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INTRA-INDUSTRY TRADE BETWEEN MEMBERS OF THE PTA/COMESA REGIONAL TRADING ARRANGEMENT

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AFRICAN ECONOMIC RESEARCH CONSORTIUM

CONSORTIUM POUR LA RECHERCHE ECONOMIQUE EN AFRIQUE

Intra-industry trade between members of the PTA/COMESA regional trading arrangement

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By

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Abstract

Using available bilateral trade data between members of the Common Market for Eastern and Southern Africa (COMESA) formerly PTA, this study estimated the extent of intra-industry trade and the factors that determine this trade in the region. The hypothesis was that intra-industry trade exists in this region. The results of the study show that indeed this trade does exist and it is determined by the same factors as found in other regions. The principal determinant is distance, which has a negative significant relationship with intra-industry trade. Other factors include per capita income and language. The trade is more significant in bordering countries that are relatively more developed in terms of their manufacturing sectors. Special ties also seem to play a role, although the variable was not significant in the regression analysis. Improved communication networks will enhance this trade within the region.

I. Introduction

In pure theory of international trade, specialization based on comparative advantage is identified as the only source of international trade. However, it has become increasingly evident, based on even casual observations of trade figures, that there are large trade flows that are not related to specialization. Intra-industry trade is important, especially in industrialized countries.

Expanding trade among developing countries has been widely advocated and is normally one of the reasons for forming regional bodies. The approach that trade cooperation among developing countries (as a complement to trade with developed countries) should be based on regional integration is advocated for various reasons. Prospects for trade expansion are expected to be brighter in a regional context, since existing intra-regional trade, transport and communication links among others are closer than extra-regional links. Moreover, it is believed that cultural and historical ties make it easier to build on a regional foundation.

The purpose of this study is to establish the existence and extent of intra-industry trade (IIT) or two-way trade among the PTA/COMESA members of eastern and southern Africa. In addition, the aim is to scrutinize the likely factors that determine and thereby enhance or hinder intra-industry trade in the region. We test the factors commonly mentioned in literature that are supposed to influence this trade. Intra-industry trade is an area of study that has gained prominence, although much of the research has focused on developed countries. It has also been closely associated with regional integration and thus is a good topic for study in this sub-region.

The sub-region includes several countries with low per capita incomes as well as a few with medium level income. These countries, although they do belong to a group of developing countries, differ widely in terms of size among other factors. Among the objectives of most of PTA/COMESA is to increase trade among members. In general, the increase in intra-regional trade has not yet been as large as anticipated. It is for this reason that it is important to investigate intra-industry trade, for this may be an area where substantial benefit could be reaped if properly nurtured. Increasing this type of trade could assist in expanding overall intra-PTA/COMESA trade. It is our belief that factors determining this trade are different from those of inter-industry trade. There is thus a need for isolating those pertinent determinants, which is one of the prime objectives of this study.

The main objectives of the study are, therefore:

- To establish the existence and extent of intra-industry trade (two-way trade) between PTA/COMESA members.
- To scrutinize the likely factors that determine and thereby enhance intra-industry trade.
- To estimate the proposed regression model, assess the significance of the hypothesized determinants of intra-industry trade among the PTA/COMESA countries and explain the relevance of the results for policy making.
- To show the proportion of intra-industry trade in bilateral trade.

After this introduction, Section II discusses intra-industry trade, its definition and measurement. Section III gives the background and objectives of PTA and COMESA and the logic of studying intra-industry trade in the PTA/COMESA region. Section IV addresses the relationship between regional integration and intra-industry trade, while Section V presents the evidence of the existence of intra-industry trade in the region. Section VI shows the proportion of intra-industry trade in total bilateral trade. Section VII deals with the methodology used in the study and Section VIII gives estimation. Section IX is concerned with the study's empirical results and discussion. Finally, Section X offers conclusions and policy implications.

II. Intra-industry trade – Definition and measurements

Intra-industry trade (IIT) may broadly be defined as the situation where countries simultaneously import and export what are essentially the same products. The phenomenon of intra-industry trade, which is also referred to as two-way trade within the same industry, has received increasing attention since Verdoon (1960) and Balassa (1960) found evidence of increasing IIT during the years following customs union formation in Europe. Grubel and Lloyd (1975) estimated that 71% of the increase in trade between EEC countries from 1959 to 1967 was intra-industry. Explanations for IIT have been offered, such as transport costs and seasonal differences, that are also relevant to inter-industry trade. More general exposition explaining such trade involves the aspect of imperfect competition developed into the "new trade theories". (See also Appendix A.)

Intra-industry trade has been explained by many models. A group of such models is the neo-Heckscher-Ohlin models whose explanation is based on factor endowments by linking product specifications to different combinations of the basic factors, such as capital and labour. Here the main explanation for the occurrence of intra-industry trade is differences in the capabilities of different countries to produce more quality goods – vertical differentiations – and this is based on differences in the endowment of some of the basic factors of production.. The capital rich country will produce higher quality commodities and the labour rich country might produce the same commodity of lower quality, hence the basis for exchange of the same commodities. Another version of this class of models includes human capital as the explanation.

The other class of models explaining intra-industry trade is the neo-Chamberlinian models. In these models the explanation for intra-industry trade is that goods are "horizontally differentiated", that is varieties differ in their characteristics and this difference may be actual or perceived. Another group of models are neo-Hotelling models. These are related to neo-Chamberlinian models but differ in terms of how they consider consumers' demand for variety. Other models include oligopolistic models such as the Brander-Krugman model based on the Cournot duopoly model of behaviour. Yet other models includes the reciprocal dumping model where transport cost is taken into consideration, and the vertical differentiation and natural oligopolies model that takes into account the research and development expenditure for the existence of vertically differentiated products.

The models that explain intra-industry trade, while numerous, have some features in common: (1) while the models show that intra-industry trade will materialize, it is difficult to predict which country will export which commodity; (2) diversity of preferences among consumers, together with income differences, plays a significant role; (3) similarity of

tastes between trading partners plays an important role; and (4) economies of scale is an element of intra-industry trade models and may be a source of gains from this trade.

Measurement of intra-industry trade

Many empirical works on intra-industry trade focus on the testing of models and hypotheses. In measuring intra-industry trade, a definition of an industry must be adopted. One of the criteria used to show that two different products are the output of a single industry is if it is relatively easy to substitute one for the other in the production process. Closely related to this is that the products must use an identical technological intensity. The second criterion is that different products are outputs of the same industry if the consumers of the products put them to the same use. But these two criteria can be in conflict. In measuring intra-industry trade one also needs to choose the appropriate level of disaggregation to avoid "statistical artefact".

The first measure of the extent of intra-industry trade was proposed by Balassa in 1966. This measure is given as the extent to which exports of a given good are offset by imports of an equivalent good.

$$Aj = | Xj - Mj | / Xj + Mj$$

where Xj is the value of the exports of commodity j by a country, and Mj is the value of the matching imports.

However, many studies use the Grubel and Lloyd index given as

$$Bj = (Xj+Mj) - | Xj - Mj | / (Xj + Mj)$$

Xj and Mj have the same meaning as above. With the Grubel-Lloyd index, when the value is zero there is no intra-industry trade and when it is one, there is perfectly matching intra-industry trade.

Some criticism of the Grubel-Lloyd Index

Several issues can be raised in connection the Grubel-Lloyd Index in calculating intra-industry trade, despite its common use. One of the problems is classification difficulties. Many countries classify data differently, which introduces arbitrariness or randomness. This can be exacerbated by the level of aggregation of the SITC groupings. The intra-industry trade measure may be a function of the level of aggregation and thus suffer from categorical aggregation problems as it is a weighted average of the indexes for the next most dis-aggregated groups.

The classification of the commodities may suffer from downward or upward biases. Upward bias results from the heterogeneity of the commodities included in each statistical group. The downward bias stems from the inclusion of commodities with identical

technology intensity in different statistical groups. The index suffers from a downward bias if trade is unbalanced. For developing countries especially, the problem of mis-classification may be important and also the issue of entrepot/re-export activities.

The Grubel-Lloyd index is a share measure – that is the share of IIT in gross trade – and not an absolute or volume measure. A high IIT is not directly connected with a high level of gross trade in the industry. A high IIT indicates that in that particular industry a high level of the given trade is of IIT nature. Some factors that explain IIT therefore explain total trade. In addition, the index does not indicate whether one should use bilateral trade or multilateral trade. This is important especially in regional trade. In many cases bilateral trade is used.

Another problem is that it is difficult to offer a precise policy implication based on intra-industry trade as calculated from the index. For example, if intra-industry trade is high, it does not necessarily imply that the country should increase its export or imports. The same applies when the intra-industry trade is low. Based on this, calculating intra-industry trade can thus be more interesting as an empirical exercise rather than for its policy implications.

III. The background and objectives of PTA and COMESA and the logic for studying intra-industry trade in this region

The PTA/COMESA group of eastern southern and central Africa comprises about 20 countries. It started as a preferential trading area and over time its objectives and thrust widened to encompass many elements beyond the conventional definition of a preferential trading area.[1] The treaty establishing the PTA was signed on 21 December 1981 within the framework of the Lagos Plan of Action and the Final Act of Lagos. It entered into force on 30 September 1982. The objectives of the PTA as defined in the treaty and its protocols are:

- To promote cooperation and integration covering all the fields of economic activity, particularly trade, customs, industry, transport, communications, agriculture, natural resources and monetary affairs.
- To raise the standard of living of the people by fostering closer relations among member states.
- To create a common market by the year 2000 in order to allow the free movement of goods, capital and labour within the sub-region. To contribute to the progress and development of other African countries.

The PTA was created as a first step towards the establishment of the Common Market for Eastern and Southern Africa. The treaty for a common market for this region, COMESA, was signed in Kampala in November 1993 by the members of the PTA states and was ratified in December 1994. This was the second step; the third step will involve the establishment of an economic community.

In the 12 years of its existence, the PTA has recorded both successes and shortcomings. Among the successes is the establishment of supporting institutions. These include, among others, the Trade and Development Bank of Eastern and Southern Africa (The PTA Bank); the PTA Clearing House; the PTA Federation of Chambers of Commerce and Industry, to enable the private sector to participate effectively in PTA programmes for development; and preferential tariffs. Besides a system of national currency convertibility through the PTA Traveller's Cheques, PTA has a unit of account (UAPTA) as a medium of exchange and a common vehicle insurance through the "Yellow Card". The Customs Bond Guarantee and the Road Customs Transit Declaration facilitate intra-industry trade. To resolve trade disputes the Commercial Arbitration Centre has been set up. A PTA tribunal has also been established to settle disputes among member states arising from the interpretation or implementation of the treaty and common decisions. These PTA initiatives, together with other trade promotion and trade development activities, such as PTA trade fairs, buyers/sellers' meetings and the PTA Trade Information Network, have resulted in the creation of new intra-PTA trade.

A number of lessons have been learnt during the PTA's existence. One of these is the need to define clearly the strategy and objectives and to have a sense of direction. Another is that political will and commitment are essential factors determining the success or failure of economic cooperation and integration efforts. There are several other important elements. Intra-regional trade has not expanded rapidly because of the inadequacy of high quality goods that are competitive in terms of quality and packaging, and priced at levels consumers can afford. PTA markets are not integrated because of poor inter-state transport and communication as well as poor information about market and investment opportunities in these countries. Misapprehension about costs and benefits from PTA is another problem, as large and relatively more developed members are expected to gain more while small members are expected to gain less. This is especially true with those countries that have shown persistent surpluses in the intra-regional trade while others have deficits. These among other factors have led to the establishment of the Common Market for Eastern and Southern Africa (COMESA).

COMESA can be regarded as an offspring of the Abuja treaty signed on 3 June 1991 in Abuja, Nigeria, for establishing the African Economic Community. It constitutes one of the sub-regional trading blocs that will ultimately join together to form the African Economic Community. The overall objective of cooperation among PTA member states as outlined in the treaty is to promote sustainable growth and development through a significant increase in intra-PTA trade. The growth in intra-PTA trade is expected to have positive impact on other sectors of the PTA's economy, including finance, industry, agriculture, transport and communications. In addition, it has been decided that measures to increase production in the sub-region should constitute a primary objective. The main thrust of COMESA is to draw national economies closer by enhancing trade liberalization, facilitation, promotion and financing measures. The objective is to raise the share of intra-PTA trade to over 25% of its total trade by the year 2000. When full market integration is ultimately achieved, this share is envisaged to be higher.

All countries belonging to PTA/COMESA are categorized as developing. However, some fundamental differences exist within the group. These are shown in Table 1.

From Table 1 it is apparent that the PTA/COMESA members are diversified in terms of the basic indicators. The population of these countries varies from 52.8 million to 69,000. The land areas are also vastly different, while the GNP per capita ranges from $5,110 to $80. The GDP growth rate between 1980 and 1991 ranged from 8.6% to 1.0% per annum.

As mentioned above, one of the basic objectives of the PTA/COMESA strategy is to increase intra-PTA/COMESA trade to more than 25% of its global trade by the year 2000 and to a higher level thereafter. This is expected to be fulfilled after the transformation of PTA into a common market. The trade increase can be in the form of inter-industry trade (trading in commodities from different industry groups) or intra-industry trade (trading in commodities originating from same industry group). In literature it is asserted that trade liberalization following regional integration will lead to both intra-industry and inter-industry trade. However, it is advanced that the adjustment costs associated with any free trade agreement are likely to be greater when the loss of trade barriers leads to inter-industry instead of intra-industry specialization. One argument to support

Table 1: Basic indicators of some PTA/COMESA countries

Countries	Population - millions (mid 1991)	Area- thousands of square kilometres	GNP per capita- dollars (1991)	Mean tariff- percent [a]	All NTBs frequency [a]	GDP growth (1980-1991)
Ethiopia	52.8	1222	120	-	-	1.9
Burundi	5.7	28	210	37	100	4.9
Mozambique	16.1	802	80	26	100	-0.7
Rwanda	7.1	26	270	-	-	4.7
Somalia	8.1	638	120	31	100	2.4
Kenya	25.0	583	340	40	67	6.4
Tanzania	25.2	945	100	32	100	3.0
Zambia	8.3	753	420	30	100	1.4
Uganda	16.9	236	170	20	100	2.8
Lesotho	1.8	30	580	-	-	8.6
Djibouti	452[b]	22	-	-	-	-
Seychelles	69[b]	-	5110	-	-	3.2[c]
Swaziland	828[b]	17	1050	-	-	3.1/
Zimbabwe	10.1	391	650	26	100	1.6
Sudan	25.8	-	-	-	-	5.6
Mauritius	1.1	2	2410	-	-	6.7
Namibia	1.5	824	1460	-	-	1.0
Angola	9.5	-	-	-	-	-
Malawi	4.3	-	230	-	-	5.8
Comoros	492[b]	2	500	-	-	-1.0/

Sources: World Development Report (1992, 1993) and DeRosa (1992).
[b]Implies thousands; [c]is the growth of GNP for 1980-1991; [a] is for 1987.

this is that the former type of specialization may be efficient in the long run, but it necessarily produces serious dislocation in both production and employment in the short run. On the other side, intra-industry specialization would make the adjustment cost process less disruptive because, first, it would be easier for firms and plants to cease producing a given line of goods and to start producing a closely defined variety, than to move to another type of industry. Second, changes in income distribution arising from trade liberalization would not be so dramatic under conditions of intra-industry specialization (Krugman, 1981; Wannacott, 1987; Norman;,1990).

Intra-industry studies have mostly focused on trade conducted between developed countries. Studies of the link between regional trading arrangemens, and intra-industry trade includes those by Balassa (1966, 1979 and 1987), Caves (1981), Greenaway (1982), and Gavelin and Lundberg (1983), among others. Documentary evidence linking the growth of intra-industry trade to regional integration in developing countries has been provided by, for example, Balassa (1979), who found that Latin American integration (LAFTA) resulted in an increase in such trade. In fact, others have stressed that intra-industry trade is an important element in the prospects for trade among developing countries (Hughes, 1993). Hellvin (1993) analysed inter-industry and intra-industrial

specialization within the Association of SouthEast Asian Nations (ASEAN); in the case of intra-industry trade the study suggests that this trade is important.

Krugman and Obstfeld (1988) indicate that intra-industry trade is important because it produces extra gains from international trade by creating a larger market. By engaging in intra-industry trade, a country can simultaneously reduce the number of products it produces and increase the variety of goods available to domestic consumers. By producing fewer varieties, a country can produce each at larger scale and thus with higher productivity. Concurrently, consumers benefit from the increased range of choice. When intra-industry trade is the dominant source of gains from trade, the income-distribution effects will be small and there will be substantial extra gains from intra-industry trade. This is because intra-industry trade normally takes place when countries are similar in their relative factor supplies, and when scale economies and product differentiation are important. The gains from increased choice and larger scale are thus larger, as will be discussed below. Examination of whether any expansion in trade was primarily inter-industry or intra-industry in nature could provide some insights into the potential consequences of further trade liberalization (Globerman, 1992). Intra-industry trade, therefore, augments benefits obtained from inter-industry trade.

IV. The relationship between regional trading arrangements and intra-industry trade

The literature establishes a relationship between regional trading arrangements like PTA/COMESA and intra-industry trade. Drawing on the evidence accrued from various studies, both in developed and developing countries, Greenaway *et a l.* (1989) deduce that there is a causal link between intra-industry trade and regional trade arrangements. However, the theoretical analysis of the underlying mechanism is still unsatisfactory and their empirical relevance is strongly related to country-specific assumptions. Intra-industry trade may be stimulated by economic integration, but this effect is mediated by factors such as preference diversity and overlapping demand, decreasing costs in production and intra-firm trade, oligopolistic competition, and product differentiation (Behar, 1991). There are others who argue that economic integration and intra-industry trade are two phenomena that occur independently (for example, Pronfret, 1979). Another reasoning is that growing intra-industry trade as an independent phenomenon can provide a motive for economic integration (Behar, 1991). The reasons offered to explain the connection between regional integration and intra-industry trade, therefore, follow logically from the discussion of the determinants of intra-industry trade; these are discussed below.

Trading arrangements like PTA/COMESA are accompanied by the liberalization of tariff barriers among the involved economies. This trade liberalization is likely to promote trade because it is assumed that liberalization promotes trade expansion in general. A question to be answered, then, is why should economic integration stimulate intra-industry exchange to a greater degree than inter-industry exchange. It is suggested that we need to focus more closely on features of the pre-arrangement market structures (Greenaway *et al.*, 1989).

The distribution and intensity of preferences are contributory factors to the potential for intra-industry trade. If preferences are uniformly distributed across a given product, there will be a greater potential for intra-industry trade. If the pre-regional arrangement economies have like preference structures, and produce similar, but differentiated, commodities, there will be a greater inducement to intra-industry trade than would be the case with multilateral liberalization. Therefore if it is principally countries with like factor endowments, similar per capita incomes and similar demand structures that form the regional arrangement, this will be a favourable environment for intra-industry trade (Greenaway *et al.*, 1989).

The production structures and the pattern of demand existing in the preferential trading area are very important. The necessary condition for intra-industry specialization to come forth is for the production structures in individual member countries to be competitive rather than complementary. Complementary production structures may not involve

reallocation of resources within the area toward least cost producers and instead there will accrue benefits from enlargement of the market. In addition, preference of consumers can hinder intra-industry trade within the area if imports from third countries are preferred rather than locally produced goods (Drabek and Greenaway, 1984). There are cases where consumers' preferences are governed by brand image associated with foreign status (pseudo-differentiation); given this, trade liberalization may shift a country's demand for a given domestically produced product toward an imperfect substitute produced abroad by some prestigious firm (Behar, 1991).

The formation of a preferential trading area results in the reduction or elimination of non-tariff barriers. This, too, will stimulate trade expansion, directly through the reduction or elimination of these barriers, and indirectly through the reduction or removal of uncertainty.

The widening of markets resulting from trade liberalization enhances the fulfilment of decreasing costs in production. If tastes overlap, there is a benefit of decreasing costs over the relevant range of output by longer production runs and more intensive use of existing capacities (especially where excess capacity exists). The overlapping demands together with decreasing costs in the production function can encourage intra-industry trade. In addition, as income per head increases, so does the demand for variety. If forming preferential trading arrangements results in income per head rising faster than it would otherwise, then trade in differentiated goods can be expected to rise faster than otherwise.

Liberalization of capital flows can follow economic integration. Where intra-industry trade is concerned, it is likely that factor movements and trade will be complementary. Transnational corporations engaging in foreign direct investment in order to specialize in different varieties in different countries can act as the instrument of transfer. The foreign direct investment followed by intra-industry trade allows the firms to exploit the profits associated with their specific advantages, as well as providing a means for an understanding of foreign markets. This also encourages new product development and further expansion. Horizontal specialization is not the only mechanism here; vertical specialization may also be a complement factor. Firms can divide parts of the production process to take advantage of the opportunities offered by further division of labour in a larger market (Greenaway *et al.*, 1989).

Countries will therefore gain from trade liberalization, following the formation a of regional trading area, not only because this enhances trade, and thus raises the number of products available in the domestic markets. Trade liberalization also creates conditions for achieving minimum efficient scale in the new production lines, or reaping unexploited product-specific economies of scale in existing industries. Gains in the form of economies of scope would eventually be produced if the post-trade increase in product variety is due to an increase in the number of production processes observed in individual firms.

From all the factors, we can observe that there is a positive relationship between regional trading arrangements and intra-industry trade. This association is not decisive, however; it is rather that preferential trading arrangements create the environment within which intra-industry trade can increase to a greater extent than otherwise. Because of this relationship it is important to study intra-industry trade among PTA/COMESA members.

To my knowledge this kind of study has not been done because many believe that such trade does not exist in this region. It is always argued that the bulk of trade in many of these countries is on primary commodities and that they compete for developed countries' markets. Indeed, a large portion of these countries' exports is primary commodities while imports are manufactured goods from developed countries. Yet a number of the countries do trade in manufactured products within the region, in the form of both inter- and intra-industry trade. The first order of this research, then, is to establish that intra-industry trade does exist in the PTA/COMESA region.

V. The evidence of intra-industry trade in the PTA/COMESA region

Data and sources

The research required a large body of data. The data were mainly obtained from customs offices in respective countries, international organizations' publications including UN data, specifically UNCTAD publications, and other data sources in respective countries. Whenever possible we used data from respective countries as we noted that trade data reported by different countries did not tally due to the under/over-invoicing prevalent in many African countries and other problems of reporting.

Research Approach

This research is carried out in two ways. First we use statistical inferences to observe in some years the direction and magnitude of intra-industry trade between PTA/COMESA members. This includes products in all SITC groups. While it is more common to take SITC 5-9 or 5-8 (manufactured products) our choice of the groups is governed by the fact that in many developing countries the value of trade in manufactured products proper may be low, but rather larger in semi-manufactured or processed products. The inclusion of this group therefore expands the sample size while at the same time ensuring the inclusion of many countries belonging to PTA/COMESA area.

Initially, the aim was to study one pre-integration and one post-integration year. However, the availability of data from some countries and the difficulty of getting data pertaining to the same year, and in addition the ambition of observing trends, motivated the researcher to delve deeper into many years. Cross sectional data across different SITC sub-sections are used for a number of years governed by data availability. Where possible we include pre-PTA and post-PTA period.

We used a regression model for estimation based on the Grubel- Lloyd index mentioned above. The model is described in detail in Section VIII.

Data problems

It would be unrealistic to proceed and present the results of research of this magnitude without mentioning the data problems encountered. Acquiring appropriate data in some

African countries is likened to mining a very hard rock. Even after mining, there is no assurance that one will end up with the kind of mineral one was searching for; more often the reward is a large variety of ores most of them useless to say the least. In undertaking this project we encountered many problems, especially getting exactly what we needed. Because of the limited demand for very disaggregated data, it is difficult for statisticians to understand this kind of data.

Second, disaggregated trade statistics appear to pose a special problem in Africa. Many countries have stopped publishing disaggregated trade data so one either gets a computer printout that is quite large and cumbersome not to mention difficult to work with, or diskette-stored data that are in most cases unreadable. Third, many countries store their data in old and obsolete computers that even they themselves cannot read again; thus it is quite easy to lose whole years of information. The fourth and largest problem is that data obtained from different countries do not tally. For example, exports from Tanzania to Kenya should correspond with imports by Kenya from Tanzania after the required adjustments (FOB to CIF adjustment factor) have been made, but this is not the case. Maybe under/over invoicing can explain a part of the discrepancy, but we believe that data recording including different classification and categorization can explain a large part of this problem. This is evidenced by the experience of dealing with inter-industry trade, as indeed the number and trend of the applicable commodities are nearly the same, but different countries give different but close groups. Perhaps this problem will be solved after the harmonization exercise currently taking place in these countries is complete. Some countries had even different ways of classification unique to the country, but corresponding to none of the other countries until a conversion was done, (example Zambia up to 1989). Malawi's data, too, gave immense problems, as during the time considered they moved from BTN to CCCN classification then to HS. This required constant conversion.[2]

All these problems notwithstanding, we still calculated intra-industry trade for these PTA countries. We should mention that some countries showed no intra-industry trade; they imported or exported much to the region but imported or exported from outside the region. We therefore eliminated these countries from the outset. This is especially true with the smaller countries of the region, and those with very small manufacturing sectors.

General observations

There is an observable interesting phenomenon pertaining to intra-industry trade flows in the countries belonging to the PTA region. This is that there appears to be a sort of specialization by trading partners. The specialization seems to be governed by proximity, including easy transport and communication, common borders and similar cultural backgrounds, and relatively similar levels of development including size. Historical ties also play a major role in enhancing this trade. It also seems that the relatively more advanced a country is, the more the intra-industry trade is caused by both demand and supply factors. Demand includes the search for variety, while supply reflects the capability of the country to produce the commodities in excess of the domestic market, thus benefiting

from economies of scale, This is evident with, for example, Kenya and Zimbabwe. The contrary is true for less advanced countries that are also small, like Rwanda, Burundi, Lesotho, Seychelles, Comoros, Djibouti, etc. Some of these countries have no intra-industry trade with any country in the region, while they import a large number of commodities from the region.

Intra-industry trade for Zambia

Zambia shows large intra-industry trade with Zimbabwe, Tanzania and Malawi, and to a lesser extent with Kenya. The first three of these countries border Zambia. There is also scattered intra-industry trade with Swaziland and Lesotho but this trade is very sporadic.

Zambia and Zimbabwe: The two countries have a special relationship, for both belonged to Rhodesia (south and north) and thus expectedly there are relatively better developed transport and communication systems. The proximity is quite good as it takes about 5 to 6 hours to travel from one capital to another by road. The level of development is not so much in divergence if GNP per capita can be used as the yardstick; in 1991 the per capita income of Zambia was US$ 420 while that of Zimbabwe was US$ 650. Intra-industry trade between the two countries is large. It has grown from zero commodity groups in intra-industry trade in 1979 to 57 groups in 1987. Out of the 57 commodity groups, 45 belong to the manufactured products proper (SITC 5-8). This trend is consistent for most of the years although there is some slight increases and decreases. The year with the highest number of commodities indicating intra-industry trade is 1992. The number for 1993 does not indicate a decrease but the trade is only up to May of that year.

Zambia and Tanzania: Intra-industry trade between these two countries is also quite large relative to the other countries. Indeed, as with Zimbabwe, Zambia has had a special cordial relationship with Tanzania, at political and economic levels among other areas. The transport and communication systems between them are good, facilitated by the joint building of the railway line, TAZARA, an all weather tarmac road and a pipeline. Zambia has been using the Dar es Salaam harbour facilities for a long time. The countries share a common border and cultural relationship. The intra-industry trade between the two countries increased tremendously from the pre- to post-PTA period. In 1979 there were only 11 commodity groups indicating intra-industry trade and in 1981 there were 12. By 1987, the number had more than doubled to 32 groups and in 1988 there were 38 groups. A fall in 1991 is difficult to explain, since 1992 seems to have caught up. Again, the concentration of this trade is in manufactured products proper (SITC 5-8), though in many of the groups the intra-industry trade is not very high.

Zambia and Malawi: Intra-industry trade between these two countries is

relatively high although not to the levels of Zimbabwe and Tanzania. In 1979 there were 12 commodity groups; these grew to 18 in 1987 and 31 by 1992. The same factors as those pertaining to Zimbabwe and Tanzania can be can be cited for Malawi. Common border, language proximity, and especially the good transport and communication systems, are the plausible factors to explain this trade. The concentration of this trade is on manufactured commodities.

Zambia and Kenya: There is evidence of the existence of intra-industry trade between Zambia and Kenya. However, the number of commodity groups here is small. In 1979 there were 4 groups and in 1987 there were still 4. In 1988 they dropped to 2, but picked up in 1990 and by 1992 reached 8 groups. Although the increase is apparent and in percentage terms it is quite large – 100% from 1987 to 1992 – it is likely that these are just coincidences as there is no trend either to increase or decrease. As with trade between Zambia and Zimbabwe, Tanzania and Malawi, trade with Kenya is constrained by appearing factors. Lack of common borders between the two countries, which leads to lack of cultural relationship especially with border dwellers, difficult transport and poor communication systems are among the factors.

Kenya's intra-industry trade

Kenya is among the countries that show a large amount of both inter-industry trade and intra-industry trade. One of the explanations is that Kenya has a relatively more developed manufacturing sector, and through its membership in the East African Community it easily accessed the markets of the other two countries. It could also penetrate other markets within the region with its manufactured products. Kenya indicates intra-industry trade with Ethiopia, Comoros, Seychelles, Rwanda, Burundi, Somalia and Sudan, but the trade is small and in many cases not consistent over years.

Kenya and Tanzania: The intra-industry trade between the two countries is large. Not only that, it seems to have grown by great leaps. In 1983 there were only 11 commodities that showed intra-industry trade, and the majority did not belong to manufactured products. This situation changed drastically; by 1991 the number of commodities had increased more than four times. The bulk of the products are manufactured and semi-manufactured goods. Needless to say, we expect this trade to increase even more in the future as Tanzania catches up with other countries in the region on trade promotion, and the manufacturing sector not only expands but is geared to exports.

Kenya and Uganda: There is evidence of some intra-industry trade between the two countries although not as much as with Tanzania. Surprisingly, the larger portion of this trade is shown in 1975 with 27 products, and a bigger percentage belonging to manufactured products. Thereafter, with the breakdown of the East African Community,

the number of products dropped drastically. They increased again, except in 1990 when we have only two commodities. The explanation for this is that, typical of the other countries, the transport and communication network between these two countries is relatively good. Cultural ties and language play an important role, and, in addition, both countries have a history in common. The apparent reason for the low intra-industry trade is that Uganda has a less developed manufacturing sector. Thus we find a typical example of availability being the constraining factor. Indeed, Uganda imports a very large number of manufactured products from Kenya but exports very little.

Kenya and Zimbabwe: One would expect a large portion of trade of intra-industry specialization to take place between the two countries because both have a relatively developed manufacturing sector as compared to other countries. However, this has not proven to be the case. Evidence indicates that in 1983 there were very few products, only two. By 1989 these products increased to 8 and in 1990 there were 9. The largest number was in 1991, with 20 products. There is only a small figure for 1992, but it may be that the data are incomplete. It seems that factors that promote trade between some countries are the same factors that hinder trade between others. Proximity seems to play a big role in this region as transport costs are great. There are high transit costs if goods have to be ferried across another country, together with other inconveniences, for example handling charges, delays, theft on the way, etc. – the number of problems is endless.

Tanzania's intra-industry trade.

The observable feature of this trade as related to Tanzania is its concentration with Kenya and Zambia; the latter is explained in the Zambia section. Although Tanzania, Uganda and Kenya belonged to the defunct East African Community, the intra-industry between Tanzania and Uganda is quite small. Tanzania's intra-industry trade with Zimbabwe, Malawi, Burundi and Rwanda among others is also small.

Tanzania and Kenya: Intra-industry trade between the two countries is large, but was larger in 1975 during the East African Community. Here we find many commodity groups that show intra-industry - 74 in all. These dwindled to only 8 in 1981 after the break-up of the East African Community and closure of the border. The number picked up by 1989, when there were 32 groups, and in 1991 wiyh 38 groups. Factors explaining the large intra-industry trade between the two countries are, again, good transport and communication networks, proximity, common border, language, historical ties, including the East African Common market and Community, and -especially for Tanzania- the policies instituted from 1984 including trade liberalization that have motivated individuals to expand trade.

Tanzania and Uganda: There seems to be quite a large amount of inter-industry trade taking place but very little intra-industry trade. This phenomenon can be

attributed to the fact that while the two countries belonged to the defunct East African Community, they both depended on manufactured products imported from Kenya. There was therefore a lack of developed market links between the two countries. It might also be the fact that Uganda lacks a developed manufactured sector. The data show that in 1975 there were only two commodities in intra-industry trade between the two countries. This type of trade did not develop over time; rather, one gets a sporadic one or two products over the years.

Ethiopia's intra-industry trade

There is evidence of intra-industry trade in the case of Ethiopia. Typical of the other countries in the region, it seems that the bulk of intra-industry trade is with Djibouti. Again proximity and a special relationship play a big role. In 1988 there were 11 products indicating intra-industry trade between Ethiopia and Djibouti. In 1989 this had dropped to 9 products but in 1990 there were 12 and in 1991 there were 14 products. Kenya also shows high intra- industry trade. Other countries, including Zimbabwe, Sudan, Tanzania, Uganda, Zambia, Namibia and Mauritius, also show intra-industry trade with Ethiopia but very infrequently.

Sudan's intra-industry trade

Evidence indicates that there is little intra-industry trade between Sudan and other PTA member countries. The larger proportion of this trade is with Ethiopia and quite a small portion is with Kenya. This again proves the hypothesis that many of these countries specialize in trading within the PTA region, and proximity as well as a special relationship play a big role.

Malawi's intra-industry trade

Data obtained from Malawi have been presented in different ways of classification. From 1980 to 1983 the classification of the trade data was BTN. From 1984 to 1989 it was by CCCN, and since 1990 by HS harmonized system. We did not use the 1990 data as they were only up to September; the comparison with the other system was difficult and could have misled the casual observer on the actual trend of this trade. We instead decided to present the data as they were, rather than converting into SITC codes because of lack of time. In future, however, this conversion will be done. Because of the different way of classification, and given that the data were on two-digit levels of aggregation, it is not possible to compare these tables with those from different countries. Our main interest is in the trend of this trade.

Data from Malawi indicate a large intra-industry trade between Malawi and Zimbabwe. This trade was higher in the beginning of the 1980 s than it was later in the decade.

Among the possible reasons for this are proximity and well-developed transport and communication systems.

Another interesting observation with the Malawi data is the intra-industry trade with Mozambique. Malawi is the first country in our sample to show high intra-industry trade with Mozambique. This trade is concentrated at the beginning of the 1980s and decreases toward the late 1980s to nearly nothing. This can be explained by the internal fighting in Mozambique especially during the mid to later part of the decade. When this trade was high, proximity seems to have played a big role. Malawi also shows large intra-industry trade with Zambia, which was discussed with the Zambian data. Tanzania and Kenya also contribute to Malawi's intra-industry trade. Some other countries also show a little intra-industry trade in some years, including Swaziland and Lesotho.

Zimbabwe's intra industry trade

The data available to us show that Zimbabwe is one of the countries in the PTA region that exhibit a very high level of intra-industry trade with many countries. The countries include Malawi, Zambia, Mozambique, Tanzania, Kenya, Swaziland, Ethiopia, Sudan, Angola and Lesotho. We have detailed data for Zimbabwe for only 1991 and we observe that in intra-industry trade between Zimbabwe and other PTA countries the highest number of commodities are found between Zimbabwe and Zambia. As explained in the Zambia section this is not surprising since the two countries are neighbours connected with a good transport system; in the past they were one country and they share a border. Zimbabwe and Malawi data give 83 products, while between Zimbabwe and Mozambique there are 81 products. These two are neighbouring Zimbabwe and again have good transport systems. Kenya shows 41 products, Swaziland 24, Mauritius 18, Lesotho 8, Tanzania 6, Angola 4, Namibia 5, Sudan 1 and Burundi 1. An interesting observation is that most of the goods in the intra-industry trade between Zimbabwe and the rest of the PTA/COMESA countries are manufactured products.

Evaluation of the empirical findings

A number of observations can be drawn from these collected data. Intra-industry trade does exist between these countries of the PTA/COMESA region. However, the trade is concentrated in certain countries as shown above. The levels of the trade are low as compared to advanced countries and even the more advanced developing countries. In 1984, intra-industry trade between NICs was 22.1% while that between LDCs was 12.0 %.[3] This trade is much higher between developed countries, depending on the category. We explained earlier the determinants of intra-industry trade and its connection with economic integration. We noted that theory predicts that intra-industry trade is determined by demand and supply factors, including similarity in tastes between the trading partners. The extent of trade overlaps between potential trading partners is important in explaining this trade. Other factors include decreasing production costs, scale economies, entry

conditions and entry barriers, for example, quantitative restrictions, transport costs, natural trade barriers, product differentiation, special relations, etc.

Before we give the empirical results, logical reasoning and casual observations indicate to us that in these PTA/COMESA countries some of these factors seem to be the main influence of intra-industry trade. The main factor is proximity. It seems that communication and transport problems in these African countries compel them to trade with their next-door neighbours. However, since the neighbours may be many, it also seems that countries of similar levels of development and size have higher levels of this trade. This is connected to tastes and preferences; that is, countries that are at the same level of development will exhibit more similarity in taste and therefore show higher intra-industry trade. In addition, data suggest that many of these countries tend to have a sort of specialization as to whom to trade with through special relationships. A good example of this is Zambia and Tanzania. Indeed, it is perhaps the special relationship that motivates these countries to develop or improve their communication and transport networks. The observations from these countries agree with what theory predicts, especially with some factors that can be easily picked up. Smaller countries seem to have very little intra-industry trade and perhaps scale economies or lack thereof can explain this. One of the powerful results is that intra-industry trade does exist in these countries, problems of data notwithstanding. It is not clear whether the formation of the PTA has increased this trade, although there is some evidence in some countries, notably between Zambia and Tanzania and between Tanzania and Kenya. It is difficult to attribute the increase to regional integration, since many of these countries have adopted a variety of policies since the mid 1980 s that have also influenced intra-PTA trade.

VI. The proportion of intra-industry trade in total bilateral trade

The proportion of intra-industry trade in total bilateral trade in the PTA sub-region is shown in Table 2. This is given for selected countries and selected years to offer detail of this trade.

Table 2: Intra-Industry Trade as ratio of total bilateral trade and the average share of IIT for some countries in the PTA/COMESA region 1991

Zimbabwe with	Ratio of IIT in total	Average IIT	Kenya with	Ratio of IIT in total	Average IIT	Zambia with	Ratio of IIT in total	Average IIT
Angola	32.24	9.05	Ethiopia	3.4	36.0	Angola	-	-
Kenya	19.1	45.5	Malawi	72.0	17.7	Botswana	28.76	34.76
Lesotho	22.5	37.4	Mauritius		0.36	Egypt	-	-
Malawi	48.1	22.2	Mozambique		24.71	Kenya	-	-
Mauritius	10.4	21.7	Rwanda		11.23	Malawi	64.14	21.86
Mozambique	40.6	19.4	Sychelles		14.01	Namibia	41.70	23.92
Burundi	-	10.8	Somalia	0.29	55.43			
Ethiopia	36.4	52.9	Sudan	4.83	9.34	South Africa	22.88	18.23
Namibia	9.3	15.3	Tanzania	31.02	31.1	Swaziland	0.3	16.33
Sudan	1.78	3.53	Uganda	6.42	26.31	Tanzania	72.24	25.31
Swaziland	19.5	16.6	Zambia	7.73	16.9	Zaire	-	-
Tanzania	27.73	4.33	Zimbabwe	16.0	32.97	Zimbabwe	29.52	27.61
Zambia	54.74	19.91	-	-	-	-	-	-

Source: Calculated by the author using data from CSO Zambia and COMESA Secretariat.

Table 2 shows that the ratio of intra-industry trade in total bilateral trade is high for some countries for Zimbabwe and Zambia it is over 50%, likewise for Malawi and Mozambique. Zimbabwe in 1991, has a high number of countries that show intra-industry trade, ranging from 54.74 % with Zambia to 1.8% with Sudan. One interesting observation is in order here and that is that the countries that border Zimbabwe also show a relatively higher intra-industry trade component of bilateral trade, further confirming the empirical observations above. Kenya shows a high ratio with Malawi and Tanzania. Zambia's data show a high ratio with Malawi, Tanzania and Namibia. The average level of the index of IIT differs among the bilateral partners but overall it is below that of developed countries. Zimbabwe's IIT for the year 1991 ranges between 53% with Ethiopia and 3.53% with Sudan, while Kenya's ranges between 55% with Somalia and 0.36% with Mauritius.

We present further data for the ratio of IIT in bilateral imports and exports in Appendix B because in many cases the variation is quite large. An average of all countries will

obstruct the uniqueness shown by different countries. This is calculated as the sum of those exports appearing in intra-industry trade and divided by total exports to that country for exports and the sum of those imports appearing in intra-industry trade and divided by total Imports from that country for imports. As expected, results are only for selected countries since some countries do not have any significant intra-industry trade. A country like Rwanda, for example, may show one entry of intra-industry trade occasionally but with no distinct pattern.

From Table B6 in the appendix, we observe that the proportion of intra-industry trade in total bilateral trade is very high in some cases. In 1991, intra-industry trade between Kenya and other PTA countries indicates a very high proportion in imports. For Sudan it is 99.6%, Ethiopia 93.6% and Uganda 88.8%; Tanzania is medium at 46.9%. For exports, the highest is with Zimbabwe (46%) followed by Tanzania (27.6%). These results say that most of the imports from Sudan, Ethiopia and Uganda are two-way products. This can be explained by the fact that Kenya is relatively more industrialized compared with these other countries, thus whatever importation takes place, it is quite likely that the commodities are available in Kenya as well, though different from the exports with the same countries whose intra-industry proportion is low.

In intra-industry trade between Zimbabwe and other PTA countries in 1991, we see that for imports, the highest is with Angola (87.7%), then Sudan (77.8%), followed by Ethiopia (75.6%), Zambia (66.7%), Malawi (60.5%), and Tanzania (47%). A high level of Zimbabwe's imports from these PTA countries is in two-way tradeables. For exports, Swaziland shows 93.1% of the proportion of intra-industry trade in total bilateral exports. Zambia also gives a high proportion (51.7%) while Malawi gives 47.2% and Mozambique 40.1%. (See Appendix C for a summary of intra-industry trade for Zimbabwe and Kenya).

Intra-industry trade between Zambia and other countries shows that, for 1990, the high proportion is with Malawi (60.8%) for imports, while for exports it is with Lesotho (85.7%). This pattern is repeated for 1992, with imports from Malawi indicating 30.4% and exports 87.7%. For Zambia also, the proportion of intra-industry exports in 1992 is quite high for all countries reported. For 1993, exports to Zimbabwe are high at 98.9%. However, the figures for 1993 are only up to May of that year.

Malawi is not directly comparable to other countries since here the data are for two-digit classifications. However, an indication is in order, and we observe that the proportion of intra-industry trade in total trade is high with Zimbabwe for both imports and exports. Tanzania shows a high level of intra-industry trade with Malawi's imports.

Refer to Appendix D for trade categories and Appendix E for summary tables of intra-industry trade for selected PTA/COMESA countries.

VII. Methodology and hypotheses explaining intra-industry trade

Empirical studies of intra-industry trade are few. Balassa (1986) investigates this trade in developing countries, among others. He uses country characteristics including average per capita income, income inequality, average country size, inequality in country size, trade orientation, distance, border and common language variables. The hypotheses put forward are supported in many of them, although some are not significant. Hellvin (1993) provides another empirical study for Asian countries. The variables included are both country and industry specific, although the final report concentrates on country specific-variables. The result of the study is that only distance and tariffs are significant. In this study we concentrate mainly on country variables.

The extent of intra-industry trade in an industry is expected to be larger the higher the degree of scale economies in that industry. If differentiated goods were produced with constant economies of scale, each variety could be produced domestically and no intra-industry trade would take place. With economies of scale, each firm specializes in production of a specific variety in order to take advantage of the economies of scale in production. Countries specialize in production of a few varieties and exchange these by trade in order to satisfy the demand for variety. Many studies, especially in developed countries and a few in developing countries, proxy economies of scale with minimum optimal scale as percentage of consumption, or other scale efficiency measures. (see Behar 1991, among others). However, it is difficult to get a minimum optimal scale for many of the countries belonging to PTA/COMESA, and calculating for all these countries will take us out of the scope of the study, not to mention the time limitation. In addition, casual observations of the trend of this trade in these countries suggest that country-specific characteristics are more important.

Product differentiation in an industry also affects the extent of intra-industry trade in that industry; the higher the degree of product differentiation, the larger the trade. As explained above, intra-industry trade occurs in differentiated commodities. If domestic industry is not able to produce all potential varieties, theoretical analysis shows that the number of available products will probably be larger when countries engage in trade and in this respect regional trading will enhance this effect. There are two fundamental types of product differentiation: horizontal and vertical. The former refers to differences in product characteristics primarily related to style. The latter refers to differences primarily related to quality. In empirical models product differentiation can be measured by the coefficient of variation of export unit values to diverse destination (Hufbauer index) among other methods. The greater the coefficient, the larger the extent of product differentiation. Another approach is to interpret large percentage differences between

unit values of imports and exports as an indication of vertical specialization. Others use research and development (R&D) expenditure, while others use advertising to sales ratio (Clark, 1993). While all these measures are important, we note that research and development are quite minimal in many of the countries we are interested in and likewise advertising; in addition, information pertaining to expenditure on research and development and advertising is not readily available. In general, we concentrate on the country characteristics rather than the industry characteristics following the example of many who have dealt with multi-country studies based on developing countries, for example Balassa and Bauwens (1987) and Lee and Lee (1993).

We employ a regression analysis to ascertain the significance of the factors frequently mentioned in theory that are supposed to explain intrase factors include the level of per capita incomes, differences in the per capita incomes, the average country size, the similarity/differences in the country sizes, income overlap, the distances between the countries, scale economies, product differentiation and average levels of trade barriers. In addition to these factors and in particular for these PTA/COMESA members, we can include a variable that will take care of countries that had/have special economic relationships. It is reasonable to assume that if two countries have a special relationship – economic, political, etc. – it is more likely that a relatively larger trade including intra-industry will take place than in those without. For instance, trade between Kenya, Tanzania and Uganda might be higher compared with other PTA/COMESA members as these countries used to belong to the now defunct East African Community and this ensured that they had better linkages in many areas.

The model

We used a regression model for estimation based on the Grubel-Lloyd index, which is normally used to measure intra-industry trade:

$$IITjk = 1 - (\sum_i |Xjki - Mjki| / \sum_i (Xjki + Mjki)) * 100 \qquad (1)$$

The value of IIT shows the extent of intra-industry trade and is used as the dependent variable. The country-specific variables as discussed above are used as independent variables. The method used is a cross-country test of determinants of intra-industry trade between members of PTA/COMESA. Those countries that did not indicate any intra-industry trade were excluded, as were those for which we could not get information. According to Equation 1 the dependent variables lie within the range of (0,100), depending on the importance of intra-industry trade. To ascertain that the predicted values are also limited to the interval, a logistic function is employed and non-linear least squares that permit inclusion of extreme values (Balassa, 1986; Balassa and Bauwens, 1987; Lee and Lee, 1993). The non-linear least squares method has the advantage of permitting the inclusion of zero observations.

This is specified as

$$IITjk = 1/[1+EXP\ -\beta Zjk] + e, \qquad (2)$$

where Zjk is the vector of explanatory variables, β the corresponding vector of coefficients, and e is the disturbance term.

The explanatory variables, which are country characteristics, include APC, the average level of per capita-incomes; SAZ, the average country size; and the DIS, distance between countries.TB is trade barriers, DPC is dissimilarity in per capita income, D1 is a dummy variable to take into account the special relations, D2 is a dummy variable to take into account countries with common borders, and D3 is a dummy to take into account common language.

The extent of intra-industry trade between countries is hypothesized to be larger/smaller the higher/lower the average level of their per capita-income. The positive relationship between level of development and the level of intra-industry trade is explained by a high per capita income, which is interpreted as a high ratio of capital-labour endowments. Countries with high per capita income are expected to be more endowed with capital. Assuming differentiated goods to be more capital-intensive in production than homogeneous goods, production of differentiated goods will then increase with capital endowments.

The share of IIT will be negatively related to the dissimilarity in per capita incomes. A similar level of per capita income represents a similar demand structure. Similarity in per capita incomes will influence preference and overlapping demand, which will increase intra-industry trade. Disparate per capita incomes imply less IIT.

The extent of intra-industry trade between two countries is expected to be larger/lower the larger/smaller their average country size. Differentiated commodities are assumed to be produced with economies of scale. A country with a small domestic market has a limited opportunity to take advantage of the economies of scale in production. The likelihood that domestic firms are exploiting all extant economies of scale is greater, other things being equal, the larger the size of the domestic economy. For small countries, the domestic market by itself may not be able to sed plants of minimum efficiency in scale. Hence, the larger the domestic market, the larger the potential for production of differentiated commodities and the greater the opportunity for intra-industry trade.

Barriers to trade reduce competitive pressures and hence the incentive to cut costs. Where domestic producers are not exploiting all extant economies of scale, increased competitive pressures should encourage efforts to improve efficiency. In this regard, trade liberalization of product flow is expected to encourage IIT by stimulating competition within domestic industries.

Distance shipped is another important factor. Intra-industry trade is expected to be higher for commodities that have lower transportation costs. In many empirical studies of intra-industry trade, distance has been hypothesized to have a negative impact on the

share of intra-industry trade. It is assumed that the consumption of differentiated goods requires more information than consumption of homogeneous goods. In addition, given that we are concerned with developing countries characterized by inadequate development of their intra-regional infrastructure, the longer the distance, the more direct transportation cost and more inconveniences including uncertainties – thus less intra-industry trade. It is thus hypothesized that the extent of intra-industry trade will be negatively correlated with the distance between countries.

Familiarity with each other's products contributes to increased intra-industry trade between countries. Common language is a vehicle towards this familiarity, as is the existence of past colonial ties. This gives us the hypothesis that the existence of a common language increases the extent of intra-industry trade between countries.

The existence of common borders also contributes to information flows. Grubel and Lloyd (1975) suggest that in countries sharing a common border, intra-industry trade may take place in products that are functionally homogeneous but differentiated by location. Hence we hypothesize that the extent of intra-industry trade will be higher between countries that share a common border than otherwise.

VIII. Estimation

The parenthetical information in Table 3 explains how the particular variable will be measured. The justification for the choice of these variables is that most seem to be representative and are, moreover, commonly used in empirical studies of this nature. We also include other variables that might be important as we observe the data from these countries.

Table 3: Variables used in our study: What they are expected to measure, expected signs and hypotheses

Variable	Aimed to measure (how measures)	Expected sign	Hypotheses
APC	Average per capita income (GDP per capita)	Positive	The lower the average per capita income the smaller is IIT and vice versa
SAZ	Average country size (level of GDP or population)	Positive	The larger/smaller the average country size, the higher/lower the IIT.
DIS	Distance (kilometres between capitals)	Negative	The larger the transport costs, the smaller is the IIT
DPC	Dissimilarity in per capita income (variation in per	Negative	The more dissimilar the per capita incomes the lower the IIT and vice versa
TB	Trade barriers (tariffs and frequency of QRs.)	Negative	The higher the average level of level of trade barriers, the smaller the IIT
D1	Dummy for common language (English)	Positive	The extent of IIT is expected to be larger if the countries share common language
D2	Dummy for special relations	Positive	The closer the special relations the higher the IIT
D3	Dummy for common border	Positive	The shared border increases the likelihood of higher IIT

IX. Empirical results and discussion

The empirical estimates for some PTA/COMESA countries are reported in Table 4. The sample includes those countries that portrayed IIT and those for which we managed to obtain information. These countries are Tanzania, Zambia, Kenya, Zimbabwe, Malawi, Ethiopia and Sudan. However, for independent variables, we included all countries in the PTA/COMESA region.

Table 4 indicates several features of intra-industry trade in PTA region. The estimations are for the year 1991, as we had consistent data for most of the variables for the year. The results support the hypotheses put forward regarding country characteristics as far as expected signs are concerned. We dropped the variable DPS, which was to take care of dissimilarity of tastes because it was highly collinear with that of APC indicating per capita incomes. All variables came out with correct signs. However, in terms of significance of the variables, it is only DIS that is significant at 1% level. For the estimation of this variable we used the distance between two trading capitals, and the actual distance of roads connecting the two capitals. The two gave almost the same results. We even tried with actual cost of shipping the goods but more complications on this variable arose due to the issue of handling and delays, which are different for different areas. Apart from that, different goods command different prices especially if they are in bigger or smaller loads. This variable proves that indeed distance plays a big role in reducing the level of intra-industry trade between these countries. The level of tariff protection came out with correct negative sign in most cases but it is not significant, which suggests that in these countries factors other than tariff levels obstruct trade. These factors include the level of income, here indicated by per capita income, which came out significant at 5% level. The population level, which is a proxy for size of the countries, is also supported. The language dummy, which is 1 for English speaking and 0 otherwise, is weakly supported at 5% level. The other variables are not significant.

We also experimented with manufactured value added of different countries belonging to COMESA and we observed that manufactured value added is significant and positive. This indicates that the availability of manufactured goods to trade with each other is important. The dummy variables indicating shared border, special relations and common language (we took English for common and otherwise zero) are weakly significant and only when they are regressed separately. This might indicate that there is a correspondence between these dummies. For example, it is more common for countries sharing the same borders to have special relationships including the same language.

The results obtained by logit estimations are supported by these by non-linear

Table 4a: Results for country variables (logit estimation)

Variable	Expected sign	Equation 1	Equation 2	Equation 3	Equation 4
Constant		8.62 (1.35)	10.4(1.5)	15.7(2.0)	19.0(3.44)
Log DIS	Negative	-1.9(-3.1)**	-2.3(-3.3)**	-2.9(-4.3)***	-2.5(-4.3)***
Log SAZ	Positive	0.83(3.0)**	0.9(2.94)**	1.0(3.32)**	0.44(2.5)**
Log TB	Negative	-0.62(-0.6)	-0.92(-0.83)	-1.07(-0.97)	-0.8(-0.59)
Log APC	Positive	1.02(2.5)**	1.28(2.9)**	1.19(2.8)**	
D 1	Positive	1.32(2.5)**	1.11(2.1)**	0.96(1.9)*	1.2(2.42)*
D 2	Positive	0.3 (0.4)			
D 3	Positive	1.0 (1.3)	1.3 (1.8)*		
Number of observations		118	118	118	118

***implies significant at 99%, **significant at 95% and *significant at 90% confidence level.

Table 4b: Results for country variables (non-linear estimation (NLS))

Variable	Expected sign	Equation 1	Equation 2	Equation 3	Equation 4
Constant		34.5 (1.0)	30.8 (0.7)	44.9(1.61)	63.7(2.3)
Log DIS	Negative	-7.3 (-2.2)*	-6.93 (-3.0)**	-8.52(-3.5)***	-8.9(-3.1)**
Log SAZ	Positive	3.44(2.63)*	3.5 (2.7)**	3.77(3.0)**	2.4(2.3)
Log TB	Negative	-0.46(-0.1)	-0.71(0.12)	-0.83(-0.14)	-2.34(0.4)
Log APC	Positive	4.2(2.0)*	3.9 (1.9)	6.79(2.2)*	
D 1	Positive	6.8(2.12)*	6.95(2.2)*	0.12(1.4)	7.74(2.5)*
D 2	Positive	4.0(1.1)			
D 3	Positive	6.8(1.6)	4.03(0.87)		
Number of observations	118	118	118	118	
		$R^2 = 0.26$	$R^2 = 0.26$	$R^2 = 0.24$	$R^2 = 0.21$
		D.W = 1.7	D.W =1.65	D.W = 1.65	D.W = 1.64

estimations. The non-linear estimates give us R^2, which is about 0.26, implying that the explanatory power of the variables is only 26%. However, this result is plausible given that the explanation for the existence of intra-industry trade in these countries is difficult to establish because of the randomness of their trading. The year-to-year variations of intra-industry trade in the region are quite large.

Overall the results from our estimation concur well with those of the other studies noted above. In most of the studies, distance gives negative and significant results, which agrees with our findings. This is the same with many other variables, indicating that intra-industry trade in the region is determined by common variables pertaining to other countries.

The empirical support in our study is smaller than other studies especially those conducted in developed countries because of the presence of domestic distortions caused by inward-oriented regimes in many of the countries in our sample. Many hypotheses

that have been tested are generated from models that are based on assumption of efficient markets, an assumption that is not satisfied in our countries of concern. However, the presence of these distortions is manifest in the low level of intra-regional trade for these countries so that the distortions are already apparent. The regression analysis is also constrained by the poor quality of data pertaining in these countries.

X. Conclusions and policy implications

As stated at the beginning of this report, the aim of the study was to investigate intra-industry trade in the PTA/COMESA sub-region. This study has attempted to show, from the data available, that the countries belonging to this sub-region do engage in intra-industry trade especially with their immediate neighbours, and those that are relatively more advanced in terms of their manufacturing sectors. It is shown that distance and thus transportation pose a problem in this type of trade between these countries. However, we need to mention that other constraints such as delays at the borders to clear goods and other administrative constraints negatively affect the penetration of these goods in the regional market.

The study also shows that in some of these countries the proportion of intra-industry trade in the bilateral trade is quite high. When we analyse the exports and imports represented in the intra-industry trade, we observe that the high ratio of intra- industry trade in bilateral trade is more evidenced with imports and exports from the smaller countries than from the relatively larger ones. In some cases the protion of intra-industry trade is quite high even in absolute figures.

These results have important policy implications. One is that, indeed, intra-industry trade does exist in some of these countries; thus there is a need to direct attention to this trade as an adjutant of inter-industry trade. This is even more important given the ambition of these countries to further trade liberalization. As shown in the estimation, tariff barriers exert negative influence, implying that further liberalization will induce a higher level of this trade. Distance also shows a negative relationship with intra-industry trade; solving transportation problems will likely increase the trade. In general, therefore, the study points to the fact that these countries need to put more efforts into this trade by offering more incentives to traders. In addition, there is a need to increase efforts to solve the constraints to this trade, especially including transportation and communication networks. With good transportation systems, distance may be less of an obstacle to the trade. Some other factors that promote this trade are more difficult to influence, for example common borders.

Appendix A. Results of other empirical research on intra-industry trade

Several empirical studies have been done in both developing and developing countries. We summarize some of them below.

Appendix A1: Balassa, B., and L. Bauwens (1987) -Trade among developing countries

Variable	Measure	Coefficient	T Values
Constant	-		-2.0(-3.35)
Ln AY/P	Average per capita income	0.788	(7.97)
INEQY/P	Income differences	-0.362	(-1.95)
Ln AY	Average country size	-0.425	(-4.21)
INEQY	Differences in country size	0.973	(3.02)
ATO	Average trade orientation	0.256	(7.90)
Ln D	Distance	-0.392	(-10.54)
Border		0.606	(4.12)
English		0.600	(8.10)
LAFTA	Latin America Free Trade Area	1.346	(7.69)
FRENCH		-0.499	(-0.58)
SPANISH		1.207	(4.63)
PORTUGUESE	0.986		(3.73)
PD	Product differentiation	0.243	(2.85)
MKT	Marketing variable	3.373	(3.11)
SDPR	Standard deviation of profit rates	0.340	(0.69)
ECSC	Economies of scale	-1.515	(-1.36)
IACR	Industrial concentration	-0.914	(-1.70)
TSD	Tariff dispersion	0.639	(0.35)
R^2			0.2249
N			6697

Estimation is for country and industry characteristics. The developing countries includes: Spain, Singapore, Greece, Argentina, Hong Kong, Portugal, Yugoslavia, Mexico, Brazil, Taiwan, Malaysia, Tunisia, Korea, Morocco, Turkey, Egypt, Thailand, Philippines, India and Pakistan.

Method of estimation is non-linear least squares estimation of the logistic function.

Appendix A2: Balassa, B. (1986) -Trade of manufactured products among developing countries

Variable	Measure	Coefficients	T Values
Constant	-	5.121	(3.92)
Ln AY/P	Average per capita income	1.117	(4.02)
INEQY/P	Income differences	-0.564	(-0.98)
Ln AY	Average country size	0.872	(3.57)
INEQY	Differences in country size	-1.592	(-2.14)
ATO	Average trade orientation	0.875	(7.88)
Ln D	Distance	-0.609	(-5.79)
Border		0.880	(2.48)
English		0.776	(3.33)
LAFTA	Latin America Free Trade Area	2.187	(5.56)
FRENCH		0.404	(0.05)
SPANISH		1.556	(3.90)
PORTUGUESE		0.620	(0.55)
σ			0.0501
R^2			0.7402
N			175

The developing countries include: Spain, Singapore, Greece, Argentina, Hong Kong, Portugal, Yugoslavia, Mexico, Brazil, Taiwan, Malaysia, Tunisia, Korea, Morocco, Turkey, Egypt, Thailand, Philippines, India and Pakistan. Estimated by Non-linear least squares.

Table A3: Hellvin, L. (1993) -Intra-industry trade between ASEAN countries

Variable	Measure	Coefficients	T Values
Constant	-	1.40	(0.16)
Ln AY/P	Average per capita income	0.28	(0.37)
INEQY/P	Income differences	-2.05	(-1.14)
Ln AY	Average country size	-0.41	(-0.86)
INEQY	Differences in country size	-0.10	(-1.07)
Ln IO	Income Overlapp	0.58	(1.07)
Ln D	Distance	-0.17	(-1.97)
Ln T	Tariff	-0.46	(-2.25)
Ln NTB	Non tariff Barriers	-0.36	(-0.96)
N			45
R^2			0.57

Countries include: India, Sri Lanka, Pakistan, Indonesia, The Phillippines, Thailand, Malaysia, Republic of Korea, Hong Kong, Singapore.

Appendix A4: 4. Lee, H.H., and Lee, Y.Y. (1993) -intra-industry trade in manufactures: The case of Korea

Variable	Measure	Logit analysis	Nonlinear least squares
Constant		5.639	0.629
		(1.985)	(0.695)
RDPCI	Relative difference in per capita GNP	-3.872	-1.768
		(-1.676)	(-1.973)
		(1.676)	(1.973)
RDGNP	Relative difference in GNP Between Korea and Trading Partners	-3.934	0.439
		(-2.729)	(0.841
POSTAGE	Cost of postage	-1.205	-0.419
		(2.428)	(2.488)
TINT	Korea's trade intensity with trading partners	17.251	3.932
		(1.890)	(2.461)
ASIA	Dummy for Asian countries	2.010	1.261
		(1.765)	(4.253)
TIMB	Trade imbalances	-4.608	-2.136
		(-3.338)	(3.828)
DOF	Degrees of freedom	74	74
R^2		0.4326	0.4235

The methods used are logit analysis and non-linear least squares. In this study zero values of IIT index were replaced with a very small number (0.0000001) so the observations ccould be included in the analysis.

Table A5: Globerman S. and J.W Dean (1990) -Recent trends in intra-industry trade and their implications for future trade liberalization

Highlights of studies of intra-industry trade.

Author	Country	Industry	Period	Main finding
Grubel, Lloyd (1975)	10 industrialized countries	All industries	1959-67	IIT as a % of total trade rose steadily from .36 to .48.
McAleese (1979)	Ireland	All industries	1964-77	IIT rose from .36 to .56.
Finger, DeRosa (1979)	14 industrialized countries	144 SITC 3 digit products	1961-76	Increase in IIT for most products.
Glejser (1979)	EEC	64 industries	1973-79	Slowness in growth of IIT compared to 1960s.
Kol, Mennes (1979)	Netherlands	9 industry group	1970-80	No general increase or decrease in IIT.
Schumacher (1979)	Germany	All industries	1962-80	Increase in IIT throughout period. Largest relative increase from 1962 to 1976.
Greenaway (1979)	UK	8 SITC divisions	1964-77	Increase in IIT for all divisions.
Greenaway, Milner (1986)	UK	9 SITC divisions	1970-79	Increase in IIT for all divisions for 1970-77. Increase for only 4 divisions from 1977 to 1979.
Balassa (1975)	EEC	All industries	1958-70	Average increase in degree of IIT of 30%
Drabek, Greenaway (1984)	EEC, Austria, Sweden, Norway, Switzerland	5 SITC divisions	1966-77	Increase in average IIT for all countries.

Appendix B: The proportion of intra-industry trade in total bilateral trade within PTA countries

Kenya with 1991	Somalia	Sudan	Tanzania	Uganda	Zambia	Zimbabwe			Ethiopia	Burundi	Mozambique	Malawi	Mauritius
Import	6.54	99.6	46.9	88.8	1.3	4.8			93.6	3.0	8.3	13.9	6.4
Export	0.26	4.44	27.64	4.45	26.7	46.0			3.0	0.03	0.7	3.3	0.004
Zim. with 1991	Swazi	Sudan	Tanzania	Lesotho	Zambia	Kenya	Namibia	Angola	Ethiopia	Burundi	ozambique	Malawi	Mauritius
Import	13.4	77.8	47.0	63.1	66.7	27.7	15.7	87.7	75.6	0.081	43.8	60.5	8.6
Export	93.1	1.73	13.1	11.6	51.7	15.1	9.74	32.2	23.3	0.029	40.1	47.2	28.9
Zambia with 1990	Kenya	Tanzania	Zimbabwe	Malawi	Lesotho	Zambia	Malawi	Kenya	Tanzania	Zimbabwe			
Import	24.4	55.4	36.8	60.8	0.7	Import	30.4	3.5	11.7	17.2			
Export	2.8	23.7	27.6	14.4	85.7	Export	87.7	49.3	81.7	78.8			
Zambia with 1993	Malawi	Kenya	Tanzania	Zimbabwe									
Import	6.33	0.35	22.5	26.6									
Export	39.0	0.032	33.1	98.9									
Malawi with 1987	Tanzania	Zambia	Mozam.	Zimbabwe	Kenya	Malawi	Tanzania	Zambia	Mozambq	Zimbabwe	Kenya		
Import	64.9	9.3	3.5	78.4	1.1	Import	4.9	14.5	0.007	77.9	2.9		
Export	15.0	50.9	0.3	74.9	24.5	Export	33.0	31.1	0.007	94.7	30.1		
Malawi with 1989	Tanzania	Zambia	Mozambique										
Import	18.8	10.9											
Export	18.2	73.0											

Appendix C: Intra-industry trade values and total trade values for 1991 for Zimbabwe and Kenya (US$)

ZIMBABWE WITH

	Imports	Exports
Angola		
IIT	6077	2477902
Total	6929	7698218
Kenya		
IIT	1771049	2125041
Total	6400974	14040384
Lesotho		
IIT	195178	132647
Total	309128	114711
Malawi		
IIT	1857438	212447824
Total	3069405	44989638
Mauritius		
IIT	645305	211645
Total	7491279	733062
Mozambique		
IIT	2370915	14966040
Total	5411972	37288840
Ethiopia		
IIT	49301	45323
Total	65212	194720
Namibia		
IIT	44434	306139
Total	283671	3141403
Sudan		
IIT	937	29155
Total	1205	16854229
Swaziland		
IIT	1244995	716698
Total	9300350	770108
Tanzania		
IIT	1395767	513706
Total	2909298	3917260
Zambia		
IIT	8052031	25049827
Total	12060386	48416183

KENYA WITH

	Imports	Exports
Sudan		
	87327	929630
	87327	20950901
Somalia		
	3266	33738
	49875	12761908
Tanzania		
	3912335	10833532
	8341721	39188462
Uganda		
	1644034	3446952
	1851237	77399499
Zambia		
	113439	790143
	8730012	2959874

Appendix D: SITC and close ISIC description of the groups that portray intra-industry trade

SITC	DESCRIPTION	ISIC
001	LIVE ANIMALS	1110
011	"MEAT: FRESH, FROZEN, OR CHILLED"	1110
012	"MEAT: DRIED, SALTED, OR SMOKED"	1110
022	MILK AND CREAM	3112
023	BUTTER	3112
025	EGGS	1110
024	CHEESE AND CURD	3112
034	"FISH, FRESH, FROZEN OR CHILLED	1110
035	"FISH, DRIED, SALTED OR SMORKED"	1110
036	"CRUSTACEANS, FRESH, DRIED, SALTED, CHILLED"	1110
037	"FISH, CRUSTACEANS, PREPARED/PRESERVED"	3114
041	UNMILLED WHEAT AND MUSLIN (INC.SPELT)	1110
042	RICE	1110
043	BARLEY UNMILLED	1110
044	"MAIZE, CORN, UNMILLED"	1110
045	"CEREALS, UNMILLED, NES"	1110
046	MEAL AND FLOUR OF WHEAT OR OF MUSLIN	3116
047	"MEAL AND FLOUR OF CEREALS, NES"	3116
048	"CEREAL PREPS & OF STARCH, FRUIT, VEG"	3116
054	"VEG. FRESH, FROZEN, OR PRESERVED, & VEG. NES"	3113
056	"VEG., ROOTS &TUBERS, PREPARED/PRESERVED"	3113
057	"FRUITS & NUTS, FRESH OR DRIED"	1110
058	"FRUIT, PRESERVED &FRUIT PREPARATIIONS"	3113
061	SUGAR AND HONEY	3118
062	SUGAR CONFECTIONERY & SUGAR PREPARATIONS	3119
071	COFFEE & COFFEE SUBSTITUTES	3121
072	COCOA	3119
073	CHOCOLATE & FOOD PREPARATIONS OTHER	3119
074	TEA & MATE	3121
075	SPICES	3121
081	ANIMAL FOODS (NOT UNMILLED CEREALS)	3122
091	MARGARINE & SHORTENING	3112
098	"EDIBLE PRODUCTS & PREPARATIONS, NES"	3121
111	"NON-ALCOHOLIC BEVERAGES, NES"	3134
112	ALCOHOLIC BEVERAGES	3131
121	"TOBACCO, UNMANUFACTURED"	1110
122	TOBACCO MANUFACTURES	3140
211	HIDES & SKINS UNDRESSED	1110
212	"FUR SKINS, UNDRESSED"	1110

222	OIL SEEDS, OLEAGINOUS FRUIT (SOFT VEG. OIL)"	3115
223	OIL SEEDS, OLEAGINOUS FRUITS NES	1110
232	"NATURAL RUBBER LATEX, NATURAL RUBBER"	1110
244	"CORK, NATURAL, RAW AND WASTE"	1110
245	PULPWOOD	1110
247	OTHER WOOD IN THE ROUGH OR SQUARED	1110
248	WOOD, SIMPLY WORKED, RAILWAY SLEEPERS	3311
251	PULP & WASTE PAPER	3411
263	COTTON	1110
264	JUTE	1110
265	VEGETABLE FIBRES, NES	3211
266	SYNTHETIC & REGEN . (ARTIFICIAL) FIBRES	3211
267	OTHER MAN-MADE FIBRE FOR SPINING & WASTE	3211
268	WOOL & OTHER HAIR EXCLUDING WOOL TOPS	3211
269	OLD CLOTHING & RAGS	2902
273	STONE, SAND & GRAVEL	2901
277	NATURAL ABRASIVES, NES	2909
278	OTHER CRUDE MINERALS	2909
281	IRON ORE & CONCENTRATES	2301
282	IRON & STEEL SCRAP	2301
287	ORES & CONCENTRATES OF BASE METALS, NES	2301
288	NON-FERROUS BASE METAL WASTE, SCRAP	2302
291	CRUDE ANIMAL MATERIALS, NES	1110
292	CRUDE VEGETABLE MATERIALS, NES	1110
322	COAL, LIGNITE & PEAT	2100
333	PETROLEUM OILS ,CRUDE	2200
334	PETROLLEUM PRODUCTS REFINED	3530
335	RESIDUAL PETROLUEM PRODUCTS	3530
411	ANIMAL OILS & FATS	3115
431	ANIMAL/ VEGETABLE OILS, FATS(PROCESSED) & WAXES	3115
511	HYDROCARBONS NES, & THEIR DERIVATIVES	2200
512	ALCOHOLS, PHENOLS, & DERIVATIVES	2200
513	CARBOXYLIC ACIDS & DERIVATIVES	2200
514	NITROGEN FUNCTION COMPOUNDS	2200
515	ORGANO-INORGANIC & HETEROCYLIC COMPS.	2200
516	OTHER ORGANIC CHEMICALS	2200
522	INORGANIC CHEMICALS, OXIDES, HALOGEN SALTS	3511
523	INORGANIC CHEMICALS, OTHER	3511
524	RADIO ACTIVE & ASSOCIATED MATERIALS	3511
531	SYNTHETIC ORG. DYES, NAT INDIGO, COL, LAKES	3511
532	DYEING & TAN. EXTERS & SYNTH TAN MATERIAL	3511
533	PIGMENTS, PAINTS, VARNISH & REL, MATRL	3511
541	MEDICINE & PHAMACUETICALS PRODS	3511
551	ESSENTIAL OILS, PERF. & FLAVOR MATERIALS	3511
553	PERFUMERY, COSMETICS & OTHER TOILET PREPS	3511
554	SOAPS, CLEANSING, & POLISHING PREPS.	3511
562	FERTILIZERS, MANUFACTURED	3512
572	EXPLOSIVES & PYROTECHNIC PRODUCTS	3529
582	CONDENSATION PLASTICS	3560
583	POLYMERISATION PLASTICS	3560
591	DISINFECTANTS, ETC	3529
592	STARCHES, INULIN & WHEAT GLUTEN:GLUES	3529
598	MISCELLANEOUS CHEMICAL PRODUCTS NES	3529
611	LEATHER	3231

612	MANUF. OF LEATHER OR ARTIF. LEATHER NES	3231
613	FUR SKINS, TANNED OR DRESSED, INCL. DYED	3232
621	MATERIALS OR RUBBER	3551
625	RUBBER TYRES, INNER TUBES & TYRE FLAPS	3559
633	CORK MANUFACTURES	3319
634	VENEERS, PLYWOOD, OTHER WOOD, WORKED, NE	3311
635	WOOD MANUFACTURERS, NES	3320
641	PAPER & PAPER BOARD	3411
642	ARTICLES MADE OF PAPER OR PAPERBOARD	3412
651	TEXTILE YARN AND THREAD	3211
652	COTTON FIBRIC,WOVEN EX. NARROW FABRICS	3212
653	FABRICS, WOVEN OF MAN-MADE FIBRES	3211
654	TEXTILE FABRICS, WOVEN, OTHER	3219
655	KNITTED, CROCHETED FABRICS	3213
656	TULLE, LACE, RIBBONS & OTHER SMALL WARES	3219
657	SPECIAL TEXTILE FABRICS & REL. PRODS	3220
658	MADE-UP ARTICLES, CHIEFLY TEXT, MATERS.	3220
659	FLOOR COVERINGS, ETC	3214
661	LIME, CEMENT & FABR. BUILDING MATER	3692
662	CALY & REFRACTORY CONSTRUCTION MATER	3691
663	MINERAL MANUFATCURES NES	3699
664	GLASS	3620
665	GLASSWARE	3620
666	POTTERY	3610
667	PEARLS & PREC STONES UNWORKED OR WORKED	3901
671	PIG IRON, IRON/STEEL POWDS, SPIEGFLEIISEN	3710
672	INGOTS & OTHER PRIME FORMS INC. TUBES ETC	3710
673	IRON & STEEL BARS, RODS ANGLES & SHAPES	3710
674	UNIVERSAL, PLATES & SHEETS OF IRON/STEEL	3710
675	HOOP & STRIP OF IRON OR STEEL	3710
676	RAILS & R/WAY CONSTR. MATS. OF IRON/STEEL	3710
677	IRON & STEEL WIRE	3710
678	TUBES PIPES FITTING OF IRON OR STEEL	3710
679	IRON/STEEL, CAST OR FORGED, UNWORKED NES	3710
681	SILVER, PLATINUM & ASSOCIATED METALS	3720
682	COPPER (INC. BRASS &BRONZE)	3720
683	NICKEL	3720
684	ALUMINIUM	3720
685	LEAD	3720
686	ZINC	3720
687	TIN	3720
689	MISC. NON-FERROUS BASE METALS	3720
691	FINISHED STRUC PARTS & STRUCTURES NES	3813
692	METAL CONTAINERS FOR STORAGE & TRANSPORT	3819
693	WIRE PRODUCTS (EXC. ELECTRIC) & FENCING	3819
694	NAILS, SCEWS, NUTS BOLTS & SIMILAR ARTS	3811
695	TOOLS FOR USE IN THE HAND OR IN MACHINES	3811
696	CUTLERY	3811
697	HOUSEHOLD EQUIPMENT OF BASE METALS	3812
699	OTHER MANUFACTURES OF METALS NES	3819
711	STEAM GENERATING BOILERS	3821
712	STEAM ENGINES, OTHER VAPOUR POWER UNITS	3821
713	INTERNAL COMBUSTION PISTION ENGINES	3821

714	ENGINES & MOTORS, NON-ELECTRICAL	3821
716	ROTATING ELECTRIC PLANT & PARTS, NES	3831
718	POWER GENERATING MACHINE	3831
721	AGRICULTURAL MACHINERY & PARTS	3822
722	TRACTORS	3822
723	CONTRACTORS' PLANT & EQUIPMENT & PARTS	3824
724	TEXTILE & LEATHER MACHINERY	3829
725	PAPER/PULP MILL & PAPER MACHINERY OTHER	3824
726	PRINTING/BOOKBINDING MACHINERY & PARTS	3824
727	FOOD-PROCESSING MACHINES & PARTS	3824
728	OTHER MACHINERY FOR SPECIAL INDUSTRIES	3824
737	METAL WORKING MACHINERY, OTHER	3823
741	HEATING & COOLING EQUIPMENT & PARTS	3833
742	PUMPS & LIQUIDS	3829
743	PUMPS (EX.LIQUIDS), COMPRESSORS, FANS	3833
744	MECHANICAL HANDLING EQUIPMENT & PARTS	3819
745	OTHER NON-ELECTRICAL MACHINERY, TOLLS ETC	3839
749	NON-ELECTRIC PARTS & ACCESSORIES, NES	3839
751	OFFICE MACHINES	3825
752	A.D.P. MACHINES & UNITS THEREOF	3825
759	OFFICE & A.D.P. PARTS & ACCESSORIES, NES	3825
761	TELEVISION RECEIVERS	3832
762	RADIO-BROADCAST RECEIVERS	3832
763	GRAMOPHONES, SOUND RECORDERS	3832
764	TELECOMUNICATIONS EQUIPMENT & PARTS	3832
771	ELECTRIC POWER EQUIPMENT & PARTS	3839
772	ELECTRICAL APPARATUS FOR CIRCUIT CONTROL	3831
773	ELECTRICITY DISTURB. EQUIPMENT	3831
774	ELECTRIC APPARATUS, MEDICAL PURPOSES	3832
775	HOUSEHOLD, ELECTRICAL & NON-ELECTRIC EQUIPMENT	3833
776	THERMIONIC ETC VALVE TRANSISTORS, ETC	3832
778	ELECTRICAL MACHINERY & APPARATUS, NES	3839
781	PASSENGER CAR MOTORS	3843
782	MOTOR VEHICLES:GOODS TRANSPORTING	3844
783	ROAD MOTOR VEHICLES, NES	3843
784	MOTOR VEHICLE PARTS & ACCESSORIES	3843
785	MOTORCYCLES, SCOOTERS & OTHER CYCLES	3844
786	TRAILERS & OTHER VEHICLES,NON-MOTOR	3843
791	RAILWAY VEHICLES & ASSOCIATED EQUIPMENT	3842
792	AIRCRAFT & ASSOCIATED EQUIPMENT	3845
793	SHIPS & BOATS (INC HOVERCRAFT)	3841
812	PLUMBING, HEATING, & LIGHTING FIXTS/FITS.	3909
813	FURNITURE	3320
821	FURNITURE	3320
831	TRAVEL GOODS, H/BAGS & SIMILAR ARTICLES	3909
842	OUTER GARMENTS, MEN'S & BOY'S	3220
843	OUTER GARMENTS, WOMEN'S & GIRL'S	3220
844	UNDER GARMENTS	3220
845	OUTER GARMENTS, KNITTED, CROCHETED	3213
846	UNDER GARMENTS, KNITTED, CROCHETED	3213
848	APPAREL OF NON-TEXTILE MATERIALS	3909
851	FOOTWEAR	3240
871	OPTICAL INSTRUMENTS & APPARATUS	3852

872	MEDICAL INSRUMENTS & APPLIANCES	3851
873	METERS & COUNTERS, NES	3851
874	MEASURING, ANALYSIS, CONTROLLING APPT NES	3851
881	PHOTOGRAPHIC APPT. & EQUIPMENT, NES	3852
882	PHOTOGRAPHIC & CINE SUPPLIES	3852
883	CINEMATOGRAPH FILM, EXP. & DEVELOPED	3852
884	OPTICAL GOODS, NES	3852
885	WATCHES & CLOCKS	3852
892	PRINTED MATTER	3420
893	ARTICLES, ARTIFICIAL PLASTIC MATERIALS	3560
894	PERAMBULATORS, TOYS GAMES, & SPORTS GOODS	3909
895	OFFICE SUPPLIES & STATIONERY NES	3909
896	ANTIQUES, COLLECTORS PIECES, WORKS OF ART	3909
897	JEWELLERY, G/SMITHS' & S/SMITHS' WARES	3909
898	MUSICAL INSTRUMENTS, PARTS & ACCESSORIES	3833
899	MANUFACTURED ARTICLES NES	3909
961	COIN, NOT GOLD COIN, NOT FOR LEGAL TENDER	0
971	GOLD	0

Source: CSO Lusaka. Description and Matching of SITC and ISIC codes made by the author.

Appendix E: Intra-industry trade in some selected PTA/COMESA countries

Table E1: Zimbabwe's intra-industry trade with other PTA countries

Zimbabwe	Angola	Zimbabwe	Kenya	Zimbabwe	Lesotho	Zimbabwe	Malawi
SITC	IIT	SITC	IIT	sitc	IIT	sitc	IIT
o12	21.6	o22	0.02	611	84.8	oo1	4.0
o25	0.02	112	8.9	621	17.8	o47	8.0
o54	0.5	278	72.5	699	3.1	o54	40.0
o75	11.3	292	94.6	724	11.9	o57	20.8
898	11.8	541	0.2	784	96.4	o58	93.7
Zimbabwe	Mozambque	542	8.33	851	0.6	o61	1.2
SITC	IIT	551	0.8	892	62.4	o74	88.0
oo1	0.2	553	96.4	931	22.2	o75	13.0
o12	7.6	582	48.5			o98	0.3
o25	2.5	591	69.7			112	19.1
o34	4.6	598	38.0			121	7.5
o35	0.1	621	0.01			122	0.9
o37	0.13	641	11.8			288	37.0
o42	44.4	642	0.2			292	0.01
o46	0.5	652	54.3			334	0.33
o47	2.2	658	1.5			512	0.27
o48	1.3	673	27.9			516	59.5
o54	1.0	695	0.5			522	26.7
o59	4.4	696	0.1			523	10.4
o91	0.1	697	15.7			531	35.1
o98	13.3	699	11.64			541	0.02
111	0.16	721	68.0			542	3.34
112	1.02	741	24.6			551	4.3
121	75.2	743	1.5			553	5.0
122	0.02	745	48.3			554	10.5
247	10.3	747	93.1			571	5.0
248	16.0	775	28.3			573	98.0
269	7.6	781	46.8			575	0.8
273	1.0	785	59.7			581	33.3
278	5.4	821	55.9			591	0.5
292	53.3	831	8.1			592	0.1
411	13.6	841	83.9			598	58.2
431	11.1	851	42.8			611	80.0
541	0.04	872	0.93			621	33.8
542	0.6	892	7.4			625	0.01
554	4.5	893	20.5			629	3.5

Table E1: continued...

571	0.2	894	1.0			635	15.2
625	22.2	898	67.5			641	1.1
629	6.0	899	21.7			642	13.2
641	1.4	931	76.0			651	10.1
642	7.6					652	46.0
652	2.9					654	40.9
658	0.4					657	55.9
661	0.6					661	0.02
661	0.6					661	0.02
663	0.1					665	0.5
665	12.2					673	17.9
693	56.4					679	2.7
695	3.7					694	0.7
696	4.5					695	0.4
697	0.6					697	14.6
699	0.01					699	0.01
716	17.8					713	6.8
721	4.8					721	0.1
723	62.7					724	8.4
724	10.7					727	1.5
728	87.1					733	5.1
731	3.2					741	0.1
742	0.7					743	99.2
743	48.9					744	46.3
748	1.6					747	0.6
749	0.3					751	19.1
751	98.4					752	92.8
761	42.2					759	0.5
762	6.97					762	47.8
763	14.6					772	5.1
764	54.7					775	1.3
775	1.9					778	0.01
778	15.4					781	14.1
782	11.8					782	0.1
784	3.3					784	1.8
785	25.01					785	14.8
791	54.7					821	31.2
793	21.1					841	1.6
841	0.9					843	0.1
842	15.0					846	55.5
843	1.3					848	39.3
844	17.0					851	1.4
845	81.2					885	9.2
851	1.9					892	18.5
873	71.2					894	0.7
874	93.1					898	67.7
885	24.3					899	5.5
892	92.8	Ethiopia		Burundi		931	20.8
893	1.31	696	31.9	sitc			
895	83.3	764	25.2	892	10.8		
898	83.1	892	16.3				
899	0.7	931	98.0				
931	6.7						

Table E2: Zimbabwe with other COMESA countries

Zimbabwe	Zambia	Zimbabwe	Sudan	Zimbabwe	Namibia	Zimbabwe	Mauritius
oo1	63.6	code	IIT	Code		o12	35.8
o37	1.3	931	5.7	oo1	0.9	o56	32.6
o48	0.01		0.13	o57	11.6	o57	15.8
o56	4.8		4.7772	112	8.7	112	2.6
o58	53.0		3.5282	641	19.5	292	39.1
o59	0.03	Zimbabw	Swaziland	721	1.7	591	15.1
o61	1.1	code	IIT	741	12.6	629	3.71
o98	0.01	292	49.3	785	2.9	642	0.28
111	3.3	335	0.9	892	8.8	652	25.2
112	1.5	542	0.2	898	2.0	696	0.3
248	38.8	598	7.3	931	10.4	723	10.1
278	66.0	629	0.1	Zimbabw	Tanzania	771	11.0
321	21.1	652	5.4	591	0.2	778	0.02
334	10.9	658	2.5	699	1.9	874	16.1
335	29.5	678	46.4	762	8.7	892	70.1
411	6.2	693	20.3	851	0.6	893	61.1
522	0.7	694	24.5	892	0.5	898	0.05
531	26.2	699	12.6	931	14.2	931	51.6
533	16.9	742	0.1				
541	10.4	743	2.8				
542	71.0	747	84.5				
551	0.4	759	1.7				
553	4.01	775	17.9				
554	0.01	778	0.1				
581	24.9	784	1.0				
582	2.1	845	11.3				
592	4.1	874	68.2				
625	73.7	892	21.8				
629	12.1	893	0.9				
635	24.3	898	0.27				
641	11.2	931	18.7				
642	3.6						
651	21.3						
652	0.1						
653	81.3						
654	62.1						
656	17.3						
658	8.7						
661	26.5						
664	0.2						
665	0.2						
679	7.6						
684	22.2						
685	12.0						
686	1.7						
692	12.9						
693	2.0						
694	3.7						
695	2.1						

Table E2: continued...

699	2.9
716	60.6
723	36.6
724	28.8
727	29.3
728	2.5
731	26.5
737	0.39
741	1.3
743	3.7
744	11.9
749	2.5
752	69.2
761	41.7
762	60.1
763	78.9
764	0.2
771	0.8
773	8.3
775	0.2
778	1.04
781	8.02
782	29.98
783	12.1
784	0.7
785	33.4
786	51.6
811	1.3
813	3.2
841	2.1
842	48.6
843	9.1
844	4.8
851	0.04
874	35.3
882	77.4
891	79.5
892	2.7
893	17.7
896	0.5
898	37.0
899	1.01
931	40.5

Table E3: Zambia's intra-industry trade

(a) Zambia intra-industry trade with Tanzania

1979		1981		1987		1988		1990		1991		1992		1993	1993
Code	IIT	Code	IIT	code	IIT	Code	IIT	code	IIT	Code	IIT		IIT	code	May
o98	3.49	o75	0.001	oo1	0.35	o11	16.93	oo1	0.11	o47	0.54	o62	0.07	522	64.20
344	45.39	291	11.45	o24	0.22	211	2.34	o71	1.68	o61	0.01	o98	27.85	625	5.17
522	63.42	332	43.46	o54	0.94	222	10.43	533	1.85	o71	43.15	121	0.05	642	8.70
523	22.46	514	66.04	o71	17.25	291	82.78	541	60.61	593	1.03	248	6.71	731	57.69
541	66.67	599	61.67	o46	53.49	522	0.05	628	15	625	40.08	263	22.92	792	3.57
692	39.79	629	72.92	291	1.56	533	4.78	641	0.37	661	0.65	266	3.15	899	46.04
695	0.62	641	81.16	334	1.69	541	31.53	642	32.86	682	0.001	292	1.92		
699	70.00	657	7.65	533	11.08	551	1.56	651	17.66	684	2.44	351	0.23		
721	2.34	674	97.60	541	44.13	572	0.08	652	25.41	716	24	421	0.33		
778	0.05	692	20.35	634	76.44	582	28.36	657	39.76	724	88.89	524	0.20		
851	28.21	821	54.40	641	16.27	598	45.44	658	14.74	741	8.07	532	0.11		
		892	2.33	651	0.88	628	61.90	661	4.71	775	10.16	575	25.25		
				652	4.75	641	2.14	666	1.93	778	23.41	591	20.32		
				657	10.94	642	6.66	684	20.00	782	62.66	593	0.04		
				665	3.55	651	0.19	685	6.14	784	27.30	625	0.99		
				674	11.55	652	0.74	693	84.03	843	4.26	652	0.30		
				695	17.68	658	22.19	695	13.84	851	58.10	661	25.95		
				699	20.45	666	9.23	697	22			682	0.03		
				724	56.31	674	71.52	699	76.73			692	5.14		
				744	61.32	691	23.08	723	1.07			693	10.74		
				749	42.86	695	44.85	749	13.41			724	3.69		
				762	70.32	699	26.26	764	85.06			742	70.75		
				763	13.58	725	22.11	778	50.51			752	1.59		
				775	25.40	741	3.13	784	62.63			763	5.68		
				778	41.01	749	27.74	785	5.37			764	84.62		
				784	97.00	751	93.70	821	7.05			775	5.31		
				786	50.67	764	14.68	842	5.03			785	31.47		
				843	3.49	775	12.85	843	10.93			821	2.46		
				851	5.15	778	91.77	885	13.33			843	63.63		
				855	64.57	784	42.58	894	62.5			848	3.91		
				874	18.52	785	65.35	895	44.07			898	0.996		
				892	43.44	843	62.56	899	5.26						
				893	10.43	848	0.30								
				896	79.52	851	0.44								
				899	17.76	874	11.69								
						892	0.03								
						895	12.07								
						898	33.22								

(b): Zambia's Intra-industry trade with Zimbabwe

code	1987	code	1988	code	1990	code	1991	code	1992	code	1993
291	66.07	o44	0.22	oo1	1.53	o22	1.27	o22	0.49	o54	81.23
o57	88.33	o54	4.69	o61	40.56	o34	92.7	o35	28.12	o57	0.70
o44	1.44	o57	4.58	o71	2.82	o44	42.03	o47	6.14	o61	0.50
o45	2.68	o61	2.69	121	46.77	o56	26.96	o54	97.14	o72	76.04
222	25.86	o75	19.08	211	66.3	o61	3.43	o58	63.14	o74	11.08
o61	97.59	121	10.04	222	18.35	o62	17.35	o61	7.14	o81	8.45
o81	45.39	222	3.95	248	28.42	121	1.48	o74	16.96	o91	0.12
121	6.18	247	27.63	269	9.23	222	0.13	o81	94.52	o98	0.01
273	62.07	334	16.05	278	7.33	248	79.5	o98	2.9	121	14.42
278	70.4	335	30.23	288	41.85	265	30.77	112	9.6	222	0.20
278	40.05	431	0.42	291	73.06	266	92.68	121	1.02	278	9.22
334	5.9	522	3.03	322	43.28	278	31.27	122	70.65	522	84.19
522	74.55	541	55.25	335	21.74	292	0.16	211	0.41	542	16.91
512	9.2	551	0.03	511	16.18	325	2.52	222	0.34	554	0.005
553	10.4	553	1.6	522	79.28	522	93.36	248	2.09	634	13.04
554	0.01	554	0.01	533	0.1	542	27.06	266	0.02	641	1.83
592	9.63	572	0.13	541	23.14	574	3.22	269	5.32	652	68.08
598	20.64	592	4.54	553	54.31	611	6.21	274	0.64	656	0.28
582	11.05	625	60.55	583	1.6	625	64.58	278	8.92	657	30.13
625	24.31	635	44.58	625	49.33	634	18.64	291	21.05	661	52.44
848	0.52	651	23.42	634	71.88	651	13.7	334	59.02	679	0.02
634	45.5	652	92.65	635	62.7	652	97.89	335	36.58	682	39.20
641	0.16	657	45.69	651	45.94	656	52.88	411	23.26	686	11.34
892	21.07	664	0.02	652	38.76	658	8.52	421	56.33	778	46.25
651	27.25	674	0	653	4.68	661	22.99	431	0.05	784	46.58
652	4.63	682	16.79	657	0.05	665	4.18	522	19.95	872	8.39
657	38.57	693	2.69	661	48.9	682	63.63	523	35.58	893	0.41
843	8.92	695	24.26	682	0.79	685	19.5	553	13.06	898	0.62
658	0.31	697	36.04	684	90.14	686	0.68	592	3.91		
851	0.21	699	35.31	685	12.91	699	2.18	593	87.26		
661	0.03	721	0.02	691	32.9	728	0.01	634	0.28		
665	0.03	728	5.97	692	0.03	745	0.03	651	63.13		
693	0.97	755	0.09	693	5.13	773	15.02	652	0.2		
607	0.71	759	56.76	699	15.16	781	37.55	654	7.06		
682	0.39	764	51.77	716	0.58	783	1.44	657	20.57		
692	0.05	771	6.3	726	1.47	784	48.38	661	2.37		
697	0.21	773	56.63	741	1.31	786	0.01	665	50.52		
699	87.54	775	0.43	743	16.92	884	36.65	685	62.78		
695	12.05	778	17.87	774	19.71	892	0.58	686	0.02		
699	0.39	782	40.83	745	0.03	893	1.41	692	0.3		
713	70.1	786	0.08	749	0.09	897	70.59	694	0.05		
743	2.72	791	35.37	755	0.02	898	5.93	695	0.08		
741	0.86	792	27.11	759	54.85			696	19.13		
745	0.01	821	0.1	762	10.13			699	4.35		
723	9.32	842	0.05	764	6.53			737	0.17		
727	6.79	843	10.17	781	5.8			761	4.64		
724	71.14	846	0.09	782	0.13			778	8.01		
728	8.25	851	0.02	784	94.3			781	56.39		
749	0.08	892	0.09	792	35.71			783	27.43		
778	7.11	894	0.02	821	0.19			784	30.03		
783	2.04	895	1.29	842	2.4			785	52.47		
785	9.3	899	24.27	892	0.84			841	59.35		
881	1.56			893	0.11			842	4.07		
898	54.92			898	91.43			874	35.22		
821	0.08			899	3.42			881	88.57		
899	4.76			931	1.4			892	0.6		
894	1.22							893	9.58		
								899	76.54		

(c): Zambia's intra-industry trade with Malawi

Code	1979	code	1987	code	1988	code	1990	code	1991	code	1992	code	1993
048	23.53	054	0.19	001	7.31	001	0.13	074	0.03	022	3.23	001	4.83
081	0.43	075	0.84	003	3.87	061	2.19	098	2.34	054	62.5	022	6.29
098	98.4	121	92.5	058	62.9	111	23.4	121	0.03	074	17.5	121	0.01
278	3.74	541	0.01	335	0.71	112	77.4	222	0.02	111	72.3	278	75.2
635	0.60	625	45.8	893	22.9	121	7.94	292	42.1	112	8.74	522	70.8
641	0.04	634	39.1	625	21.3	222	1.30	591	3.64	121	14.1	781	5.42
665	2.97	892	3.32	641	0.24	292	1.09	592	32.5	222	0.01		
699	2.86	652	17.2	892	13.4	523	3.11	651	0.16	278	61.2		
778	27.7	657	28.0	663	3.76	641	1.25	658	52.2	292	63.9		
791	3.46	843	8.98	673	0.02	652	38.8	661	0.05	421	0.81		
848	44.8	851	72.8	695	0.44	665	1.1	663	0.72	542	61.8		
892	1.53	666	16.3	764	12.6	699	3.18	665	2.4	553	76.7		
		694	0.16	778	0.47	741	71.1	682	0.14	591	76.5		
		699	98.9	786	11.2	762	9.52	684	35.1	635	62.2		
		695	5.24	821	3.8	778	15.9	699	9.12	642	0.72		
		745	9.2			782	1.29	892	74.1	651	1.59		
		778	99.5			785	0.57	898	0.08	661	0.3		
		784	17.7			851	1.71	899	8.6	663	0.44		
						892	24.9			682	0.03		
										724	53.3		
										728	66.6		
										764	36.8		
										773	23.0		
										778	38.7		
										781	95.3		
										782	47.9		
										784	0.97		
										785	0.43		
										821	1.21		
										841	20.3		
										843	24.2		

(d): Zambia's intra-industry trade with Kenya

Code	1979	Code	1987	Code	1988	Code	1990	Code	1991	Code	1992	Code	1993
211	11.6	523	50.2	892	97.4	532	40.6	022	21.1	591	24.0	676	29.5
771	3.62	625	14.6	665	92.6	749	2.12	292	8.74	625	19.1		
778	2.91	892	0.67			778	49.0	892	0.46	682	0.67		
842	24.0	728	0.03			781	13.8			778	63.5		
						842	16.4			781	64.3		
						893	48.5			892	57.5		

(e): Zambia's intra-industry trade with Swaziland and Lesotho

Code	Swaziland 1988 IIT	Code	Lesotho 1990 IIT
635	86.48	659	75.47
892	1.14		
682	29.12		

Table E4: Tanzania

(a): Tanzania intra-industry trade with Kenya

Code	1975	Code	1981	Code	1989	Code	1991
oo1	14.14	o75	0.04	oo1	0.06	oo1	11.06
o11	57.06	631	26.74	o31	42.95	o42	16.92
o13	0.74	632	4.63	o52	16.55	o51	0.003
o31	0.10	641	0.02	o54	70.16	o52	10.39
o51	10.45	655	25.83	o75	92.79	o53	38.34
o54	63.17	684	70.73	o81	21.54	o61	95.28
o55	19.54	698	1.10	112	43.75	o75	38.53
o61	2.40	892	0.05	267	62.78	o81	16.54
o71	0.06	893	4.71	276	3.44	211	3.04
o74	22.46			292	21.29	221	34.83
o75	24.71			421	17.33	231	0.8
o81	89.81			431	44.97	242	8.22
o91	13.54			532	0.06	251	89.10
121	0.003			611	0.08	261	1.66
243	29.74			629	1.60	291	6.71
263	0.02			631	9.77	292	18.28
267	51.63			632	47.68	521	84.25
275	89.90			641	78.16	541	0.02
276	9.62			656	33.32	629	63.23
282	37.44			665	0.01	631	50.79
291	7.58			666	0.05	632	19.02
292	19.74			678	0.32	641	62.15
332	0.006			697	0.24	642	20.27
422	39.07			719	2.88	651	1.63
431	11.84			722	38.56	655	59.36
513	67.51			725	0.57	656	1.25
514	7.15			729	0.75	665	23.86
533	3.04			732	1.03	679	4.05
541	0.23			733	0.33	692	7.15
553	52.10			831	21.84	697	3.72
554	99.13			841	86.93	722	65.76
581	12.91			892	0.89	732	99.91
599	78.32					812	11.03
611	13.64					821	11.52
612	21.78					861	0.17
621	15.57					892	0.14
629	99.69					899	0.81
631	93.13					931	27.89
632	23.82						
641	23.22						
642	0.23						
651	0.33						
652	4.75						
653	8.06						
655	74.91						
656	57.62						
657	7.17						
661	0.002						
663	36.71						
664	36.81						
665	0.03						
666	44.00						
673	23.18						
678	18.94						

Table E4: continued

Tanzania intra-industry trade with Kenya

Code	1975	Code	1981	Code	1989	Code	1991
684	10.61						
692	0.21						
694	0.07						
695	11.50						
697	77.56						
698	3.28						
712	51.79						
718	24.43						
719	0.77						
724	0.33						
729	38.12						
821	60.69						
831	11.47						
841	12.18						
851	42.93						
891	30.73						
892	5.33						
893	37.96						
895	0.19						
899	54.70						

(B): Tanzania intra-industry trade with Uganda, Burundi and Zambia

Tanzania	Uganda 1991	Tanzania	Burundi 1991	Tanzania	Zambia 1991
Code	IIT	Code	IIT	Code	IIT
599	45.36	697	25.79	284	2.30
892	73.11			629	12.80
Tanzania	Zimbabwe	1991		642	19.72
732	47.64			678	0.06
931	5.97			682	0.03
				695	18.69
				698	14.18
				723	10.03
				725	18.07
				732	84.19
				899	62.09
				931	54.64

Table E5: Kenya

(a): Kenya -Tanzania

1983		1989		1990		1991		1992	
Sitc		sitc		sitc		sitc		sitc	
oo1	16.67	o57	43.97	o57	42.29	oo1	2.52	o57	54.07
o34	89.29	o81	37.16	o81	0.59	o54	8.48	o81	98.16
o54	84.98	292	6.87	222	4.84	o57	51.21	248	1.37
o57	27.01	421	7.22	248	74.56	o81	39.50	292	2.22
o74	0.25	591	0.41	251	79.40	222	9.43	421	17.19
o81	17.18	629	62.37	292	17.20	292	17.43	581	0.08
222	0.35	641	3.78	581	0.05	421	97.80	591	0.58
591	0.91	523	65.58	591	0.61	523	11.02	621	0.12
641	36.3	658	0.10	625	0.13	533	0.01	625	0.26
658	1.22	679	1.96	629	34.90	581	0.05	629	5.40
695	1.11	684	55.67	641	37.35	591	1.54	641	50.64
		695	16.34	684	70.6	598	3.41	657	0.76
		723	16.11	713	37.28	621	73.47	658	0.52
		741	23.02	723	39.65	625	4.42	684	66.36
		778	12.05	728	10.92	629	12.75	693	0.38
		784	32.41	741	2.33	641	18.91	694	0.41
		874	59.01	772	5.23	657	7.96	695	84.04
		892	5.81	778	0.22	658	1.41	696	2.66
				784	5.38	679	32.78	699	0.16
				892	3.03	684	53.77	713	71.58
						686	0.17	723	8.01
						693	3.31	724	77.43
						694	1.75	728	79.94
						695	93.30	741	0.21
						696	9,91	742	0.72
						699	0.01	772	0.96
						713	41.91	778	7.04
						723	27.66	784	10.41
						724	47.46	821	0.02
						728	24.19	892	14.93
						737	71.25		
						741	23.78		
						742	36.1		
						772	0.23		
						778	65.33		
						781	28.91		
						784	2.13		
						785	12.17		
						813	43.92		
						821	1.52		
						873	82.42		
						874	77.52		
						884	42.33		
						892	0.40		
						897	60.12		
						899	1.37		

(b): Kenya Zambia intra-industry trade

1975 code	1975 IIT	1983 code	1983 IIT	1989 code	1989 iit
291	31.45	591	26.31	778	16.25
541	0.08	778	58.63	892	22.92
621	2.62	892	39.63		
629	41.90				
698	3.32				
719	0.01				
722	9.18				
892	7.46				

(c): Kenya-Uganda

1975 code	iit	1983 code	iit	1989 code	iit	1990 code	iit	1991 code	iit	1992 code	iit
044	0.12	242	70.74	081	12.60	081	40.24	074	49.14	075	1.83
051	31.89	263	4.16	248	9.38	263	0.01	075	0.96	081	4.88
054	91.53	621	3.42	522	0.28	892	14.91	081	43.93	542	0.45
075	45.84	661	0.77	533	95.24			222	12.65	598	0.96
121	82.26	764	81.42	621	0.71			248	6.31	695	3.97
243	23.50	778	2.26	661	0.49			263	0.18	821	4.54
421	1.33			676	2.10			542	1.48	892	0.17
513	70.53			692	2.03			695	43.95	898	0.51
533	0.61			693	2.54			727	39.24		
554	4.93			759	16.32			786	97.10		
621	8.69			772	17.98			821	0.15		
629	0.23			892	0.27			892	0.041		
632	0.34							898	0.08		
642	0.23										
651	94.68										
652	6.88										
656	0.78										
657	94.15										
662	3.82										
673	18.45										
678	4.31										
692	0.30										
841	66.69										
892	1.67										
893	5.57										
899	8.84										

(d): Kenya-Zimbabwe

1983 code	iit	1989 code	iit	1990 code	iit	1991 code	iit	1992 code	iit
591	13.84	112	0.39	112	56.54	112	0.95	112	32.02
742	99.27	278	17.24	542	94.78	278	51.60	278	87.38
		542	32.50	591	0.07	522	3.38	542	77.60
		554	26.75	641	7.19	533	0.54	591	90.50
		575	9.34	695	11.48	542	6.13	641	29.87
		591	38.89	697	6.93	591	89.99	695	49.31
		641	0.24	743	0.22	641	16.62	699	65.38
		699	4.86	778	0.03	642	1.16	778	14.74
				893	80.32	658	9.42	893	3.88
						695	1.82		
						697	29.41		
						699	15.58		
						713	6.22		
						742	64.77		
						743	3.78		
						744	7.79		
						775	2.97		
						778	0.01		
						893	32.83		
						894	12.55		

(e): Kenya intra-industry trade with some other countries

Ethiopia Code	1983	Comoros Code	1983	Sychelles code	1983	Rwanda code	1983	Burundi code	1983	Burundi code	1989	Burundi code	1992
112	19.22	24	95.24	278	85.53	071	1.20	892	0.06	892	37.29	691	38.84
598	20.93					074	4.28						
892	68.15					554	34.16						

(f): Kenya's intra-industry trade with some other countries.

Somalia 1983 code		Somalia 1989 code		Somalia 1991 code	
625		642	1.08	625	87.20
642	0.43			786	3.05

Sudan code	1983 IIT	Sudan code	1989 IIT	Sudan code	1990 IIT	Sudan code	1991 IIT	Sudan code	1992 IIT	Mauritius 1983 code	
292	28.68	292	2.62	625	7.25	625	0.62	o61	0.24		
625	0.86	695	0.95			742	16.88	292	0.68	642	4.64
695	60.12	775	43.15					553	28.21	892	
27.63											
892	0.29							892	2.39		

Table E6: Ethiopia's intra-industry trade

1991			1990			1989			1988		
country	sitc		country	sitc		country	sitc		country	sitc	
Djibout	o23	13.30	Djibout	o57	0.01	Djibout	o61	0.27	Djibout	o54	0.36
Djibout	o54	0.15	Djibout	o61	2.52	Djibout	334	46.05	Djibout	o57	0.82
Djibout	o56	29.58	Djibout	o98	47.96	Djibout	659	16.77	Djibout	o61	0.28
Djibout	o57	1.17	Djibout	112	1.66	Djibout	663	4.29	Djibout	o98	1.12
Djibout	o61	27.79	Djibout	334	7.36	Djibout	763	4.20	Djibout	112	0.22
Djibout	o75	0.49	Djibout	658	4.47	Djibout	785	1.17	Djibout	659	34.31
Djibout	112	5.04	Djibout	661	12.24	Djibout	821	10.99	Djibout	666	7.63
Djibout	334	9.16	Djibout	821	11.88	Djibout	844	6.90	Djibout	821	24.12
Djibout	652	75.27	Djibout	843	30.41	Djibout	847	34.06	Djibout	843	29.98
Djibout	699	0.58	Djibout	844	49.91	Kenya	269	0.15	Djibout	851	84.70
Djibout	821	6.54	Djibout	846	38.97	Kenya	659	60.37	Kenya	o54	4.28
Djibout	843	81.98	Kenya	o45	0.08	Kenya	775	6.55	Kenya	659	3.69
Djibout	844	2.99	Kenya	o54	51.62	Kenya	821	71.01	Kenya	775	36.42
Djibout	892	0.51	Kenya	o75	0.14	Kenya	843	57.46	Uganda	659	32.99
Kenya	112	17.57	Kenya	775	47.04	Kenya	851	0.99	Zambia	659	20.41
Kenya	775	28.13	Kenya	843	17.74	Zimbabwe	775	28.57			
Kenya	843	37.04	Kenya	844	64.40	Sudan	775	48.74			
Mauritius	775	81.45	Kenya	851	7.78	Tanzania	821	95.24			
Zimbabwe	775		50.95	Kenya892		0.85	Uganda	775	78.60		
			Zimbabwe	659	24.85	Zambia	659	51.32			
			Namibia	659	18.71	Zambia	775	28.79			
			Tanzania	775	24.38						

Table E7: Sudan's intra-industry trade.

1988			1989		
country	sitc		country	sitc	
Ethiopia	oo2	0.42	Kenya	732	27.70
	o23	33.79		734	69.84
	o61	2.39	Ethiopia	734	25.46
	o75	7.00			
	851	14.78			
Kenya	718	64.61			
Ethiopia	734	4.11			

Table E8: Malawi

(a): Malawi intra-industry trade with Zimbabwe

Code	1980	1981	1982	Code	1983	Code	1984	1985	1986	code	1987	1988	1989
oo	62.99	9.09	0.18	oo	16.93	oo	23.71	0.02	0.01	oo	27.17	60.68	23.73
o1	-	9.23	26.35	o3	22.95	o1	-	0.22	-	o1	0.52	-	-
o3	-	0.01	-	o8	5.38	o2	5.84	-	-	o6	-	-	58.87
o7	9.69	3.21	0.08	o9	0.34	o3	-	-	4.22	o9	0	9.01	63.13
o8	89.79	45.66	25.51	10	48.38	o7	-	6.96	-	10	0.01	53.92	19.70
o9	0.61	1.69	0.62	11	1.71	o8	5.52	55.82	6.73	11	1.93	-	-
10	-	60.00	24.15	15	5.00	o9	-	-	0.07	12	0.17	12.84	0.93
11	42.05	7.01	90.26	17	59.72	10	-	20.19	-	15	0	60.54	10.12
12	24.34	8.08	4.06	18	68.40	11	-	2.65	0.73	17	83.06	9.67	84.76
15	57.19	31.77	11.55	19	85.27	12	2.20	5.67	1.03	18	5.56	-	-
16	-	16.07		20	15.42	15	-	8.73	-	19	-	-	1.54
17	4.52	34.23	9.40	21	44.61	17	1.16	14.6	7.03	20	76.42	73.99	73.41
18	-	90.32	88	22	0.16	18	-	-	0.95	21	0.02	0.07	4.35
19	77.5	85.6	40.5	23	1.42	19	-	1.24	6.8	22	0.27	0	3.03
20	9.8	16.82	10.1	24	72.23	20	61.1	53.2	92.8	23	-	9.16	-
21	55.61	19.91	30.91	25	17.8	21	57.3	20.95	7.93	24	0	0	0.09
22	-	38.6	13.2	30	0.05	22	0.2	87.64	5.7	27	-	2.98	-
23	2.21	1.71	2.41	33	83.4	23	26.34	51.48	-	33	-	-	1.51
24	64.5	10.94	3.4	39	89.1	24	64.32	33.1	2.0	34	18.84	0.51	-
28	0.27	5.11	-	40	26.34	25	9.6	-	-	35	-	19.2	-
29	14.8		-	41	53.2	27	-	0.03	-	39	16.12	46.6	-
30	0.48	-	-	44	47.2	33	31.3	-	-	40	64.21	89.85	74.8
33	0.41	50.81	-	49	23.22	34	23.4	8.04	1.83	41	44.41	61.4	90.52
34	1.89	-	-	58	24.5	35	25.6	-	26.01	44	95.82	73.9	39.8
37	13.99	0.9	0.34	59	5.02	37	-	0.3	-	46	0	0	-
39	51.2	45.41	82.01	61	12.7	39	14.6	7.3	17.51	47	0	0	0
40	2.6	17.99	10.21	62	55.51	40	32.13	92.4	79.72	48	0.002	1.99	0.01
41	61.9	78.92	74.52	64	83.12	41	22.6	-	37.9	49	83.64	70.2	19.6
42	-	60.61	98.7	73	16.82	44	6.74	2.71	81.4	55	44.8	94.72	60.61
44	30.71	41.3	24.64	78	52.3	48	0.01	-	-	56	94.82	49.72	18.97
48	0.05	7.28	1.08	82	19.41	49	30.2	13.8	13.8	59	37.81	46.2	39.1
49	10.21	45.44	12.22	91	64.8	55	24.57	69.02	45.43	61	19.96	41.14	26.9
55	2.77	1.38	84.52	94	1.11	58	18.41	-	3.39	62	-	39.78	-
56	0.074	-	5.34	97	50.3	59	74.77	92.21	64.04	64	0.17	0.02	4.7
57	-	3.9	-	98	21.63	61	95.01	81.9	52.63	69	0.21	-	-
58	-	0.05	-			62	-	69.44	-	73	5.76	13.96	2.81
59	15.22	10.96	9.03			64	11.5	75.1	0.18	74	29.9	47.53	24.01
60	99.63	29.5	-			70	0.08	-	-	76	44.81	45.6	16.71
61	15.23	6.8	20.72			71	-	70.9	21.61	78	-	-	0
62	69.02	31.71	49.5			73	0.05	3.37	5.63	82	-	27.1	1.26
64	82.44	50.7	77.94			76	-	-	16.96	83	-	9.36	-
68	-	-	0.15			78	86.8	86.51	64.93	84	-	0.2	3.6
73	-	0.03	17.89			85	-	1.66	-	94	5.80	8.30	25.4
74	62.17	47.4	6.85			94	1.65	1.62	0.12	96	2.15	3.89	0
76	11.02	3.29	1.14			97	14.56	80.8	48.41	97	60.5	27.24	16.3
78	-	77.73	57.9										
82	18.11	7.04	19.78										
84	22.6	-	-										
94	5.93	45.2	9.05										
95	1.26	-	6.89										
96	8.73	60.4	3.65										
97	60.1	35.58	7.82										
98	34.21	7.2	19.78										

(b): Malawi-Mozambique

code	1980	1981	1982	code	1983	code	1984	1985	1986	code	1987	1988	1989
00	24.05			00	69.03	00	5.87	3.78	-	00	11.66	-	-
03	0	27.27		07	11.89	09	5.44	2.67	-	27	-	-	0.04
10			97.77	10	0.002	12		-	0.3	48	0.76	-	-
11			19.43	15	46.39	15	33.38	-	-	49	7.72	-	-
12		12.17		25	0.39	16	2.57	-	-	73	75.24	26.6	-
15			0.14	27	14.54	25	11.41	90.58	-				
17	1.16			30	31.3	27	11.95	29.72					
21	10.12			39	15.44	44		75.75					
27	7.17	14.53	9.14	55	0.12	49	9.07						
32	60.51		75.23	61	48.65	62	13.9						
34	92.46	16.14	44.35	73	53.08	82		-	0.12				
39	51.65	0		84	76.98	85		-	22.35				
40	1.91		3.42			87		-	13.79				
42	89.8					94		-	19.07				
44		19.09											
48	28.66												
49			68.97										
59			81.78										
61	0		7.88										
62	0.97		1.28										
64			31.5										
68	0.43												
69			77.42										
73	50.57	8.37	19.25										
82			80.01										
83			5.32										
85			24.98										
97			67.31										

(c): Malawi-Zambia

code	1980	1981	1982	code	1983	code	1984	1985	1986	code	1987	1988	1989
00	18.9	15.38	43.96	00	8.47	00	12.34	12.49	8.59	00	48.25	25.58	74.02
01	-	10.25	3.93	03	4.95	21	-	22.43	-	07	-	0.008	
03	-	-	0.38	11	26.59	25	-	0.006	-	08	3.84	-	-
12	11.82	0.89	-	21	29.93	30	-	46.15	0.02	10	0.003	-	-
19	-	-	40.7	24	66.7	33	-	-	88.2	12	24.3	-	0.82
21	-	-	82.57	33	24.6	39	0.06	0.16	12.74	19	-	-	3.62
24	0.02	0.08	0.7	34	5.61	40	13.03	9.9	-	20	-	-	53.26
28	5.44	-	-	49	7.15	48	16.7	32.8	-	21	-	-	71.4
29	19.05	-	-	55	0.32	49	17.05	4.01	22.04	28	4.12	-	0
30	0.014	0.02	0.07	59	0.13	55	26.41	-	-	30	-	-	3.74
33	11.75	-	-	61	4.49	59	0.43	-	7.02	32	-	-	-
39	0.95	0.65	6.97	64	75.99	61	85.96	93.83	25.02	33	47.81	-	-
40	-	-	23.52	73	2.51	64	19.58	20.74	15.8	39	0.14	10.83	0.53
48	7.39	32.9	36	84	88.1	73	18.84	15.51	28.61	40	48.2	-	-
49	27.61	14.29	78.1	-	-	82	-	-	0.06	41	0	-	-
55	60.63	-	0.03	-	-	84	2.93	-	-	44	13.95	93.85	-
56	16.75	-	-	-	-	94	24.05	-		48	89.7	28.18	-
61	86.44	20.04	0.51							50	3.81	92.71	0
62	1.01		62.61							58	0		
64	34.48		1.00							59	-		
70	39.08	7.19	12.45							60	0		
73	45.79	0.67	2.67							61	83.33	31.23	22.74
84	39.84									62	0.02		0
85			0.47							63	-		2.97
87		2.48								64	51.3		
94			95.74							67	0		
98		70.77								68	0	3.91	
										69	0		1.29
										70	0		32.15
										73	24.26		0.31
										74	0		0
										76	0		
										78	0		14.8
										79	-		
										80	0		
										82	7.83	16.88	-
										83	0		
										84	21.11	33.21	71.48
										85	0.94		0.003
										87	0		7.91

(d): Malawi's intra-industry trade with Tanzania

Code	1981	1982	1983	Code	1984	1985	1986	Code	1987	1988	1989
oo	3.75	81.86	47.02	oo	3.30	0.87	-	oo	51.27	37.40	39.64
21	-	-	76.71	12		-	3.82	o7	-	-	-
22	-	-	43.14	49		2.79	-	12	-	80.74	52.74
30	-	-	1.79	61		18.59	-	27	1.09	-	-
49	1.71	18.43	0.42					40	51.14	-	-
58	-	50.21	-					48	-	16.51	-
61	5.39	-	-					49	0.09	1.29	4.90
84	-	-	1.59					61	-	67.11	-
	-	-	-					85	-	-	34.76

(e): Malawi's intra-industry trade with Kenya

Code	1981	1982	1983	Code	1984	1985	1986	Code	1987	1988	1989
oo	74.85	24.22	83.22	oo	50.65	54.87	74.34	oo	57.31	62.76	14.02
o9	-	3.02	-	o3	78.73	-	-	22	-	39.23	-
12	-	95.6	-	44	0.66	42.86	-	30	-	-	5.34
21	-	15.65	-	49	92.85	48.60	27.10	37	-	1.56	-
44	-	-	3.78	84	-	3.01		48	-	-	5.35
49	72.93	76.07	69.90					49	23.79	98.67	83.42
64	5.31							90			60.30
84	56.80										

Notes

1 With a Preferential Trading Area members reduce or remove impediments to trade among each other but individually retain their restrictions with the rest of the world. Over time many other developmental strategies have been adopted including monetary issues.

2. This is not a unique problem of these countries but many other empirical studies have noted this. For example, Finger and DeRosa 1978, discusses the classification difficulties with the US data. Drabek and Greenaway discusses also problems of data comparison in their study which compares The EEC and CMEA Intra-Industry Trade.

3. Hellvin 1993.

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