Graduate Institute of
International Studies | Geneva
Economics

HEI Working Paper No: 12/2006

A New Tariff Database for Selected Least Developed Countries

Lisa Borgatti
Graduate Institute of International Studies

Abstract

This paper presents a new hand-gathered database on tariff rates for 18 least developed countries and Korea at the 4-digit level in HS 1988 and SITC revision 2. The database contains one observation per country and per decade starting from the 1970s to 2000/2002. Over time, the tariff schemes of the LDCs follow a symmetric bell-shaped distribution with low rates in the 1970s, which are raised in the 1980s, and then lowered or kept constant in the 1990s and substantially lowered in 2000/02. The analysis in the paper shows that the LDCs have already lowered their average tariff rates to those levels considered 'optimal' by many economists and that they have not shifted the protection over time, keeping the highest rates on labor-intensive and on medium skill manufactures and the lowest rates on mineral products.

1

A new tariff database for selected least developed countries *

Lisa Borgatti [§]

June 2006

Abstract

This paper presents a new hand-gathered database on tariff rates for 18 least developed countries and Korea at the 4-digit level in HS 1988 and SITC revision 2. The database contains one observation per country and per decade starting from the 1970s to 2000/2002. Over time, the tariff schemes of the LDCs follow a symmetric bell-shaped distribution with low rates in the 1970s, which are raised in the 1980s, and then lowered or kept constant in the 1990s and substantially lowered in 2000/02. The analysis in the paper shows that the LDCs have already lowered their average tariff rates to those levels considered 'optimal' by many economists and that they have not shifted the protection over time, keeping the highest rates on labor-intensive and on medium skill manufactures and the lowest rates on mineral products.

Keywords: Tariff Rates, Protection, Commercial Policy

JEL Codes: F13, C82

'The world has never been as open as it is now'
Dani Rodrik

1. Introduction

International financial institutions often provide policy advice to least developed countries (LDCs) based on the experience of developed countries or of other developing countries, because they are faced with the impossibility of monitoring the development of the LDCs' economies due to a lack of long-term data, especially on tariff and trade policies.

This paper attempts to fill this statistical gap by presenting a new hand-gathered database[1] that includes tariff rates for 18 LDCs and Korea at the 4-digit level in HS 1988 and SITC revision 2. The database contains one observation per country and per decade starting from the 1970s to 2000/2002. The database has been constructed based on the seemly plausible assumption that the LDCs do not change their tariff rates over the medium term.

This paper is divided into two parts. The first part presents and discusses the 'phases' required to build the tariff database as well as some specific descriptive statistics on the overtime trends and major features in the tariff policy on a country-by-country basis. It is found that, over time, the tariff schemes of LDCs follow a bell-shaped distribution with low rates in the 1970s, which are raised in the 1980s, and then lowered or kept constant in the 1990s and substantially lowered in 2000/02. Furthermore, evidence shows that the bell-shape distribution of the tariff rates is symmetric.

The analysis in the paper highlights that the LDCs have already lowered their average tariff rates to those levels considered 'optimal' by many economists. Although, the current level of tariff protection is half the one Rodrik advised the LDCs to have, the expected benefits from liberalization are yet to be seen, in spite of an increase in the export growth rate in the last decade.

The second part of the paper analyses the database. A look at the tariff rates in times of conflicts shows that war-affected countries have imposed very high tariff rates on the importation of arms and ammunitions, while neighboring countries have lowered

---

[1] The database at HS 1988 and SITC revision 2 can be obtained from the author upon request.

3

them. Tariff rates on arms and ammunitions were the highest levied in the 1970s, 1980s and in 2000/02.

Although the LDCs have lowered their average tariff rates, they have not shifted the protection of their products over time, keeping the highest rates on labor-intensive and on medium skill manufactures and the lowest rates on mineral products. Amongst the countries in the sample, only Haiti, a manufactures exporter, has experienced a clear switch in its protection patterns.

A comparison with the tariff policy of South Korea shows that the LDCs have applied the same tariff policy with a 10-15-year-lag.

The paper is structured in the following way. Section 2 discusses the phases of the construction of the database. Section 3 presents the major features arising from the database analysis, while section 4 focuses on a product-by-product analysis of the tariff rates. Section 5 compares the features of the tariff schedules of the least developed countries with that of South Korea and section 6 contains some concluding observations.

2. *Database Construction*

2.1 *Content and Objective*

This database aims at providing a coherent set of information on the tariff rates applied by the least developed countries over the past forty years. This analysis does not aim at providing a comprehensive spectrum of the trade protection mechanisms used in the LDCs, as the non-tariff barriers have been excluded from the database for lack of data.

Due to data unavailability, it was only possible to obtain one tariff observation per decade at 4 digits. This does not pose a serious limit to the analysis since the LDCs, especially in the early decades, did not change their tariff rates in the medium term. For each of the eighteen countries analysed (Burundi, Central African Republic, Chad, Democratic Republic of Congo, Ethiopia, Haiti, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, Sudan, Tanzania, Togo, Uganda and Zambia), the database contains one tariff schedule per decade, i.e. during the 1970s, during the

1980s, during the 1990s and in 2001.[2] Annex 1 contains in detail the specific years available in the database for each country in each decade.

Countries typically applied a range of custom and fiscal duties. The database contains the sum of these ad valorem rates since they play an additive effect over the import cost. Specific duties were applied on certain products, mostly on beverages and spirits (Chapter 22) but they were not included in the database.[3]

The strength of this database is that it is not influenced by any exogenous factors - such as demand or supply changes or domestic/international price changes - the way those tariff databases, computed by dividing the custom revenues over the total value of imports, are.[4]

2.2 Database Construction

To construct the tariff database the author relied on International Customs Journals published by the International Customs Tariffs Bureau, on the Zoll und Handels Information by the Bundesstelle Fur Aussenhandelsinformation and on the World Bank/UNCTAD WITS database. The above sources were further complemented by the tariff scheduled deposited by the local governments to the tariff unit of the World Trade Organization. Annex 1 contains the data source for each year and country.

The tariff schedule published by the International Customs Tariffs Bureau is received directly from the national governments. The advantage of using tariff data provided by the International Customs Tariffs Bureau is that common harmonized codes are used for the products' identification. The harmonized system is normally composed of codes of 6 to a maximum of 8 digits.

---

[2] For Mozambique, no data was available for the 1980s, for Niger no information was available for the 1970s, for the Democratic Republic of Congo no data available for 2000/01 and while the data was available in the 1970s for Ethiopia it could not be used in this database because the codes of the tariff schedule were not from the harmonised system.

[3] Further information on specific duties can be obtained from the author upon request. For some countries, information on the export and indirect taxes is also available.

[4] For example, this is the case of the Williamson Tariff Project Database, which contains data for 35 countries from the 1860s to World War II. Interestingly, this database contains data for one LDCs, namely Burma. It also applies to the O'Rourke's database (2000).

Brussel Nomenclature: Pre-1988 codes

Prior to 1988, the product codes for each country were comparable only at the 4-digit level. The countries were rather free to choose their own nomenclature of the remaining 2 digits according to their needs as well as nature and features of the local products. In order to make a cross-country comparison possible, data were taken at the 4-digit level. The remaining 2 digits were averaged out using simple averages. As Rodriguez and Rodrik (2000) state "trade-weighted tariff averages are misleading as indicators of the stance of trade policy" and that "[…] simple averages of taxes on imports and exports and NTB coverage ratios leaves us with the impression that these measures do a decent job of rank-ordering countries according to the restrictiveness of their trade regimes" (p. 40).

The tariff regime in the pre-1988 nomenclature contained 1,099 lines per year, while the schedule for Mali in 1970 and for Zambia in 1971 and 1987 contained a number of lines equal to 1,121. The tariff nomenclature for these last countries had an extra chapter (i.e. chapter 100, titled 'Goods for special uses'), which was used to list local or other products that could not be included in the standard classification. It needs to be noted that the codes' description for chapter 100 varied widely from country to country. On top of chapter 100, the tariff schedule of Malawi in 1968 and in 1978 contained chapters 101 and 102 (respectively titled 'Goods for special uses under the conditions imposed by the Minister' and 'Divers'), which increase the number of lines to 1,135.

Harmonised System: Post-1988 codes

After 1988 a new classification was introduced, which allowed a perfect correlation of the full 6 digits among countries. The pre- and the post-1988 nomenclatures are rather different from each other; the first one contains 99 chapters and 1,099 lines while the second has 97 chapters and 1,240 lines. A concordance exercise was therefore needed in order to have a comparable over time vision of the change in tariff. All the tariff schedules classified according to the pre-1988 classification were converted into the post-1988 nomenclature. Chapters 100 to 102 were not included in the conversion

since they were only used by some countries on an ad hoc basis in specific years.[5] The pre-existing conversion tables required some manual adjustments, since not all product codes in the pre-1988 nomenclature had a direct correspondent in the post-1998 one. A second concordance exercise was therefore carried out on the basis of the product description.

All the countries that have adopted the post-1988 nomenclature have left chapter 77 tariff-free and description-free since it was supposed to be used in case of need.

For consistency reasons, the same averaging procedure for the last two digits used for the pre-1988 nomenclature was applied to the post-1988 nomenclature. It follows that the original database has been constructed at 4-digit HS 1988, with 1,240 rows for each available year and for each country with a total of 87,040 observations.

Standard International Trade Classification (SITC)

In order to make the tariff database as widely used as possible, another conversion was carried out; from the harmonised system into SITC revision 2. SITC is a statistical classification of the commodities entering external trade designed to provide the commodity aggregates needed for the purposes of economic analysis and to facilitate the international comparison of trade-by-commodity data. This conversion reduced the number of lines per country to 763. This nomenclature turns out to be rather useful when tariff rates are compared with import and export flows. It is also used for the product classification of Annex 4.

2.3. Country Notes

Haiti

A little over 30% of the total custom tariff lines in 1970 were composed of specific duties. They were applied to almost every chapter.[6] The specific duties in gourdes for each of the lines are available upon request. Furthermore, having Haiti joined the GATT in 1950, custom tariffs were different depending on whether they were applied

---

[5] The percentage rates of chapters 100-102 for the above three countries are available from the author upon request.
[6] They were applied to chapters 1-2, 4-5, 7-12, 14-29, 32, 34-42, 44-49, 53-57, 59-60, 62, 64-65, 68-71, 73-85, 87, 89, 92-93, 96-98.

to GATT members or to non-GATT members[7]. Typically the tariff rates applied to GATT members were a third lower than those applied to non-GATT members.

In 1977 the tariff regime of Haiti changed again. The distinction between the tariff rates applied to GATT members and non-members was kept. However, differently from tariff schedule of the 1970, for the non-GATT members there was only a direct reference to *minima* tariff rates applicable. A note specified that the maximum rates were taken to be the minimum rates multiplied by a hundred in respect to all articles other than textile fabrics and articles of silk or of man-made textile for which the maximum tariff rates were 200%. The maximum duty was not applied to the imports made by private persons. On average, the minimum tariff rates applied to non-GATT members continued to be three times bigger than the rates applied to GATT members. Specific duties in gourdes were applied to the same chapters and product codes as per the 1970 tariff schedule. By mid-1990s Haiti's tariff schedule had been uniformed and simplified.

Malawi and Senegal

Malawi, in the late 1960s, and Senegal, in the late 1970s, charged another custom duty on imports coming from abroad, on top of the ordinary revenue tariff. As it was for Haiti, this last duty had different rates according to the countries of origin of the imports.

In 1978 the tariff schedule of Senegal made a distinction between imports coming from the European Economic Community (EEC) and those that were not. The custom duty applied to imports from the EEC was half the one applied to non-EEC countries. In a similar vein, in 1968 Malawi had different custom duties according to the imports' origins. Imports from the United Kingdom and the Island of Man were taxed at the lowest average rate (6.8%), imports from the British Commonwealth countries were taxed at 9.2%, while imports from all other countries were taxed at double the rate applied to the United Kingdom and the Island of Man (i.e. 12.6%).[8]

---

[7] In the non-GATT members category are included also the countries with which Haiti had a Trade Agreement.
[8] Including chapters 100 to 102, the average applied duties become 6.6% to the United Kingdom and Island of Man, 8.8% to the British Commonwealth and 12.3% to other countries.

Mozambique

The tariff schedule of Mozambique in 1968 only provides custom duties and minimum tariff rates. The maximum tariff rates are set as being equal to the double of the minimum tariff, with a minimum of 10% even in the case where only specific duties are applied.[9] The database reports the sum between custom duties and the minimum tariff rate. For those few products that had specific duties, a 10% ad valorem rate was applied.

Ethiopia, Tanzania, Uganda and Zambia

In the tariff schedules of Ethiopia in 1981, of Tanzania in 1971 and of Uganda in 1971, chapters 28 and 29 were only partially completed since the nomenclature used was different from the Brussels one. It followed that only the tariff rates applied to those codes whose description matched the Brussels nomenclature were taken. On top of chapters 28 and 29, chapter 39 in the 1971 Zambia's tariff schedule did not follow the Brussels nomenclature. The same description matching procedure was therefore used.

3. Tariff Database Analysis

3.1 Historical background of tariff protection

Landes (1990) noted that "Third World (like First World) awareness of backwardness (or poverty) came relatively late" (p. 6) and was related to the 20th century's achievement of independence.

All the LDCs included in the sample had been colonies of European countries. This implied that they had an implicit free trade with their 'mother' countries and that they adopted the same external tariff rates as their coloniser country. Free trade with a more developed country restricted the colonies' exports to a few products – notably primary commodities – where they had a natural comparative advantage.

On average, LDCs became politically independent during the 1960s, table 1 lists the years of independence for each of the countries analysed. Although they gained

---

[9] Article 11 of the 1968 Bulletin. "Les droits du tax maximum sont fixes au double des droits du tariff minimum avec, toutefois, un minimum de 10% ad valorem dans les cas des droits spécifiques".

political independence, they continued to have strict economic links with their respective 'mother' countries. The once-colonies kept on providing raw materials to the industries located in the Northern countries. This close relationship affected the trade regime of the ex-colonies, which, right after their declaration of independence, continued to have a rather open trade policy. Such a policy was matured within the GATT rules to which the majority of the countries adhered soon after their colonial independence. At that time, application procedures for ex-colonies were rather simple (or simplified) as it was sufficient for them to apply and to declare that they would continue to apply the rules enshrined in GATT (i.e. non-discrimination and most-favored-nation treatment) as it was done *de facto* previously to their territory by their mother country ('fast-track' article XXVI:5c).

It is interesting to notice that the once-British colonies joined the GATT either the same year of their independence (as in the case of Malawi and Uganda) or some years before they gained full political independence (as in the case of Niger and Tanzania). Although the 'mother countries' could no longer interfere directly with the economic policies of the ex-colonies, the attempt was made to interfere indirectly at the international level.

Table 1: Independence Years for selected LDCs.

Countries	Mother countries	Years of Independence	Year of GATT membership
Burundi	Germany, France	1962	1965
Central African Republic	France	1960	1963
Chad	France	1960	1963
Congo D.R.	France	1960	1971
Ethiopia	Italy	-	Observer
Haiti	France	1804	1950
Madagascar	France	1960	1963
Malawi	United Kingdom	1964	1964
Mali	France	1960	1993
Mozambique	Portugal	1975	1992
Niger	United Kingdom	1968	1963
Rwanda	Belgium	1956	1966
Senegal	France	1960	1963
Sudan	United Kingdom, Egypt	1956	Observer
Tanzania	United Kingdom, Germany	1964	1961
Togo	Germany, France	1960	1964
Uganda	United Kingdom	1962	1962
Zambia	United Kingdom	1964	1982

Source: CIA, available at www.cia.gov and WTO members, online document available at www.wto.org

It was only when the notion of political independence was extended to the economic sector that the trade policy of the newly-independent states shifted to become more inward-oriented. Such a change was supported by some economic thinkers of the

1970s as well as by the GATT framework for developing countries, according to which economic development could be carried out under defensive tariff barriers. It was at that time that tariff and non-tariff barriers were raised to high levels. Such a shift was supported by low capacity to tax, few bureaucratic resources to implement an efficient collection, limited access to foreign capital markets and the widespread poverty. Customs revenues became therefore an easy way to collect resources necessary to finance Government expenditures.

As it occurred in the newly independent Latin American countries during the 19th century, civil wars and violent border disputes affected many LDCs after their political independence. These conflicts limited the capital available to the Government and put an increasing pressure to raise tariff rates. This issue will be dealt with in detail in section 3.3.

Tariffs and non-tariff barriers started to be decreased in the 1980s, mainly due to the conditionality included in the Stuctural Adjustment Facilities of major international institutions. On average, the current trade regime of the LDCs is as open as that of the United States, Europe and Japan even though some LDCs, mainly those affected by major civil conflicts, still have rather high tariff rates. [10]

3.2 Tariff Rates

3.2.1 Is there an optimum level of tariff protection?

There is no consensus among economists on the optimum level of tariff protection for developing countries. According to Little et al. (1970) the percentage should be 20% for developing countries and 0% for developed countries. Mitra (1991) argues for a uniform tariff rate no higher than 10-15%. The World Bank (1991) argues for levels ranging from 15 to 25%, while Rodrik (1992b) suggests average protection rates between 10%, for middle-income countries, and 50% for poor countries. Dornbusch (1992) prefers a gradual approach to liberalization, which sees it to be divided into two rounds: first, non-tariff barriers should be converted into tariffs as high as 50%, then as the economy develops, tariffs should be lowered to 10%. Under certain conditions, Buffie (2001) argues that optimal tariff rates should not exceed 30% and

---

[10] For further information on the exact period of trade liberalization for most of the countries analysed as well as on the influence of the IMF Structural Adjustment Facilities and the consequent aid flows, see chapter 2.

that should be below 20%. He also sees it possible to have much higher rates of effective protection of the order of 40-70% in order to protect import-competing sectors.

A consensus has been reached on the needs to impose uniform rates, which help reducing administrative and bureaucratic costs and make custom officials less bribe-prone. It needs to be stressed that uniformity does not imply necessarily one single tariff rate per country. Rodrik (1992a) argues that uniformity would be consistent with 2-3 different tariff rates. However, due to the characteristics of the LDCs, it could be argued that uniformity for these countries would still be consistent with up to five different rates.

3.2.2. Past and current tariff rates

Table 2 contains the average tariff rates per country and per decade applied by each country in the sample. It is worth noting that the LDCs have already reached what Buffie (2001), the World Bank (1991) and Little et al. (1970) have defined as the 'optimal' rate of tariff protection. While 12 LDCs had an average tariff rate which was less than 30% and 5 had an average that was below 20% in the 1990s, by 2000/02 16 LDCs (all the LDCs in the sample with the exception of Burundi) have an average tariff rate less than 30% and for 15 LDCs it is less than 20%. The current level of tariff protection is therefore half the one Rodrik (1992b) advised the LDCs to have.

The data show the existence of a bell-shaped trend in the average tariff rates over time. Tariffs were low in the late 1950s, the 1960s and the 1970s. They were increased in the 1980s and then lowered either in the 1990s or in 2000-2002. In 2000-02 the average tariff level is below 20% for all countries in the sample, except for Sudan and Burundi. While Burundi has decreased its average tariff rate in 2000-02, Sudan has recently increased it. The high tariff rates in Sudan have to be seen in light of the political and civil war that affected the country from 1963 to 1972, from 1983 to 1992 and from 1995 to 2001.[11]

---

[11] Prio. 2003. The periods listed only include those that were ranked as war-periods. The conflict in 1993 and 1994 is defined as intermediate.

Table 2: Average Ad-valorem HS Tariff Rates, percentage.

Countries	Previous years	1970s	1980s	1990s	2000-2
Burundi		30.5	37.6	38.6	31.8
Congo D.R.		2.7	24.2	35.7	
Central African Republic		45.5	40.3	34.5	18.1
Chad		44.7	33.2	34.5	18.1
Ethiopia			29.4	27.1	18.1
Haiti		28.4	17.9 to GATT 25.9 to Non-GATT members	12.2	2.9
Korea	(1969) 49.8	48.7	29.8	11.2	8.2
Madagascar		30.6	53.8	5.7	4.4
Malawi	(1968) 6.8 to UK 9.2 to Commonwealth 12.6 to Other	9.8	14.4	28.7	13.0
Mali	(1959) 17.6	34.9	22.9	17.7	11.8
Mozambique		12.2		5	13.2
Niger	(1959) 17.6		22.9	24.0	11.8
Rwanda		18.9	39.7	38.1	9.9
Senegal		(1970) 17.4 (1978) 15.4 to EEC 20.1 to non-EEC	55.5	32.5	11.8
Sudan	(1957) 24.6	97.1	95.4	4.3	21.1
Tanzania		17.9	24.7	19.7	16.1
Togo	(1959) 17.6	14.0	22.9	27.2	11.8
Uganda		17.9	25.1	17.2	9.3
Zambia		10.1	29.2	26.1	12.7

Source: Author's calculations.

This bell shape becomes evident in Chart 1 where the average tariffs are plotted from the 1970s to 2000-02 together with their upper and lower bounds, calculated by summing and subtracting their standard errors. This bell trend of the average applied tariff rates is clearly visible for half of the countries in the sample. In three other cases (Congo D.R., Niger, Sudan) the bell-shaped trend is not fully visible from the 1970s to the 2000-02 due to a lack of data, but it can be reasonably reconstructed. If the period under consideration was extended to the late 1950s (decade for which tariff data exist), the bell-shaped trend becomes visible in Niger and Sudan. Niger's average tariff in 1959 amounted to 17.6%, which is 5 points lower than its average in the 1980s. Similarly, Sudan's average tariff in 1957 was a third of the average tariff in the 1970s. Furthermore, as shown in Annex 2, from the higher import share in GDP in Congo D.R. in 2000-02 with respect to the correspondent value in the 1990s, it might

be possible to infer that a considerable fall in the tariff rate took place in recent years, thus supporting a bell-shaped trend.

In the case of Central African Republic, Chad, Mali, and Haiti only the decreasing part of the bell is visible. This may be due to lack of data from their political independence from France, which took place in 1960 for the first three countries and in 1804 for Haiti. Other comparable French colonies show that right after independence the tariff rates applied by the newly-independent countries were lower than those applied during the two decades of import-substitution policies. It follows that if a fifth observation had been available in the 1960s it would have most likely shown a lower average tariff level than that of the 1970s.

The bell-shaped trend is not visible in Ethiopia and Mozambique. This may be due to the civil conflicts that have affected these countries for a period longer than 14 years (see table 6), which clearly had an impact on their government revenue policies. These two are amongst the worst conflict affected countries of the sample.

As shown in chart 1, the tariff rates' variance (measured by the standard error) was very large in the 1970s and in the 1980s, showing the non-uniformity of their tariff policies. The 1990s and the years 2000-02 showed a considerable reduction in the tariff rates' variance. This process was triggered by the IMF Standard Facility Programmes that pushed for uniformity in tariff policies. As expected, the variance is higher in conflict-affected countries during times of conflict.

Chart 1: Average tariff rates and their lower and upper bounds measured by their standard errors

Niger

Rwanda


Senegal

Sudan

Tanzania

Togo

Uganda

Zambia

Korea

16
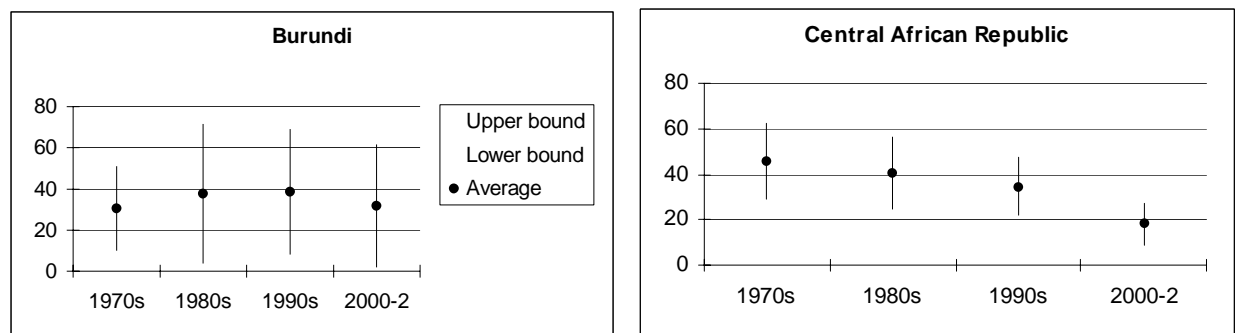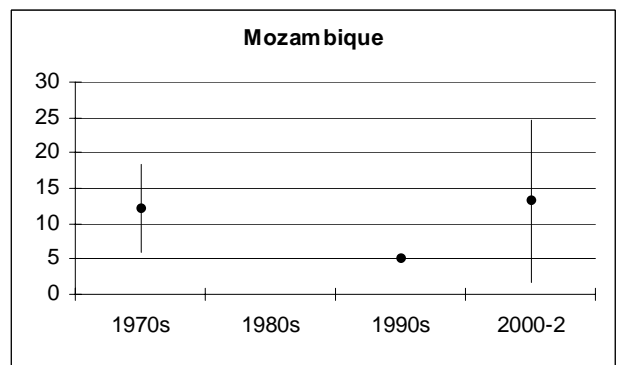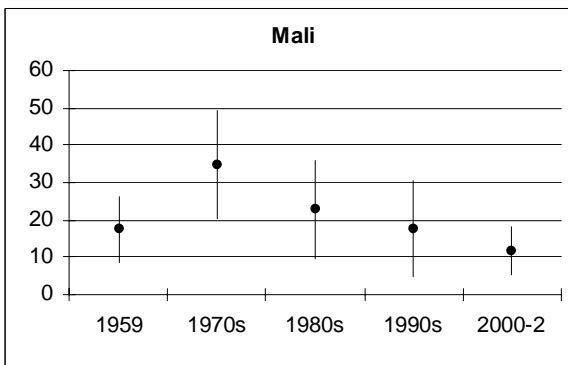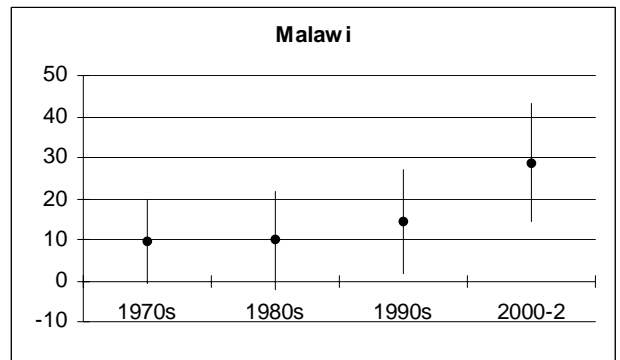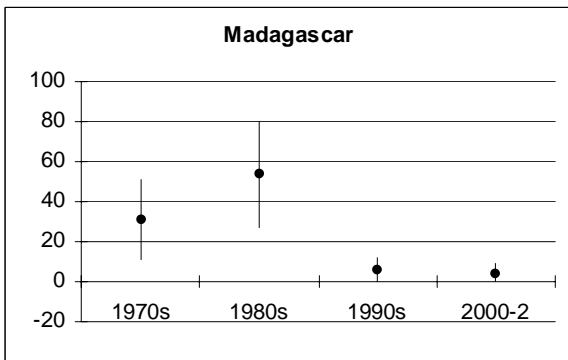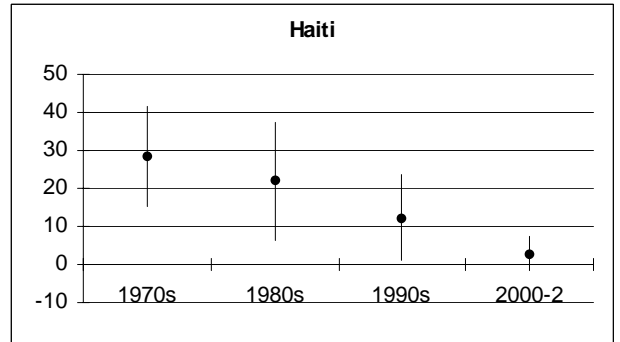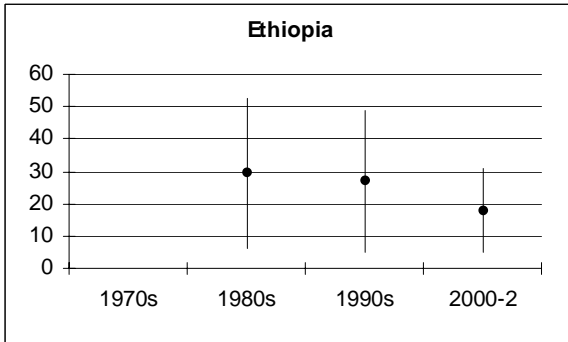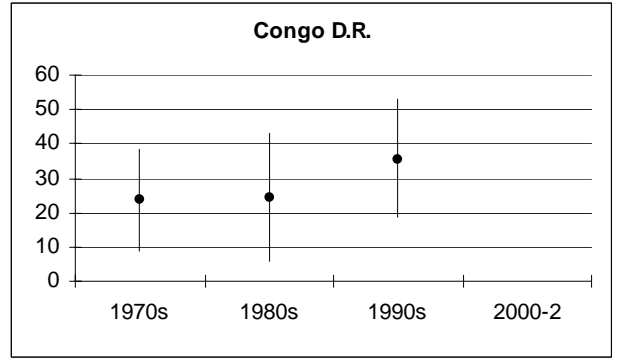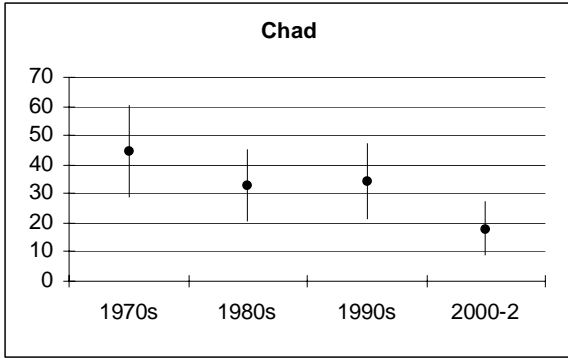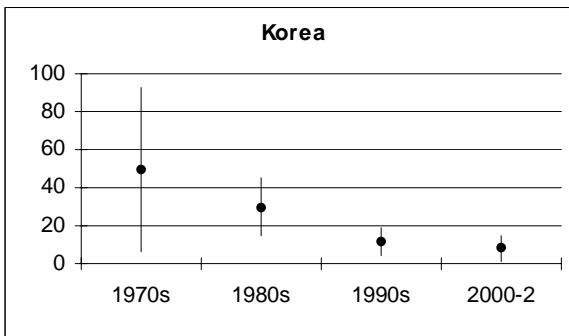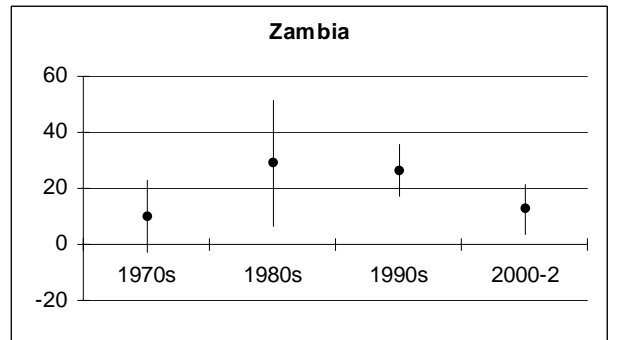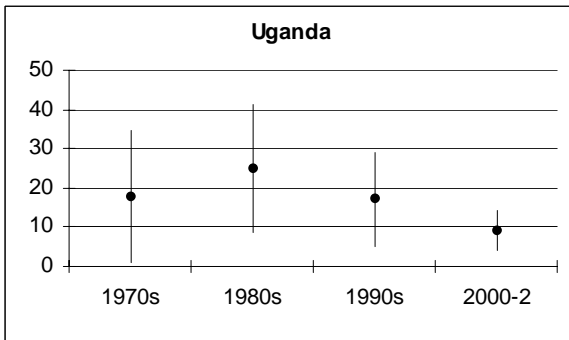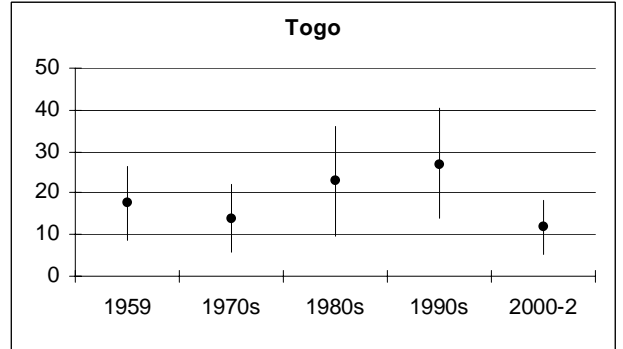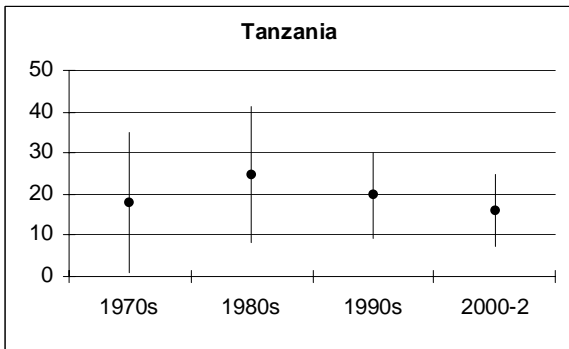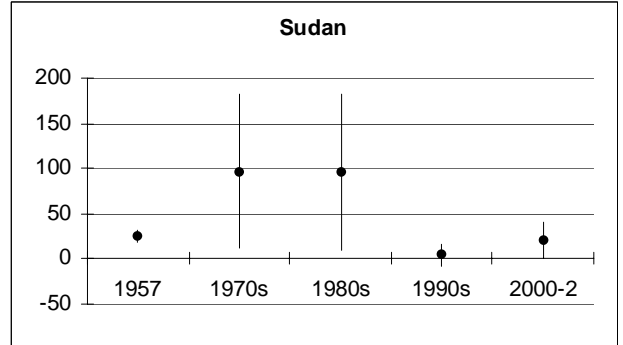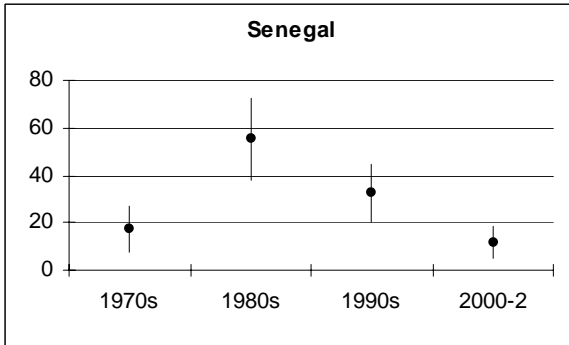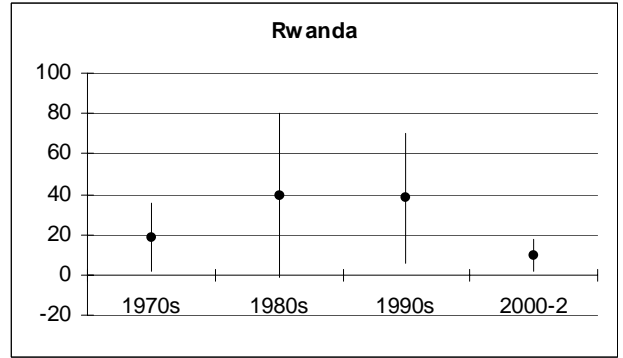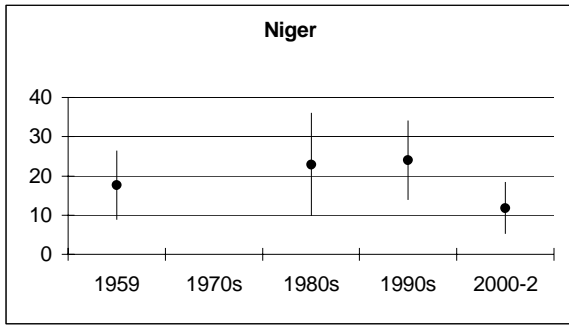
Source: Author's calculations.
Note: For legend see Burundi.

3.2.2.1 Outliers

After having ranked the tariff rates from the highest to the lowest, the lower and the highest 5% of the tariff lines have been eliminated. A simple average and standard deviation were then calculated on the remaining tariff rates.

Table 3 lists the average rates, obtained by eliminating the outliers, and compares them with those averages and standard errors used for chart 1, which include all available tariff rates. The country's average without outliers is only a few points lower than the average tariff calculated including all tariff rates. The difference ranges between 0 for Chad and Korea in the 1980s, Mozambique and Togo in the 1990s, Uganda in 2000/02 and 4 points for Rwanda in the 1980s.[12] This finding supports the approach of using un-weighted tariff rates.

By removing the outliers, it is normally expected to find the resulting average to decrease with respect to the average calculated on the full sample. This normally happens when there are a few high tariff rates. It needs to be noticed that in eight cases[13] the average without outliers is bigger than the one calculated including all tariff rates.

With a few exceptions, the exclusion of the highest and the lowest 5% of tariff rates does not change much the average tariff rates but it decreases the standard error by some percentage points in all cases. In the 1970s and in the 1980s the changes in the standard errors due to the exclusion of the outliers were higher than for the remaining two decades. Excluding Sudan, the standard deviation without outliers is between a maximum of 8.5 (in the case of Burundi in the 1980s) and a minimum of 0.5 (in the case of Ethiopia in the 1980s) higher than the standard deviation calculated including all rates.

In Sudan the standard deviations excluding outliers fell by 34 points in the 1970s and by 37.1 in the 1980s. It is worth noticing that the tariff policy of Sudan was largely

---

[12] Sudan experienced a difference in the two averages equal to 72.2 points in 1957, 9.1 in the 1970s and 9.4 in the 1980s. The difference then reduced to 1.8 points in the 1990s and to 1.4 in 2000/02.
[13] Chad in the 1970s, Ethiopia in the 1970s, Haiti in the 1980s, Mali in the 1980s, Niger in the 1990s, Senegal in the 1990s and Tanzania in the 1980s and 1990s.

uniform in the 1957 as it included only two rates.[14] The highest rates, which were almost 5 times the rate normally applied, were raised only to those products pertaining to chapter 22. Their exclusion caused a fall of 84.4 points in the standard deviation.

It is not surprising to find that in the 1990s and in 2000/02 – during the implementation of the IMF Structural Adjustment Facilities - the averages with and without outliers were rather similar and that the standard deviations differed by a maximum of 4.3 points.[15]

Table 3: Average tariff rates per country and per decade, including and excluding outliers.

Countries	Tariff	Previous years	1970s	1980s		1990s	2000-02
Burundi	Average		30.5	37.6		38.6	31.8
	S.D.		20.4	34		30.4	29.8
	Average w/o outliers		29.1	34.1		37.2	29.2
	S.D. w/o outliers		16.4	25.5		28.1	26.2
Central Afriacan Repulic	Average		45.5	40.3		34.5	18.1
	S.D.		16.9	16.1		12.9	9.4
	Average w/o outliers		45.3	40.2		34.2	18
	S.D. w/o outliers		11.3	11.7		8.6	9.02
Chad	Average		44.7	33.2		34.5	18.1
	S.D.		16	12.4		12.9	9.4
	Average w/o outliers		44.8	33.2		34.2	18
	S.D. w/o outliers		10.8	8.9		8.6	9
Congo Democratic Republic	Average		23.7	24.2		35.7	
	S.D.		15	18.6		17.1	
	Average w/o outliers		23.1	22.8		35.0	
	S.D. w/o outliers		12.7	12.7		14.9	
Ethiopia	Average			29.4		27.1	18.1
	S.D.			23		22	12.8
	Average w/o outliers			31.2		25.1	17.5
	S.D. w/o outliers			22.5		18.3	11.8
Haiti	Average		28.4	25.9 Non-GATT	17.9 GATT	12.2	2.9
	S.D.		13.1	12.9 Non-GATT	17.9 GATT	11.3	4.5
	Average w/o outliers		30.1	27.5 Non-GATT	16.5 GATT	11.4	2.3
	S.D. w/o outliers		11.5	11.6 Non-GATT	15 GATT	9.4	3.6
Korea	Average	49.8 (1969)	48.7	29.8		11.2	8.2
	S.D.	43.1 (1969)	43.2	15.2		7.2	6.7
	Average w/o outliers	47.9 (1969)	46.4	29.8		10.3	6.9
	S.D. w/o outliers	28.2 (1969)	28.2	12.1		3.4	3.4
Madagascar	Average		30.6	53.7		5.7	4.3
	S.D.		19.9	26.5		6	4.7
	Average w/o outliers		29.5	52.9		5	3.7
	S.D. w/o outliers		11.6	21.5		4.1	3.4
Malawi	Average		9.8	14.4		28.7	13
	S.D.	(1)	11.9	12.7		14.3	9
	Average w/o outliers		9.3	13.7		28.2	12.9
	S.D. w/o outliers		11	10.7		11.9	8.5
Mali	Average	17.6 (1959)	34.9	22.9		17.7	11.8
	S.D.	8.9 (1959)	14.6	13.2		13	6.6
	Average w/o outliers	17.3 (1959)	34.5	22.4		18.1	11.7
	S.D. w/o outliers	6.6 (1959)	11.2	10.7		12.7	6.4
Mozambique	Average		12.2			5	13.2
	S.D.		6.2			0	11.4
	Average w/o outliers		11.8			5	12.8
	S.D. w/o outliers		4.2			0	11

[14] A rate of 25% and one of 115% at four-digit level.
[15] The maximum variation of the standard deviation was 7.3 in the 1990s for Sudan.

Country		C1	C2	C3	C4	C5
Niger	Average	17.6 (1959)		22.9	24	11.8
	S.D.	8.9 (1959)		13.2	10.1	6.6
	Average w/o outliers	17.3 (1959)		22.4	24.1	11.7
	S.D. w/o outliers	6.6 (1959)		10.7	9.9	6.4
Rwanda	Average		18.9	39.7	38.1	9.9
	S.D.		16.9	41	32.4	7.7
	Average w/o outliers		17.4	35.7	36.2	9.5
	S.D. w/o outliers		13.1	32.8	29.8	6.9
Senegal	Average		17.4	55.5	32.5	11.8
	S.D.		9.5	17.2	12.5	6.6
	Average w/o outliers		16.9	55.4	32.9	11.7
	S.D. w/o outliers		7.1	14	10.2	6.4
Sudan	Average	97.1 (1957)	97.1	95.4	4.3	21.1
	S.D.	85 (1957)	85	86.6	12.1	19.1
	Average w/o outliers	24.9 (1957)	88	86	2.5	19.7
	S.D. w/o outliers	0.6 (1957)	51	49.5	4.8	17.5
Tanzania	Average		17.9	24.7	19.7	16.1
	S.D.		16.9	16.5	10.6	8.8
	Average w/o outliers		17	24.8	19.6	16.1
	S.D. w/o outliers		15	14	8.9	8.6
Togo	Average	17.6 (1959)	14	22.9	27.2	11.8
	S.D.	8.9 (1959)	8.3	13.2	11.6	6.6
	Average w/o outliers	17.3 (1959)	13.9	22.4	27.2	11.7
	S.D. w/o outliers	6.6 (1959)	6.9	10.7	11.6	6.4
Uganda	Average		17.9	25.1	17.2	9.3
	S.D.		16.9	16.2	11.9	5.1
	Average w/o outliers		17	25.2	17	9.3
	S.D. w/o outliers		15	13.5	10.7	4.8
Zambia	Average		10.1	29.2	26.1	12.7
	S.D.		13	22.5	9.2	8.8
	Average w/o outliers		9.6	27.1	26.6	12.3
	S.D. w/o outliers		11.4	16.1	7.3	8.5

Source: Author's calculations.
(1) Malawi 1968

	Other	Commonwealth	United Kingdom
Average	12.6	9.2	6.8
S.D.	11.2	11.3	8.2
Average w/o outliers	12.4	8.7	6.5
S.D. w/o outliers	10.2	10.2	7.4

Overall this exercise shows that the bell-shaped distribution of the tariff rates is symmetric and that the fact of removing the highest and the lowest 5% tariff lines does not change the distribution's function.

To further support this finding, two truncated averages have been calculated by removing either the highest 5% of the ranked tariff lines (upper truncation) or the lowest 5% (lower truncation). It is noteworthy that these two averages do not differ much one from the other and that their difference has been decreasing over time. In the 1970s and in the 1980s, the difference between the upper and lower truncated averages was of the order of 4-5%; in the 1990s it was of the order of 2-3%, while in 2000/2 it was of the order of 1-2%. With three exceptions (Mozambique, Sudan and Zambia [16]), the standard deviations have decreased over time in both types of truncation and in all countries analysed.

---

[16] If the lower truncation is considered.

Table 4: Tariff Averages truncated by the 5% highest tariff rates or by the 5% lowest tariff rates

Countries	Years	Upper Truncation		Lower Truncation	
		Average	S.D.	Average	S.D.
Burundi	1970s	27.76	17.04	31.93	19.95
	1980s	32.51	25.83	39.42	33.92
	1990s	35.93	28.01	39.99	30.56
	2000/02	28.17	26.00	33.02	30.15
Central African Republic	1970s	43.54	13.44	47.24	15.31
	1980s	38.49	13.57	42.06	14.59
	1990s	32.90	10.28	35.88	11.68
	2000/02	17.48	9.27	18.62	9.20
Chad	1970s	43.02	12.94	46.44	14.35
	1980s	31.81	10.55	34.61	11.04
	1990s	32.90	10.28	35.88	11.68
	2000/02	17.48	9.27	18.62	9.20
Congo D.R.	1970s	21.98	13.30	24.87	14.48
	1980s	21.59	13.44	25.52	18.26
	1990s	33.81	15.49	36.93	16.57
	2000/02				
Ethiopia	1970s				
	1980s	29.39	23.01	31.17	22.50
	1990s	24.22	18.61	28.03	21.74
	2000/02	16.90	12.1	18.75	12.59
Haiti	1970s	28.43	13.09	30.06	11.51
	1980s non-GATT	25.94	12.94	27.47	11.66
	1980s GATT	15.62	15.06	18.85	17.81
	1990s	10.78	9.55	12.90	11.27
	2000/02	2.20	3.60	3.00	4.56
Korea	1969	45.37	29.47	53.16	42.62
	1970s	43.93	29.32	51.99	42.90
	1980s	28.25	13.42	31.31	14.03
	1990s	9.86	3.93	11.68	7.03
	2000/02	6.85	3.52	8.28	6.72
Madagascar	1970s	28.01	13.04	32.21	19.17
	1980s	50.70	23.11	56.1	25.2
	1990s	4.77	4.17	6.04	5.97
	2000/02	3.61	3.42	4.52	4.67
Malawi	1968 Other	11.76	10.31	13.32	11.15
	1968 Commonwealth	8.22	10.13	9.68	11.38
	1968 UK	6.15	7.36	7.20	8.25
	1970s	8.81	10.87	10.38	12
	1980s	12.98	10.85	15.19	12.61
	1990s	27.13	12.76	29.75	13.54
	2000/02	12.36	8.72	13.51	8.73
Mali	1959	16.53	7.32	18.45	8.34
	1970s	33.10	12.51	36.36	13.53
	1980s	21.35	11.37	24.03	12.58
	1990s	17.08	12.97	18.69	12.61
	2000/02	11.37	6.53	12.16	6.51
Mozambique	1970s	11.37	4.59	12.65	5.96
	1980s				
	1990s	5	0	5	0
	2000/02	12.33	11.04	13.70	11.40
Niger	1959	16.53	7.32	18.45	8.34
	1970s				
	1980s	21.35	11.37	24.03	12.58
	1990s	23.44	10.08	24.71	9.93
	2000/02	11.37	6.53	12.16	6.51
Rwanda	1970s	16.47	13.36	19.92	16.74
	1980s	33.89	33.03	41.82	40.97
	1990s	34.79	29.84	39.69	32.39
	2000/02	9.13	7.04	10.32	7.60
	1970s	16.14	7.72	18.20	8.98

Senegal	1978 Non EEC	19.34	6.75	20.96	6.95
	1978 EEC	14.60	6.32	16.05	6.91
	1980s	53.63	15.59	57.25	15.71
	1990s	31.41	11.79	33.89	11.04
	2000/02	11.37	6.53	12.16	6.51
Sudan	1957	24.11	3.36	25.35	6.27
	1970s	83.41	53.76	102.26	84.21
	1980s	81.51	52.25	100.41	86.03
	1990s	2.37	4.80	4.56	12.34
	2000/02	18.97	17.33	21.85	19.31
Tanzania	1970s	16.11	15.16	18.88	16.88
	1980s	23.46	14.71	26.07	15.91
	1990s	18.58	9.73	20.73	9.89
	2000/02	15.60	8.75	16.55	8.59
Togo	1959	16.53	7.32	18.45	8.34
	1970s	13.20	7.44	14.73	7.85
	1980s	21.35	11.37	24.03	12.58
	1990s	25.98	12.44	28.40	12.29
	2000/02	11.37	6.53	12.16	6.51
Uganda	1970s	16.11	15.16	18.88	16.88
	1980s	23.84	14.31	26.46	15.47
	1990s	16.08	11.05	18.09	11.52
	2000/02	8.97	5.05	9.63	4.85
Zambia	1970s	9.10	11.31	10.64	13.17
	1980s	25.73	16.82	30.71	22.03
	1990s	25.38	8.91	27.30	7.75
	2000/02	12.07	8.58	12.93	8.77

Souce: Author's calculations.

3.2.2.2 A comparison between ex-French and ex-British colonies

From the available data, summarized in table 5, it may be noted that, throughout the period analyzed, the British colonies have kept lower tariff rates than the French colonies, with the notable exception of Sudan. In the 1970s, the average tariff rate imposed by the French colonies was double that of the British colonies (excluding Sudan) and it was a third higher in the 1980s. In the 1990s and in 2000/02 the gap between the two groups shrunk to a mere 5 points difference.

Table 5: Average Ad-Valorem tariff rate for British and French colonies

	1970s	1980s	1990s	2000-02
French colonies excluding Haiti	27.5	36.3	28.3	18.0
British colonies excluding Sudan	13.9	23.3	22.9	12.8
French colonies including Haiti	27.6	34.7	26.5	16.1
British colonies including Sudan	30.6	37.8	19.2	14.4

Source: Author's calculations.

The average tariff rate in Sudan has been far higher than the average of other British colonies: in the 1970s Sudan's average was 7 times higher than the average for the other British colonies, while in the 1980s it was 4 times higher and in 2000-02 it was 'only' two times higher than that for the other British colonies. Only in the 1990s, Sudan had a lower average tariff than that of the other British colonies.

Over time Haiti has applied lower tariff rates than other French colonies, with the only exception of the 1970s. In the 1980s, Haiti's average tariff rate was a third lower than that applied by the other French colonies; while in the 1990s and in 2000-02 Haiti's average rate was respectively half and a sixth that of other French colonies.

In the 1970s and in the 1980s the trade policy of the majority of LDCs was stricter than the rates listed in table 2 would lead us to believe because the presence of non-tariff barriers has not been quantified here. For some countries, the higher rates in the 1990s could reflect the transformation of non-tariff barriers into ad-valorem tariff rates, as required by Washington-based institutions. Such a conversion has been carried out at a pace that varied from country to country.

3.2.3. Is there a relation between tariff rates and trade flows?

It is normally assumed that higher tariff rates directly constrain import flows and indirectly constrain export flows. During the period of import substitution (IS) policies, high tariffs would protect domestic, and often uncompetitive, firms from foreign competition. This type of protection is thought of moving resources out of the exporting sectors into import-competing industries, leading to an export fall. "Import substitution itself is import intensive, both because rising rates of investment in 'modern industries' have a high component of imported goods and because many IS industries rely on imports of intermediate goods and raw materials" (Kruger, 1998, p. 1516). And "even if all that IS did was to misallocate resources and result in static inefficiency, the gains from liberalizing might be sufficient so that the growth rate accelerated for a period of years." (Krueger, 1998, p. 1517)

This section aims at verifying whether the above assertions are supported by evidence in the 18 LDCs. Chart 2 contains the period variations in the tariff rates and in the real import shares in GDP. As expected, the majority of the variations in the tariff rates for the period 1970-1980 are positive, showing an increase in tariff rate in the early

1980s, with respect to the 1970s, while the tariff variations for the period 1990-2000/02 were mostly negative. The changes in imports are negatively correlated with the changes in tariff rates, i.e. the highest the tariffs the lowest the imports. The trend was steeper between the 1970s and the 1980s, indicating that a fall in tariff rate led to a greater import response than in the following decades. On average, tariffs increased by 4.1% from the 1970s to the 1980s and imports increased by 2.2% over the same period. From the 1980s to the 1990s, tariff rates fell by 7.4% and, interestingly, imports as share of GDP also fell by 2.8%. Finally, from the 1990s to 2000/02, tariff fell by 10.3%, while imports rose by 0.8%[17]. This exercise shows that the drastic fall in tariff rates of the recent decades only led to a modest increase in imports.

Chart 2: Real Imports as a share of GDP and tariff rates, period variations.
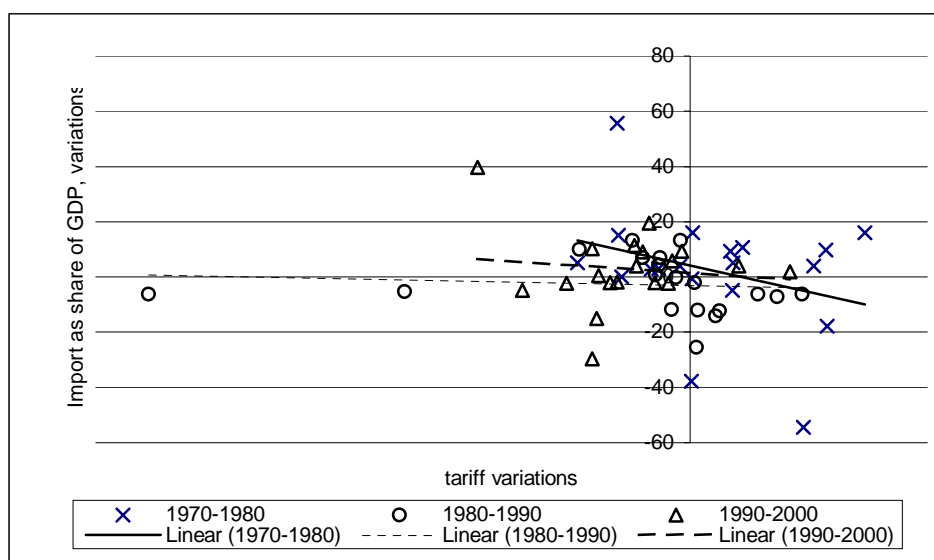
Source: Author's calculation.

Throughout the periods under consideration, tariff rates have been positively correlated to GDP growth. However, in the 1980s, 13 out of 17 LDCs had GDP growth rates that were lower than those in the 1970s, thus leading to negative variations. In the 1990s, 7 out of 19 countries had lower GDP growth rates than in the 1980s, while in 2000/02, 8 out of 19 had lower GDP growth rates than in the 1990s. Furthermore, 8 countries out of 19 had higher GDP growth rates in the 1970s than in 2000/02. The trend relationship is steeper between 1990 and 2000 than in other

---

[17] This figure excludes the D.R. of Congo. If it were included, imports would have increased by an average of 3%.

decades, indicating a greater response of growth rates to changes in import tariffs (see chart 3).

On average, over the period 1970-1980, tariff rates increased by 4.1% and GDP fell by 0.3%. The fall in tariff rates by 7.4% over the period 1980-1990, only led to an increase in GDP of 0.8%. Similarly, for the period 1990-2000 the fall in tariffs led to an increase in GDP of 1%[18]. The large falls in tariff rates were accompanied by very modest GDP growth rates. Over the entire period (i.e. 1970-2000), tariffs fell by 13.6%, on average, when GDP rose by a modest 0.8%.

Chart 3: Real GDP growth and tariff rates, period variations
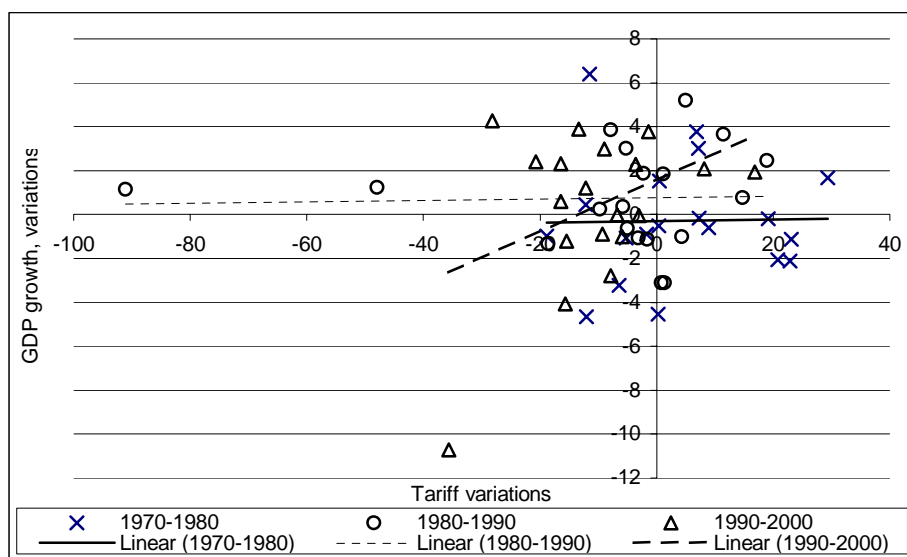
Source: Author's calculations.

During the decades of import substitution policies (i.e. the 1970s and 1980s) the government relied enormously on the tariff revenues for its expenditure planning. New domestic activities were created at that time. However, as Krueger (1998) emphasized, the gold period of import-substitution was short-lived. With the lowering of tariff rates the economy had to rely on exports and aid in order to finance their imports.

---

[18] This figure excludes the D.R. of Congo. If it were included, GDP would have included by an average of 0.4%.

Chart 4 highlights the period changes of exports and tariff rates. The trend relationship was negative in the 1970-1980 and became positive as protection rates were relaxed. This positive trend is however fictional since it is statistically insignificant. For the period 1970-1980 when tariffs increased by 4.1% on average, exports increased by a small 0.6%. In later decades, when the tariff rates started to be decreased, exports rose by 0.2% over the period 1980-1990 and by 3.9%[19] over the period 1990-2000. The fall in tariffs was accompanied by an increase in export rate in the more recent decades. This simple analysis finds some supporting evidence to the argument that import-substituting policies have had a discrete level of import intensity.

Chart 4: Real export as share of GDP and tariff rates, period averages.
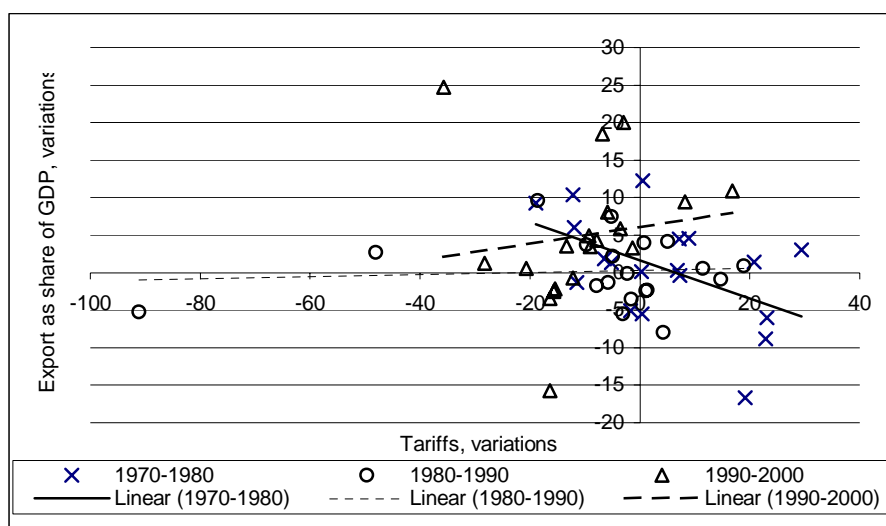
Source: Author's calculations.

Although export rates have increased recently (i.e. the past 10-12 years), the expected benefits from liberalization on GDP growth are yet to be seen.

Annex 2 shows, on a country-by-country basis, the evolution of tariff rates, import and export share of GDP and the GDP growth per decade. Typically the higher the tariff rate, the lower the import flows in the country. There are three cases where this is not true: Senegal, Tanzania and Togo in the 1980s. Senegal almost tripled its

---

[19] This figure excludes the D.R. of Congo. If it were included, the average export growth would have been 5%.

average tariff rate in the 1980s vis-à-vis the rate in the 1970s, but the share of imports in GDP did not fall. In the case of Tanzania and Togo, the import shares in GDP increased by 10 percentage points, in spite of a substantial increase in the tariff rate. It is also interesting to notice that in spite of lower tariff rates, the current import share in GDP is lower than it was in the 1970s for Chad, Madagascar, Malawi, Niger, Senegal, Togo and Zambia.

On average, the more open the economy, the higher the share of exports in GDP. With the only exception of Zambia in the 1990s and the years 2000-02 and of Central African Republic for the years 2000-01, the share of export in GDP has always been lower than the import share, leading to current account imbalances. The export share has been increasing over time. This trend is highly visible for Burundi, Congo D.R., Ethiopia, Haiti, Mali, Mozambique, Sudan (in recent years), Tanzania and Uganda. The export share in GDP remained more or less constant in Central African Republic, Chad, Madagascar, Malawi, Rwanda, Senegal and Togo (although the export share for Togo fell in recent years).

The trend in growth performance is mixed, since seven countries have experienced higher GDP growth in the 1970s and in the 1980s (Burundi, Chad, Congo D.R., Haiti, Malawi, Mali, Togo), one in the 1990s (Uganda), and the remaining countries in recent years (Central Africa Republic, Ethiopia, Madagascar, Mozambique, Niger, Rwanda, Senegal, Sudan, Tanzania and Zambia). It is worthwhile to notice that the recent positive increase in the growth rate of Sudan is primarily due to the fact that it has been exporting oil as of 2000. Furthermore, Mozambique has experienced its highest growth rate in 2000-02, when its average tariff rate had increase with respect to its previous decade.

3.3 The Influence of Conflicts on the Tariff Schedule

The changes in the tariff rates depended also on the presence of civil or border conflicts. Typically, a government of a conflict-affected country has two trade policy options: increase or decrease tariffs on arms and ammunitions' imports. An increase in tariffs, when the conflict has already started or when there is a high chance that it would occur, increases government revenue (which can in turn be used to finance the acquisition of more arms), provide a 'dissuading' effect and/or fosters arms'

smuggling from countries with a lower import tariff rate. A fall in the tariff rates brings no direct benefit to the government and it simply leads to higher flows of arms in the country.

A revenue-oriented government would therefore opt for the first option, i.e. raise tariffs in wartime and decrease them subsequently. Such a choice is supported by the available evidence on applied tariff rates on Arms and Ammunitions of Annex 3. As Keen (2003) rightly pointed out "the aim in a war is not necessarily to win" (p. 3). Within the tariff schedule, the rates on arms and ammunitions were the highest levied in at least one decade, in 12 of the countries considered.[20] For three decades (i.e. 1970s, 1980s and in 2000/02) the tariff rates on arms and ammunitions constituted the highest applied rates for the whole sample of countries considered with an average of 53.5%, 68% and 25%, respectively (see Annex 3).

Table 6 lists the years where the sample countries were affected by conflicts that were ranked as intermediate or full wars[21]. Minor conflicts were not considered because they were thought of having a negligible importance in influencing tariff policy.

Table 6: Years of Conflicts, 1960-2002.

Countries	Conflict Intensity	
Burundi	1997	Intermediate
	1998	War
	1999	Intermediate
	2000/01	War
Chad	1965-88	War
	1987	War
	1989	Intermediate
	1990	War
Congo D.R.	1964-65	War
	1978	Intermediate
	1997-00	War
	2001	Intermediate
Ethiopia	1968-73	Intermediate
	1976-91	War
	1998-00	War
Mozambique	1972-73	War
	1974	Intermediate
	1981-92	War
Rwanda	1991-92	War

---

[20] Burundi (2002), Central African Republic (1970s-1990s), Chad (1970s-1990s), Congo DR (1990s), Ethiopia (1990s), Madagascar (1970s, 1980s, 2001), Malawi (1970s), Mozambique (2001), Niger (1990s), Senegal (1970s-1990s), Sudan (1970s, 1980s, 2000), Zambia (1970s).

[21] A minor armed conflict is defined as a conflict with at least 25 battle-related deaths in one year and fewer than 1,000 battle-related deaths during the course of conflict. An intermediate armed conflict is defined as a conflict with at least 25, but fewer than 1,000 battle-related deaths in that year and an accumulated total of at least 1,000 deaths. A war is defined as a conflict with at least 1,000 battle-related deaths in that year. Prio. 2003. (www.prio.no/cwp/armedconflict/)

	1993-94	Intermediate
	1998	War
	1999-00	Intermediate
	2001	War
Senegal	1997-01	Intermediate
Sudan	1963-72	War
	1983-92	War
	1993-94	Intermediate
	1995-01	War
Uganda	1979	War
	1981-89	War
	1990	Intermediate
	1991	War
	1996-01	Intermediate

Source: Prio. 2003, available at www.prio.no/cwp/armedconflict/

Table 7 summarizes the average tariff rate raised on arms and ammunitions by war-affected and war unaffected countries. War-affected countries have imposed higher tariffs on imports of arms and ammunitions during times of conflicts. The war affected countries had double the tariff rates on arms and ammunitions than the war unaffected countries.

These results mask a very high variance among the countries analysed. Such a variance is higher in the 1970s and in the 1980s than in more recent periods and it is primarily due to the very high tariff rates on arms and ammunitions imposed by Sudan. If Sudan were excluded from the group of war-affected countries, their correspondent tariff average would fall to 34.7% in the 1970s and to 60% in the 1980s.

Table 7: Tariff average on arms and ammunitions

Countries	1970s	1980s	1990s	2000-02
War-affected	69.7	95.5 [a]	43.0	34.6
War unaffected	33.6	48.5 [b]	26.0	17.6
Standard Deviation	68.3	71.0	23.3	21.8

Source: Author's calculations.
[a] The observation for Senegal refers to the year 1984.
[b] The observation for Haiti in the 1970s was calculated as the arithmetic average between the tariffs raised to GATT and to non-GATT members.
Note: To the group of the war-affected countries belong all the countries listed in table 6, while the remaining countries have been included in the group of war unaffected.

Chad imposed the highest import tariff rates on arms and ammunitions from the early 1970s until the 1990s. The rates averaged from 65% in the 1990s to 77% in the 1970s. As shown in table 6, Chad was facing a war during the same period. Only in more

recent years, when the conflicts were over, was the tariff on arms and ammunitions lowered to being the second highest level with an average rate of 29%.

Ethiopia was affected by a conflict from 1976 to 1991. In the early 1980s, the import tariff rate on arms and ammunition was the fourth highest rate (44%), but by the end of the conflict in mid-1990s, it had become the highest rate (69%). Furthermore, in 2001, right after the end of the last conflict, the average tariff on arms was the second highest with a 34% rate.

Senegal in the 1980s assigned the highest tariff rate to arms and ammunitions, most likely for preventive reasons. However, during the most recent war (i.e. 1997-2001), the tariffs on arms were kept at the highest rate (at 45%) and only when the war was declared over, the rates were decreased to 18%, the second highest rate.

In the case of Sudan, a country that was largely affected by conflicts during the whole period analysed, the tariff rates on arms' imports reached 280% in the 1970s and 309% in the 1980s and they remained the highest rate also during the years 2000/02, with a 47% rate.[22]

Differently from the cases discussed above, Uganda and Congo D.R. imposed tariff rates on arms which were, by far, lower than those applied by other countries in times of conflicts. Furthermore, these two countries kept a rather open trade regime compared to those of other countries in wartime. Uganda taxed imports of arms and ammunitions at half the percentage raised by other comparable countries, i.e. 12% in 1996 and 6% in 2001. Similarly, Congo D.R. imposed a 29% tariff rate in 1968 and a 30% rate in 1982. It needs to be noticed that while the above rates are lower than those applied by other conflict countries, they are among the highest rates of their tariff schedule. These rates are more in line with those of non-conflict countries, such as Haiti with its 20% and 5% rates applied respectively in the late 1990s and 2001, or the 10% rate applied by Madagascar during the same period.

In period of conflicts, arms' smuggling becomes a very profitable activity. Indeed, in presence of high tariff walls at home, conflicting parties may have found it cheaper to smuggle the arms from a neighbour country with a 'softer' tariff policy.

The Mozambican case may provide a good example of this although the lack of data of its tariff policy in the 1980s limits the analysis. During Mozambique's last conflict

---

[22] Unfortunately, the tariff rate on arms and ammunition for the year 1996 was not available.

(i.e. from 1981 to 1992), Malawi, Mozambique's direct land neighbor, imposed a rate that was almost ten times lower (11% in 1987 down from 30% in 1978.).

4. *Product Analysis*

This section argues that the countries' tariff schedules have been protecting the same products and/or group of products over time.

An analysis of the highest and lowest tariff rates, carried out according to the division in section averages as per Annex 3, shows that the majority of the countries have kept the same protective structure, levying the highest rates on textiles and footwear, headgear and umbrella and the lowest rates on mineral products (see tables 8 and 9). It is interesting to notice that while the countries analyzed have diversified their highest tariff rates over time, 14 of them have concentrated their lowest tariff rates on mineral products in 2000/02. This finding is surprising since we would have expected to find the lowest duties being levied on capital good imports, which are, on average, one third higher than those levied on the imports of mineral products. Although in case of re-exports, low tariffs on mineral products may be justified, in all other cases it seems inappropriate.

According to Buffie (2001), protection should be moderate but highly escalated in order to combat underemployment, with the tariffs on consumer imports being the highest and those on capital imports the lowest. "A tariff structure that lowers the relative prices of imported equipment and intermediates promotes aggregate capital accumulation and encourages greater utilization of inputs complementary to labor" (p. 171). This pattern is found in the current tariff schedule of the LDCs where, on average, the tariff rate on capital goods is 8.67% on average, against a 17.4% applied to consumer goods. Being the demand for consumer goods typically inelastic and that for capital goods elastic, these findings are consistent with the Ramsey pricing rule, which calls for a mark-up that is inversely-related to the import demand elasticity.

Table 8: Country classification according to the highest tariff rates applied to sections of tariff policies [a]

Sections	1970s	1980s	1990s	2000/02
Live animals	Mozambique, Rwanda, Tanzania, Uganda	Rwanda	Burundi	Burundi
Vegetable products			Korea	Korea
Animal and vegetable fats	Mali			
Prepared foodstuffs, beverages and tobacco	Sudan	Congo D.R., Korea, Madagascar, Sudan, Zambia	Senegal, Sudan, Zambia	Rwanda
Artificial resins	Togo			
Leather			Uganda	Sudan
Wood			Central African Republic, Chad	Zambia
Textiles	Korea, Madagascar, Senegal	Mali, Niger, Tanzania, Togo, Uganda	Madagascar, Tanzania	Madagascar
Footwear, headgear, umbrellas	Burundi, Central African Republic, Chad, Congo D.R., Haiti, Zambia	Burundi, Central African Republic, Chad, Ethiopia, Haiti, Malawi	Congo D.R., Ethiopia, Haiti, Malawi, Mali, Niger, Rwanda	Central African Republic, Chad, Ethiopia, Haiti, Malawi, Tanzania, Uganda
Optical photography		Senegal		
Miscellaneous manufactures articles	Malawi		Togo	Mali, Mozambique, Niger, Senegal, Togo

[a] The section 19 on arms and ammunitions has been excluded.

Table 9: Country classification according to the lowest tariff rates applied to sections of tariff policies

Sections	1970s	1980s	1990s	2000/02
Live animals	Central African Republic, Chad			
Vegetable products	Senegal			
Animal and vegetable fats			Niger	
Mineral products	Burundi, Congo D.R., Korea, Malawi, Rwanda, Tanzania, Uganda, Zambia	Burundi, Congo D.R., Ethiopia, Korea, Madagascar, Malawi, Mali, Niger, Rwanda, Tanzania, Togo, Uganda	Burundi, Congo D.R., Ethiopia, Haiti, Korea, Madagascar, Malawi, Rwanda	Burundi, Central African Republic, Chad, Ethiopia, Haiti, Korea, Madagascar, Mali, Mozambique, Niger, Rwanda, Sudan, Tanzania, Togo
Chemical	Sudan	Sudan	Mali	Malawi, Senegal

products				
Artificial resins	Mali		Zambia	
Paper-making material			Senegal	
Machinery	Haiti, Mozambique	Haiti	Uganda	Uganda
Vehicles, aircrafts	Madagascar, Togo	Central African Republic, Chad, Senegal, Zambia	Central African Republic, Chad, Tanzania, Togo	Zambia
Optical photography			Sudan	

Source : Author's calculations based on Annex 3.

The product variance of the tariff rates, measured by the standard deviation, has decreased over time, except for Burundi, Congo, Mozambique and Sudan. It is interesting to notice that the product variance shows an over-time inverted U-trend. It starts off with a low variance, which is subsequently increased and then decreased to levels that are the lowest of the whole period taken into consideration (i.e. 1970s-2000/02). The decades characterized by the highest variance in product tariff rates are the 1980s and the 1990s with an average standard deviation of 17.6% and 18.7%, respectively.

On a country level, variations in tariff rates have decreased over time. Interestingly, the products that experienced the highest per country rate of tariff variation in the past are the same nowadays.

This finding is further supported by a product classification based on factor intensity of the tariff rates, which shows that, over time, countries have not changed the factor intensity of their protection. Table 10 shows that all the countries in the sample have been protecting, with the highest tariff rates, labor-intensive and resource intensive manufactures, first, and then agricultural products and medium skill, scale intensive manufactures. Within the first group of labor-intensive manufactures, 10 countries are currently protecting mostly toys and sports equipments, 7 are mostly protecting leather, textiles, apparel and footwear, while only Haiti is protecting non-metallic mineral products (see Annex 4). Within these product groups, countries have widened their protection levels to cover more products, thus increasing the average tariff rates of the product group during the 1970s and the 1980s.

Table 10: Average tariff rates of products classified according to factor intensity

Countries	Periods	Agricultural Products	Mining Products	Labor intensive manufactures	Low skill manufactures	Medium skill manufactures	High skill manufac.
Burundi	1970s	29.32	14.54	41.87	21.97	26.66	31.57
	1980s	43.8	15.09	53.31	32.79	30.41	40.18
	1990s	49.39	18.98	53.48	23.12	27.31	28.25
	2000/02	44.92	18.24	47.65	18.39	23.48	32.56
Central African Republic	1970s	45.51	37.08	57.25	39.05	45.01	36.89
	1980s	38.15	34.08	50.8	33.58	43.26	34.87
	1990s	31.73	25.42	41.09	27.04	34.94	28.04
	2000/02	21.48	15.84	25.16	17.66	18.34	12.00
Chad	1970s	44.86	37.08	56.63	38.91	44.06	36.45
	1980s	33.43	30.04	41.12	27.45	32.75	28.17
	1990s	31.73	25.42	41.09	27.04	34.94	28.04
	2000/02	17.93	10.62	24.22	17.00	17.99	12.06
Congo D.R.	1970s	24.17	15.46	31.14	19.29	25.69	19.46
	1980s	26.91	15.22	35.84	19.08	26.04	20.80
	1990s	32.41	25.28	46.93	34.70	36.76	37.82
Ethiopia	1980s	29.71	13.39	41.98	14.79	23.69	17.05
	1990s	24.82	12.07	40.58	12.25	25.57	14.93
	2000/02	15.86	8.56	26.89	11.87	19.92	12.74
Haiti	1970s	23.15	8.09	27.41	17.19	20.35	25.19
	1980s non-GATT	18.99	11.37	24.78	19.36	21.72	25.86
	1980s GATT	24.63	14.77	28.11	18.59	22.24	26.06
	1990s	26.31	13.55	18.33	13.67	12.00	13.90
	2000/02	15.30	6.79	4.71	2.13	4.73	3.28
Korea	1969	43.71	17.97	69.62	35.53	45.19	35.94
	1970s	39.26	16.10	71.87	43.04	52.60	25.46
	1980s	26.73	9.95	37.65	24.77	35.39	22.02
	1990s	13.52	5.29	10.82	8.89	12.61	8.83
	2000/02	11.53	4.09	7.37	5.54	7.83	3.95
Madagascar	1970s	18.36	14.04	33.61	17.55	31.38	28.49
	1980s	48.48	31.59	71.27	40.10	78.47	48.56
	1990s	7.68	2.79	8.60	5.48	9.04	5.62
	2000/02	7.46	2.75	8.55	4.63	6.16	4.02
Malawi	1968 Other	5.19	5.63	15.48	5.14	9.04	7.14
	1968 Commonwealth	8.44	4.91	12.33	4.73	7.15	5.09
	1968 UK	6.50	4.96	18.56	9.12	13.47	9.74
	1970s	12.01	9.48	20.69	10.15	10.76	11.69
	1980s	16.09	7.42	20.48	11.91	13.20	14.77
	1990s	21.60	10.25	37.67	24.04	33.08	29.53
	2000/02	10.08	5.27	19.75	13.81	15.03	12.26
Mali	1959	18.41	12.83	21.95	12.85	18.82	14.31
	1970s	29.82	19.99	40.01	28.22	32.77	32.38
	1980s	19.18	12.08	32.35	18.91	30.96	22.28
	1990s	20.24	13.89	23.26	14.22	15.78	10.24
	2000/02	10.30	6.54	16.29	11.56	12.57	8.80
Mozambique	1970s	13.59	8.21	11.55	13.52	10.36	12.43
	1990s	6.73	5.84	5.74	5.35	5.69	5.31
	2000/02	15.52	6.05	20.66	11.50	15.35	12.01
Niger	1959	18.41	12.83	21.95	12.85	18.82	14.31
	1980s	19.18	12.08	32.35	18.91	30.96	22.28
	1990s	24.02	18.54	28.21	17.27	26.73	19.97
	2000/02	12.63	6.83	16.28	11.65	11.95	9.18
Rwanda	1970s	18.76	9.52	28.50	15.32	12.03	13.03
	1980s	46.72	19.33	54.85	24.15	27.19	18.91
	1990s	38.56	17.48	53.75	31.44	31.06	30.37
	2000/02	11.61	6.52	13.57	6.78	11.85	7.68
Senegal	1970s	16.20	10.93	22.33	12.75	24.83	15.40
	1978 Non EEC	17.53	15.62	25.23	15.52	22.68	17.13
	1978 EEC	12.88	10.57	20.54	11.57	17.12	14.47
	1980s	58.34	53.53	63.85	46.07	59.18	51.99

	1990s	35.27	28.62	38.92	24.87	32.06	34.22
	2000/02	10.84	6.60	16.13	11.51	12.82	8.96
Sudan	1957	28.90	25.93	24.76	19.70	26.71	29.39
	1970s	91.39	68.79	127.86	76.81	95.91	80.43
	1980s	93.47	66.77	127.73	75.04	89.96	75.99
	1990s	14.46	5.72	10.27	3.47	5.79	1.40
	2000/02	24.16	9.18	34.65	13.56	23.21	9.89
Tanzania	1970s	18.03	3.24	25.16	10.00	16.50	15.47
	1980s	27.40	9.26	31.13	17.00	20.53	23.59
	1990s	18.44	12.05	19.51	10.51	12.19	14.38
	2000/02	14.92	8.36	20.53	14.63	17.28	12.81
Togo	1959	18.41	12.83	21.95	12.85	18.82	14.31
	1970s	13.05	11.27	17.44	7.78	13.14	12.33
	1980s	19.18	12.08	32.35	18.91	30.96	22.28
	1990s	21.44	17.70	33.99	22.81	29.23	25.70
	2000/02	13.04	8.04	16.60	11.57	12.55	9.66
Uganda	1970s	18.03	3.24	25.16	10.00	16.50	15.47
	1980s	30.53	10.24	31.10	17.14	20.88	23.12
	1990s	21.59	10.49	22.78	10.50	12.73	9.49
	2000/02	10.68	9.13	13.11	6.52	8.18	4.87
Zambia	1970s	14.96	6.04	20.85	15.09	8.49	13.19
	1980s	31.79	14.70	36.51	25.74	20.32	23.11
	1990s	24.67	16.52	26.91	24.63	24.46	23.78
	2000/02	14.70	7.69	17.71	8.21	13.13	8.54

Source: Author's calculations.
Note: see Annex 4 for details.

Using this product classification, it is interesting to look at the over time evolution of the product with the highest tariff rate, excluding arms and ammunitions. Table 10 shows that the majority of the countries in the sample either shifted their protection from labor intensive manufactures to medium skills manufactures or they provided the highest protection to labor intensive manufactures throughout the four decades under consideration. This form of infant industry protection is seen as necessary as the garment industry (a labor intensive manufacture) is one of the first manufacturing export sectors to develop in a low-income country. In part, this is because garment production relies on low-cost labor, but also because of the perceived high risks of operating in developing countries that often delay other types of investments.

It is interesting to notice that Haiti (currently a manufactures exporter) has switched its protection to agricultural products.[23] As expected, agricultural exporters have protected primarily labor intensive manufactures and only in recent years the tariff structure of four of them (i.e. Malawi, Mali, Rwanda and Togo) has switched to protect medium skill manufactures the highest. The only oil exporter in the sample, i.e. Sudan, has switched its highest protection over time from high-skill to medium skill manufactures.

---

[23] This may be the result of the averaging process since, from Annex 5, the highest tariff rate was raised on footwear, headgear and umbrellas, which are labor intensive manufactures.

Table 10: Country classification based on factor intensity - shifting the highest protected products from the 1970s to 2000 [1].

Shift in protection : From	Shift in protection: To	Countries
From labor intensive manufactures	to labor intensive manufactures	Burundi, Ethiopia, Madagascar, Tanzania, Uganda, Zambia
	to medium skill manufactures	Malawi, Mali, Rwanda, Togo
	to agricultural products	Haiti
From medium skill manufactures	to labor intensive manufactures	Central African Republic, Chad, Senegal
	to medium skill manufactures	Congo D.R., Niger
From low skill manufactures	to medium skill manufactures	Mozambique
From high skill technology	to medium skill technology	Sudan

Source: Author's calculations.
[1] Or available years as per annex 1.

5. *The South Korean Example*

The database contains the tariff rates for Korea from 1969 to the present day. The South Korean case can be considered as one of successful targeting since it developed under a selective protective regime, which encouraged infant industries.

As a republic, South Korea has not experienced war since the end of the Korean war of 1953. From the 1950s to the mid-1960s, its trade regime was very protected. Two subsequent liberalization attempts in 1961 (ended in 1963 for inflationary reasons) and in 1964-1965 made South Korea's trade policy more liberal than what it used to be (Baldwin, 2003). Yet, in the 1970s, South Korea had an average tariff rate (48.7%) which was higher than that of all the LDCs considered (excluding Sudan). In the 1980s its tariff rates had lowered by one third to 30%, a figure that is lower than the period average for the LDCs during that decade (i.e. 37.6%). In the 1990s and in the more recent years, the tariff average of South Korea has been half that of LDCs. Interestingly, two manufactures exporters' LDCs (Haiti and Madagascar) have current average tariff rates that are lower than the average tariff of South Korea.

It seems that South Korea undertook import substitution policies a decade or two before the LDCs did and it obtained political independence some 15 years before the average LDC did.

The lack of data on the tariff scheme of South Korea in the early 1960s does not allow identifying a clear bell-shaped trend. Chart 1 only shows the right hand side of the bell.

In the 1970s and in the 1980s, South Korea protected primarily labor-intensive goods, while in the 1990s and in more recent years it protected primarily agricultural products. The only country that followed a similar path is Haiti, an LDC that gained political independence a century before the other LDCs and that was not affected by intermediate conflicts or wars. Tariffs were lowered on labor-intensive goods only when those industries had been successfully developed.

With some exceptions, the LDCs have never reached the same levels of tariff protection of South Korea (the available data only shows those rates after Korea's liberalization in the 1960s). However, it seems that the tariff policies that the LDCs are currently following reflect those used by South Korea 10-15 years earlier. However, as Rodrik (1992b) argued, the empirical evidence is not a good guide to policy. "Observing that targeted sectors grew fast and became successful exporters is insufficient to judge the policies a success" (p. 315).

Indeed, it is widely recognised that the 'miracle' growth rates that South Korea was able to achieve relied much on industrial policies that are currently denied by the WTO agreements. These policies included liberal use of quotas to protect their domestic firms, patent-infringement to gain technological knowledge, generous export subsidies, performance requirements in the form of export-import balance requirements, domestic content requirements on foreign investors, restriction on capital flows, among others. It follows that the LDCs should not be imitating the South Korean example, but they would need to find other alternatives that would suit their features better and that would be acceptable at the international level.

6. Concluding Observations

International institutions and several economists recommend the LDCs to have a low tariff schedule. While it might seem theoretically correct, there are no proofs that it will work in practice. Such a tariff schedule resembles closely the 'unequal treaties' imposed in the 19th century by the United Kingdom over the semi-independent

countries of Latin America. Those treaties were very profitable to the 'imposing' country, but they had rather negative consequences on the 'implementing' countries.

Historically, protection was used by the currently developed countries to stimulate infant industries, to influence income distribution and to cope with the impact of recessions and wars. The anti-historical push for trade liberalisation that LDCs had to implement led to a de-industrialisation and aid-dependency that may have retarded the future development of the countries themselves. Furthermore, the positive statistical relationship between growth-openness is only a recent phenomenon that has no historical funding (Vamvakidis, 2002).

The currently developed countries took hundreds years to develop, while the LDCs are expected to do the same in a few decades since they are thought to benefit mostly from the leader-follower relation, which links them to the developed countries. But as Landes (1990) correctly noticed"it may no longer pay to be late, but better late than never".

The paper has shown that over time the tariff scheme of the LDCs follow a bell-shaped distribution with low rates in the 1970s, raised in the 1980s, and then lowered or kept constant in the 1990s and finally lowered in 2000/02. It was shown that the LDCs have lowered their average tariff rates to levels below what is considered 'optimal' by many economists. Furthermore, the analysis of the database has shown that the LDCs have kept the highest rates of tariff protection on the same products, which are primarily labor-intensive. Only Haiti, a manufactures exporting LDCs, has shifted its protection pattern over time, supporting Rodrik's view that "most if not all the arguments that favor protection for industry are likely to become less powerful as an economy develops and income grows" (1992b, p. 316). However, it needs to be stressed that in spite of these positive developments, Haiti is still a least developed country with a real per capita income of $467 in 2003, compared to $1289 for low and middle income countries.

BIBLIOGRAPHY

- Baldwin, R. E. 2003. "Openness and Growth: What's the Empirical Relationship?". NBER Working Paper no. 9578, Cambridge.

- Buffie, E. 2001. Trade Policy in Developing Countries. Cambridge: Cambridge University Press.

- Dornbusch, R. 1992. "The Case for Trade Liberalization in Developing Countries". *Journal of Economic Perspectives*. Vol. 6, No. 1, pp. 69-85.

- Landes, D. S. 1990. "Why Are We So Rich and They So Poor?". *American Economic Review*, Vol. 80, No. 2, pp. 1-13.

- Little, I., Scitovsky, T., Scott, M. 1970. "Industry and Trade in Some Developing Countries. A Comparative Study". Oxford University Press: London. OECD.

- Keen, D. 2003. Greedy Elites, Dwidling Resources, Alienated Youths. The Anatomy of Protracted Violence in Sierra Leone. International Politics and Society, 2.

- Krueger, A. 1998. "Why Trade Liberalization is good for Growth". *The Economic Journal*, Vol. 108, No. 450, pp. 1513-1522.

- Mayer, J., Butkevicious, A., Kadri, A. 2002. "Dynamic Products in World Exports". UNCTAD Discussion Paper No. 159, Geneva.

- O'Rourke, K. 2000. "Tariffs and Growth in the Late 19th Century." *The Economic Journal*, Vol. 110, pp. 456-483.

- Rodrik, D. 1992a. "The Limits of Trade Policy Reform in Developing Countries". *Journal of Economic Perspectives*, Vol. 6, No. 1, pp.87-105.

- Rodrik, D.1992b. "Conceptual Issues in the Design of Trade Policy for Industrialisation". *World Development,* Vol. 20, No. 3, pp. 309-320.

- Rodrik, D., Rodriguez, F. 2000. "Trade Policy and Economic Growth: A Skeptics Guide to the Cross-National Evidence". In Bernanke, B., Rogoff, K., eds., NBER Macroeconomics Annual 2000, Cambridge: MIT Press.

- Vamvakidis, A. 2002. "How Robust is the Growth-Openness Connection? Historical Evidence". *Journal of Economic Growth*, Vol. 7, No. 1, pp. 57-79.

- World Bank. 1991. World Development Report, 1991 – The Development Challenge. New York: Oxford University Press.

ANNEX 1 : Data Availability and Sources

Countries	Years Available	Sources
Burundi	1969	ICTB
	1981	ICTB
	1988	ICTB
	2002	Government
Central African Republic	1972	ICTB
	1985	ICTB
	1990	ICTB
	2001	WITS
Chad	1972	ICTB
	1985	ICTB
	1990	ICTB
	2001	WITS
Congo Dem. Republic	1968	ICTB
	1982	BFAI
	1991	ICTB
Ethiopia	1971 [1]	ICTB
	1981	ICTB
	1995	WITS
	2001	WITS
Haiti	1970	ICTB
	1977	ICTB
	1996	Government
	2001	Government
Korea	1969	ICTB
	1973	ICTB
	1983	ICTB
	1992	WITS
	2002	WITS
Madagascar	1967	ICTB
	1988	BFAI
	1995	WITS
	2001	WITS
Malawi	1968	ICTB
	1978	ICTB
	1987	BFAI
	1994	WITS
	2001	WITS
Mali	1959	ICTB
	1970	ICTB
	1980	BFAI
	1995	WITS
	2001	WITS
Mozambique	1968	ICTB
	1994	WITS
	2001	WITS

|		
Niger	1959	ICTB
	1980	BFAI
	1994	WITS
	2001	WITS
Rwanda	1969	ICTB
	1984	BFAI
	1993	WITS
	2001	WITS
Senegal	1959	ICTB
	1970	ICTB
	1978	ICTB
	1984	BFAI
	1997	Government
	2001	WITS
Sudan	1957	ICTB
	1971	ICTB
	1980	ICTB
	1996	WITS
	2000	Government
Tanzania	1971	ICTB
	1979	BFAI
	1993	WITS
	2000	WITS
Togo	1959	ICTB
	1971	ICTB
	1980	ICTB
	1992	BFAI
	2001	WITS
Uganda	1971	ICTB
	1977	ICTB
	1996	Government
	2001	Government
Zambia	1971	ICTB
	1987	BFAI
	1993	WITS
	2002	WITS

Legend: ICTB = International Custom Tariffs Bureau
BFAI = Bundesstelle Fur Aussenhandelsinformation
WITS = World Bank/UNCTAD World Integrated Trade Solution
Government = local government.
[1] Not classified according to the Harmonised System

Annex 2

Average tariff rates, real export and import share and real GDP growth

Uganda

Zambia

Korea
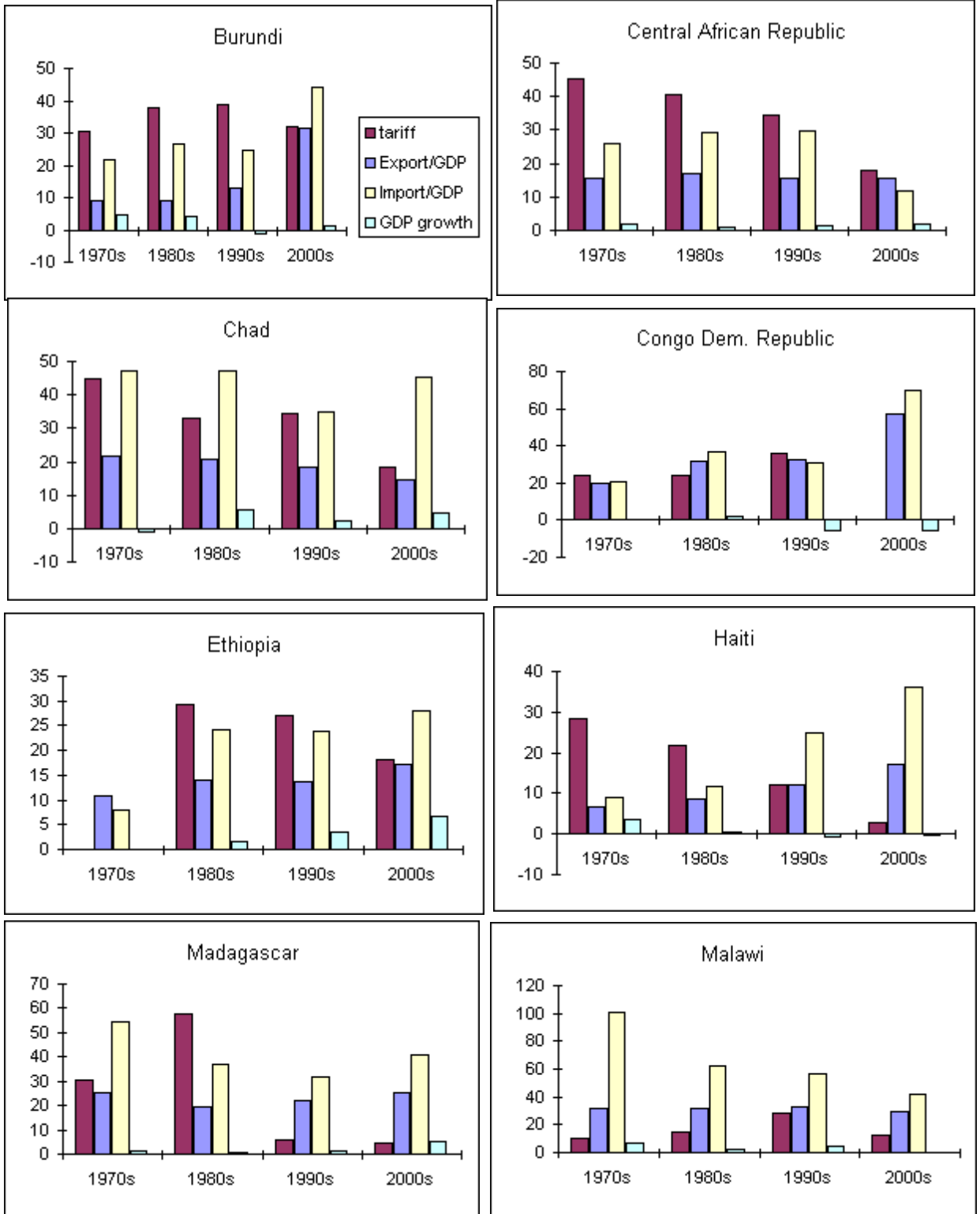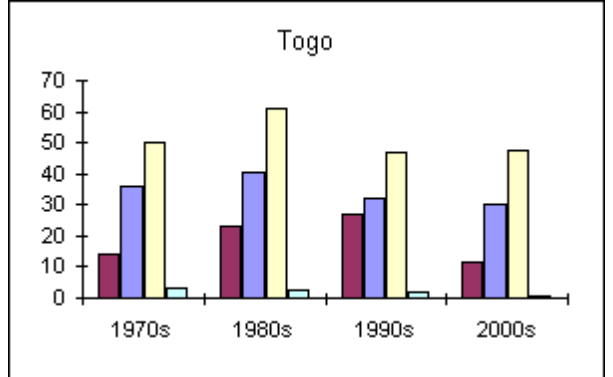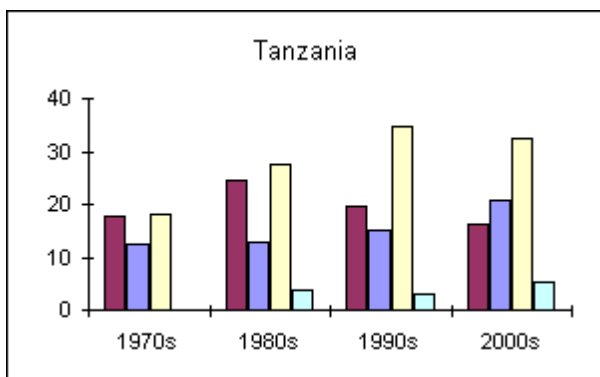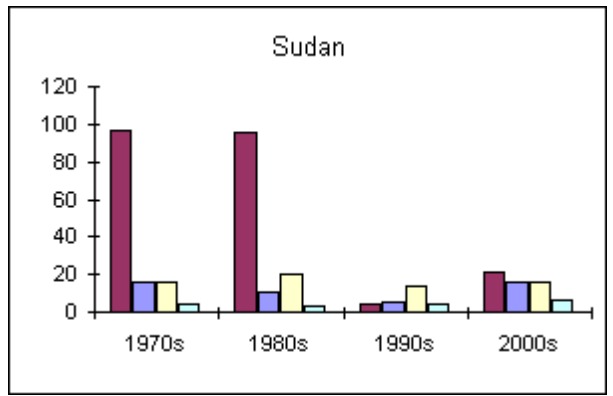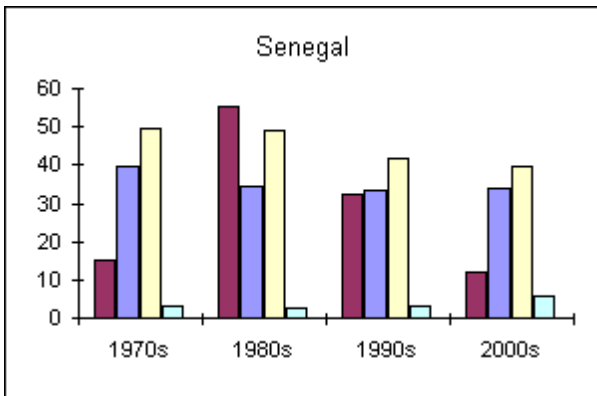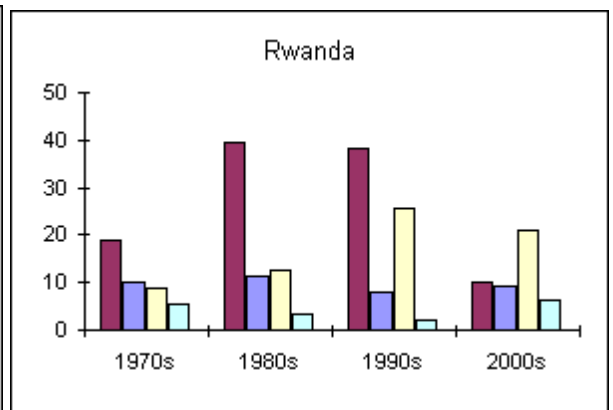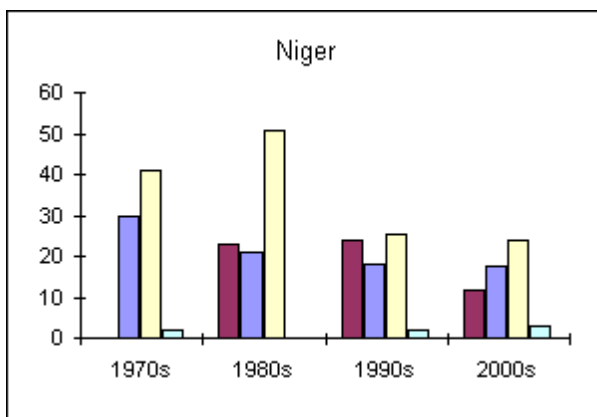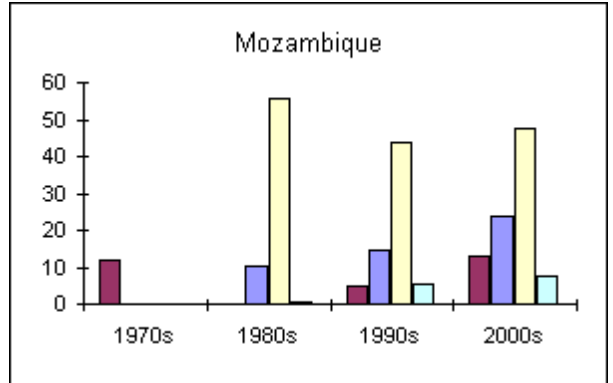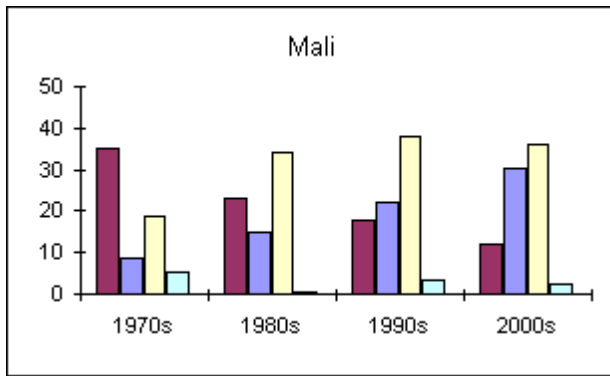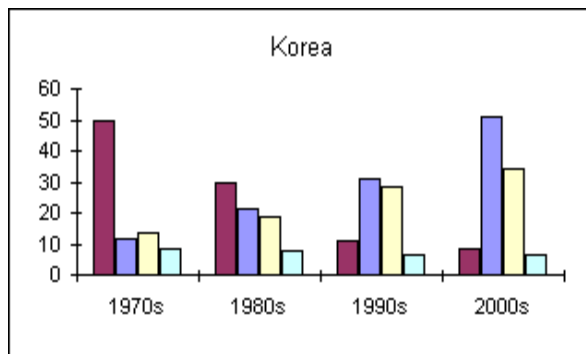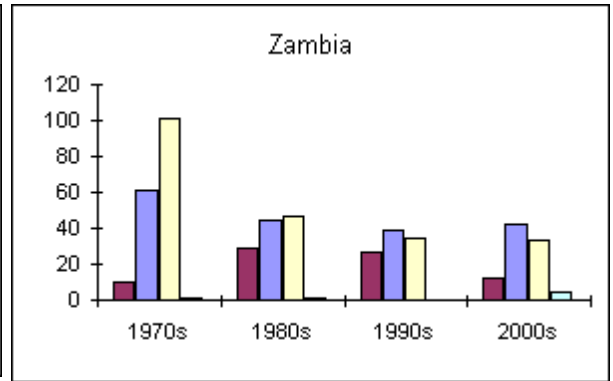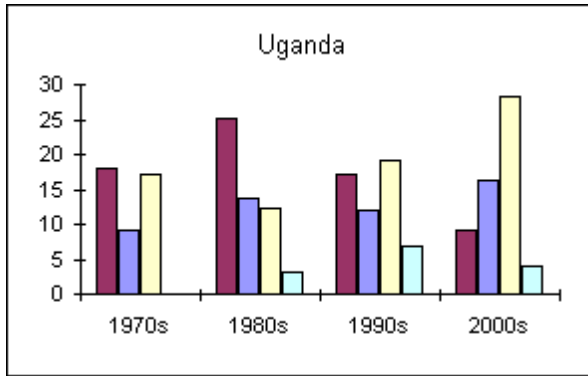
Source: Author's calculations and database and World Bank. World Development Indicators. 2003.

Note: The volume figures are in US dollars, except for Central African Republic and Sudan where the local currencies were used.

For legend, see chart on Burundi.

The real imports and export growth of Ethiopia, Tanzania, Uganda and for Central African Republic in the 1970s and in the 1980s were estimated on the basis of UNCTAD Handbook of Statistics. 2003.

Annex 3: Product classification of tariffs rates based on section groupings

Sections	Descriptions	Chapters	Burundi				Central African Republic			
			1969	1981	1988	2002	1972	1985	1990	2001
I	Live animals	1-5	40.96	69.43	90.23	89.09	25.25	24.19	20.91	23.38
II	Vegetable products	6-14	42.14	67.78	71.46	57.82	50.18	38.21	32.56	22.17
III	Animal and vegetable facts	15	12.09	20.11	29.92	20.45	49.04	41.57	38.54	24.69
IV	Prepared foodstuffs, beverages, spirits and tobacco	16-24	49.52	76.89	85.32	60.61	53.36	51.68	43.92	24.74
V	Mineral products	25-27	7.27	7.14	14.81	10.28	33.24	27.70	27.67	9.93
VI	Products of the chemicals and allied industries	28-38	18.54	18.72	21.33	17.51	40.45	33.92	33.71	11.56
VII	Artificial resins	39-40	24.00	24.84	23.49	15.20	39.30	40.71	34.55	15.88
VIII	Leather	41-43	28.67	43.62	47.90	40.94	46.19	38.10	35.48	18.49
IX	Wood	44-46	36.14	33.68	31.71	22.31	52.35	56.21	50.99	26.30
X	Paper-making material	47-49	17.64	19.60	25.55	19.16	44.51	33.27	27.26	12.89
XI	Textiles	50-63	43.64	51.18	46.95	35.78	59.26	49.19	42.45	21.56
XII	Footwear, headgear, umbrellas	64-67	55.41	85.47	81.48	73.74	67.75	60.54	48.38	29.50
XIII	Articles of stone	68-70	32.07	31.39	36.06	29.16	50.59	48.16	40.36	25.60
XIV	Pearls and precious stones	71-72	37.17	40.90	43.13	37.73	46.42	48.38	36.76	20.29
XV	Base metals	73-83	25.61	24.70	22.33	17.18	46.23	40.09	33.39	16.71
XVI	Machinery	84-85	28.33	32.04	23.64	18.68	38.87	38.07	27.80	13.68
XVII	Vehicles, aircrafts	86-89	17.37	26.38	22.34	24.09	26.85	22.37	18.95	12.58
XVIII	Optical photography	90-92	35.44	39.02	33.38	29.28	47.93	47.49	38.14	19.61
XIX	Arms and ammunitions	93	36.43	73.81	64.29	100.00	77.14	79.43	65.36	28.81
XX	Miscellaneous manufactures articles	94-97	44.72	56.63	63.56	66.76	48.67	38.98	32.96	27.41
	Standard error		20.44	33.97	30.40	29.84	16.87	16.07	12.90	9.45

Source: Author's calculations.

Sections	Chad				Congo D.R.			Ethiopia			Haiti				
	1972	1985	1990	2001	1968	1982	1991	1981	1995	2001	1970	1977 Non-GATT	1977 GATT	1996	2001
I	24.00	20.35	20.91	23.38	23.03	25.80	45.51	34.70	37.66	20.81	31.14	30.36	16.13	15.06	3.33
II	46.94	31.67	32.56	22.17	31.94	30.54	39.54	33.68	33.45	19.13	26.07	22.58	12.86	24.65	6.40
III	49.04	38.19	38.54	24.69	29.02	25.43	37.05	25.57	28.92	25.23	25.17	24.85	16.64	12.56	0.50
IV	50.42	41.42	43.92	24.74	35.40	40.38	47.24	50.87	53.63	30.03	35.09	29.59	19.89	22.31	6.85
V	33.24	27.03	27.67	9.93	11.56	11.07	23.63	10.05	9.56	6.36	23.50	24.64	1.65	5.11	0.43
VI	40.45	31.41	33.71	11.56	18.09	18.96	26.06	18.47	16.76	11.21	28.64	27.40	19.58	8.06	1.43
VII	39.30	32.11	34.55	15.88	20.42	19.59	26.97	29.45	20.00	14.03	26.66	19.68	14.68	15.03	2.51
VIII	46.19	33.81	35.48	18.49	27.43	27.50	39.61	29.69	33.30	27.60	32.29	30.97	23.60	20.19	5.24
IX	52.35	47.14	50.99	26.30	30.31	28.73	45.85	32.78	27.40	12.65	35.73	27.57	19.37	8.18	1.57
X	44.51	27.42	27.26	12.89	21.64	20.58	31.47	28.16	20.61	10.04	26.13	21.81	13.63	10.18	1.21
XI	57.17	40.86	42.45	21.56	30.21	31.68	41.39	56.12	46.45	28.29	39.77	37.08	34.33	9.14	3.63
XII	63.00	48.17	48.38	29.50	35.50	35.10	52.29	60.58	59.02	37.59	41.14	41.08	38.41	26.60	9.21
XIII	50.59	40.51	40.36	25.60	23.73	23.69	36.93	32.16	29.16	23.12	31.94	24.18	11.44	19.54	4.99
XIV	46.42	36.42	36.76	20.29	27.22	27.61	37.59	28.73	27.33	17.59	30.00	26.36	7.69	16.01	5.58
XV	46.23	31.81	33.39	16.71	19.71	19.75	33.83	17.04	15.98	14.51	31.62	27.51	7.51	10.68	1.14
XVI	38.70	27.73	27.80	13.68	16.94	16.97	27.50	16.90	15.02	12.03	16.25	15.60	17.68	6.34	0.50
XVII	26.30	17.85	18.95	12.58	17.78	17.88	33.46	12.33	10.47	9.03	18.95	18.52	18.74	9.13	2.69
XVIII	47.75	37.13	38.14	19.61	27.86	30.54	48.91	26.83	27.51	24.89	24.82	25.23	24.82	13.18	3.23
XIX	77.14	66.57	65.36	28.81	28.57	30.00	54.41	43.75	68.57	34.29	25.75	31.20	22.29	20.00	5.00
XX	48.55	29.06	32.96	27.41	32.61	34.50	47.98	39.47	43.73	28.98	27.35	23.32	22.64	14.34	3.65
S.e.	15.97	12.38	12.90	9.45	15.03	18.65	17.10	23.01	21.93	12.84	13.09	12.94	17.83	11.34	4.49

Annex 3, cont.d

Sections	Korea					Madagascar				Malawi			
	1969	1970	1983	1992	2002	1967	1988	1995	2001	1968 Other	1968 Commonwealth	1968 UK	1978
I	40.78	40.78	25.95	20.88	16.76	21.88	58.69	2.86	2.68	3.60	1.60	1.62	2.41
II	41.12	41.12	30.96	22.09	18.39	38.81	64.43	8.11	6.48	10.36	6.29	6.29	7.84
III	46.14	46.14	28.48	11.90	8.18	29.89	51.79	8.25	6.58	8.86	7.02	4.68	7.02
IV	85.80	85.80	49.11	20.21	16.80	41.49	79.25	7.96	7.28	18.46	12.98	12.18	16.91
V	13.36	13.36	8.27	3.63	2.87	18.85	34.35	0.52	0.21	2.59	0.32	0.27	0.31
VI	33.13	33.13	26.63	10.49	7.22	29.10	41.57	1.72	1.40	7.98	3.97	2.73	4.40
VII	41.51	41.51	33.08	10.56	7.62	27.03	47.87	3.25	2.76	11.61	7.82	5.42	6.61
VIII	64.92	64.92	34.98	9.14	7.09	38.54	61.99	5.71	5.71	18.21	15.95	12.38	15.95
IX	46.54	46.54	30.35	9.62	6.78	23.99	72.36	3.35	3.17	10.39	7.84	5.59	7.19
X	46.85	46.85	25.74	7.79	3.92	27.71	47.70	3.24	2.00	10.18	7.87	5.50	9.16
XI	93.39	93.39	41.12	10.62	8.93	46.36	72.20	10.65	7.62	19.72	17.53	11.31	17.39
XII	87.95	87.95	48.50	11.00	9.50	43.25	73.40	8.00	7.37	24.98	21.85	16.10	21.85
XIII	58.96	58.96	33.83	11.21	7.89	33.38	50.12	6.97	5.70	13.15	9.67	7.02	9.67
XIV	32.85	28.81	22.22	7.54	3.86	22.78	43.90	4.99	2.77	14.26	11.27	8.03	8.77
XV	45.52	43.27	27.12	9.76	6.61	22.05	43.22	4.97	3.99	10.35	6.71	4.78	9.19
XVI	40.38	32.22	23.30	10.92	6.18	25.21	49.35	7.50	4.15	13.81	9.55	7.35	8.84
XVII	26.71	34.22	22.69	7.64	4.22	18.23	37.23	6.35	4.92	8.88	5.55	3.72	6.92
XVIII	41.63	45.64	32.69	11.13	6.94	34.83	55.98	7.44	5.67	15.90	12.55	10.27	20.84
XIX	37.50	35.46	14.29	4.62	3.33	51.43	95.00	10.00	9.86	20.18	19.04	10.95	30.00
XX	77.65	71.47	39.44	9.42	6.22	31.57	66.39	5.89	5.77	26.47	20.07	16.58	13.35
S.e.	35.60	35.90	15.20	7.23	6.74	19.89	26.50	5.97	4.66	11.25	11.28	8.19	11.91

Annex 3, cont.d

	Malawi			Mali					Mozambique			Niger			
	1987	1994	2001	1959	1970	1980	1995	2001	1968	1994	2001	1959	1980	1994	2001
Sections															
I	9.52	25.41	10.93	15.05	36.01	19.50	25.91	13.78	18.75	5.00	22.23	15.05	19.50	33.58	13.78
II	13.47	26.38	12.65	10.06	29.16	16.71	24.76	13.07	12.72	5.00	18.67	10.06	16.71	26.01	13.07
III	12.58	26.81	16.33	21.66	51.73	30.92	20.20	12.52	15.11	5.00	13.07	21.66	30.92	13.05	12.52
IV	27.29	38.62	20.27	23.28	48.63	33.69	26.56	16.01	13.59	5.00	22.25	23.28	33.69	33.08	16.01
V	0.79	8.05	7.59	13.57	24.51	14.29	19.66	5.51	10.34	5.00	3.73	13.57	14.29	18.93	5.51
VI	9.92	26.38	7.44	16.57	32.03	16.07	5.48	7.66	11.14	5.00	6.74	16.57	16.07	20.73	7.66
VII	12.35	29.11	11.21	17.32	22.76	24.03	8.65	10.15	10.74	5.00	9.70	17.32	24.03	27.30	10.15
VIII	18.39	31.51	20.24	19.52	46.08	23.47	26.67	11.67	13.60	5.00	14.29	19.52	23.47	35.00	11.67
IX	12.42	29.82	16.94	15.08	40.98	24.20	20.95	11.47	12.90	5.00	11.13	15.08	24.20	16.23	11.47
X	12.12	22.53	10.67	14.84	27.53	15.91	10.36	9.17	11.04	5.00	13.64	14.84	15.91	22.64	9.17
XI	21.35	38.00	18.41	27.62	47.81	34.41	26.65	15.85	12.32	5.00	20.41	27.62	34.41	32.93	15.85
XII	29.56	46.50	25.05	20.65	50.26	33.28	28.81	17.38	17.59	5.00	21.84	20.65	33.28	35.00	17.38
XIII	15.70	31.88	16.56	18.01	40.51	27.91	23.40	17.46	14.25	5.00	10.51	18.01	27.91	15.00	17.46
XIV	11.28	24.66	12.63	19.37	31.26	23.60	19.03	9.47	10.70	5.00	10.21	19.37	23.60	22.66	9.47
XV	13.63	26.37	10.86	15.44	31.12	19.93	20.19	14.12	12.58	5.00	9.53	15.44	19.93	18.62	14.12
XVI	13.25	27.71	8.45	12.46	26.12	17.76	8.13	8.09	8.88	5.00	8.61	12.46	17.76	17.68	8.09
XVII	9.29	19.51	12.61	12.58	23.65	17.86	7.82	8.02	9.55	5.00	11.06	12.58	17.86	17.46	8.02
XVIII	27.10	34.00	16.37	21.17	42.55	31.87	18.57	12.91	14.75	5.00	16.50	21.17	31.87	28.68	12.91
XIX	10.71	38.33	22.14	22.86	41.03	34.00	24.50	17.77	12.42	5.00	30.00	22.86	34.00	35.00	17.77
XX	13.41	39.86	21.49	22.34	40.20	31.62	26.73	18.91	13.43	5.00	26.84	22.34	31.62	34.34	18.91
S.e.	12.73	14.32	8.94	8.88	14.61	13.16	12.95	6.64	6.20	0.00	11.44	8.88	13.16	10.14	6.64

Annex 3, cont.d

Sections	Rwanda				Senegal						Sudan				
	1969	1984	1993	2001	1970	1978 Non-EEC	1978 EEC	1984	1997	2001	1957	1971	1980	1996	2000
I	40.00	107.56	68.11	15.35	14.02	17.30	12.98	69.03	37.84	13.78	25.00	134.13	133.01	8.78	23.89
II	35.04	88.45	57.80	9.01	9.67	14.04	9.37	57.15	34.11	13.07	24.98	113.88	112.09	4.73	24.27
III	12.25	36.71	32.10	10.39	21.97	21.38	16.38	60.06	30.41	12.52	25.00	68.06	68.06	2.90	21.00
IV	33.10	78.76	64.27	18.92	23.24	23.55	18.79	66.02	43.33	16.01	34.38	177.05	181.92	19.69	41.78
V	8.39	13.16	14.54	4.54	10.22	15.30	10.30	52.64	32.59	5.51	25.00	75.61	75.84	2.09	6.18
VI	11.79	19.69	22.99	7.03	16.69	19.67	15.25	50.90	22.70	7.66	25.00	43.08	41.67	2.28	12.04
VII	11.57	21.67	20.82	8.10	16.97	20.33	15.33	51.83	28.59	10.15	25.00	69.73	67.76	3.87	20.69
VIII	25.00	52.26	56.32	13.38	17.14	23.37	18.37	59.58	42.98	11.67	25.00	114.17	106.68	7.86	43.71
IX	17.10	30.56	44.63	12.41	14.63	20.24	15.24	52.25	33.12	11.47	25.00	75.76	72.55	2.41	21.48
X	11.05	17.72	30.15	10.70	14.72	17.50	13.84	41.18	25.23	9.17	25.00	62.61	62.61	2.73	9.91
XI	24.99	47.88	45.36	12.73	27.80	26.15	21.15	60.90	38.24	15.85	24.56	173.47	166.19	7.50	39.19
XII	38.95	76.93	75.05	17.75	22.57	26.75	21.75	66.25	42.79	17.38	25.00	131.76	131.76	6.50	34.50
XIII	20.68	43.16	55.53	10.04	18.14	22.63	17.63	57.24	32.58	17.46	25.00	93.47	92.68	3.06	39.03
XIV	17.57	44.63	33.04	5.46	18.94	21.20	16.20	60.30	36.74	9.47	15.74	83.76	83.76	1.57	18.13
XV	13.79	21.51	34.06	9.71	14.73	18.57	13.57	53.56	31.95	14.12	21.95	73.66	72.02	3.56	15.46
XVI	8.96	25.38	24.03	7.25	12.50	16.29	11.29	44.28	25.05	8.09	24.34	79.48	77.32	1.18	9.59
XVII	9.75	20.55	21.60	5.50	14.12	12.57	9.54	41.79	29.00	8.02	23.30	77.64	74.88	1.72	8.18
XVIII	21.99	34.63	39.38	11.04	21.30	25.17	20.17	72.77	40.49	12.91	25.00	116.25	114.46	0.77	21.38
XIX	30.71	60.71	29.17	12.50	22.86	28.73	23.73	85.00	45.00	17.77	25.00	280.00	308.57		47.14
XX	30.01	60.49	70.38	15.43	22.87	27.61	22.67	57.10	42.52	18.91	25.00	83.06	81.62	5.41	16.91
S.e.	16.89	40.96	32.42	7.71	9.47	7.70	7.33	17.16	12.51	6.64	6.95	85.02	86.61	12.07	19.14

Annex 3, cont.d

	Tanzania				Togo					Uganda			
Sections	1971	1979	1993	2000	1959	1971	1980	1992	2001	1971	1977	1996	2001
I	32.51	21.50	29.75	19.15	15.05	9.32	19.50	20.32	13.78	32.51	21.50	29.18	14.15
II	30.44	36.40	28.99	20.62	10.06	7.26	16.71	24.14	13.07	30.44	37.22	26.72	10.33
III	20.07	20.18	19.55	15.21	21.66	16.04	30.92	23.07	12.52	20.07	20.18	15.84	11.16
IV	28.08	40.47	24.55	23.06	23.28	18.18	33.69	31.95	16.01	28.08	40.47	32.57	14.24
V	4.51	11.65	16.98	5.63	13.57	9.01	14.29	18.44	5.51	4.51	11.65	12.66	8.17
VI	7.98	22.78	18.82	10.12	16.57	19.46	16.07	25.42	7.66	7.98	23.12	12.61	7.66
VII	10.02	16.02	9.81	13.71	17.32	19.54	24.03	30.19	10.15	10.02	16.02	14.22	8.58
VIII	24.64	30.03	22.90	11.90	19.52	18.57	23.47	32.57	11.67	24.64	30.03	33.14	10.81
IX	21.91	24.66	21.67	18.52	15.08	11.37	24.20	28.08	11.47	21.91	24.66	30.15	13.96
X	19.62	22.52	16.78	14.90	14.84	13.25	15.91	25.85	9.17	19.62	21.17	14.02	7.68
XI	31.83	41.81	30.12	18.18	27.62	18.04	34.41	32.74	15.85	31.83	41.81	19.78	12.90
XII	30.99	33.48	25.00	24.50	20.65	17.92	33.28	34.50	17.38	30.99	33.48	32.40	14.80
XIII	22.27	23.93	17.50	22.23	18.01	15.53	27.91	35.43	17.46	22.27	23.93	13.62	13.80
XIV	10.44	21.36	19.66	17.37	19.37	15.33	23.60	27.33	9.47	10.44	21.64	16.07	9.79
XV	9.92	15.79	17.79	19.49	15.44	10.86	19.93	28.71	14.12	9.92	16.00	13.69	8.04
XVI	14.72	16.18	11.92	13.10	12.46	9.13	17.76	20.41	8.09	14.72	18.70	6.40	3.12
XVII	5.24	12.87	6.12	8.96	12.58	2.96	17.86	14.53	8.02	5.24	12.87	8.30	4.17
XVIII	18.13	26.26	11.75	18.87	21.17	14.73	31.87	33.17	12.91	18.13	26.26	18.27	6.24
XIX			8.57	21.43	22.86	16.92	34.00	4.86	17.77			12.00	6.00
XX	25.04	31.00	21.81	22.59	22.34	17.27	31.62	43.82	18.91	25.04	31.00	25.40	12.87
S.e.	16.96	16.54	10.64	8.77	8.88	8.31	13.16	13.14	6.64	16.96	16.17	11.90	5.10

Sections	Zambia				Average [1,2]				Standard Deviation [1]			
	1971	1987	1993	2002	1970s	1980s	1990s	2000-02	1970s	1980s	1990s	2000-02
I	2.05	39.64	33.25	18.78	30.49	42.16	30.06	19.95	30.16	34.65	20.92	17.80
II	8.39	42.08	31.52	18.28	32.55	42.41	29.19	17.70	25.94	27.57	15.90	11.05
III	11.60	24.02	26.14	15.22	27.37	32.82	22.14	14.60	17.79	15.20	11.20	6.45
IV	16.84	60.71	33.40	19.77	41.66	56.58	35.66	21.96	38.48	36.87	19.10	12.15
V	1.40	17.53	20.54	8.64	17.33	20.98	14.85	5.92	18.66	18.59	9.35	2.85
VI	4.64	22.95	22.58	8.85	20.93	25.05	17.73	8.47	13.10	11.10	9.98	3.61
VII	4.21	19.86	20.07	11.38	22.53	28.78	19.26	10.99	16.30	14.99	10.36	4.38
VIII	16.79	37.02	26.16	19.29	33.47	39.20	28.78	16.88	24.21	21.55	14.28	10.49
IX	8.47	36.32	32.75	23.15	28.99	36.49	25.94	14.59	19.02	17.56	15.62	7.06
X	8.00	16.14	20.89	13.29	23.59	25.63	18.40	9.98	15.27	13.55	9.39	4.32
XI	13.05	43.84	32.49	18.68	42.11	50.82	29.42	18.40	38.01	32.10	14.56	8.72
XII	24.28	38.11	32.08	22.63	43.27	53.67	36.78	23.72	28.27	27.10	21.57	14.61
XIII	12.23	24.66	26.46	13.01	30.73	35.82	25.27	17.61	20.91	18.76	14.17	8.54
XIV	11.08	27.68	23.88	5.86	26.92	34.38	23.14	12.52	19.55	18.00	12.47	8.16
XV	7.39	20.93	24.30	10.12	23.92	27.49	20.45	12.03	18.32	15.96	10.55	4.75
XVI	9.92	19.94	23.42	6.26	22.44	26.70	16.71	8.76	18.22	20.61	9.20	4.19
XVII	10.38	12.97	20.71	5.15	18.13	23.03	14.69	8.77	17.60	15.86	8.69	4.74
XVIII	22.09	27.06	25.46	10.05	32.59	40.36	24.91	14.52	25.10	22.86	13.93	6.77
XIX	31.79	37.77	27.64		53.49	68.00	32.37	24.73	68.26	70.97	23.26	21.83
XX	20.19	35.05	25.74	18.29	33.23	40.74	31.15	20.90	17.11	17.59	18.74	13.26
S.e.	13.04	22.46	9.25	8.84								

[1] Korea is excluded
[2] Burundi 1969, Congo D.R. 1968, Madagascar 1967, Malawi 1968, Mozambique 1968, Rwanda 1969 were included in the 1970s. Tanzania 1979 and Uganda 1977 were included in the 1980s. Burundi 1988 was included in the 1990s.

Annex 4: Product Classification of Tariff rates based on Factor Intensity

		Burundi				Central African Republic			
	Chapters	1969	1981	1988	2002	1972	1985	1990	2001
Agricultural Products									
Food	(0+1+22+4)	29.78	48.41	60.07	50.37	51.99	46.63	35.66	27.98
Raw Materials	(21+23+24+25+26+29)	28.85	39.19	38.71	39.47	39.02	29.68	27.80	14.99
Mining Products									
Ores and other minerals	(27+28)	12.59	13.48	20.22	17.58	33.14	28.87	23.70	13.29
Fuels	(3)	5.14	4.63	14.12	16.06	32.35	28.97	23.86	16.96
Non-ferrous metals	(68)	25.87	27.16	22.60	21.10	45.74	44.41	28.71	17.26
Labor intensive and resource intensive manufactures									
Leather, textiles, apparel and footwear	(61+65+83+84+85)	38.82	52.08	50.41	40.93	59.96	48.97	42.14	23.55
Toys and sport equipment	(894)	50.09	77.76	67.78	72.54	63.84	55.24	43.19	29.54
Wood and paper products	(63+64+82)	40.44	44.64	52.55	37.31	53.71	48.89	40.27	22.19
Non-metallic mineral products	(66)	38.12	38.75	43.20	39.82	51.49	50.10	38.75	25.37
Low skill, technology, capital manufactures									
Iron and steel	(67)	20.69	20.07	21.39	15.97	39.01	37.59	28.87	12.92
Fabricated metal products	(69)	30.93	29.84	29.27	21.87	48.30	39.25	33.95	22.03
Simple Transport equipment	((78+79)-(781/784 and 792+793))	16.94	18.30	20.68	16.91	30.92	28.00	24.02	15.02
Sanitary and plumbing equipment	(81)	29.42	64.29	24.67	16.89	52.25	44.48	38.65	24.17
Ships and boats	(793)	11.87	31.46	19.59	20.30	24.77	18.58	9.72	14.17
Medium skill, technology and scale intensive manufactures									
Rubber and plastic products	(62+893)	37.02	47.27	44.89	36.67	64.51	66.00	55.10	29.46
Non-electrical machinery	(71/74)	23.41	23.87	21.49	16.26	32.42	31.80	23.16	11.27
Electrical machinery other than semiconductor	(77-776)	28.01	30.14	23.10	20.83	39.96	38.36	31.28	16.21
Road motor vehicles	(781/784)	18.18	20.37	19.78	20.16	43.16	36.87	30.24	16.43
High skill technology and scale intensive manufactures									
Chemical and pharmaceutical products	(5)	18.91	18.40	21.17	16.96	36.59	33.31	29.84	11.23
Computer and office equipment	(75)	29.82	30.50	22.73	15.00	51.82	48.64	38.00	13.56
Communications equipment	(76+776)	48.34	60.39	37.90	24.21	50.95	49.01	36.55	19.73
Aircraft	(792)	31.88	56.77	34.12	82.89	0.00	0.00	0.00	0.00
Scientific instruments, watches	(87+88)	28.88	34.83	25.30	23.72	45.08	43.42	35.82	15.47

Source: Author's calculations. Source of product classification: Mayers, Butkevicius and Kadri. 2002.
Note: SITC Revision 2 Classification. This classification excludes Section IX on Commodities not elsewhere classified.

Annex 4, cont.d

	Chad				Congo D.R.			Ethiopia			Haiti				
	1972	1985	1990	2001	1968	1982	1991	1981	1995	2001	1970	1977 Non-GATT	1977 GATT	1996	2001
Agricultural Products															
Food	50.74	38.54	35.66	23.89	31.87	38.17	43.30	42.21	35.47	21.17	25.07	22.47	34.28	34.71	9.54
Raw Materials	38.98	28.32	27.80	11.97	16.47	15.66	21.53	17.21	14.17	10.55	21.24	15.52	14.98	17.91	21.07
Mining Products															
Ores and other minerals	33.14	26.97	23.70	9.71	12.57	12.05	26.46	12.71	11.98	7.11	4.37	7.86	7.97	8.84	3.36
Fuels	32.35	28.09	23.86	10.93	11.70	11.52	20.61	8.97	7.40	6.18	9.73	11.63	9.97	10.65	11.71
Non-ferrous metals	45.74	35.06	28.71	11.23	22.13	22.08	28.78	18.47	16.83	12.41	10.16	14.62	26.38	21.16	5.29
Labor intensive manufactures															
Leather, textiles, apparel and footwear	57.71	39.32	42.14	21.23	33.21	35.22	45.59	51.11	49.02	32.74	37.23	35.13	39.61	16.95	6.16
Toys and sport equipment	63.63	43.28	43.19	29.54	27.54	28.62	52.26	38.46	51.17	31.86	13.82	16.24	11.29	10.36	2.75
Wood and paper products	53.71	40.51	40.27	22.19	35.51	51.52	48.23	41.93	31.67	20.25	38.11	27.22	27.96	13.21	3.74
Non-metallic mineral products	51.49	41.38	38.75	23.91	28.31	27.99	41.67	36.42	30.46	22.71	20.48	20.52	33.56	32.82	6.18
Low skill manufactures															
Iron and steel	39.01	30.34	28.87	13.37	13.14	13.12	26.56	5.46	6.84	7.03	10.05	22.18	3.36	6.05	1.52
Fabricated metal products	48.30	31.33	33.95	22.03	22.81	22.92	43.34	21.90	20.88	18.94	23.72	20.90	19.24	20.67	2.37
Simple Transport equipment	30.92	23.46	24.02	15.02	21.65	19.31	27.52	9.90	6.41	6.93	17.59	15.91	19.64	7.52	0.91
Sanitary and plumbing equipment	51.58	37.53	38.65	24.17	22.46	21.47	39.92	23.56	20.87	18.37	20.83	27.83	44.86	31.63	0.83
Ships and boats	24.77	14.58	9.72	10.42	16.36	18.60	36.17	13.13	6.25	8.08	13.75	10.00	5.84	2.50	5.00
Medium skill manufactures															
Rubber and plastic products	64.11	51.76	55.10	29.46	43.85	44.78	59.93	37.17	38.63	30.94	25.43	32.47	27.77	25.64	5.07
Non-electrical machinery	32.40	22.36	23.16	11.19	11.36	10.42	21.46	11.22	9.94	8.19	11.18	10.24	12.28	4.51	0.56
Electrical machinery other than semiconductor	39.21	28.77	31.28	15.51	20.73	20.99	33.51	23.57	23.42	19.16	20.03	18.53	21.34	8.84	3.87
Road motor vehicles	40.53	28.12	30.24	15.80	26.82	27.96	32.15	22.79	30.29	21.41	24.75	25.63	27.57	9.00	9.43
High skill manufactures															
Chemical and pharmaceutical products	36.58	29.16	29.84	10.13	16.32	15.96	22.48	19.56	14.11	10.02	25.06	23.11	17.30	13.51	3.15
Computer and office equipment	51.82	38.18	38.00	13.32	20.68	20.68	37.03	13.33	11.82	11.55	23.73	24.55	28.88	4.55	0.00
Communications equipment	49.70	38.78	36.55	19.73	32.45	33.02	48.96	28.95	23.87	19.16	24.84	27.65	30.42	10.31	0.83
Aircraft	0.00	0.00	0.00	0.00	6.49	8.30	37.17	0.00	0.00	0.00	30.00	30.00	30.00	30.00	10.00
Scientific instruments, watches	44.13	34.73	35.82	17.14	21.35	26.02	43.45	23.38	24.84	23.00	22.34	24.00	23.68	11.12	2.41

	Madagascar				Malawi							Mali	
	1967	1988	1995	2001	1968	1968	1968	1978	1987	1994	2001	1959	1970
Agricultural Products					Commonwealth	UK	Other						
Food	20.51	55.86	11.77	10.65	9.87	13.89	12.13	21.11	18.83	29.21	13.46	21.26	34.49
Raw Materials	16.20	41.11	3.59	4.27	0.51	3.00	0.87	2.91	13.35	13.99	6.70	15.55	25.15
Mining Products													
Ores and other minerals	14.92	30.68	2.84	1.74	1.43	1.01	2.77	6.40	3.75	8.12	7.01	15.53	20.30
Fuels	12.17	31.58	1.76	3.24	6.07	4.55	3.59	7.15	5.61	4.90	2.91	6.78	15.24
Non-ferrous metals	15.04	32.52	3.76	3.27	9.40	9.16	8.52	14.90	12.89	17.72	5.89	16.17	24.43
Labor intensive manufactures													
Leather, textiles, apparel and footwear	48.59	76.74	11.83	13.65	21.85	15.00	23.96	21.83	25.46	41.37	22.59	25.45	52.12
Toys and sport equipment	28.37	78.05	8.13	7.95	11.97	12.75	18.63	18.72	16.62	44.12	22.45	26.90	37.50
Wood and paper products	29.06	74.73	6.66	6.08	14.71	10.54	17.50	21.81	22.58	35.91	18.20	17.09	35.01
Non-metallic mineral products	28.43	55.56	7.80	6.52	13.38	11.04	14.13	20.40	17.27	29.28	15.74	18.36	35.40
Low skill manufactures													
Iron and steel	13.29	31.41	4.71	1.92	3.96	4.07	7.83	2.92	6.16	21.22	10.10	14.11	25.42
Fabricated metal products	20.81	49.68	6.61	5.41	6.94	5.82	9.35	12.98	16.78	31.20	14.76	16.39	30.78
Simple Transport equipment	19.61	38.46	9.39	5.00	8.75	6.48	14.52	12.44	15.89	17.08	11.57	11.34	23.36
Sanitary and plumbing equipment	31.66	57.38	6.02	5.83	6.03	7.30	13.93	19.29	13.55	36.53	21.14	18.96	45.76
Ships and boats	2.38	23.60	0.69	5.00	0.00	0.00	0.00	3.13	7.19	14.17	11.46	3.44	15.80
Medium skill manufactures													
Rubber and plastic products	47.03	86.47	10.01	9.68	16.69	12.89	20.89	20.92	24.35	49.50	25.52	29.45	42.56
Non-electrical machinery	22.26	42.01	7.97	3.80	6.22	4.76	11.04	8.33	13.45	23.70	6.17	10.24	21.50
Electrical machinery other than semiconductor	32.09	134.36	7.24	4.83	13.26	10.93	16.97	8.17	13.11	28.80	12.28	14.86	30.30
Road motor vehicles	24.15	51.03	10.94	6.33	0.00	0.00	5.00	5.63	1.88	30.31	16.15	20.72	36.74
High skill manufactures													
Chemical and pharmaceutical products	21.85	33.72	1.39	2.07	4.24	3.65	7.36	4.84	11.59	22.74	6.01	15.33	24.96
Computer and office equipment	33.49	63.75	12.73	4.41	1.82	1.82	7.27	23.18	24.89	40.91	10.45	15.00	31.82
Communications equipment	34.28	68.67	5.00	4.13	12.03	8.02	14.66	13.75	11.45	40.47	19.97	17.12	44.63
Aircraft	20.17	25.00	0.00	4.17	7.34	4.60	8.28	0.42	7.81	12.92	11.25	5.40	20.42
Scientific instruments, watches	32.65	51.65	8.99	5.31	10.24	7.36	11.13	16.26	18.10	30.60	13.62	18.71	40.09

Annex 4, cont.d

	Mali			Mozambique			Niger				Rwanda			
	1980	1995	2001	1968	1994	2001	1959	1980	1994	2001	1969	1984	1993	2001
Agricultural Products														
Food	27.72	25.33	12.93	14.63	8.39	20.43	21.26	27.72	22.13	12.53	27.76	62.40	54.34	14.67
Raw Materials	10.64	15.16	7.67	12.55	5.08	10.61	15.55	10.64	25.91	12.72	9.76	31.05	22.78	8.54
Mining Products														
Ores and other minerals	12.48	18.00	5.86	8.09	5.66	6.26	15.53	12.48	14.88	5.25	9.80	16.93	14.08	5.30
Fuels	10.14	8.19	4.29	8.61	6.12	5.47	6.78	10.14	22.74	6.05	7.04	15.25	10.41	7.35
Non-ferrous metals	13.62	15.50	9.49	7.93	5.74	6.41	16.17	13.62	18.00	9.19	11.72	25.80	27.96	6.90
Labor intensive manufactures														
Leather, textiles, apparel and footwear	35.77	25.86	17.84	13.04	6.68	21.44	25.45	35.77	33.91	17.32	28.90	54.95	54.58	14.76
Toys and sport equipment	38.03	21.85	18.16	9.31	5.00	28.54	26.90	38.03	35.00	18.16	38.24	68.82	59.18	16.73
Wood and paper products	27.69	20.71	14.18	12.04	5.00	18.31	17.09	27.69	25.83	14.18	23.42	49.23	55.94	12.64
Non-metallic mineral products	27.92	24.64	15.00	11.81	6.29	14.37	18.36	27.92	18.09	15.48	23.42	46.41	45.28	10.17
Low skill manufactures														
Iron and steel	15.56	14.99	9.17	11.48	6.14	8.25	14.11	15.56	14.77	9.62	9.51	14.59	17.92	6.25
Fabricated metal products	23.32	23.04	17.09	13.34	5.00	12.73	16.39	23.32	20.64	17.09	16.38	26.41	39.02	11.14
Simple Transport equipment	20.34	6.90	7.73	11.73	5.00	9.38	11.34	20.34	16.51	7.73	8.27	12.95	16.91	2.73
Sanitary and plumbing equipment	29.68	23.66	16.11	21.04	5.00	18.33	18.96	29.68	21.67	16.11	24.71	23.89	54.63	9.39
Ships and boats	5.64	2.50	7.71	10.01	5.63	8.83	3.44	5.64	12.75	7.71	17.71	42.92	28.72	4.38
Medium skill manufactures														
Rubber and plastic products	54.74	28.87	21.86	15.84	7.50	32.98	29.45	54.74	47.72	21.86	23.53	38.37	50.71	18.72
Non-electrical machinery	14.16	4.41	6.37	6.68	5.00	6.13	10.24	14.16	15.02	6.37	6.79	23.32	17.08	4.61
Electrical machinery other than semiconductor	23.23	13.67	12.45	9.71	5.25	10.52	14.86	23.23	21.67	9.95	8.21	25.60	33.64	12.35
Road motor vehicles	31.70	16.19	9.60	9.21	5.00	11.79	20.72	31.70	22.50	9.60	9.61	21.47	22.81	11.70
High skill manufactures														
Chemical and pharmaceutical products	19.93	4.99	7.80	11.19	5.01	6.49	15.33	19.93	18.13	6.30	10.61	19.27	16.49	6.09
Computer and office equipment	23.28	11.70	8.35	11.45	5.00	7.50	15.00	23.28	17.00	11.98	12.05	22.50	33.49	5.63
Communications equipment	30.85	15.48	11.78	19.78	5.00	16.26	17.12	30.85	22.99	11.78	20.99	18.19	42.51	13.31
Aircraft	10.00	5.00	5.00	6.00	5.00	15.21	5.40	10.00	15.00	5.00	6.49	4.84	26.53	3.89
Scientific instruments, watches	27.35	14.01	11.06	13.74	6.55	14.62	18.71	27.35	26.71	10.82	15.01	29.73	32.82	9.49

54

	Senegal						Sudan					Tanzania			
	1970	1978	1978	1984	1997	2001	1957	1971	1980	1996	2000	1971	1979	1993	2000
Agricultural Products		non-EEC	EEC												
Food	22.87	19.34	14.96	63.15	34.68	13.91	32.95	111.23	115.89	25.49	32.28	22.20	32.00	21.40	21.72
Raw Materials	9.54	15.71	10.80	53.53	35.86	7.76	24.85	71.55	71.06	3.43	16.03	13.86	22.80	15.48	8.11
Mining Products															
Ores and other minerals	9.97	13.99	9.43	51.65	30.16	5.10	24.56	72.77	72.83	3.97	8.40	4.39	10.76	14.98	5.91
Fuels	8.97	15.37	9.78	53.33	24.40	5.49	28.24	65.64	59.82	7.72	6.80	4.48	8.95	6.10	5.42
Non-ferrous metals	13.85	17.50	12.50	55.59	31.31	9.22	25.00	67.96	67.67	5.46	12.35	0.83	8.08	15.08	13.77
Labor intensive manufactures															
Leather, textiles, apparel and footwear	26.77	26.75	21.75	61.31	42.21	17.89	24.89	175.70	170.32	10.35	47.54	33.29	42.20	28.61	18.42
Toys and sport equipment	25.74	28.18	24.43	70.77	42.72	18.16	24.15	153.55	157.30	2.16	24.13	18.86	21.54	11.64	22.32
Wood and paper products	17.61	22.41	17.41	63.74	36.18	14.18	25.00	83.87	86.24	20.69	33.65	24.62	33.02	18.07	21.43
Non-metallic mineral products	19.19	23.58	18.58	59.60	34.58	14.30	25.00	98.32	97.05	7.89	33.27	23.87	27.77	19.70	19.95
Low skill manufactures															
Iron and steel	13.76	15.35	10.35	52.26	28.47	9.17	10.31	61.83	60.38	4.53	16.70	5.46	13.65	14.52	16.50
Fabricated metal products	16.18	20.38	15.38	53.42	32.21	16.83	19.58	72.42	70.19	5.05	17.93	16.20	21.71	15.71	20.08
Simple Transport equipment	13.71	17.85	13.08	35.87	21.58	7.73	23.61	71.86	66.69	2.89	7.53	7.36	8.51	4.39	9.48
Sanitary and plumbing equipment	16.84	21.52	16.52	59.41	25.18	16.11	20.00	97.92	97.92	4.17	17.12	20.97	24.47	12.11	20.42
Ships and boats	3.24	2.53	2.53	29.38	16.88	7.71	25.00	80.00	80.00	0.73	8.50	0.00	16.65	5.83	6.67
Medium skill manufactures															
Rubber and plastic products	42.73	38.19	30.94	91.48	50.34	21.86	37.50	126.15	115.22	16.34	52.05	18.77	24.11	17.57	31.52
Non-electrical machinery	10.45	13.55	8.55	35.30	21.34	6.37	24.01	53.66	52.35	1.64	7.86	12.11	10.85	9.15	10.72
Electrical machinery other than semiconductor	14.01	17.28	12.28	58.47	29.70	13.45	25.00	84.48	79.54	3.08	14.47	23.27	20.37	13.53	15.40
Road motor vehicles	32.13	21.70	16.70	51.47	26.84	9.60	20.31	119.36	112.73	2.10	18.47	11.86	26.79	8.51	11.50
High skill manufactures															
Chemical and pharmaceutical products	14.28	17.96	13.36	48.15	20.48	7.19	25.24	49.38	49.15	3.77	12.80	7.45	22.76	12.95	7.51
Computer and office equipment	12.95	17.88	12.88	36.36	21.75	8.80	25.00	105.45	105.45	0.91	8.48	28.64	32.73	11.82	12.56
Communications equipment	26.15	28.02	28.85	61.97	32.50	11.78	47.92	131.30	109.43	0.64	11.47	26.47	30.62	21.53	20.63
Aircraft	5.00	0.00	0.00	55.00	59.28	5.00	25.00	20.00	20.00	0.00	6.00	0.00	10.00	10.00	5.00
Scientific instruments, watches	18.63	21.77	17.25	58.46	37.10	12.01	23.81	96.03	95.93	1.69	10.69	14.80	21.85	15.59	18.36

Annex 4, cont.d

	Togo					Uganda				Zambia			
	1959	1971	1980	1992	2001	1971	1977	1996	2001	1971	1987	1993	2002
Agricultural Products													
Food	21.26	17.68	27.72	20.94	15.87	22.20	38.66	29.23	13.11	20.13	37.93	27.03	16.93
Raw Materials	15.55	8.42	10.64	21.94	10.21	13.86	22.39	13.96	8.26	9.79	25.64	22.32	12.48
Mining Products													
Ores and other minerals	15.53	9.05	12.48	15.45	5.70	4.39	11.35	11.20	9.11	5.08	15.26	17.11	5.94
Fuels	6.78	11.13	10.14	14.73	8.70	4.48	11.11	10.22	7.87	7.30	15.28	16.30	10.17
Non-ferrous metals	16.17	13.62	13.62	22.91	9.71	0.83	8.27	10.07	10.41	5.74	13.56	16.15	6.96
Labor intensive manufactures													
Leather, textiles, apparel and footwear	25.45	19.85	35.77	36.48	17.98	33.29	42.20	27.23	12.93	21.41	43.57	30.21	19.84
Toys and sport equipment	26.90	17.51	38.03	33.08	17.55	18.86	21.54	21.44	12.92	28.64	27.65	22.12	16.75
Wood and paper products	17.09	15.52	27.69	35.15	14.18	24.62	32.99	26.77	12.48	16.60	47.90	29.16	18.87
Non-metallic mineral products	18.36	16.89	27.92	31.26	16.71	23.87	27.68	15.70	14.09	16.75	26.90	26.17	15.38
Low skill manufactures													
Iron and steel	14.11	6.63	15.56	28.29	9.40	5.46	14.32	9.18	6.27	6.59	18.75	21.67	4.28
Fabricated metal products	16.39	11.25	23.32	29.73	16.88	16.20	21.77	15.40	9.69	15.75	25.00	25.22	13.16
Simple Transport equipment	11.34	4.50	20.34	15.55	7.73	7.36	8.51	7.31	4.22	7.63	8.74	20.99	3.59
Sanitary and plumbing equipment	18.96	16.50	29.68	36.50	16.11	20.97	24.47	13.21	11.17	20.46	43.69	31.95	16.67
Ships and boats	3.44	0.00	5.64	4.00	7.71	0.00	16.65	7.42	1.23	25.00	32.50	23.33	3.33
Medium skill manufactures													
Rubber and plastic products	29.45	25.98	54.74	55.83	23.26	18.77	24.11	22.05	15.30	9.75	36.02	32.99	28.96
Non-electrical machinery	10.24	6.33	14.16	12.99	6.37	12.11	14.84	2.27	0.82	7.60	14.09	20.77	3.81
Electrical machinery other than semiconductor	14.86	12.48	23.23	24.09	10.95	23.27	19.21	11.28	6.96	11.58	22.75	24.10	8.49
Road motor vehicles	20.72	7.75	31.70	24.00	9.60	11.86	25.36	15.32	9.64	5.04	8.41	20.00	11.27
High skill manufactures													
Chemical and pharmaceutical products	15.33	17.40	19.93	22.40	8.02	7.45	23.40	10.77	7.16	7.32	21.23	18.79	7.10
Computer and office equipment	15.00	11.82	23.28	29.50	11.98	28.64	32.73	4.80	3.00	4.94	24.89	23.26	9.77
Communications equipment	17.12	19.03	30.85	37.76	11.78	26.47	28.35	19.33	9.23	22.08	34.15	33.23	14.01
Aircraft	5.40	0.00	10.00	7.33	5.00	0.00	10.00	2.00	0.58	13.75	8.96	20.00	0.00
Scientific instruments, watches	18.71	13.42	27.35	31.52	11.53	14.80	21.13	10.56	4.37	17.88	26.31	23.63	11.81

Annex 4, cont.d

	Korea					Average [1,2]				Standard Deviation [1]			
	1969	1970	1983	1992	2002	1970s	1980s	1990s	2000-2	1970s	1980s	1990s	2000-2
Agricultural Products													
Food	61.70	55.36	29.78	20.57	18.07	30.99	38.98	30.82	19.50	23.66	21.87	12.99	10.12
Raw Materials	25.72	23.15	23.68	6.47	4.98	19.93	23.50	19.30	12.44	17.26	14.51	9.97	8.03
Mining Products													
Ores and other minerals	12.92	11.09	7.03	3.23	2.49	15.12	16.97	15.07	7.21	17.65	14.94	7.75	3.71
Fuels	13.82	14.23	8.20	5.20	4.39	14.53	15.76	13.01	7.98	15.68	12.81	7.37	4.06
Non-ferrous metals	27.19	22.99	14.63	7.45	5.40	19.42	22.12	18.69	10.05	18.13	14.34	8.61	4.48
Labor intensive manufactures													
Leather, textiles, apparel and footwear	100.40	99.46	44.00	11.37	9.63	42.16	47.84	33.09	21.58	37.20	31.24	14.43	10.22
Toys and sport equipment	70.65	63.58	38.80	10.62	7.15	36.48	43.39	31.91	22.94	34.55	33.06	19.86	14.93
Wood and paper products	52.78	74.15	39.01	10.95	5.48	31.12	39.56	30.13	17.88	19.07	17.34	14.60	8.42
Non-metallic mineral products	54.65	50.30	28.78	10.34	7.21	30.13	35.10	27.35	18.17	21.41	17.81	12.47	8.76
Low skill manufactures													
Iron and steel	29.80	21.43	17.36	9.37	4.37	17.02	19.06	16.94	9.32	15.92	12.93	9.13	4.65
Fabricated metal products	46.30	55.15	28.63	11.09	7.47	24.48	27.56	23.94	15.30	17.38	12.72	11.32	5.66
Simple Transport equipment	43.33	37.35	24.32	8.18	5.35	18.16	20.53	14.15	8.19	16.14	13.06	7.95	4.45
Sanitary and plumbing equipment	58.24	71.57	38.14	11.65	8.00	29.81	35.73	25.83	15.82	22.04	19.69	14.03	6.09
Ships and boats	0.00	29.69	15.40	4.16	2.50	14.45	18.45	11.48	8.13	19.33	18.06	10.05	4.39
Medium skill manufactures													
Rubber and plastic products	86.97	79.55	46.95	15.06	10.96	37.39	46.81	37.15	25.60	28.43	22.42	17.28	10.77
Non-electrical machinery	35.61	27.39	20.17	10.67	6.44	16.54	18.89	13.61	6.88	13.09	11.39	8.09	3.92
Electrical machinery other than semiconductor	38.28	42.36	28.39	11.03	6.85	24.80	31.21	20.41	12.22	18.38	28.00	10.28	4.62
Road motor vehicles	19.88	61.10	46.04	13.68	7.07	24.77	30.83	19.79	12.85	27.94	22.21	9.59	4.36
High skill manufactures													
Chemical and pharmaceutical products	32.85	32.96	26.66	10.43	7.24	18.43	22.79	16.05	8.00	12.83	8.48	8.48	3.50
Computer and office equipment	38.49	29.26	25.99	11.00	0.75	27.22	31.91	20.28	9.20	25.20	20.88	13.26	4.08
Communications equipment	38.46	28.25	30.36	11.26	4.81	35.15	37.44	26.14	14.10	27.90	21.26	14.48	6.13
Aircraft	34.72	0.00	0.49	0.44	0.38	10.13	12.11	14.69	9.35	10.62	14.23	16.77	19.42
Scientific instruments, watches	35.16	36.82	26.62	10.99	6.54	26.85	31.12	23.12	12.67	21.31	17.34	12.24	5.83

[1] Korea is excluded
[2] Burundi 1969, Congo D.R. 1968, Madagascar 1967, Malawi 1968, Mozambique 1968, Rwanda 1969 were included in the 1970s.
Tanzania 1979 and Uganda 1977 were included in the 1980s. Burundi 1988 was included in the 1990s.