Policy and Non-Policy Barriers to Trade and Implicit Taxation of Exports in Uganda

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Uganda has made significant progress in reducing policy-induced anti-export bias in its trade policy in the 1990s. Taxes on exports have been abolished, and import protection has been reduced considerably. Such trade policy barriers are only a component of the transactions costs associated with trade. Poor infrastructure, notably by increasing transport costs, and institutional inefficiencies can significantly increase trade costs. The effective protection of imports, and implicit tax on exports, due to transport costs is calculated and compared to effective protection due to trade policy barriers for Uganda. The results reveal that transport costs are often very high, in many cases representing a greater cost (tax) to exporters than trade policy.

I. INTRODUCTION

A number of low-income countries have implemented significant trade liberalisation reforms with the aim, amongst others, of fostering export growth. Taxes on exports have been abolished, and import protection has been reduced considerably. For most of the countries, especially those in Africa, the export response has so far been sluggish. A number of explanations have been suggested for this, including the credibility and sustainability of reforms and factors constraining supply response of agricultural commodities. Here we focus on alternative contributory explanations, namely the extent to which countries are disadvantaged by 'natural' barriers (associated with location or infrastructure) that effectively

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tax (explicitly or implicitly) exports. Trade policy barriers are only a component, albeit important, of the transactions costs associated with trade. Poor infrastructure, notably by increasing transport costs, and institutional inefficiencies (for example, in customs clearing procedures), can significantly increase trade costs, especially for countries such as Uganda that are land-locked. This study uses data from a range of sources to estimate the transport costs for imports to, and exports from, Uganda. Separate estimates are provided for road freight, sea freight and air freight for fourteen productive sectors of the economy. The effective protection of imports, and implicit tax on exports, due to transport costs is calculated and compared to effective protection due to trade policy barriers. The results reveal that transport costs are often very high, in many cases representing a greater cost (tax) to exporters than trade policy. These non-policy barriers can help explain the slow response of Ugandan manufacturing to trade liberalisation. Measures to improve the transport infrastructure could be of significant benefit to Uganda, especially to exporters.

The main objective in this study therefore is to quantify the relative importance of 'policy-induced' and 'non-policy' barriers to trade, using an effective protection approach. By policy-induced barriers we refer to price distortions and trade costs associated with trade policies. In particular, this quantifies the effect of taxes on imports (tariffs), non-tariff barriers (NTBs) and taxes on exports. The non-policy barriers are those not associated directly with trade policy. Some will be transaction costs resulting from other (non-trade) policies. For example, a highly regulated exchange rate regime can increase the costs of exchanging currency; exporters may not be able to retain the full true value of foreign exchange earnings, or importers may have difficulty getting the hard currency they require. Similarly, an inefficient financial system can increase the costs of, and ration access to, credit (necessary, for example, to finance trade). The focus here, however, is on what can be termed natural barriers. Some countries will face additional international trade costs because of their geographical characteristics. For example, countries like Uganda are land-locked whilst islands like Mauritius are remote. These natural barriers will increase costs of importing and exporting for affected countries, relative to countries with more favourable geographical characteristics. We address this by examining international transport costs.

To some extent the distinction between trade policy and non-policy barriers is arbitrary. In principle, one could envisage various ways of categorising trade distortions or barriers: trade policy-induced, non-trade policy, infrastructure inefficiencies (that, for example, increase transport, storage and distribution costs), institutional constraints (slow customs procedures at borders, lack of marketing information) and natural barriers.

Many of these are difficult to measure, even approximately; we confine attention to two and take the example of Uganda. First, we will measure effective protection due to trade policy (specifically, taxes on imports and exports). Second, using an adapted effective protection formula, we will measure implicit taxing and subsidising effects of transport costs on different types of producers; note that this measure conflates two barriers, infrastructure inefficiencies and natural barriers, into one. Importers and exporters in Uganda will face higher transport costs than, for example, competitors in Kenya simply because they have to transport goods further to get to ports to ship goods overseas.[1] This is the natural element. However, if transport infrastructure is poorly maintained and inefficient within Uganda, this increases trade costs. These costs associated with poor infrastructure can be avoided by improving the quality of infrastructure. By quantifying the costs, one can estimate the potential benefits from investing in improved infrastructure.

The principal aim of this study is to demonstrate that the implicit export tax associated with transport costs in Uganda is quite high, and for many sectors exceeds the costs of trade policy barriers. These high transport costs are one factor that can help to explain why, although significant trade liberalisation has been implemented by Uganda in the 1990s, the supply response of exporters has been sluggish and limited [*Morrissey and Rudaheranwa, 1998*]. The main argument is that transport costs provide 'natural' protection to domestic sales and increase costs of imported inputs. Transport costs also disprotect producers of exports. We argue that trade liberalisation is likely to be more effective if such transaction costs are reduced.

The study is organised as follows. Section II reviews the trade policy reforms implemented in Uganda in the 1990s and presents evidence to show that the supply response of exports has been limited. In section III we briefly review the literature on transport costs and international trade. Our analysis offers an advance on this literature as we address the effective protection associated with transport costs across various sectors and, specifically, the implicit taxation of exports. The method we use for measuring protection associated with transport costs is detailed in section IV and the data are described in section V. Our estimates of effective protection due to trade policy and transport costs are presented and discussed in section VI. Section VII concludes, relates our findings to other studies in this collection and considers the policy implications of the research.

II. TRADE LIBERALISATION IN UGANDA

Trade liberalisation may imply the removal of tariffs or any other intervention that restores the free-trade set of relative prices. In practice,

however, trade liberalisation encompasses any policy changes that reduce the anti-export bias and move prices of tradables towards neutrality, or changes that promote the substitution of more efficient for less efficient forms of intervention [*Greenaway, 1998; Milner and Morrissey, 1999*]. For purposes of the discussion here, trade liberalisation refers to the reduction/removal of various controls on import trade in Uganda. Price controls, overvalued exchange rate, foreign exchange allocations and a number of quantitative trade restrictions dominated economic policies in Uganda before 1987 [*World Bank, 1995*]. The overvalued exchange rates encouraged imports, a bias against exports and trade deficits. As a result imports were restricted, for example, by import licences, bans and quotas and/or restricted allocation of foreign exchange. The current discussion concentrates on the reduction of import controls, but we note that the exchange rate was devalued considerably and liberalised during the 1990s. All forms of foreign exchange controls were abolished in 1993; exchange rates are now market-determined.

The comprehensive Economic Recovery Programme introduced in 1987 lead to a simplified external trade regime. Automatic renewable certificates replaced selective and specific import licensing in 1991. Both the average and range of tariff rates was reduced substantially by 1997; a detailed account of trade policy reforms in Uganda is given in Morrissey and Rudaheranwa [*1998*] and Collier [*1997*]. The last ten years also witnessed a significant tariffication of non-tariff barriers, elimination of most import restrictions and a reduction of the number of commodities on the negative list.

Export taxes in Uganda are now implicit rather than explicit. Tax on coffee exports was abolished in 1992 but reintroduced in 1994 to limit the appreciation of the exchange rate as a result of the coffee price boom. This coffee tax (the Stabilisation tax) was abolished in 1996. The implicit taxes, such as tariffs on imported inputs, have been eroded over time as import liberalisation proceeded, with successive measures since 1992 to replace quantitative restrictions with tariffs, rationalise and reduce tariffs, and reduce the number of goods on the negative list. The first bout of tariff rationalisation in 1992 established a range of 10–60 per cent, reduced to 10–50 per cent in 1994; by 1996 the highest tariff rate was 30 per cent, and in 1997 the range of rates was further reduced to 0, 5, 10 and 20 per cent. This understates actual protection. When tariffs were reduced in 1996 an Excise Duty of 12 per cent (of the tariff inclusive price) was imposed on certain imports. The Duty was reduced to 10 per cent in 1997, but its coverage extended to apply to almost all finished and consumption goods.[2]

A number of marketing boards have either been privatised or lost their monopoly powers by being exposed to competition from the private sector.

A prominent example is the former Uganda Coffee Marketing Board, which since 1992 has increasingly lost most of its coffee export share to private exporters (especially multinationals, which now dominate). The monopoly power of Uganda Railway Corporation in shipping coffee exports was reduced recently when coffee shipments were opened to competition, allowing the participation of truck transport as well. Other policies include replacement of the trade licence needed each time an export transaction is made with a trade certificate that lasts at least six months.

To insulate the economy from adverse terms of trade and instability in export earnings associated with commodity concentration, there has been a move to diversify the country's exports to include non-traditional (mainly agricultural) exports. Traditional exports comprise coffee, tea, cotton and tobacco while the main non-traditional exports are sesame seeds, maize, beans, horticulture and fish.[3] Earnings from non-traditional exports have risen from $3 million in 1986 to $71 million in 1993, representing 35 per cent of total export earnings, and to $151 million in 1995, representing 27 per cent of total export earnings [*Sharer et al., 1995*]. Traditional exports, especially from coffee, have never accounted for less than 60 per cent of export earnings in the 1990s.

Two factors that influence export performance in Uganda can be distinguished, a combination of deteriorating terms of trade and declining (but erratic) volumes of traditional exports, especially coffee (there are some signs of both trends reversing since 1996). Uganda's export earnings in $US increased by 13 per cent between 1994/95 and 1996/97 (despite a decline in earnings from coffee of some 20 per cent) but the cost of imports rose by about 20 per cent, increasing the trade deficit [*Background to the Budget 1998/99*]. The increase in the volume and value of non-traditional exports has rarely been sufficient to compensate for declines in coffee export earnings. Producers of non-traditional exports report difficulties getting access to credit to finance investment [*EPAU, 1995a*].

Exports from Uganda are not only composed of a few commodities but also are destined for a few countries, primarily in Europe but also North America. Given the negligible share of manufacturing exports, it follows that most exports are unprocessed. There is very little trade between Uganda and its neighbours, with the exception of imports from Kenya and low volumes of exports of food to Kenya. Regional trade is constrained by poor transport and communication systems, and long border and customs clearance delays [*Folke et al., 1993*]. A more obvious factor for Uganda is that it produces primary commodities, generally the same as those produced by neighbours, which are only likely to be demanded (in large volumes) by industrial countries.

There was a general expectation that improved resource allocation and productive efficiency would follow trade liberalisation. The impact of trade

liberalisation, however, can be quite complex and affects sectors in different ways. The reduction of tariffs can increase the inflow of relatively cheap imports that can in turn lead to a decline in production in import-competing industries. Thus, a reduction in protection may not be desirable for the formerly protected manufacturing producers. This is likely to be the case where the reduction of tariff rates is not accompanied by a devaluation of the exchange rate (as the latter increases the domestic currency price of imports). On the other hand, firms using imported inputs will benefit from low-cost inputs, unless imported inputs had benefited from tariff exemptions prior to the reform. Producers of goods for export should benefit from liberalisation, directly if export taxes are reduced or there is a devaluation (as they are price takers in world markets denominated in hard currency) and indirectly as reduced protection increase the relative price of exportables. Specific export promotion measures can facilitate export growth.

Reforms to trade and exchange rate policies alter the relative incentives facing producers in different sectors. Other factors will influence the ability of producers to respond to these incentives. In Uganda many of these factors act as constraints. The banking sector is relatively inefficient, interest rates are high and access to credit for investment is limited. A survey conducted by the Export Policy Analysis Unit [*EPAU, 1995b*] revealed that exporters and investors in Uganda appreciate the extent of macroeconomic policy reforms but regard institutional and infrastructure support as being inadequate. Exporters identify a number of problems that increase trade costs: paperwork and slow clearing procedures for exporting, the high cost and lack of credit, and high freight charges. These high transaction costs make exporters less competitive in export markets. Exporters also perceive tariff reforms and incentives provided by the government to reduce anti-export bias as being inadequate.

In Uganda, poor transport infrastructure is perceived as a major constraint to exporters. Results from the EPAU [*1995b*] survey of exporters show that high fuel costs and poor roads, especially in the rainy season, were major concerns with regard to internal transportation while international transport attracted high freight charges and losses due to delays in transit. As Uganda exports mainly unprocessed (low value added) commodities, freight costs are a relatively high proportion of export value. As processed goods are generally lighter and less bulky than raw materials, one would expect that exporting processed (higher value added) goods would save on transportation costs, although evidence suggests this is not always the case.[4] While there are probable benefits to the Ugandan economy from moving up the processing chain and aiming to export higher value added processed goods, this is unlikely to yield any gains in lowering unit

transport costs (relative to unit value). In fact, the desire to diversify exports is likely to increase the transport, infrastructure and institutional needs of exporters.

Transport inefficiencies impose a significant cost on Ugandan exporters. This is most pronounced for railway connections through Kenya and exacerbated by gross inefficiency at Mombasa port. In both cases, Ugandan goods appear to be particularly badly treated. In principle it should be possible to transport goods from Kampala to Mombasa within a week; in practice it takes three weeks on average, and often as long as two months [*World Bank, 1994*]. The unreliability of predicting arrival times makes it difficult for exporters to book space on ships; departure times are often missed (at high cost) and goods remain at the port for long periods. Exporters consequently prefer to send goods by road, despite the increased risk of theft and higher freight costs – equivalent to roughly two-thirds of the cost of shipping a containerised tonne by sea from Mombasa to Europe [*UNCTAD, 1999: 16, 43*].[5] Ugandan exporters are further disadvantaged because they are more likely to ship bulk cargo than containers. Unit transport costs are higher for bulk cargo, and as most imports are containerised there are fewer outgoing ship spaces for bulk from Mombasa.

III. TRANSPORT COSTS AND INTERNATIONAL TRADE

Trade barriers, be they artificial (for example, tariffs and import restrictions) or natural, such as geographical distance between producing and market centres, increase transaction costs of traders. Transport costs may pose even more of a constraint to foreign trade [*Waters II, 1970; Finger and Yeats, 1976; Yeats, 1977a*]. Although acknowledged as important, the literature on the impact of transport costs is sparse. This limited attention is often attributed to several factors such as lack of reliable data on incidence, the assumption that transport costs are outside the direct control of policy makers, and that the influence of transport costs on trade flows relative to that of tariffs is small. The latter assumption may have been true in highly protected economies, but one can question whether it is still true following bouts of trade liberalisation over the past decade or so.

Evidence on the importance of freight costs from Waters II [*1970*], Finger and Yeats [*1976*], Clark [*1981*] and Milner [*1996*] shows that the effective rate of protection due to transport costs is often as high or higher than their tariff counterparts. Finger and Yeats [*1977b*] further indicate that the incidence of freight charges is higher on goods exported by developing countries relative to those of industrial nations. Arguments have been advanced indicating that there are policy options that would reduce the impact of high freight costs in international trade [*Amjadi and Yeats, 1995a,*

1995b]. Such options include exploiting economies of scale in transportation (increasing the volume shipped), increasing efficiency in the shipping system, or increasing the unit value of commodities shipped. All would reduce the relative impact of freight charges on trade flows. Milner and Morrissey [*1999*] and Milner [*1996, 1998*] disaggregate natural barriers into 'avoidable' and 'unavoidable' components and argue that increasing infrastructure efficiency would reduce the avoidable trade barriers.

There are salient advantages of reducing transaction costs resulting from avoidable natural trade barriers relative to the provision of subsidies or export incentives. Reducing transaction costs is an efficient means to resource utilisation and, unlike the provision of subsidies, does not invite retaliation by trading partners. The provision of subsidies encourages rent-seeking and induces economic inefficiency by distorting relative prices. Moreover, there may be inefficiencies and administrative costs on trading agents associated with the implementation of subsidies [*Corden, 1971*].

Most past research concentrates on protection due international (air/marine) transport costs only, with no adjustment made for overland transport costs borne by land-locked countries.[6] Most researchers use the difference between the 'free on board' (f.o.b.) and 'cost, insurance, freight' (c.i.f.) values as a proxy for transport costs, a method initially developed by Moneta [*1959*]. The f.o.b. value includes production costs and all charges incurred in placing the goods on board a ship, while the c.i.f. value equals the f.o.b. value plus freight and insurance charges to the entry port of the importing country. The c.i.f./f.o.b. ratio for a country aggregates over all commodities and sources and is thus a broad proxy for the extent to which the domestic producer is protected (or an exporter disprotected) by international (both air and marine) transport costs. It excludes transaction costs in the goods distribution chain between the port of entry and the inland destination. Such transaction costs may arise from inefficiencies in transport, clearing procedures, port facilities and losses due to poor storage facilities in the distribution network. High transaction costs from such a poor infrastructure system may reduce and even nullify any comparative advantage that might be revealed by producer price comparisons.

It may not matter whether the country is land-locked or not; significant trade barriers may originate from inefficiency in seaport services. Clark [*1981*] shows that a high proportion of transport costs originate from inefficiency in stowing, loading and unloading, and clearing of cargo at ports. Furthermore, large countries may have to transport goods long distances overland. However, the problems are even greater for land-locked countries, especially in the case of exports. For example, Kenya, Tanzania and Uganda all export coffee. Kenya's internal transport infrastructure is probably less inefficient than Tanzania's, although the port at Dar-es-

Salaam is probably less inefficient than Mombasa. The transport costs facing Kenyan and Tanzanian producers may be similar, but Ugandan producers (and those in Rwanda and Burundi) face even higher costs as they have to go through one of the former countries. In addition to the overland transport costs, there may also be costs associated with delays and processing at customs points.

Limão and Venables [*1999*] provide a recent and innovative study of the extent to which poor infrastructure increases transport costs and reduces the volume of trade. They use two measures of transport costs: the cost of shipping a standard container from Baltimore to 65 destination cities in different countries (35 are land-locked), and the c.i.f./f.o.b. differential for 98 countries. They also construct an infrastructure index based on telephone lines per person and density of roads, paved roads and rail lines. The main findings are that poor infrastructure is a significant factor in increasing transport costs, being land-locked increases transport costs by more than can be explained by the additional distance alone, and higher transport costs are associated with lower trade volumes. These results hold whichever measure of transport costs is used. The median land-locked country has transport costs some 42–58 per cent higher than the median coastal country, and has only some 30 per cent of the trade volume of the latter; a 100 per cent increase in transport costs would reduce the value of imports by 80 per cent [*Limão and Venables, 1999: 16–18*]. They also demonstrate that poor quality infrastructure, and high transport costs, is a significant factor in explaining the low trade volumes of African countries.

Our analysis goes beyond previous studies in a number of respects. First, our transport costs are not based on c.i.f./f.o.b. differentials; we use direct estimates of marine and air shipping costs. Consequently we can examine how transport costs vary across commodities (at the sector level) and, importantly, we can examine the taxing effect of transport costs on exports. Second, we distinguish overland freight charges incurred in shipping goods between seaport and inland destinations from the marine shipping costs element. Third, we use a more general analytical framework to measure transport costs not simply as increasing the price of the good in question but as increasing production costs. In other words, we estimate the effective protection (implicit tax on export production) associated with transport costs, rather than simply the nominal protection.

IV. ANALYTICAL FRAMEWORK

Methods for measuring the impact of trade barriers are well developed [*Greenaway and Milner, 1993*]. The nominal rate of protection (NRP) captures the price raising effect of a trade barrier on the affected product.

For example, a tariff of 15 per cent increases domestic prices of imports by that percentage, hence domestic producers of competing goods can price up to that level, that is, the domestic price can exceed the world price by 15 per cent (NRP = 0.15) if there is perfect substitutability. This ignores the fact that some domestic producers use imported inputs; trade barriers increase the price of inputs, therefore increase production costs (or reduce value added). The effective rate of protection (ERP) incorporates this combination of subsidising and taxing effects by measuring the proportional change in the value added for a product (j) as a result of a given trade barrier. Both measures can be adapted to measure the protection (implicit tax) associated with 'natural' trade barriers like freight costs [*Milner, 1996; Milner and Morrissey, 1999*].

The method outlined below is partial equilibrium; data availability did not permit general equilibrium analysis. We assume that domestically produced and foreign goods are perfect substitutes. This is a restrictive assumption when one is using a high level of commodity aggregation, especially for manufactures, but may not be too unrealistic where primary products dominate and manufacturing is of relatively simple products [*Tsakok, 1990*], as is the case in Uganda. Nevertheless, our assumption of an infinite elasticity of substitution implies that our figures should be interpreted as upper estimates.

In the absence of 'natural' barriers to trade and treating tradable inputs alone, the ERP afforded to the value added of commodity j by tariffs on product j and inputs i is given by e_j:

$$ej = [t_j - \Sigma_i a_{ij} t_i]/[1 - \Sigma_i a_{ij}] \quad (1)$$

Where t_j and t_i are *ad valorem* tariff rates on imported final output (j) and intermediate inputs (i) respectively while a_{ij} is the technical coefficient that represents the amount of input i used in producing one unit of output j.

We modify equation [1] to include the influence of transport costs by assuming a free trade world without tariffs and consider the protection afforded to domestic industries by freight charges on imports relative to the situation where they do not exist. The party that bears the burden of costs due to trade barriers is determined by the relative magnitudes of elasticities of demand and supply of the commodity in question [*Yeats, 1980*]. When the elasticity of demand is higher than that of supply for a given commodity, a higher burden of freight costs would be borne by exporters. A small country like Uganda is likely to face a more elastic demand than supply of her exports and, being a small country importing from the rest of the world, a more elastic supply than demand for her imports. Therefore a higher burden of shipping costs is borne by Ugandan importers and exporters. This implies that reducing (at least the avoidable part of) freight costs in

production and distribution process would be beneficial for Uganda's trade in addition to promoting efficient resource utilisation.

Introducing transport costs, the effective rate of protection is then a percentage increase in the value added per unit in any economic activity made possible by freight charges relative to the situation in the absence of transport costs. If we let d_j and d_i be the *ad valorem* freight rates borne on output j and input i respectively, in the absence of trade barriers we get:

$$e_j = [d_j - \Sigma_i a_{ij} d_i]/[1 - \Sigma_i a_{ij}] \quad (2)$$

Both tariffs and freight costs on outputs provide an implicit subsidy to producers of import-competing goods (but freight costs tax export sales), while tariffs and freight charges on imported inputs increase costs of production and reduce producers' profits. However, regarding policy barriers, custom duty exemptions are often provided to domestic producers using imported inputs. This reduces or eliminates the tax. In contrast, it is difficult to avoid the implicit tax associated with natural trade barriers.

In practice, both policy-induced and 'natural' trade barriers may apply. In this case a combined (interaction) effect from the two sources is expected. There are two approaches used in the literature to compute protection rates once both tariffs and transport costs apply [*Balassa, 1968; Johnson, 1969*]. If tariffs are levied on the f.o.b. value of imports, the combined effects of both trade barriers is the sum of the tariff and natural rates of effective protection. Alternatively, in the case where tariffs are calculated as a proportion of the c.i.f. value (including transportation costs), the interactive effect augments the two effects under the f.o.b. valuation system. The c.i.f. valuation system is more commonly used than the f.o.b. system, mainly because authorities are more concerned with government revenue than trade distortions *per se*. Uganda levies import duties on the c.i.f. system and importers are also affected by the interaction of freight and tariff rates.

For a combined protection due to tariff and freight charges we have:

$$e_j = (t_j - \Sigma a_{ij} t_i)/(1 - \Sigma a_{ij}) + (dj - \Sigma a_{ij} d_i)/(1 - \Sigma a_{ij}) + (d_j t_j - \Sigma a_{ij} t_i\, d_i)/(1 - \Sigma a_{ij}) \quad (3)$$

Equation (3) gives the total protection that would result from both tariffs and transport costs under the c.i.f. valuation system. That is, the first term on the right hand side is the tariff protection effect only, given by equation (1), the second term is the natural protection effect only, given by equation (2), and the last term is the protection due to interaction of tariffs and transport costs.

The production process also employs non-traded inputs. An import duty, for example, would affect the demand for (and therefore the price of) non-traded goods. The impact of protection on non-traded goods depends on the

substitutability or complementarity between tradables and non-traded goods.[7] First, protection on importables tends to increase the price and therefore production (but reduce consumption) of importables at the expense of both exportables and non-traded goods. Second, where non-traded goods are inputs to production of importables, increased production will increase the demand for, and prices of, non-tradables. This second influence leads to a gap between the intended and true protection of importables, and creates an implicit anti-export bias.

Two approaches (the Corden and Balassa methods) have been developed in the literature to handle non-traded inputs. Traded inputs are subtracted from the value of output under the Corden measure, while both traded and non-traded intermediary inputs are subtracted under the Balassa system. In our estimation process, non-traded inputs are treated according to the Balassa method,[8] which assumes an infinite elastic supply of non-traded inputs and therefore that all-non-traded inputs are supplied to the processing sectors at constant costs. It disregards value added embodied in the production of non-traded inputs. As a result the prices of their value added components remain unchanged when domestic values of output and inputs are re-valued at world prices. The resulting formula is (where a_{nj} is the share on non-traded inputs n in production of a unit of output j):

$$e_j = [(t_j - \Sigma a_{ij} t_i) + (d_j - \Sigma a_{ij}\, d_i) + (d_j\, t_j - \Sigma a_{ij}\, t_i\, d_i)]/(1 - \Sigma_i a_{ij} - \Sigma_n a_{nj}) \quad (4)$$

Equation (4) provides a measure of total protection from policy and natural protection in domestic sales, with barriers against final imports implicitly subsidising competing local producers at nominal rates t_j and d_j. Barriers against intermediate inputs tax local producers at rates t_i and d_i. Note, however, that there are some asymmetries between import-competing final production and export production. Local production for export sales continues to be taxed by barriers against importable inputs into export production at the relevant t_i and d_i rates. Export production, however, is no longer subsidised by barriers against imports into the local market; final goods are sold at world prices when exported, not the tariff-inclusive domestic prices as in the case of domestic sales. In other words, for export sales t_j equals zero in equation (4).

Natural barriers against final exports therefore tend to tax rather than protect if the transport costs are borne by exporters. In this case the sign on d_j in equation (4) needs to be reversed when measuring effective protection in export sales. As argued above, Ugandan exporters are likely to bear the bulk of transport costs. Demand for exports is likely to be relatively elastic as Uganda is supplying to a world market where there are many alternative suppliers. On the other hand, supply will be relatively inelastic, especially

as most exports are agricultural commodities for which there will be constraints on supply response.

Finally, it should be acknowledged that there are limitations to using partial equilibrium estimates of effective protection for commenting on general equilibrium resource allocation effects. The present analysis, however, is concerned with commenting on the cross-industry or sector incentive structure, in particular the differences in relative rates of policy-induced and total (including transport costs) protection in each sector. To the extent that total effective protection in domestic sales is consistently higher in each and every sector than policy-induced protection, or that overall effective disprotection of exports is consistently higher for all sectors when natural barriers are included, then we may more confidently talk about trade regime bias than we would about intersectoral resource allocation effects.

V. DATA AND ESTIMATION PROCEDURE

Three years, 1987, 1994 and 1997, are chosen as representing initial values, early (partial) liberalisation and post-liberalisation respectively. Technical coefficients are extracted from a 30-sector input–output table for Uganda in 1992 [*Republic of Uganda, 1995*], assumed to be applicable to all years. These are post-protection technical coefficients and are deflated to estimate adjusted technical coefficients in terms of free trade (border) prices [*Milner et al., 1999*]. The choice of tariff and freight cost measures is dictated by data availability. Our basic data are for 97 commodities at the two-digit HS level, which are then aggregated into fourteen groups (see Appendix) consistent with sectors given in the national input–output table. It follows that the tariff rates used for each sector are average rates on commodities in that sector. The tariff averaging masks tariff rate dispersion across commodities in that sector; average, maximum and minimum rates of protection for each sector in 1994 are reported in Milner *et al.* [*1999*].

The nominal rate of protection would appropriately approximate the *ex-ante* or listed tariff rate if there were no other policy impediments to trade, such as quantitative restrictions, and if there were no exemptions from import duties. To accommodate exemptions, it is appropriate to use *ex-post* or implicit tariff rates (measured by revenue collected as a share of value of imports). The tariff rates used in our analysis for 1994 are *ex-post* rates computed from the 1993/94 tariff schedule provided by Uganda Customs Department, distinguishing trade with African countries in the Preferential Trading Arrangement (PTA, or COMESA) and with the rest of the world (non-PTA, or NPTA). Unfortunately, data on implicit tariffs are not available for 1987 or 1997. Nominal tariff rates for 1987 are from World

Bank [*1990*] and are modal rates and no rates were reported for sectors covering fish, coffee products, tobacco and beverages. We assume that fish products had tariffs equivalent to those on animal products. Coffee, cotton and sugar manufactures were assumed to have the same tariff rates as food products. Tobacco and beverages were subject to an import ban until 1997 and we assume this implies an infinite rate of protection. Nominal tariff rates for 1997 were taken from the published tariff schedule.

Data on individual commodity freight rates are extracted from Amjadi and Yeats [*1995b*] and are used to compute sector average freight rates. Amjadi and Yeats [*1995b*] report transport costs on exports to the USA from low-income countries of Eastern and Southern Africa and two assumptions are made here. First, transport costs on exports and imports are assumed equal and second, vessel transport costs on Ugandan trade flows are between Mombasa and USA. As most Ugandan trade is with Europe, we effectively over-estimate transport costs (transport costs between East Africa and Europe are roughly 70 per cent of costs on the USA route). However, we exclude air transport and do not allow for the costs of delays and wastage in transport; these will tend to off-set this source of over-estimation.[9]

Most of the literature on transport and international trade ignores costs of land transportation, a serious omission for landlocked countries such as Uganda. Data on freight rates for overland trade are provided in World Bank [*1994*] from which we derive estimates of overland costs by sector for Uganda (see Appendix). Our estimates are based on road transport costs of break-bulk imports on the Kampala–Mombasa route, added to marine freight rates to get total surface freight rates.[10] Furthermore, due to lack of data, we must assume that these transport costs estimated for the mid-1990s are applicable to 1987 and 1997. There is no evidence that transport costs (as a percentage of unit value) have altered significantly during that period.

VI. TRENDS IN PROTECTION IN UGANDA, 1987–97

Tables 1 and 2 provide a summary of tariff protection estimates on products competing with imports from PTA and NPTA respectively (exports are discussed below). Consider first protection against PTA imports (Table 1; data were not available for 1987). The sector average nominal and effective rates of protection were about 17 per cent and 22 per cent respectively in 1994 which declined to five per cent and just over three per cent respectively in 1997. With the exception of minerals (fertilisers), all sectors experienced a significant decrease in the protection of domestic sales against PTA imports. The nominal and effective protection declined (on average) by about three times and by about seven times respectively

TABLE 1

AVERAGE PROTECTION AGAINST PTA IMPORTS (%)

	Nominal rates of protection			Effective rates of protection		
Sector	1987	1994	1997	1987	1994	1997
Food products	–	23.2	4.7	–	23.5	4.6
Animal products	–	14.6	4.5	–	15.1	4.4
Forestry products	–	11.3	3.0	–	11.8	2.2
Fish products	–	30.8	6.0	–	32.0	5.8
Minerals and quarry	–	5.3	14.7	–	4.5	20.5
Coffee and sugar goods	–	16.6	4.7	–	19.2	5.2
Manufactured foods	–	18.5	5.3	–	27.5	0.9
Tobacco and beverages	–	∞	12.0	–	∞	16.1
Textiles and footwear	–	19.6	3.8	–	24.6	–1.1
Building materials	–	15.5	2.3	–	29.2	–2.5
Chemicals	–	13.5	3.5	–	23.7	–5.2
Metals and machinery	–	7.2	2.8	–	1.8	1.1
Other manufactures	–	15.3	2.5	–	23.3	–1.7
Transport equipment	–	13.4	1.0	–	20.4	–4.2
Average	–	*16.9*	5.0	–	21.9	*3.3*

Notes: Calculated as described in the text. The symbol ∞ indicates that imports were banned, implying infinite protection. The average for 1994 is for the 13 sectors excluding 'tobacco and beverages'.

between 1994 and 1997. About five sectors seem to have encountered effective taxation in 1997. The significant tariff reductions after 1994 might be partly attributed both to the continued trade liberalisation and more importantly to the ratification of PTA (now COMESA) in 1994, with the resulting aim of removing policy-induced trade barriers among member states. These rates are scheduled to decrease even further from 1999 given the commitment of COMESA countries to liberalise intra-regional trade. The protection rates for tobacco and beverages in 1994 are not defined as these products were still subject to import bans.

Table 2 summarises trends in protection on domestic sales against NPTA imports from 1987 to 1997. Protection is expected to decline following trade liberalisation, and all but six sectors experienced greater nominal protection in 1987 than in 1994. One should not place too much emphasis on this because the data on tariffs in 1987 are both less detailed and less reliable. Sectors such as textiles, coffee, fertilisers, machinery, other manufactures and transport equipment had modal tariff rates in 1987 that were lower than (average) tariff rates in 1994. It is possible that the range of tariff rates was wider in 1987 than 1994 so that we underestimate relative 1987 rates. Maxwell Stamp [*1993*] reports an average ERP of 62 per cent in 1992, which indicates protection rates are likely to have been higher in 1987 than revealed here. The protection of domestic sales in 1987 was reinforced

TABLE 2

AVERAGE PROTECTION, DOMESTIC SALES AGAINST NPTA IMPORTS (%)

	Nominal protection			Effective protection		
Sector	1987	1994	1997	1987	1994	1997
Food products	30	27	21	30.6	27.4	21.5
Animal products	40	31	25	41.8	32.4	26.1
Forestry products	20	13.5	15	23.7	14.8	18.8
Fish products	40	33.3	30	45.4	35.1	35.1
Minerals (fertilisers)	10	13.3	10.7	12.3	16.5	14.5
Coffee and sugar goods	30	25.3	23.3	36	29.9	28.2
Manufactured foods	30	14.3	24.6	45.7	17.2	47.5
Tobacco and beverages	∞	∞	40	∞	∞	70.7
Textiles and footwear	30	55.9	18.8	77.3	151	51.4
Building materials	30	24.9	12.5	65.7	56	26.7
Chemicals	10	9.9	11.1	3.1	11.4	20.7
Machinery	10	20.2	8.4	16.1	38.8	16.9
Other manufactures	10	14.6	14	9.9	21.3	30.7
Transport equipment	20	21.5	5	43.7	42.7	6.8
Average	*23.8*	*23.4*	*18.5*	*34.7*	*38*	*29.7*

Notes: Calculated as described in the text. The symbol ∞ indicates that imports were banned, implying infinite protection. The averages for 1987 and 1994 are for the 13 sectors excluding 'tobacco and beverages'.

by other forms of trade restrictions (import licences, foreign exchange controls, etc.) most of which were abolished in 1993. The impact of liberalising such non-tariff barriers, which is likely to be substantial, is not captured in our protection estimates.

More tariff liberalisation was implemented between 1994 and 1997; with a few exceptions, tariff rates are generally lower in 1997. The overall sector average NRP was reduced from about 23 per cent in 1994 to just below 19 per cent in 1997. Notable reductions are in sectors producing textiles, transport equipment, machinery, building materials and animal products. Chemicals, forestry products (paper and other printing materials), manufactured foods, other manufactures experienced increased effective protection between 1994 and 1997. Protection increases may be partly attributed to the removal of tariff exemptions and/or conversion of non-tariff barriers into tariffs on some products in some sectors (for example, high ERP on tobacco and beverages).[11] Alternatively, sectors experiencing increased protection are likely to be those identified as 'sensitive' (mostly in manufacturing, where tariffs on inputs may have been reduced by more than tariffs on outputs). Despite protection increases in some sectors, overall effective protection in 1997 is lower by almost ten percentage points than that in 1994.

Protection due to Transport Costs

The relative impact of protection on domestic sales due to tariffs and transport costs in 1994 is summarised in Table 3 (Appendix Table 1 gives a breakdown of protection due to surface transport costs). Clearly transport costs increase the degree of protection on domestic sales substantially such that all sectors, with the exception of chemicals, enjoy total protection of more than 50 per cent and three attract protection exceeding 100 per cent (Table 3). Sectors other than fish, textiles and animal products, machinery and transport equipment, encountered higher protection from transport costs than from tariffs in 1994. Hence, reducing policy-induced trade barriers (such as tariffs) only would lower, but is not likely to eliminate, protection to production for domestic sales.

Tariffs were reduced significantly by 1997, but transport costs are unlikely to have fallen (there is no evidence of increased efficiency or shorter delays at border or ports). Consequently, protection arising from transport costs is likely to be higher in 1997 than that due to tariffs for almost all commodities. The protection rates arising from transportation on overland and sea sections have the same pattern across sectors because of the computation approach employed in our estimation (see Appendix). However, one can compare the relative rates of protection arising from each form of transport. In general, the protection arising from land transport is higher than that due to marine transport (Appendix Table 1).

TABLE 3

TOTAL PROTECTION ON DOMESTIC SALES IN 1994

	Surface transport		Policy (tariffs)		Total protection	
Sector	NRP	ERP	NRP	ERP	NRP	ERP
Food products	0.556	0.569	0.270	0.274	0.826	0.843
Animal products	0.187	0.188	0.310	0.324	0.497	0.512
Forestry products	0.364	0.433	0.135	0.148	0.499	0.581
Fish products	0.184	0.189	0.333	0.351	0.517	0.541
Minerals and quarry	0.278	0.377	0.133	0.165	0.411	0.542
Coffee, cotton and sugar	0.275	0.324	0.253	0.299	0.528	0.622
Manufactured goods	0.488	0.907	0.143	0.172	0.630	1.079
Tobacco and beverages	0.801	1.276				
Textiles, cloth and footwear	0.231	0.471	0.559	1.510	0.789	1.980
Building materials	0.537	1.166	0.249	0.560	0.786	1.726
Chemicals	0.166	0.054	0.099	0.114	0.265	0.168
Metals and machinery	0.166	0.259	0.202	0.388	0.368	0.647
Other manufactures	0.241	0.334	0.146	0.213	0.387	0.547
Transport equipment	0.171	0.276	0.215	0.427	0.386	0.703
Average	*0.332*	*0.487*	*0.234*	*0.380*	*0.566*	*0.867*

Notes: Calculated as described in the text. For 'tobacco and beverages' protection associated with transport (a disincentive to smuggling) may be overestimated as it includes marine shipping (about a third of the total).

Disprotection of Exports

In addition to the relative disprotection of exports associated with the high levels of total protection to import-substitution activities, we can also explore the direct and absolute disprotection of exports. Producers of exports are taxed on imported inputs. In principle, exporters that use imported inputs are entitled to reimbursement of import duties under the duty drawback scheme but there are likely to be high transaction costs arising from the complexity and inefficiency in the operation of such schemes, and effective take-up rates are often low. Table 4 decomposes the taxation of exports into that arising from costs of transportation (sea and overland) and from tariffs on imported inputs. Table 4 clearly shows that the taxation arising from freight costs is very high, equivalent in total to about two-thirds of value added on average (compared to protection equivalent to about half of value added on average for importables). Six of the 14 sectors face a total implicit tax in excess of 100 per cent, and another two face a tax greater than 50 per cent (these are sectors producing goods that are bulky relative to value and/or require imported inputs). The implicit tax associated with these high transport costs reduces the competitiveness of Ugandan exporters in overseas markets.

The coffee sector is the principal source of Ugandan exports and, although the implicit tax is relatively low it is non-negligible at 25 per cent

TABLE 4

IMPLICIT TAXATION OF EXPORTS FROM UGANDA IN 1994

Sector	Land transport		Sea transport		Policy (tariff)		Total	
	NRP	ERP	NRP	ERP	NRP	ERP	NRP	ERP
Food products	–0.171	–0.184	–0.179	–0.192	0.000	–0.007	–0.350	–0.383
Animal products	–0.059	–0.068	–0.062	–0.070	0.000	–0.003	–0.121	–0.142
Forestry products	–0.124	–0.206	–0.130	–0.214	0.000	–0.038	–0.254	–0.457
Fish products	–0.054	–0.083	–0.056	–0.086	0.000	–0.055	–0.110	–0.224
Minerals and quarrying	–0.099	–0.170	–0.103	–0.176	0.000	–0.035	–0.202	–0.381
Coffee, cotton, etc. products	–0.088	–0.116	–0.092	–0.121	0.000	–0.013	–0.180	–0.250
Manufactured foods	–0.159	–0.522	–0.166	–0.539	0.000	–0.173	–0.325	–1.234
Tobacco and beverages	–0.240	–0.611	–0.251	–0.631	0.000	–0.129	–0.491	–1.371
Textiles, cloth and footwear	–0.066	–0.394	–0.069	–0.405	0.000	–0.437	–0.135	–1.236
Building materials	–0.173	–0.674	–0.181	–0.696	0.000	–0.148	–0.354	–1.517
Chemicals	–0.056	–0.446	–0.059	–0.455	0.000	–0.220	–0.115	–1.122
Metals and machinery	–0.056	–0.267	–0.059	–0.275	0.000	–0.188	–0.115	–0.730
Other manufactures	–0.080	–0.398	–0.084	–0.408	0.000	–0.198	–0.164	–1.005
Transport equipment	–0.056	–0.253	–0.059	–0.260	0.000	*–0.164*	–0.115	–0.677
Average	*–0.106*	*–0.314*	*–0.111*	*–0.323*	*0.000*	*–0.129*	*–0.217*	*–0.766*

Notes: Tariff rates on output are set to zero as in 1994 there was no explicit taxation on Ugandan exports; the taxation due to policy barriers arises from tariffs on imported inputs. Rates of protection are assumed to be the same on export sales in PTA and NPTA markets.

of value added. As coffee can be shipped in bulk, the implicit tax associated with transport is relatively low. Nevertheless, there is a tax of about 12 per cent associated with each of marine and land transport. This would place Ugandan exporters at a disadvantage compared to competitors in, for example, Kenya. Emerging export sectors, such as fish and food products, face a similar problem, more severe in the case of food where the implicit tax on exports is almost 40 per cent. Costs of transportation clearly constrain producers stationed in remote areas.[12] Recall also that we may underestimate the true costs associated with transport as our estimates do not account fully for delays and losses on the inefficient overland routes.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

The intention in this study was to investigate the impact of trade policy reforms on the protection of production sectors, and the implicit taxation of exports associated with transport costs, in Uganda. Trade liberalisation is analysed through estimating changing effective rates of protection between 1987 and 1997. Three broad conclusions emerge. First, there have been significant trade policy reforms in Uganda over the last ten years. Effective protection against PTA imports has been almost eliminated for most sectors. Nominal protection against imports from outside of Africa was less than 20 per cent on average in 1997, and effective protection was less than 30 per cent on average (although about 50 per cent or higher for manufactured foods, textiles and footwear, and tobacco and beverages). Second, natural protection on domestic sales arising from transport costs remains high, equivalent to an effective rate of protection of 48 per cent on average in 1994 (about a quarter higher than protection due to trade policy). In some sectors such as food products and manufactured foods, transport costs provide far greater protection than do tariffs. Although our transport cost estimates are for 1994, there is no reason to believe they have been reduced significantly since then.

Third, although effective disprotection of exports directly due to trade policy has been virtually eliminated, export sales from Uganda are relatively disadvantaged compared to import-competing producers and face high implicit taxation from transport costs. In the principal export sectors (coffee and cash crops, fish and foods), negative protection associated with trade policy was five per cent or less in 1994. However, the implicit tax associated with transport costs was as high as 100 per cent for manufactured foods, almost 40 per cent for food products, almost 25 per cent for coffee, cotton and tea, and about 20 per cent for fish. Given that Ugandan exporters normally have to transport their goods through Kenya or Tanzania, potential competitors in all products, they are placed at a disadvantage relative to

producers in those countries (in particular competitors closer to the ports of Mombasa or Dar-es-Salaam).

Transport costs are only one of the transactions costs associated with trade.[13] Access to trade finance, market information and reliable supplies of utilities (water and electricity) are also important, and are also constraints to Ugandan producers. If other constraints could be quantified, the implicit taxation of exporters associated with transactions costs would be even higher than our estimates. While trade policy reforms are important to improve incentives, especially for exporters, and encourage efficiency, they would be more effective if transaction costs resulting from natural trade barriers were also lowered. Similarly, high transactions costs, often associated with institutional as much as geographical remoteness, limit the ability of producers to avail of improved incentives and opportunities following trade liberalisation. Failure to address these other constraints offers one explanation for why exports in Uganda have not increased noticeably following the reforms of the 1990s.

The major policy conclusion is that measures to improve transport efficiency specifically, and more generally to reduce transaction costs, are essential to support export diversification and expansion in Uganda. This general conclusion applies to other African countries (Wood and Jordan, this collection) and to low-income countries in general, especially those that are land-locked (such as Bolivia and Nepal). This could be achieved in a number of ways. Investment in roads and railways is clearly necessary, throughout the East African region. A new channel has been dredged that should make Dar-es-Salaam port more efficient and competitive with Mombasa. However, goods from Uganda (and from inland Kenya and Tanzania) have to get to the ports. The poor quality of rolling stock and limited network render the railways slow and unreliable, but roads are poorly maintained and journey times are long. Severe floods in recent years have only made matters worse.

Investment in infrastructure is an expensive, if needed, means of improving transport efficiency and may not be the optimal allocation for scarce investment resources; the need to invest in human capital and skills is demonstrated by Söderbom and Teal (this collection). There are less costly options that could have more immediate and significant effects. The commitment to regional integration in the revived East African Cooperation includes measures to improve customs clearance procedures for goods in transit between Kenya, Tanzania and Uganda. This can reduce delays at border points but also at ports. As indicated earlier, Ugandan goods take at least three times longer to get to port than would be the case under a reasonably efficient transport system. Eliminating this inefficiency would represent a significant benefit to Ugandan exporters, and may be essential if

the country is to diversify its exports. Similarly, there is scope to reduce delays in transporting by road or rail, and in the turn-around time at sea ports.

NOTES

1. This specific argument relates to trade with overseas markets. The case of regional markets is different, and addressed below. For example, its land-locked status does not impose a differential cost on Uganda's trade with neighbours.
2. A number of products attract very high tax rates as excise duties at rates above 100 per cent are levied on imports of petroleum products. Beers, mineral waters, car batteries and vehicle retreads were removed from the negative list on 1 April 1998, and cigarettes removed in 1999, but any imports will attract high excises.
3. In the 1990s gold has become an import export, representing over ten per cent of earnings in some years. As the gold is not mined in Uganda, this reflects instability in neighbouring countries and is not a reliable base for sustained export earnings.
4. Empirical studies show that as developing countries move into processing their *ad valorem* shipping costs increase [*Waters, 1970; Yeats, 1977; Clark, 1981; Amjadi and Yeats, 1995b*]. This is attributed to the institutional structure of the shipping industry [*Hecht, 1997: 1709*]. Most marine shipping is by liners or tramps. Tramps handle bulk and are chartered by the client, therefore affordable to exporters that can fill the ship. In contrast, liners travel scheduled routes, transport small quantities and handle fragile or perishable processed goods. Developing country exporters tend to deal in relatively small volumes of fragile or perishable processed goods therefore rely on the liners. However, liner companies are organised into cartels and charge higher freight rates. As a result shipping costs facing developing countries often rise when they move into exporting processed goods.
5. This information was provided by Adrian Wood.
6. See, for example, studies by Waters II [*1970*], Finger and Yeats [*1976*], Yeats [*1977a*, 1997*b*], Jansson and Shneerson [*1978*], Clark [*1981*]. For a broader ranging and innovative study of transactions costs in trade see Abdel-Latif and Nugent [*1996*].
7. The substitution index ranges between one and zero, where one implies perfect substitutes. The substitution index in Uganda has been estimated as 0.66 [*Milner and Morrissey, 1999*].
8. The simple Balassa method treats non-tradable inputs like tradable inputs with unchanged prices, while the modified Balassa (sometimes called Scott) method treats non-tradable inputs like tradable inputs with an allowance of their prices to change as a result of protective measures. There are computation difficulties with the Corden method while the Scott method is not suitable for estimation of ERP under the partial equilibrium framework. This leaves us with the simple Balassa method.
9. Milner *et al.* [*1999*] report estimates for protection associated with air freight in 1994. On average, these are some three times marine rates, although for some commodities air is cheaper than the combined land and marine costs associated with shipping from Mombasa.
10. Our land transport costs are an approximate average. While they include some allowance for inefficiencies (road transport would cost less if the journey and turn around were faster), they do not fully allow for the inefficiencies, especially those associated with rail transport (personal communication from Adrian Wood). The estimates are indicative of the order of magnitude.
11. It may also, of course, be due to data deficiencies as 1994 is an implicit tariff whereas for 1997 we have to use the average of scheduled tariffs.
12. Rudaheranwa [*1999*] investigated the possible links between changes in effective protection, the implicit tax associated with transport cost and sector performance (output, exports and capacity utilisation) in Uganda. However, no obvious pattern emerged. This can at least partly be explained by limitations in the data and the relatively short period for analysis (1994–97 for effective liberalisation).
13. Other important issues include access to market information and distribution networks. Some

of these are addressed elsewhere in this collection (Kaplinsky, Dolan and Humphrey, Knorringa and Schmitz).

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APPENDIX

Aggregating Commodities into Sectors

The input-output sectors and corresponding two-digit harmonised System (HS) code are as follows: Animal products (01–02, 04–05, 41–43), Food products (06–08, 10–14), Coffee, tea, mate, and spices (09+17+52), Manufactured foods (15–16, 18–21, 23), Tobacco and beverages (22, 24), Mineral products (25–27), Chemical products (28–38), Forestry products (44–49). Textiles, clothing and footwear (50, 52–67), Base metals and articles thereof (72–83), Machinery (84–89), Transport equipment (86-89), Miscellaneous products (39+40, 68–71, 90–97).

Estimating Overland Transport Costs

Freight rates for overland trade flows are derived from World Bank [*1994*] that reports freight rates as an overall average. We require freight rates on a sector level. Proxies for overland freight rates are derived using the following procedure. Let AVF_N and AVF_P be the overall average vessel and overland freight rates respectively while F_{iN} and F_{iP} are their freight rates for sector i respectively. We have data on AVF_P [*World Bank, 1994*] and F_{iN} derived from Amjadi and Yeats [*1995b*] and we can compute the value of AVF_N (from the sector values). We have no data on F_{iP}. Computing $AVF_N = (\Sigma F_{iN})/\Sigma i$ where Σi is the number of sectors (in our case 14) and then using it in $F_{iP} = (F_{iN}{*}AVF_P)/AVF_N$, we get the nominal freight rates used in the computation overland freight rates of protection for each sector (Appendix Table 1).

Our computation uses road-transport costs of break-bulk imports on the Kampala-Mombasa route in deriving sector overland freight rates, which are added to seaborne freight rates to get total surface freight rates. Some products would be transported by container, hence cheaper. Similarly, some products would go by rail and this may be cheaper (although not if one accounts fully for delays and losses). Finally, some goods are transported via Tanzania. Morrissey and Rudaheranwa [*1998*] compare costs of these various alternatives. It appears the differences are not great.

APPENDIX

TABLE A1

PROTECTION DUE TO TRANSPORT COSTS (AVERAGE, %)

Sector	Overland		Sea		Total Surface	
	NRP	ERP	NRP	ERP	NRP	ERP
Food products	32.9	33.7	22.7	23.2	55.6	59.6
Animal products	10.6	10.7	8.1	8.1	18.7	18.8
Forestry products	21.6	26.3	14.8	17.0	36.4	43.3
Fish products	10.9	11.6	7.5	7.4	18.4	18.9
Mining and quarrying	16.2	22.2	11.7	15.5	27.8	37.7
Coffee, cotton and sugar products	16.0	18.9	11.5	13.4	27.5	32.4
Manufactured foods	29.3	57.3	19.5	33.4	48.8	90.7
Beverages and tobacco	49.5	82.2	30.6	45.4	80.1	127.6
Textile, cloth and footwear	12.3	26.5	10.8	20.6	23.1	47.1
Building materials	31.1	70.5	22.6	46.1	53.7	116.6
Chemicals	10.1	9.8	6.5	-3.4	16.6	5.4
Metals and machinery	9.5	16.4	7.1	9.6	16.6	25.9
Other manufactures	14.4	23.5	9.6	9.9	21.4	33.4
Transport equipment	10.0	17.7	7.2	9.9	17.1	27.6
Sector average	*19.6*	*30.4*	*13.6*	*18.3*	*33.2*	*48.7*

Notes: NRP = Nominal rates of protection, ERP = Effective rates of protection.