The graduation scheme started 1st of January 1995 although the update of the GSP scheme was only prolonged for one year before that same document implemented a ten year extension of the GSP scheme from 1st of January 1996 to 31st of December 2005 (European Union, 1994)

[5] The period was first from 2002-2004 (European Union, 2001) and later extended one year (European Union, 2003)

Step 1: Calculating the Development index

Calculating a development index for each country is the first step to ascertain whether a sector will be graduated or not and the formula is given in Box 1.

Box 1. Development index

The development index refers to a country's level of industrial development. It compares that level to the one of the European Union, using the following formula:

$\{\log[Yi/Yue] + \log[Xi/Xue]\}/2$

Where:

Yi = the beneficiary country's gross national product per capita,

Yue = the European Union's gross national product per capita,

Xi = the value of the beneficiary country's manufactured exports,

Xue = the value of the European Union's manufactured exports.

Manufactured exports are those of Standard International Trade Classification (SITC) 5 to 8 less 68.

Source: European Union (2001)

The development index indicates how a country performs considering the development in GNP per capita and exports of manufactured goods per capita compared to the EU. A low absolute number on the development index (note that the development index is negative) indicates low development of that country. Depending on the development index, the countries will end up in five different polls which can be seen in Table 1. I simulated numbers to increase the understanding of what level a country needs to perform at to end up in the different polls; a country performing on average 10 times lower than the EU, considering GNP per capita and total exports, will have -1 in development index. The other thresholds at the development index given in Table 1 are -1.23, -1.70 and -2 which respectively are 17, 50 and 100 times lower than the EU on average.

Table 1. Thresholds for the polls in the Development Index

Poll	Development Index Thresholds
1	> - 1,00
2	< - 1,00 and > - 1,23
3	< - 1,23 and > - 1,70
4	< - 1,70 and > - 2,00
5	< - 2,00

Source: European Union (2001)

Step 2: Calculating the specialisation index

The second step is to calculate the specialisation index for each sector. Cuyvers (1998) uses a formula like the one explained in words by the EU and is presented in Eq. 1. The specialisation index first looks at the ratio of import of one sector from one country compared with the total GSP covered imports of that sector. This ratio is then divided by the total ratio of GSP covered imports from that country compared to total GSP covered imports from all countries.

Eq. 1

$$SI_{i,k} = \frac{M_{i,k} \Big/ \sum_{k} M_{i,k}}{\sum_{i} M_{i,k} \Big/ \sum_{i} \sum_{k} M_{i,k}}$$

with : $M_{i,k}$ = imports in the EU of product i from country k.

Source: Cuyvers (1998)

This will indicate how big that specific sector is relative to other sectors in that country and relative to other GSP beneficiaries' sectors. The specialisation index is produced in percentage. A sector receiving 100% means that the sector exports the same ratio to the EU as all sectors' combined ratio to the EU. If a sector on the other hand receives 500% on the specialisation index, it would mean that the sector exports at a five times higher ratio than the average sector of that country.

Step 3: Deciding the thresholds using the development- and specialisation indices.

Thirdly, Table 2 shows the thresholds of the development- and specialisation- indices together. Depending on which poll the country ends up in from the development index, the sector will be allowed to receive a specialisation index less than 100 %, 150 %, 500% or 700% without being graduated (European Union, 1994). For example, if a country ends up in the third poll considering the development index (between -1,23 and -1,70) a sector that receives more than 500% on the specialisation index will be graduated. Worth noting here is if a country's development index is higher than -1 all sectors exporting above average ratio to the EU will be graduated. Countries with a development index less than -2 will not get their sectors graduated through the specialisation index.

Table 2. The thresholds of the development Index and Specialisation Index

Poll	Development Index Thresholds	Specialisation Index Thresholds
1	> - 1,00	100%
2	< - 1,00 and > - 1,23	150%
3	< - 1,23 and > - 1,70	500%
4	< - 1,70 and > - 2,00	700%
5	< - 2,00	---

Source: European Union 2001

According to the development- and specialisation indices, the EU is more generous towards, what is considered, less developed developing countries. It is plausible that the major sectors of a country normally are a couple of times larger than the average sector of that country and therefore many countries, regardless of size, will have at least one sector graduated. This is proved right when viewing empirics of graduation from the EU's GSP.

There were three additional statutes complementing the indexes above (European Union, 1994):

1. One sector of a country will be graduated if it exceeds 25% of total GSP import of that sector to the Community. This is commonly called the "*lion's share*".
2. A country whose GNP per capita exceeded $6 000 in 1991 would be phased out from GSP in two steps over 1995-96 (European Union, 1994). The limit changes in accordance to recommendations by the World Bank and their latest figures.
3. A country whose GSP covered import is less than 2% of total GSP covered import to the EU would not be applicable to the graduation mechanism.

The lion's share is a complement to the development- and specialisation indices when to graduate sectors and it does not consider anything else but the EU's import from one sector in one country compared to the EU's overall GSP covered import in that particular sector. The second point is the only criterion that can graduate countries as whole from the GSP and has only been applied a few times. The first countries to be graduated by this criterion were Hong Kong, Singapore and South Korea. They were all graduated on the 1st of January in 1998; firstly for achieving higher than $ 8 210 GNP per capita in 1995 which was the current recommendation limit by the World Bank in 1997 plus having a development index higher than -1[6] (European Union, 1997).

3.1.2 Changes in the graduation mechanism in 2006

The graduation mechanism did not change between 1996- 2005 however, major changes were made when GSP entered a new ten year period in 2006 (European Union, 2005).

When graduation was first applied, a total of 33 specific *sectors* divided the products into different categories but was altered in 2006 to a total of 19 *sections* [7]. The sectors are highly coordinated with the sections, but more specific; fewer products in each category[8]. Ten of the sections contain one sector while the other nine sections contain two or more sectors. The sector approach was applied during 1995 -2005 before it was altered in 2006 to be the original sections.

The EU summarizes the changes of sectors to sections in the graduation mechanism in 2006 as "*As well as being simple, this system has the advantage that it would graduate only groups of products from the biggest beneficiaries. Only the countries that were, on average, competitive for all the products in a section would be graduated for these groups of products. Small beneficiaries, competitive for just a few products, or group of products would under no circumstances be graduated solely on the basis of those few products.*" (European Commission, 2004) This means, according to the EU, that the product groups were enlarged to reduce the chance of graduating a sector of a small country.

The development and specialisation indices were removed in 2006. At this time, only one mechanism to graduate a sector was applied and one mechanism to graduate a country:

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[6] The Council Regulation (European Union, 1994) does not mention that the development index needs to be higher than -1 to graduate countries through the criterion in point two but it is mentioned as one of the reasons for graduating Hong Kong, Singapore and South Korea in Council Regulation (European Union, 1997).
[7] EU created in 1987 the Combined Nomenclature (CN), which is based on the universal Harmonized System (HS), to group related products in order to simplify administration. This is done by an eight-digit code where the first two digits define a chapter. There are a total of 98 chapters which in turn are divided into 20 sections.
[8] See Annex I the relation between sectors and sections and which products they contain.

- The criterion to graduate a country as a whole was now for the country to be classified as a high-income country for three consecutive years and that "*the five largest sections of its GSP-covered imports to the Community represent less than 75 % of the total GSP-covered imports of the beneficiary*" (European Union, 2005). As there are a total of 20 sections, this means that the five largest sections of a country have to be three times larger than the other 15 sections combined to fulfill this requirement.

- Requirements to graduate a *section* compared to the previous *sector* changed to only concern the lion's share instead of a combination of the lion's share and the development- and specialisation- indices. The lion's share was decreased from 25 % to 15 % (12,5 % for textile) of total GSP covered import of that section to the Community.

Another feature with high impact was the introduction that the demands for graduation needed to be met for three consecutive years and a graduated sector that no longer did fulfill the criteria for three consecutive years would be reintroduced to the GSP (European Union, 2005). The reintroduction of GSP will further on be called "de-graduation".

3.2   Discussion about the graduation mechanism

This part is devoted to a discussion about graduation, the mechanism of graduation and what sectors and countries are affected. Is the EU's intention really to promote the poorer developing countries or is graduation a way to avoid the decreased tariffs for some sectors and countries? This chapter starts by mapping out the initial mechanism of graduation and characteristics of sectors graduated and then continue to the current mechanism of graduation. The two reasons for graduation were stated previously in this chapter.

- The first is based on whether industrialized countries should have to offer non-reciprocal trade preferences toward developing countries that can compete at the same condition as industrialized countries. GSP is offered to promote economic growth and trade to developing countries that lag behind industrialized countries and needs a subsidy. The subsidy is not to out-compete industrialized countries.

- The second point is to improve trade for other beneficiaries; a strong sector in one developing country should not out-compete other developing countries. GSP should rather benefit the ones who really need it.

Both reasons are logical but implicitly assume that the graduated sectors are efficient according to economic theory and an indirect assumption is also that sectors not graduated are inefficient according to economic theory. It would otherwise be unjust to the graduated sectors if equally

efficient sectors would still enjoy the GSP. As the example in Box 2, the development- and specialisation indices does not guarantee that sectors with equal export volume to the EU are treated equal.

Box 2. Example of development and specialisation indices

When looking at the initial mechanism of graduation, if country A for example has five major sectors exporting to the EU where not one of them meets the lion's share; it would be a good chance that they do not get graduated through the development- and specialisation- index. Country B however, is a less productive country but has one sector as large as the five major sectors of country A in absolute terms. That sector of country B will most likely to be graduated on the basis of the development- and specialisation- indices. This example is not unrealistic as only seven out of the 76 initial graduated sectors in 1996 was through the lion's share and all other graduated sectors through the development- and specialisation- index (European Union, 1994, ANNEX II, PART 1).

Considering that sectors could not be de-graduated, along with the previous mentioned aspects, the rules of graduation were formed to affect a few sectors in many countries rather than a straight forward mechanism to graduate all sectors competitive at the world market. It is plausible that the largest exporting sector from a country is competitive but there was no guarantee that an equally strong, or even stronger, sector from other countries would be graduated.

Another aspect is that better performing developing countries will most likely have one or more sectors graduated. It could be considered reasonable that many countries are each slightly affected by graduation but not based on the previous two reasons stated by the Council Regulation (European Union, 1994).

The graduation mechanism changed in 2006. One of the changes was that a sector now needed to meet the demands for graduation for three consecutive years instead of one, which was introduced in order to increase transparency (European Union 2005). Another measure taken by the European Commission to increase transparency was simplifying the graduation mechanism by removing the development- and specialisation indices. The development- and specialisation indices were changed to solely be covered by the straightforward criterion of the lion's share (European Union, 2005). The lion's share was decreased from 25 % of total GSP covered import of that sector to 15 %. It should be stressed that the new mechanism of graduation, the decreased lion's share, only

accounts for the relative export to the EU in each sector which can be seen as the sector's international competitiveness; thus this is in line with treating sectors equally and assuring that no stronger sectors enjoy the GSP than the graduated sectors.

The graduation of *sectors* was changed in 2006 to now affect *sections*. The sections contain more products on average than the sectors. This change can be considered unjust as more products in each group will result in more different products in the groups. This can lead to companies in need of the benefit from GSP ending up in a graduated section. For example, beverage and tobacco are now in the same section while formerly in different sectors, and the two products are not necessarily equally efficiently produced.

To summarize this discussion, the initial graduation mechanism was designed to affect a few sectors in many countries but there was no guarantee that equally efficient sectors were treated equally. Since de-graduation during this time was not available, there were no possibilities for graduated sectors to regain the benefits of the GSP. The changes in the graduation mechanism are in line with treating sectors more equal.

3.3   Empirics of graduation from EU's GSP scheme

This part provides an overview of sectors affected by graduation in the EU's GSP scheme[9]. All cases of sector graduation from the EU's GSP scheme are collected from the Council Regulations (the legislative documents) of the EU. There have been five periods for graduation from the GSP since graduation was introduced in 1995. Three of them are in the first regime of the graduation mechanism while the two latter are in the second regime where de-graduation is also possible. To point out the importance of the different periods, they are presented in chronologic order:

- A. 1995-1998 (4 years) Initial graduation mechanism
- B. 1999-2001 (3 years) Initial graduation mechanism
- C. 2002-2005 (4 years) Initial graduation mechanism
- D. 2006-2008 (3 years) Second graduation mechanism
- E. 2009-2011 (3 years) Second graduation mechanism

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[9] The diagrams and graphs in this chapter will only consider graduated sectors and not countries. In case a country has sectors graduated before being fully graduated as a country, the sectors are considered to be graduated in the observation were the sectors are graduated, but removed from later observations once the country is fully graduated. It was a change in the definition of graduation of sectors to graduation of sections in 2006. One section can contain several sectors and in order to be able to compare graduation within the two different regimes, they are always referred to as sectors. For example, if a country gets one section that contains two sectors graduated, it will be consider as two sectors. The sectors and sections are manually converted and an exact schedule is available at Annex I.

Diagram 2. Total number of countries with graduated sectors
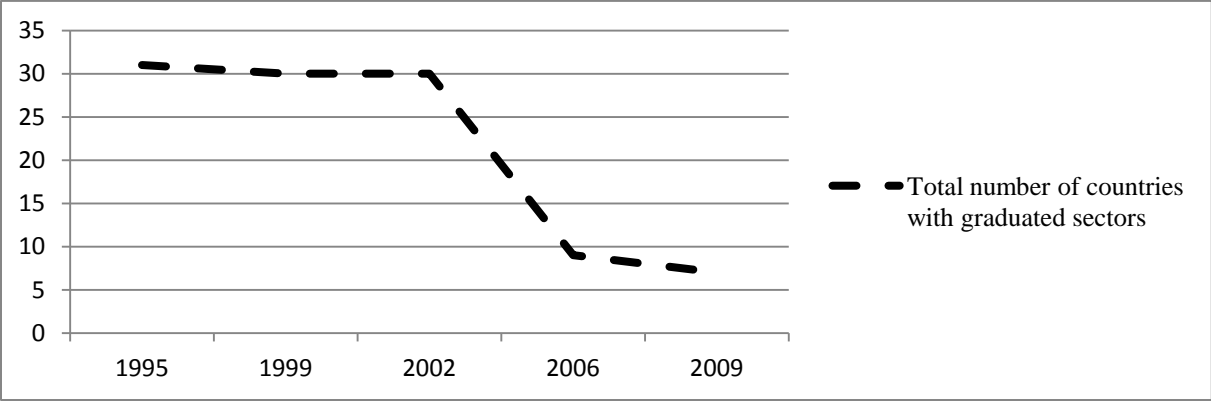
Source: European Union (1994, 1998, 2001, 2005, 2008)

Diagram 2 provides an overview of how the number of affected countries shifts over the different periods. There were 31 countries affected during the first period and 30 countries affected during second period. Hong Kong, Singapore and South Korea all had graduated sectors during the first period but were fully graduated in 1998 and therefore not accounted as countries with graduated sectors in any of the latter periods, hence two new countries were affected by sectors graduated in the second period. The remarkable decrease of countries affected in the fourth and fifth period is the expected effect from the changes in the graduation mechanism. First because countries for the first time could be de-graduated and second due to the removal of the development- and specialisation indices. Not many new countries were affected by the new mechanism as eight of the nine affected countries in the fourth period were affected the period before.

Diagram 3. Total number of graduated sectors across countries
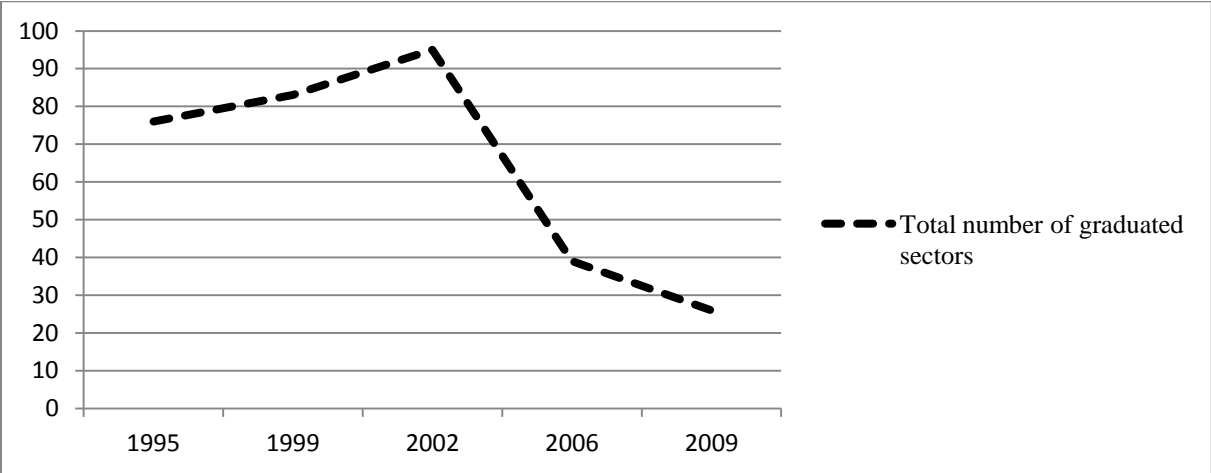
Source: European Union (1994, 1998, 2001, 2005, 2008)

Diagram 3 provides an overview of the total amount of graduated sectors across countries; hence sectors of more than one country can be graduated within one sector. As sectors never were de-graduated before 2005 an increase in graduated sectors only is first witnessed. When the de-graduation is introduced and the graduation mechanism changed in 2006, over half of the affected sectors were de-graduated. The amount of graduated sectors decreased from 95 in the period starting in 2002 compared to 39 graduated sectors the following period. The decrease in graduated sectors in the last period is not from changes in the graduation mechanism but indicates that sectors find it more difficult to fulfill the lion's share of exports to the EU.

Table 3. New graduation and de-graduation of sectors within the EU's GSP

Year	1995	1999	2002	2006	2009
New graduations total	76	23	13	21	1
New graduations through the development- and specialisation- index	69	18	--*	0	0
New graduations through the lion's share	7	5	--*	21	1
De-graduation	0	0	0	88	14

Not stated in Council Regulation which sectors were graduated through the lion's share or through the development- and specialisation- indices

Source: European Union, (1994, 1998, 2001, 2005, 2008)

Table 3 presents how new graduations are distributed among the periods and the flow of new graduations and de-graduations over time. Also presented is whether graduation is due to the development- and specialisation indices or through the lion's share. It is not legitimate to draw any conclusion from the high number of graduated sectors during the first three periods or the high number of de-graduations in the fourth period, other than the changes in graduation mechanism and the introduction of de-graduation. Worth to notice is that nine out of the fourteen de-graduated sectors in 2009 were graduated in 2005; the previous period. This means that almost half of the twenty one new graduated sectors in 2005 did not fulfill the same criteria in 2008 as they had four years earlier. Of the twelve new graduated sectors in 2005 that were not de-graduated in 2009, eleven were from China and one was from Brazil. From this crude information, it appears that sectors from larger countries are not as affected by graduation as sectors from smaller economies when looking at the lions share. 18 of the 26 graduated sectors were Chinese in the last period.

In Table 4, an overview of which sectors from which countries are graduated in which periods is compiled. The whole spectra of nations with high or low GDP per capita is represented in the table, and as the discussion in box 2 showed, the smaller countries are more easily graduated through the development- and specialisation indices than through the lion's share. When this mechanism of graduation was removed ahead of the fourth period in 2006, mainly larger countries are graduated, such as China and Brazil.

Table 4. All countries and what sectors that have been graduated and during which years.

Countries	1995	1999	2002	2006	2009
Algeria				XIII	
Albania	XXVI	XXVI			
Argentina	XVII	III, XI, XVII	I, III, XI, XVII		
Armenia	XXVI	XXVI	II, XXVI		
Azerbaijan	XXVI	XXVI	II, XXVI		
Belarus	XXVI	XXVI	II, XXVI		
Brazil	XVII, XX, XXIII, XVI, XXX	I, VI,IX, XI, XII, XVII, XX, XXIII, XVI, XXX	I, VI,IX, XI, XII, XVII, XX, XXIII, XVI, XXX	XI, XII, XIX	XI, XII, XIX
Brunei	XXV	XXV	XXV		
Chile	XV	V, IX, XV	V, IX, XV		
China	XIV, XVIII, XXII, XXIII, XXIV, XXVI, XXVII, XXXIII	IV, VIII, XIV, XVIII, XXII, XXIII, XXIV, XXVI, XXVII, XXXIII	IV, VIII, XIV, XVIII, XXII, XXIII, XXIV, XXVI, XXVII, XXXIII	XIV, XV, XVI, XVII, XVIII, XIX, XX, XXI, XXII, XXIII, XIV, XXV, XXVI, XXVII, XXVIII, XXIX, XXX, XXXI, XXXII, XXXIII	XIV, XV, XVI, XVII, XVIII, XIX, XXI, XXII, XXIII, XIV, XXV, XXVI, XXVIII, XXIX, XXX, XXXI, XXXII, XXXIII
Georgia	XXVI	XXVI	II, XXVI		
Greenland			II		
Hong Kong	XVIII, XXII, XXV, XXIX, XXXII, XXXIII				
India	XVIII, XXI	XVIII, XXI	XVIII, XXI	XXI, XXV	XXI
Indonesia	XIX, XXIII	X, XIX, XXIII	X, XIX, XXIII	X, XIX	X
Kazakhstan	XV, XXV, XXVI, XXVII	XV, XXV, XXVI, XXVII	II, XV, XXV, XXVI, XXVII		
Kyrgyzstan	XXVI	XXVI	II, XXVI		
Libya	XIII	XIII	XIII		
Macao	XXII	XXII	XXII		

Malaysia	XVI, XIX, XXII, XXIX	VII, X, XVI, XIX, XXII, XXIX	VII, X, XVI, XIX, XXII, XXIX	X	X
Mexico	XXVI	XXVI	XXVI		
Moldova	XXVI	XXVI	II, XXVI		
Pakistan	XVIII	XVIII	XVIII		
Philippines		X	X		
Russia	XIII, XV, XXVI, XXVII	XIII, XV, XXVI, XXVII	XIII, XV, XXVI, XXVII	XIV, XV, XX, XXVI, XXVII	
Saudi Arabia	XIII	XIII	XIII		
Singapore	XXVIII				
South Africa	XXVI	XXVI	XXVI	XXX, XXXI	
South Korea	XVI, XVIII, XXI, XXII, XXIII, XXVI, XXVIII, XXXI, XXXIII				
Tajikistan	XXVI	XXVI	II, XXVI		
Turkmenistan	XXVI	XXVI	II, XXVI		
Thailand	XVI, XVIII, XXII, , XXIII, XXV, XXXIII	II, V, XI, XVI, XVIII, XXII, , XXIII, XXV, XXXIII	II, V, XI, XVI, XVIII, XXII, , XXIII, XXV, XXXIII	XXV, XXX, XXXI	XXV
Uruguay		I	I		
Ukrain	XV, XXVI	VIII, XV, XXVI	II, VIII, XV, XXVI		
Uzbekistan	XXVI	XXVI	II, XXVI		
Vietnam					XXIII

Source: European Union (1994, 1998, 2001, 2005, 2008)

Graduation has occurred in every sector, but more frequently in some than others. Sector II (fishery products) had 14 countries graduated within the sector and XXVI (iron and steel) had 18 countries graduated within the sector and where by far the sectors where graduation occurred most frequently during the first graduation regime. Beside these sectors, XVII (leather and skin) and XXII (clothing) with six graduated countries each were the third most frequently graduated during this regime. A few sectors were free from graduation after the change in regimes in 2006 and only section XIX (sectors XXX and XXXI; transport equipment and automobiles) had more than two countries graduated within.

4. Previous research

There are strikingly few articles discussing the effects of graduation in general, no one has examined the effects of graduation through the gravity model and only one article (Ailert, 2010) has previously made an attempt of a more thorough discussion about the reason for graduation and explaining the graduation mechanism. This chapter collects all research done in this area and briefly describes them.

When the US graduated Hong Kong, Singapore, South Korea and Taiwan from the US's GSP scheme in 1989 it was the first time graduation was put into use. This event was the subject to a few papers examining different aspects and effects of graduation. Hoch and Ow-Taylor (1993) performed a comparative study over the previous mentioned countries. The authors look for expected loss of export to the US by using different values of elasticity and the increase on tariffs to calculate expected loss. They also consider the effect of companies moving elsewhere to keep obtaining the decreased tariffs offered through the GSP but conclude it would only be of minor importance for the affected countries. Finally they think that mainly Singapore's strong protests were an overreaction. Kirkman (1989) argues, after comparing similarity between the East Asian economies that Singapore will be affected more than South Korea and Hong Kong but also that remaining beneficiaries will benefit; some more than others.

Also on the occasion of the US graduating Hong Kong, Singapore, South Korea and Taiwan, Mendez and Murray (1990) conducted a study on potential welfare gains for African countries due to the previously mentioned graduation. They assume the loss of trade from graduation would be transferred to the remaining beneficiaries but African exporting sectors are different to the Asian's and the total gain would be negligible. They conclude that other measures would be needed to increase the benefit of the poorer African economies such as broadening the product coverage to include more products of importance for African exporting sectors.

A recent study by Zhou and Cuyvers (2012) are examining the effectiveness of the EU's GSP schedule on exports from ASIAN beneficiaries to the EU. The authors confirm a "GSP life cycle" earlier introduced by Cuyvers (one of the authors) and Verherstraeten (2005) which is a four stage cycle. The first stage is that the developing country gets accustomed to the GSP, export increases in the second stage as a product of increased utilization of the GSP. In the third stage trade start falling due to sector graduation before the whole country gets graduated in the fourth stage. Thailand and Singapore are examples of countries in stage three and four respectively. The thesis

is supported in that article by a comparative study. They find, in line with the GSP life cycle, that the least developed ASEAN members such as Cambodia, Laos and Vietnam benefited the most in both utilization rate of the GSP and expanding their exports to the EU.

This is the research conducted in the area of graduation. The studies are either comparative or ex ante, and all suggests that graduation has a negative effect on trade although the effect of graduation is usually less than initially expected.

5. Theoretical considerations

A graduated country or sector will lose the benefit of decreased tariffs to the EU that other developing countries enjoy compared to industrialized countries. This chapter will look at the benefits, from a theoretical aspect, from favorable trade agreements and then regard graduation as the loss of trade benefits, i.e. the reversal of gaining preferences.

Hine (1985) used Figure 3 to illustrate the gains for the exporter when entering a trade agreement. This figure is applicable for non-reciprocal trade preferences as well as for mutual trade preferences and is displayed in this paper because of its simplicity and pedagogical design.

This model only takes static effects from trade preferences into account but there are dynamic effects from trade preferences present such as economy of scale and learning by doing to mention some. For further reading, Pangariya (1999) and Winters (1996) provide useful overviews of the subject.

There are three main assumptions to the model behind the figure. Firstly, this is a three country model where the EU is presented as the importer, the GSP beneficiaries as the exporter and rest of the world (RoW) as the third party. Secondly, the supply from the RoW of a certain good is completely elastic at world market price and, thirdly, the model assumes that the EU does not produce this good (Persson 2004).

The world market price is at S_{ROW} while the consumers in the EU initially buy the product for world market price plus the tariff, hence S_{ROW+t}. The EU does not offer the GSP initially and imports from the GSP beneficiaries are at q_1, total imports are at q_3 and the EU gets a total tariff revenue equal to the area of (a + b + c + d) . At step two, the EU offers GSP preferences and for the simplicity of the model, the beneficiaries receive duty free access. The price for the EU consumers is still at S_{ROW+t} but imports from the GSP beneficiaries increase to q_2 and total imports are still at q_3. The EU looses (a + b + c) in custom tariffs and the GSP beneficiaries gain (a + b).

Figure 3. Trade and welfare effects of Tariff Preferences
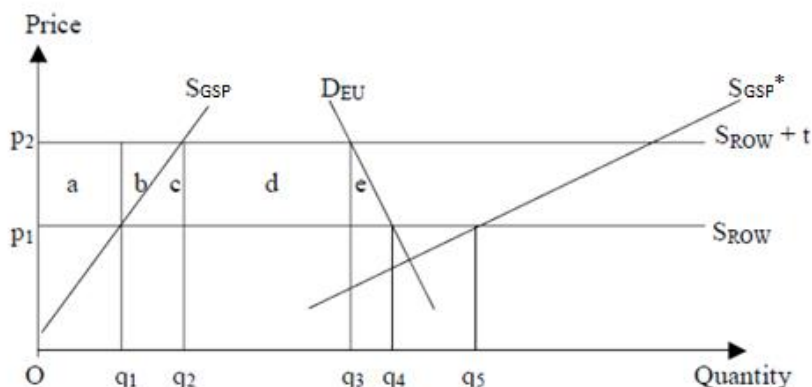
There are two welfare effects for GSP beneficiaries in this example. First is the increased terms of trade equal to the area of (a), i.e. they get more in return for one sold good since they initially sold for p_1 but at second step sell at p_2 . Furthermore exporting firms from the GSP beneficiaries get increased producers' surplus, receiving the area equal to (b). Trade diversion is present in the model as the GSP beneficiaries produce the extra quantity $(q_2 - q_1)$ more expensive than ROW previously did and the welfare loss is equal to the area (c).

If, however, the future GSP beneficiary produce more than the EU demands, supply curve at $S_{GSP}*$, the initial price and quantity of imports are the same as the previous example. When the EU introduce the GSP, the price will decrease from p_2 to p_1 and quantity will increase from q_3 to q_4. The GSP beneficiaries will cover the whole import at q_4 and export the excess quantity q_4q_5 to the world market. Under these circumstances the EU looses income from tariffs equal to (a + b + c + d) but the consumers gain consumer's surplus equal to (a + b + c + d + e). The welfare gain is the triangle area equal to (e). The GSP beneficiaries receive no gain as they both before and after the introduction of GSP export at price p_1, only a redirection of trade occurs.

The second example is more plausible if trade agreements are conducted with large countries or a larger amount of countries and would in that case be less likely to have a positive welfare effect on beneficiary countries, although export increases to the EU (Persson paper).

Graduation of sectors is connected to this model in the opposite way than gaining the preferences. Graduation of a sector will impose a negative effect on trade despite the sector is a small or major operator in the world market. Graduating a large sector will however not affect the sector negatively since the "lost" trade will be diverted into the world market while a small sector will lose beneficial terms of trade and some producer's surplus.

6. Empirical assessment of graduation

The gravity model is used in order to observe possible change in export flows to the EU from graduated countries after being graduated. The gravity model is frequently used for econometric assessment of trade data. It was first applied by Tinbergen and Pöyöhnen in the 1960s but initially lacked the theoretical foundation. There is a risk of omitted variables without the theoretical foundation and many studies have examined this problem. Among seminal articles are Anderson (1979), Bergstrand (1985), Deardorff (1998) and Anderson and van Wincoop (2003).

The latest major contribution to the econometric execution of the model comes from Silva and Tenreyro (2006) arguing that the usage of Least Squares by Anderson and van Wincoop (2003) in the presence of heteroskedasticity can lead to misleading conclusions. Silva and Tenreyro instead suggest the usage of Poisson pseudo-maximum-likelihood (PPML) which is robust to different patterns of heteroskedasticity and offers a natural way to deal with the zeros in the trade data. Westerlund and Wilhelmsson (2011) add evidence to the PPML approach and further show that this strategy is applicable when using panel data.

6.1 Empirical strategy

The intuition behind the gravity model is that economies act like masses. The force that pulls two masses or economies towards each other depends on the volume of the economies and the distance. The first model used was Eq. 2

Eq. 2 $$F_{ij} = G \frac{M_i^{\alpha} M_j^{\beta}}{D_{ij}^{\theta}}$$

F_{ij} is the flow of trade between region i and j; M is a measure of either GDP or GNI, of each region. M_i is what region i produce i.e. how much i can export, and M_j is how much region j produce i.e. how much j can import. D_{ij} denotes the physical distance between the regions. This distance is considered a trade barrier since it imposes a cost of e.g. transportation or that tax becomes greater as the distance increase (Andersson and van Wincoop, 2003).

Furthermore, bilateral and multilateral trade resistances are added to the original model. Bilateral trade resistance is specific costs and procedures affecting trade between two countries. The bilateral trade resistance is usually counted as distance (DIST) and adjacency (ADJ), but there are additional aspects such as a common language and former colonial ties. When trade agreements

occur, such as ACP preferences or a free trade agreement, this affects the bilateral trade resistance between the countries concerned and is simply captured with a dummy variable.

Multilateral trade resistance on the other hand is externalities a third party, normally called ROW, contribute to affect bilateral trade. Imagine country j importing from country i, if tariffs were reduced for country j importing from ROW, ROW would be relatively cheaper compared to country i than before which would lead to reduced imports to country j from country i (Anderson and Van Wincoop 2003). Other factors influencing multilateral trade resistance are the economic mass at ROW, the distance to ROW, land locked, adjacency etc.; basically the same factors affecting bilateral trade costs.

Multilateral trade resistance is complex to use but a shortcut was introduced by Anderson and van Wincoop (2003) by using country specific dummies. The method of using country specific dummy variables will be used in this paper and is frequently used in the application of the gravity model (Anderson and van Wincoop 2003; Rose and van Wincoop 2001; Hummels 1999).

6.2 Specification and Data

To see whether graduation from the EU's GSP scheme has any effect on export flows from graduated sectors, Eq. 3 is estimated using the Poisson pseudo-maximum-likelihood with fixed effects[10]:

Eq. 3

$$lnX_{cijt} = \beta_0 + \beta_1 ln(GDP_{it}) + \beta_2 ln(POP_{it}) + \beta_3 ln(GDP_{jt}) + \beta_4 ln(POP_{jt}) + \beta_5 ln(DIST_{ij}) + \beta_6(COLONY_{ij}) + \beta_7(ADJ_{ij}) + \beta_8(Non\ EU_{jt}) + \beta_9(GRAD_{cit}) + \gamma_t + \delta_{ci} + \mu_j + \varepsilon_{cijt}$$

The subscript "i" denotes the exporting while the subscript "j" denotes the importers which are all EU15 countries. The dependent variable X_{cijt} is yearly exports in each chapter[11], c, from the developing countries to each member of EU15. The export data is collected at chapter level at the CN schedule since it is not available at sector level, and the panels used are specified country wise, but there is one panel for each chapter within each country. Both left and right hand side are written in log-form for pedagogical reason; only the right hand side is in log-form once running the PPML regression.

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[10] Westerlund and Wilhelmsson (2011) recommend the usage of fixed effects in their contribution to the econometrical assessment of the gravity model.
[11] The thesis examines sector graduation but the data is not simply divided into the sectors used by the EU but was needed to be collected at chapter-level using the CN schedule.

To explain the variation in the dependent variable, export flows, the commonly used explanatory variables within the gravity model are applied; gross domestic product and population for both importer and exporter, and the distance between the capitals of the importer and exporter. Moreover, a set of dummy variables are added such as COLONY which is "1" if historical colonial ties exist between the countries, otherwise it is "0". ADJ is "1" if the exporter and importer share a border and the non-EU dummy is "1" for Sweden, Finland and Austria until 1995. The EBA preferences are not included in the model since it is constant within the panels, hence no effect can be picked up[12]. y_t is a year fixed effect which captures changes over years such as variation in dollar or business cycles (see Rose, 2002). δ_{ci} is a specific effect for every combination of chapter and exporter, capturing multilateral trade resistance for the exporter. μ_j is an importer specific effects, which captures multilateral trade resistance for the importer. Lastly, ε_{cijt} is an error term. Graduation is captured in a dummy variable (GRAD) explained below:

Eq. 4 $\quad Grad_{cit} = 0 \; if \; the \; sector \; is \; not \; graduated$

$\quad\quad\quad\quad Grad_{cit} = 1 \; if \; the \; sector \; is \; graduated$

It is important to understand how to interpret the coefficient of the GRAD dummy. The control group for graduated sectors is sectors eligible to the GSP but not graduated. The sign on the GRAD dummy will tell whether the graduated sectors perform better or worse[13] compared to the control group.

Total GDP in each country is expected to influence trade positive as this represents total production of a country, i.e. how much a country can export or import (Anderson and van Wincoop, 2003). Population on the other hand influence trade flows either positive or negative. A large population means a larger domestic market and higher potential for self-sufficiency which would be negative for trade but the increased opportunities for economies of scale and allocation of labor would impose a positive effect on trade (Nilsson, 2002).

Distance is assumed to affect trade flows negatively. Distance measures not only the physical distance but also accounts for information costs and various legal and regulatory costs (Anderson and van Wincoop, 2002:174). To share colonial ties, as well as sharing borders, is expected to have a positive effect on trade and this is also the case empirically (Anderson and van Wincoop,

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[12] Preferably a dummy for drug regimes would be used but the model did not converge when using this particular specification.
[13] Chapter two shows that GSP covered imports to the EU increases which mean that although a negative sign is estimated on the GRAD dummy, exports have not necessarily decreased but the increase is less than for the control group

2003; Santos and Tenreyro, 2006). The expectation on the non-EU dummy is neither positive nor negative but it is applied to remove any effect on trade from before and after Sweden, Finland and Austria joined the EU in 1995.

The graduation dummy is expected to be negative since graduation in practice is an increased trade barrier. All previous researches on graduation use *ex ante* or comparative models and expect a decrease in export flows from being graduated.

This study uses data from 1990 until 2006. This interval is the most relevant since two or three times as many sectors were graduated between 1995- 2005 compared to after 2005; also, there are five years of observations before the first case of graduation which is considered enough to pick up any effect from before graduation was introduced. Another aspect to bring to light is that this sample covers only the initial graduation mechanism and not both regimes. The regimes were different and in case the results are different in the different regimes, it is better to not mix them up. It would have been interesting however to separate the effects of the first and the second regime or separate the two different graduation mechanisms; the lion's share and the development- and specialisation indices.

The exporting countries in this sample consist of 51 developing countries eligible to the EU's GSP but not the ACP preferences or the European- Mediterranean preferences. Another criterion for including the exporting countries is the existence of data of GDP and population and data of exports from at least one observation to the EU15 over the time interval. The importing countries are each country in the EU15 individually and as mentioned before, Sweden, Finland and Austria are also part of the sample before 1995 but a dummy is added to this period, named "*non_eu*", to capture any potential bias. Data of GDP and population as well as distance between country pairs, adjacency, colonial ties and shared official language are all collected from the CEPII institute (CEPII, 2006). The export data is collected at chapter level using the CN schedule from the COMTRADE[14] data base. A common problem when performing regression analysis on trade data is when the trade data is zero. There are two explanations to a value of zero in trade data; either no trade was conducted during that period or the trade was not reported. There have been two ways to deal with this issue, either drop the observations where trade data is zero or change the data to a number close to zero. The PPML estimator allows the model to remain in the original multiplicative form which means that the observations with zero trade data can be kept.

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[14] Comtrade.un.org is the official homepage for trade data collected by the United Nations.

6.3 Empirical results

Table 5 reports the results of the Poisson Pseudo Maximum Likelihood. Estimation 6 tests robustness of estimation 1 when changing all zeros in the export data to 0.001 and as expected, no changes in the coefficients are observed. Estimations 1 to 5 use the same PPML estimation strategy but test different explanatory variables.

Table 5. Poisson Pseudo Maximum Likelihood regression analysis with cluster-robust standard errors and panel fixed effects.

	Baseline	*Robustness*				
	1	**2**	**3**	**4**	**5**	**6**
Pop exp	-5.10***	-5.12***				-5.10***
	(<0.01)	(<0.01)				(<0.01)
Pop imp	0.34	0.35				0.34
	0.56	0.54				0.56
GDP exp	0.53***	0.53***	0.66***	0.66***	0.66***	0.53***
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
GDP imp	0.24*	0.28**	0.24**	0.25**	0.23*	0.24*
	(0.09)	(0.05)	(0.04)	(0.04)	(0.06)	(0.09)
Distance	-0.28	-0.47*	-0.26	-0.45		-0.28
	(0.30)	(0.09)	(0.37)	(0.13)		(0.30)
Graduation	0.08	0.08	0.08	0.08	0.09	0.08
	(0.13)	(0.13)	(0.14)	(0.14)	(0.13)	(0.13)
Common border	1.11***		1.15***			1.11***
	(<0.01)		(<0.01)			(<0.01)
Colonial history	0.58***	0.79***	0.58***	0.80***	0.84***	0.58***
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
Common language	0.19**	0.06	0.19**	0.05	0.06	0.19**
	(0.02)	(0.49)	(0.02)	(0.57)	(0.47)	(0.02)
Non EU	-0.36**	-0.39**	-0.53***	-0.50**	-0.49**	-0.36**
	(0.04)	(0.03)	(<0.01)	(0.01)	(0.01)	(0.04)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Importer specific effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Observations	1,002,120	1,002,120	1,002,120	1,002,120	1,002,120	1,203,840
No. of Panels	4,023	4,023	4,023	4,023	4,023	4,896

P-values are presented in parenthesis'
Significance levels: * p<0.10; ** p<0.05; *** p<0.01

Starting with the results from the baseline regression in table 5, it is observed that population for exporting countries imposes a negative effect on trade while population for the importers does not affect trade flows. GDP for both importers and exporters affect trade positively although the importers GDP only is significant at a ten percent level. Distance is not significant while both adjacency and colony significantly increase the trade flows. Sharing a common official language is positive at a five percent significance level while the non_eu dummy is negative at a five percent significance level. Interestingly, the variable picking up the effect from graduation is not proven to be significant any regression. This was not expected and a discussion about this result is held further below.

The distance variable is normally highly significant, but it is not in this case. This result is rather unusual, but plausible, since all importers are countries of EU15, i.e. all importers are close geographically and every country has access to the ocean except Austria. The exporting countries on the other hand are mostly located far away. For instance, the exports from China, India, Brazil or Thailand will most likely not depend on the distance, but on the harbors, of the importing country. This is supported by the country specific dummy variables where land-locked Austria has a negative dummy meaning Austria import relatively little compared to the "natural" level[15]. Both Holland and Belgium on the other hand have significant positive country specific dummies since a relatively large part of the EU's import arrive in Holland or Belgium before transported elsewhere. The difference in distance for exporting countries to the EU will mainly be picked up in the panel fixed effect. Finland and Russia is the only country pair that shares border and the impact on trade flows is positively significant.

The coefficient of population for exporting countries is significantly negative while the importer population is not significant. This is reasonable from a theoretic point of view since a larger population also leads to a larger domestic demand which reduces exports. Extra estimations are made in order to view how effects changes when population is removed from the model.

The graduation dummy is not significant in any of the specifications. As presented in chapter two, GSP covered imports where increasing and the results indicate that graduated sectors develop at the same speed as non-graduated sectors. These results are interesting since a negative impact on exports was expected.

A possible explanation to the results is that the GSP does not provide any real gains for the beneficiaries and therefore no real loss when graduated. There has been research pointing at the

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[15] The gravity model aims to establish a natural level of trade depending on GDP, distance etc.

direction of no gain from the GSP in medium- or long- run (see Matto, Roy Subramanian, 2003; Panagariya 2002; Herts and Wagner, 2011) while other researchers find significant positive effect on trade from preferential trade preferences (Perrson 2004; Péridy 2005; Carrére 2004) which reduces the likelihood of this explanation. Another possibility is that the GSP provides important benefits for developing countries, but that the sectors which become graduated are ready to compete at the world market level (European Union, 1994).

The latter argument claims that sectors cope with graduation differently. Are sectors from different countries or sectors with different properties affected differently from graduation? Brazil, Russia, India, China and Thailand (BRICT) are among the fastest growing economies in the world and all are applicable for the GSP and all have graduated sectors. To investigate whether these homogenous countries in respect to GDP growth are affected differently; the estimation of "BRICT" is preformed containing only the BRICT countries. A regression with all countries except the BRICT countries is also performed before the twelve poorest countries[16], considering GDP per capita in the sample, are singled out into one regression in order to see if they are affected differently. These regressions use the same estimation strategy as the baseline regression in Table 5. The control groups for the graduated sectors are non-graduated sectors in the same countries. The graduation coefficient should hence be interpreted as growth in graduated sectors compared to the other sectors of that sample.

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[16] The specific countries in each group regression can be viewed in ANNEX III

Table 6. Poisson Pseudo Maximum Likelihood regression analysis with cluster-robust standard errors and panel fixed effects.

	BRICT	w/o BRICT	Poorest 12
Pop exp	-7.57***	-4.50***	-13.57**
	(<0.01)	(<0.01)	(0.03)
Pop imp	0.53	-0.04	0.21
	(0.53)	(0.94)	(0.69)
GDP exp	0.39	0.88***	-0.04
	(0.101)	(<0.01)	(0.91)
GDP imp	0.36*	0.05	0.14
	(0.08)	(0.81)	(0.61)
Distance	-0.03	-0.88	-7.77***
	(0.92)	(0.23)	(<0.01)
Graduation	0.13***	-0.02	-0.48**
	(<0.01)	(0.87)	(0.04)
Common border	0.460		
	(0.38)		
Colonial history	1.22***	0.56***	0.16
	(<0.01)	(<0.01)	(0.22)
Common language	-0.48*		0.45**
	(0.07)		(0.02)
Non EU	-0.39**	-0.07	0.37**
	(0.05)	(0.73)	(0.04)
Time effects	Yes	Yes	Yes
Importer specific effects	Yes	Yes	Yes
No. of Observations	121,125	880,995	189,990
No. of Panels	475	3,548	759

P-values are presented in parenthesis'
Significance levels: * p<0.10; ** p<0.05; *** p<0.01

When starting to view the first five explanatory variables across the three regressions in Table 6, it can be observed that the population and GDP for the European countries do not significantly affect the trade flows. Distance is only significant for the twelve poorest countries while GDP for the exporting countries is only significant in the sample of excluding the BRICT countries. Population for exporting countries is significant negative in all three regressions.

The effect of graduation is very interesting since it changes across the regressions. In the BRICT sample, graduated sectors perform better than non-graduated sectors. The graduation dummy is not significant when excluding the BRICT countries from the sample. When estimating only the twelve poorest developing countries in the sample, a negative effect of five percent significance from graduation is present.

This indicates that the EU is partly correct in their statement that graduated sectors are ready to compete at world market level (Eurpean Union, 1994). Partly right because the graduated sectors from the BRICT countries still perform better than the not graduated sectors, but partly wrong since the graduated sectors from the twelve poorest countries are affected negatively. In Table 5 it is presented that ever since the change in the graduation mechanism in 2006, only Brazil, China, India, Indonesia, Malaysia, Russia, South Africa, Thailand and Vietnam. At first glance, it looks like countries that are able to cope with graduation and only India and Vietnam in that list are also in the sample of the poorest twelve countries. This would however needs to be investigated further.

To summarize the empirical assessment, the initial baseline regression in Table 5 indicates no significant effect on trade for graduated sectors. Although, when viewing more homogenous groups of countries in respect of growth and GDP per capita, the results are different. These results indicate that sectors from poorer countries perform worse when graduated while graduated sectors within the BRICT countries still perform better than non-graduated sectors. This adds evidence to the EU's statement that graduated sectors are able to compete at world market level; although this suggests that the graduation mechanism may be poorly designed initially.

7.   Summary and Conclusion

This study provides an improved picture of graduation from non-reciprocal trade preferences. This is done by explaining the graduation mechanism and map out an empirical overview of all cases of sector graduation from the EU's GSP scheme using first hand source. Furthermore, an econometric assessment through the gravity model is conducted using a dummy variable to pick up the effect of graduation. The sample period is from 1990 to 2006 which then contains five years before, and twelve years after, the first case of graduation. Each country of EU15 are importers in this sample, 51 developing countries that enjoy the GSP but are not eligible for ACP preferences or the Mediterranean preferences are exporters and export data is collected at chapter level within each country. The results show no significant effect on trade for graduated sectors.

This outcome was not expected since previous research, as well as the theoretical aspects, indicates that graduation would have a negative effect on trade flows. There is research stating that non-reciprocal trade preferences do not benefit trade in medium to long-run and this does not rule out that idea, although other research indicates significant positive effect from trade preferences.

When changing the sample to more homogeneous groups considering GDP per capita or growth, these two attributes appear to affect the outcome. Graduated sectors from Brazil, Russia, India, China and Thailand performed relatively better than sectors not graduated from these countries, while export flows for graduated sectors from the twelve poorest countries of the sample in terms of GDP per capita were affected negatively. This support the EU's idea that countries first benefit from the non-reciprocal trade preferences but are graduated when they can compete at world market level, although the graduation mechanism could have been better designed.

Further research in this area would benefit from looking into different effects at different points of graduation, e.g. if there is an initial effect the first one or two years or any effect from being de-graduated. It would also be interesting to more thoroughly investigate how sectors from different countries are affected or whether different sectors are affected differently despite the countries. Furthermore, it is also possible to investigate the differences between being graduated through the development- and specialisation indices or the lion's share.

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Annex I

Table A1. Relation between Sections, Sectors and products.

Sections	Sectors	Sector products
I	I	Live animals and meat
	II	Fishery products
	III	Edible products of animal origin
	IV	Other products of animal origin
II	V	Trees, plants, cut flowers, edible vegetables and nuts
	VI	Coffee, tea, maté, and spices
	VII	Cereals and malt and straches
	VIII	Grains, seeds, fruit and plants
	IX	Lac, gum and resins
III	X	Fats, oils and waxes
IV	XI	Edible preparations of breverages
	XII	Tobacco
V	XIII	Mineral products
VI	XIV	Chemicals except fertilisers
	XV	Fertilisers
VII	XVI	Plastic and rubber
VIII	XVII	Leather, raw hides and skins
	XVIII	Articles of leather and furskins
IX	XIX	Wood
X	XX	Paper
XI	XXI	Textiles
	XXII	Clothing
XII	XXIII	Footwear
XIII	XXIV	Glass and ceramic
XIV	XXV	Jewlery and precious metals
XV	XXVI	Iron and steel
	XXVII	Base metals and articles of base metal, other than products of sector XXVI
XVI	XXVIII	Electro-mechanics
	XXIX	Consumer electronics
XVII	XXX	Transport equipment
	XXXI	Automobiles
XVIII	XXXII	Optical and clocks
XIX	XXXIII	Miscellaneous

Annex II

Box A1. The development- and specialisation- index. First hand source; Council regulation 3281/94 (European Union 1994)

1. Development index

The development index refers to a country's level of industrial development. It compares that level to the one of the European Union, using the following formula:

$\{\log[Y_i/Y_{ue}] + \log[X_i/X_{ue}]\}/2$

Where:

Y_i = the beneficiary country's gross national product per capita,

Y_{ue} = the European Union's gross national product per capita,

X_i = the value of the beneficiary country's manufactured exports,

X_{ue} = the value of the European Union's manufactured exports.

Manufactured exports are those of Standard International Trade Classification (SITC) 5 to 8 less 68.

2. Specialisation index

The specialisation index refers to the importance of a sector in the Community imports from a beneficiary country. It is based on the ratio between that country's share in imports from all countries, of all products of the sector concerned, whether included in the preferential arrangements or not, and its share in all imports from all countries.

3. Thresholds

Development index Threshold for the Specialisation index

Development Index	Specialisation index
> - 1,00	100 %
< - 1,00 and > - 1,23	150 %
< - 1,23 and > - 1,70	500 %
< - 1,70 and > - 2,00	700 %.

Annex III

Table A2

Developing countries used in the Baseline regression Table 5					
Anguilla	Bolivia	Georgia	Malaysia	Pakistan	Tajikistan
Argentina	Brazil	Guatemala	Maldives	Panama	Thailand
Armenia	Brunei	Honduras	Mayotte	Paraguay	Uruguay
Azerbaijan	Cambodia	India	Mongolia	Peru	Venezuela
Bahrain	China	Indonesia	Montserrat	Philippines	Vietnam
Bangladesh	Colombia	Iran	Nepal	Quatar	Yemen
Belarus	Costa Rica	Kazakhstan	Neth. Antilles	Russia	
Bermuda	Ecuador	Kuwait	Nicaragua	Saudi Arabia	
Bhutan	El Salvador	Kyrgystan	Oman	Sri Lanka	

Table A3

Developing countries used in the BRICT regression Table 6	
Brazil	Russia
China	Thailand
India	

Table A4

Developing countries used in the w/o BRICT regression Table 6					
Anguilla	Bhutan	Georgia	Malaysia	Oman	Sri Lanka
Argentina	Bolivia	Guatemala	Maldives	Pakistan	Taijikistan
Armenia	Brunei	Honduras	Mayotte	Panama	Uruguay
Azerbaijan	Cambodia	Indonesia	Mongolia	Paraguay	Venezuela
Bahrain	Colombia	Iran	Montserrat	Peru	Vietnam
Bangladesh	Costa Rica	Kazakhstan	Nepal	Philippines	Yemen
Belarus	Ecuador	Kuwait	Neth. Antilles	Quatar	
Bermuda	El Salvador	Kyrgystan	Nicaragua	Saudi Arabia	

Table A5

Developing countries used in the Poorest 12 regression Table 6	
Armenia	Mongolia
Azerbaijan	Nepal
Bangladesh	Pakistan
Cambodia	Tajikistan
India	Vietnam
Kyrgystan	Yemen