

How to Identify Trade Liberalization Episodes: An Empirical Study on Kenya

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I. Introduction

Although conceptually fairly simple, it is far from being straightforward to identify trade liberalization episodes empirically. Trade policy reform is typically a complex exercise, involving removal of, or reduction in quantitative or administrative import restrictions,¹ temporarily replaced by tariff surcharges, unification and subsequent reduction of tariffs, and introduction of direct incentives to exporters (Thomas and Nash 1991a). Despite the difficulty, unambiguous identification of liberalization episodes is important if we wish to study the economic performance of liberalizers vis-à-vis sustaining protection.

In the economies where import restrictions abound, the net effect of a reform package on relative prices is likely to be uncertain *ex ante* as the level of protection of various industries may be unknown and may vary considerably from sector to sector. Furthermore, depending on changes in other variables over time, such as production costs, world prices, or domestic demand, import restrictions become more or less binding. Therefore, the government may have a great difficulty in matching the removal of non-tariff restrictions with the desired level of temporary tariff surcharges, or devaluation. *Ex post* the effect of the reform on relative prices may be as intended (that is, an increase in the price of exportables relative to both importables and nontradables), perverse, or it may have no effect at all, if other factors override the effects of changes in trade policy instruments.

In the literature on trade liberalization and economic performance it is often disputed whether liberalization should be defined as a move to neutrality of relative prices, or as a move towards free trade with less government involvement than before. In the former case, introduction of export subsidies would qualify as liberalization, whereas according to the latter definition, the trade regime would be considered to have become less liberal. Another issue of disagreement is whether or not to include devaluation in the definition of trade liberalization. Devaluation often accompanies trade reforms to make import liberalization macro compatible, safeguard external reserves, and to provide improved incentives to the export sector. If devaluation is carried out without any changes in trade policy instruments,

¹ Although quantitative restrictions (QRs) are not necessarily the same as non-tariff barriers (NTBs), the two terms will be used interchangeably in the text.

its effect on the average relative price ratio of importables to exportables, or the ratio of domestic price of importables to their world price is ambiguous. The effect depends on the type of trade policy instruments being used, such as value or quantity quotas. In Africa, foreign exchange rationing for balance of payments purposes is closely linked to import controls which provide protection for domestic industries. When devaluation is combined with a change in the mechanism of allocating scarce foreign exchange, such as introduction of an auction, the subsidy which imports of capital and intermediate goods often enjoy due to preferential access to foreign exchange, combined with an over-valued currency, will be removed, and imports of final goods will no longer be discriminated against through non-issuance of licenses. This clearly qualifies as a move towards free trade.

A recent comparative study on trade liberalization, which was undertaken by the World Bank, and which covers 19 countries, does not employ a quantitative or objective measure for identifying episodes but uses instead a subjective liberalization index (Michaely *et al.* 1991). Although no unambiguous criteria common to all countries was used to determine when a liberalization episode began, or when an episode can be considered to have been completed, stopped or reversed, the study, nevertheless, claims to include all significant liberalization episodes of a minimum duration of two years, implemented by developing countries from World War II until 1984. The subjective criterion, which is an annual liberalization index, ranging from one (highest possible degree of trade intervention) to 20 (complete liberalization), was calculated for each country, based partly on various quantitative criteria, such as effective rate of protection, actual tariff rates, real exchange rate, degree of openness (sum of imports and exports over GDP), gap between foreign and domestic terms of trade, and so forth, and partly on judgment by the individual researcher in charge of a particular country study. It is obvious that the indices are not at all comparable across the sample. Country studies also lack consistency in the way in which various policy measures are assumed to impact on changes in the index. As pointed out in two reviews of the World Bank study (Collier 1993; Greenaway 1993), the use of a subjective index makes interpretation of empirical findings much more arbitrary than if a common quantitative criterion had been used.

The country study on Chile, for example, based the subjective liberalization index on five indicators of trade controls: an import restriction index (assigned qualitatively on the basis of changes in QRs over time), the ratio of effective exchange rate to nominal exchange

rate, the ratio of black market rate to official exchange rate, an export quota index, and the implicit tariff rate. An iterative process, including judgment when in doubt, was then used to derive the liberalization index based on these indicators. Although the authors of the study consider the implicit tariff as the ideal index of trade liberalization, they chose not to use it alone as information on its actual levels is available with significant coverage for a few years only. As will be shown below for Kenya, it is possible to derive the average implicit tariff as an index, without full information on its actual levels over time, by using average domestic and world price indices for importables. This is by no means an easy task, however, as the available price indices are prone to biases which are difficult to control and sometimes even to detect.

The World Bank study completely excludes Sub-Saharan Africa. As there have been attempts to liberalize trade regimes in Africa in the 1970s and particularly in the 1980s, application of common quantitative criteria to the identification of liberalization episodes to all developing countries could have resulted in inclusion of a few of these episodes in the study. This would have been useful from the viewpoint of policy recommendations as more attention would certainly have been devoted to the negative effects of incredibility suffered by many of these reforms. By anticipating a reversal, the private sector not only inflicts additional welfare costs arising, for example, from excessive accumulation of stocks of importables but speculation may also deplete external reserves, endangering the entire process of liberalization.

The main purpose of the rest of the paper is to derive the implicit tariff index for Kenya, and to assess its validity and reliability as an objective criterion for identifying trade liberalization episodes in African economies, including an assessment of the quality of the available price data.² To place the chosen index into context, Section 2 will provide a review of quantitative measures of trade policy. In Section 3 we will construct our base case implicit tariff index using the most relevant domestic price deflator and price index for the corresponding categories of imports. This index will then be compared to (i) a narrative of changes in trade policy in Kenya since the early-1970s, and to (ii) a measure of import compression developed by Narasimhan and Prichett (1993).

² Other studies on Kenyan trade liberalizations include Ikiara (1987), Bevan *et al.* (1990, 1991), N'geno (1991), and the World Bank (1993).

A few snapshots of the actual levels of protection, both the nominal rate of protection (implicit tariff) and the effective rate of protection are available for Kenya over time. The former assesses protection on the price of the good, while the latter measures the protection given to the value added, or the domestic factors of production. Section 4 will examine whether these snapshots concur with the changes in trade policy as indicated by the implicit tariff index, the narrative, or by the index of import compression. Section 5 contains an assessment of the quality of domestic price deflators that are available for constructing the implicit tariff index, while Section 6 examines the reliability of corresponding import price indices. Section 7 concludes.

II. A Review of Quantitative Measures of Trade Policy

One method of determining the duration of a liberalization episode would be to examine actual changes in policy instruments, such as shifts in import licensing practices, tariffs, export incentives, or the exchange rate. Introduction of policy changes marks the beginning of an episode, and when the changes are completed, stopped, or reversed, the episode has come to an end. The former two cases refer to sustained liberalization, while the latter episode is not sustainable. This approach is a useful way of distinguishing episodes, for example, when studying the speculative response by the private sector to trade reforms which lack credibility.

When introductions and reversals of policy changes follow one another in varying degree, it may not be possible to say whether the trade regime has become more liberal by examining policy changes alone. Changes made in trade policy instruments do not necessarily surface at the aggregate level as they may be in opposing directions, or influenced by other policies and variations in economic conditions. Another method of identifying episodes would be to define quantitative measures or criteria that are able to tell us whether or not various policy changes surface in aggregate data. We will next review two categories of measures which can be used as objective indicators of trade policy, relative prices and other quantitative measures.

A. Relative prices

One commonly used quantitative criterion based on the observation of relative prices is the real exchange rate. Conceptually, it can be defined in two different ways, depending on which relative price is the focus of interest: (i) the domestic price of tradables relative to the foreign price of tradables measured in a common currency, or (ii) the domestic relative price of nontradables to tradables. In practice, changes in real exchange rates are measured (particularly by the International Monetary Fund, IMF) by comparing the domestic consumer price index (CPI) with those of trading partners, measured in a common currency. This is a reasonable approximation, except for the case where quantitative or administrative import restrictions are systematically used to manage the balance of payments (Collier and Joshi 1989). When trade policy is endogenous so that quotas are used to prevent a payments deficit, nominal devaluations, instead of being payments-improving, become trade liberalizing in the sense that they reduce the implicit tariff. The CPI-based real exchange rate ceases to be a good approximation for the real exchange rate concept (ii) since there are now two relative price changes instead of one, and therefore tradables can not be treated as a composite good. While the IMF-measure records a fall in the real exchange rate by more than the devaluation, the direct observation of prices produce a different result: the price of nontradables falls relative to exportables but rises relative to importables.

Another frequently used quantitative indicator is import or export bias. Bias indices are based on the concept of neutrality of intervention rather than that of a shift towards a more liberal trade regime. A bias index B can be defined as the ratio of effective exchange rate (the average nominal or real exchange rate) received by importers EER_M and that received by exporters EER_X (The World Bank 1987b):

$$(1) \quad B = (EER_M)/(EER_X) = E_M(1+t+n+t_e)/E_X(1+s+r)$$

where E_M denotes the nominal exchange rate applicable to imports. It is corrected by tariffs t , other import surcharges n , and tariff equivalents of non-tariff restrictions t_e . E_X is the nominal exchange rate for exports which is corrected by export subsidies s and other export incentives r . $B > 1$ implies an import bias and $B < 1$ an export bias. We can see from

equation (1) that both free trade with no intervention and a highly interventionist trade system can yield $B=1$. In the latter case the interventions simply even out.

In African economies multiple exchange rates and direct export incentives have been either absent or ineffective. Hence, the bias index is equal to the implicit tariff index, or the average nominal rate of protection (NRP), which refers to the proportional difference between domestic and international prices.

$$(2) \quad NRP = [(P_d - P_w)/P_w] * 100$$

The implicit tariff consists of nominal tariffs and the tariff equivalents of non-tariff barriers, the latter being the portion of the implicit tariff above the nominal tariff rate. The implicit tariff index is a useful measure of protection where quantitative restrictions (QRs) are heavily relied on as the way of controlling imports, while the effect of multiple exchange rates and direct export incentives is minimal. Even so, there are a number of particular constraints to its use. First, characteristic of all relative price indices in the presence of QRs, a change in the implicit tariff index may result from changes in prevailing economic conditions, or from changes in other policies, such as price controls, rather than from changes in trade policy instruments. Therefore, it may not be a consistent indicator of changes in trade policy. Second, a common problem in average indices is that they conceal information: the average implicit tariff hides the dispersion of protection around the mean. A given level of average explicit or implicit tariff can result either from uniform protection to all industrial subsectors, or from an uneven pattern where domestically consumed final goods typically have much higher protection levels than intermediate or export goods. Dispersion of protection obviously has an effect on resource allocation.

Third, empirical derivation of the implicit tariff index is by no means straightforward. As observations of actual levels of the implicit tariff are infrequent, it has to be obtained indirectly. The indirectly derived implicit tariff index is at best only monotonic in the implicit tariff proper, provided the price data used to calculate the index are unbiased. Furthermore, a comparison of domestic and international prices assumes that imports and domestically produced goods are perfect substitutes, and that there is no quality or other difference between the two. In other words, imports in a given SITC (Standard International Trade Classification)

category are assumed to be the same importables as the domestic products in the corresponding ISIC (International Standard Industrial Classification) category. This may be particularly problematic when broad SITC and ISIC categories are used for calculating the implicit tariff index. Under import-substitution domestic production may be increasingly dominated by consumer goods, while imports are dominated by intermediate and capital goods. An additional difficulty in time-series analysis is that changes are likely to occur over time in the composition of both domestically produced goods as well as imports. Finally, available price deflators, particularly those for African economies, may contain biases which are difficult to detect or to control.

B. Other measures

Prichett (1991) examines cross-country data for a number of quantitative outward orientation measures. These measures are (i) an index of openness which is the share of trade (or imports) in GDP, adjusted for country structural characteristics, and for factor endowments, (ii) average tariffs, (iii) coverage ratio of non-tariff barriers,³ (iv) measure of the deviation of countries' actual trade pattern from the pattern predicted from a model of resource-based comparative advantage,⁴ and (v) the real price distortion.⁵ (i), (iv) and (v) are outcome measures that assess the deviation of the observed outcome from the outcome without trade barriers. Outcome measures are either price-based or trade flow based. (iii) is an incidence measure which counts the frequency of occurrences of the various types of non-tariff barriers. Prichett's main finding is that the alternative quantitative measures of outward orientation are more or less completely uncorrelated across countries. Rankings of countries according to outward orientation depend crucially on the chosen criterion, i.e. each measure yields a

³Thomas and Nash (1991b) suggest that (the change in) the share of the liberated commodities in the value of total imports (or exports), and (the change in) national production of goods competing directly with the liberated imports could be used as measures of trade liberalization in the presence of binding quantitative restrictions.

⁴Applied by Leamer (1988) who uses the Heckscher-Ohlin-Vanek model to obtain a prediction for the trade pattern from which the actual pattern is deducted. Residuals are then used as an intervention index of trade policy (Prichett 1991).

⁵Obtained from research into international comparisons of real national product. The study includes surveys of prices of a basket of goods in a large number of countries. The results have been used to construct purchasing power parity exchange rates.

different ranking. This makes interpretation of empirical studies on trade policy orientation and performance difficult. Similar difficulties would be expected if these measures were used for the study of trade liberalization and private responses to it.

Narasimhan and Prichett (1993) develop a method for quantitative assessment of the magnitude of import compression. This measure of import restrictiveness, which is the deviation of actual imports from the notional level of imports demanded, is used to analyze the evolution of import policies in the 1980s in Sub-Saharan Africa relative to the level of restrictions that existed in the 1970s. The notional demand for imports M_d is derived as a simple log function of real income y and the real exchange RER :

$$(3) \quad M_d = \alpha + \beta Y + \delta RER$$

If parameters α , β , and δ were known, equation (3) could be used to calculate how actual imports over time deviate from the notional demand. The deviation could be used as an indirect measure of import restrictiveness. As the parameters are not known, Narasimhan and Prichett use average estimates derived from other empirical studies for income elasticity β and price elasticity δ ($\beta = 1.25$, and $\delta = -1$). In order to obtain a value for constant α they assume that in the 1970s the actual and notional demand for imports coincide. The index of implied import restrictiveness (IIIR) is then defined as the percentage deviation of M_d from the log of actual imports M .

The IIIR is calculated for a number of African countries. For Kenya the IIIR shows a fairly large increase in the restrictiveness of the trade regime in the 1980s compared to the previous decade. The average deviation between actual and notional imports for years 1980-84 is 45 percent and 60 percent for years 1985-90 relative to the 1970s, when the IIIR is zero by assumption. In Section 3.3 below, we will compare the IIIR with the implicit tariff index for Kenya.

Although the IIIR is not given at the annual level, it could easily be calculated for each year and, at least in principle, it could be used as a quantitative criterion for identifying liberalization episodes in the 1980s. The index has a few setbacks, however. First, due to normalization, it cannot be used for the 1970s. Second, it is at best a rough measure of trade policy. This becomes clear in the case of franc zone countries. Contrary to the expectation that franc zone African countries would have similar readings of the index, variability is very

high, a few countries indicating 40 percent more of actual imports than the notional demand. Third, the index uses the real exchange rate instead of direct observation of prices. The real exchange rate is measured by comparing the domestic consumer price index with the US wholesale price index, measured in a common currency. As discussed above in Section 2.1, it is not a good proxy for the domestic relative price of nontradables to tradables when the endogenous trade policy rule is being applied. A nominal devaluation is recorded as a fall in the real exchange rate by more than the devaluation, while the direct observation of prices would indicate a fall in the price of nontradables relative to exportables but an increase relative to importables. Finally, the IIIR is calculated by using income rather than expenditure data. In African economies the two may deviate considerably from one another, depending on external borrowing and the terms of trade.

Anderson and Neary (1991) develop another trade restrictiveness index (TRI) which is based on welfare-theoretic analysis of a standard trade model. The TRI is a general equilibrium application of the distance function. In the case of tariffs, the TRI is equal to the vector of uniform tariffs which is equivalent (in the welfare sense) to a given initial tariff structure t . More specifically, the TRI is defined as the factor of proportionality by which period-one tariff factors must be scaled up or down in order to reach period-zero utility. The equilibrium of the economy can be expressed by the following balance of trade function B (in matrix form):

$$(4) \quad B(\phi, u; \gamma) \equiv E(\pi^* \phi, u) - (\phi - 1)' \pi^* m - \beta$$

where ϕ denotes the vector of tariff factors, which equal the proportional mark-ups over world prices π^* so that $\pi = \pi^* \phi_i$ and $t_i = \pi^* (\phi_i - 1)$. As to the other notation, $E(\cdot)$ stands for expenditure function, u is utility, m is import demand, β is trade surplus, and γ denotes all the exogenous variables other than trade policy. Equation (5) implicitly defines Δ , which is the trade restrictiveness index (TRI):

$$(5) \quad \Delta(\phi^1, u^0, \gamma^0) \equiv [\Delta : B(\Delta \phi^1, u^0; \gamma^0) = 0].$$

If trade policy does not change between the two periods ($\phi^0 = \phi^1$), Δ equals one. A rise in Δ means that trade policy has become less restrictive. It can be shown by totally differentiating equation (5) that a (small) proportional change in Δ equals the conventional measure of the cost of tariff protection, normalized by the total welfare cost of the initial tariff structure.

Similarly for quantity quotas q , Anderson and Neary derive the TRI by using the balance of trade function B :

$$(6) \quad B(q, u; \gamma) = E^R(q, \pi, u) + p'q - (p - p^*)'q - \beta$$

where E^R is the restricted expenditure function (restricted due to the existence of quantity quota q). π denotes domestic prices subject to tariffs, while p is the price vector of goods under quotas. The TRI for quotas is defined as the proportionate change in period-one quotas required to reach period-zero utility:

$$(7) \quad \Delta(q^1, u^0; \gamma^0) \equiv [\Delta : B(q^1 / \Delta, u^0; \gamma^0) = 0].$$

Proportionate changes in Δ can again be identified with the welfare effect of arbitrary quota changes normalized by the total welfare cost of the initial quota vector by totally differentiating equation (7).

Combining tariffs and quotas we can write the following balance of trade function:

$$(8) \quad B(q, \phi, u; \gamma) \equiv E^R(q, \Pi^* \phi, u) + p'q - (\phi - 1)' \Pi^* m - (1 - w)(p - p^*)'q - \beta$$

where w is a fraction of rents that accrue to foreigners. Defining liberalization factors λ as follows:

$$(9) \quad \lambda \equiv \begin{cases} q_i & \text{for quota-constrained goods} \\ 1/\phi_i & \text{for tariff-constrained goods} \end{cases}$$

The full TRI in terms of the liberalization factors can be written as

$$(10) \quad \Delta(\lambda^1, u^0; \gamma^0) \equiv [\Delta: B(\lambda^1/\Delta, u^0; \gamma^0) = 0].$$

The value of Δ has the interpretation of equal proportionate tightening of all quota levels and rising of all tariff factors which would be equivalent in welfare terms to a given initial protective structure with any arbitrary pattern of quotas and tariffs.

The TRI can be operationalized by using a computable general equilibrium (CGE) model in which case the level of the TRI provides a convenient measure. In the absence of a CGE model, the change in the partial TRI can be calculated for the markets of interest only. In the latter case it is convenient to assume that goods under study are separable from others so that the complicated matrix expressions will be considerably simplified. Anderson and Neary illustrate their theoretical analysis of the TRI by examining the Hong Kong exports of textiles and apparel to the U.S. in 1983-88 which are subject to binding voluntary export restrictions under the Multifibre Agreement. Differentiating and simplifying equation (8) yields the following expression for the shadow price of quotas from the U.S. point of view:⁶

$$(11) \quad -(B_q^{US})' \equiv -\bar{\tau} p' + [\tau_q - 1/\epsilon] p' / (1 + \tau_q)$$

where $\bar{\tau}$ is the U.S. average tariff, p is the U.S. import price, ϵ is the aggregate elasticity of demand for quota-constrained goods, and τ_q is the U.S. import tariff for textiles and apparel.

The shadow price of quotas from the Hong Kong perspective is:

⁶ Assuming separability and that international arbitrage equates U.S. import prices p to Hong Kong export prices p^* in the following manner: $p = (1 + \gamma_q)(p^* + \rho)$ where γ_q is the U.S. import tariff and ρ is the price of a Hong Kong export license.

$$(12) \quad -(B_q^{HK})' \equiv p' / [(1 + \tau_q)\varepsilon] + p'.$$

Equation (12) assumes that Hong Kong has market power in textiles and apparel (downwards sloping demand curve), tariffs are not imposed on other goods, and that exporters receive the full license price.

Both the uncompensated and compensated (for growth in real disposable income) TRI for the U.S. and Hong Kong are calculated using equations (11) and (12). The TRI for the U.S. suggests that there was a marked increase in the protectiveness of the trade regime. For Hong Kong it was found that a fall in Δ (which implies a more restricted trade regime) is welfare-improving due to its monopoly power. These two measures are then compared to changes in the trade-weighted average tariff equivalent for textiles and apparel. Although the two indices had the same qualitative average implication (an increased restrictiveness of the quota regime), the average tariff equivalent was found to have implausibly high variability, and for a few years it also gave opposite implications for the change in trade restrictiveness than the TRI. According to Anderson and Neary, this reveals the practical inadequacy of the tariff equivalent (i.e. the implicit tariff) as a measure of trade restrictiveness.

Despite the qualifications stated in Section 2.1, and the criticism presented by Anderson and Neary (1991), the implicit tariff index is considered as the most appropriate candidate for the average quantitative index to be used in identification of liberalization episodes in the study of foreign trade reforms in Africa.⁷ As African trade liberalizations have predominantly been import liberalizations, concentration on the price of importables relative to its world price is justified. The implicit tariff is also a useful measure when trade policy relies on QRs or discrete administrative non-tariff import controls. As in the case of Chile, time series data for the actual levels of the implicit tariff are rarely available for African economies. There are, however, indirect means of obtaining an index proxy for it.

⁷For the sake of comparison, Annex 2 derives another quantitative measure of trade policy which is the ratio of total private consumption to consumption of imports by households.

III. Implicit Tariff Index as Quantitative Indicator of Trade Policy

The implicit tariff is the ratio of the domestic price of a given group of importables relative to their world price (minus one). It captures changes in the nominal rate of protection (NRP), which is the combined effect of nominal tariffs and tariff equivalents of quantitative or non-tariff restrictions. In the absence of sufficient information on its actual levels, we will have to derive the implicit tariff index indirectly by using available price deflators. In what follows the implicit tariff index will consistently refer to the average implicit tariff index for Kenyan manufactured and semi-manufactured goods equivalent to SITC 5-8, and it will be calculated by using the average domestic ex factory price and its world price equivalent for these goods.

A. Derivation of implicit tariff index for Kenya

Decomposition of the Kenyan consumer price index is quite different from import categories, which makes a comparison of domestic consumer prices and import prices problematic. As subsectors of industrial production are easier to match with imports, we will have to choose a producer price index as our domestic price and assume that transport costs to a common location for both imports and domestically produced goods remain constant over time. In the absence of a wholesale price index, the ex factory price deflator is derived by using the value of manufacturing output for all firms and establishments and the quantity index (see Annex 1 for details).⁸

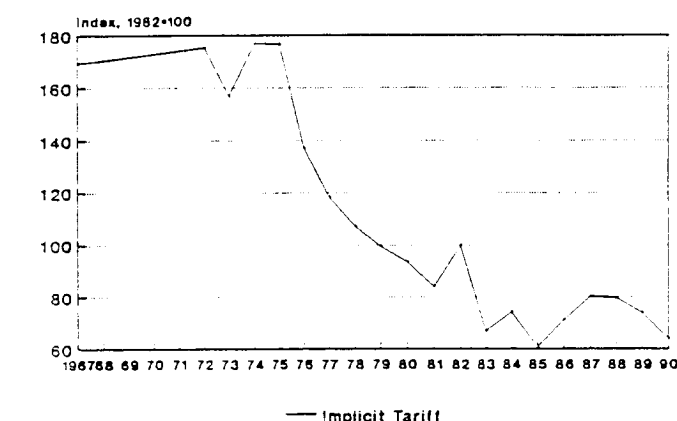
Although food processing is an important industrial sector in Kenya, it is excluded from the implicit tariff index because its domestic ex factory price is affected by price controls and import price by maize imports, which fluctuate from year to year.⁹ The cif prices of equivalent import categories (Standard International Trade Classification, SITC 5-8) reported by the Kenyan Department of Customs and Excise are used as world prices. The

⁸Data for all firms and establishments are available for 1967 and 1972-90. We exclude years 1968-71 as the annual surveys of industrial production cover large scale firms only.

⁹Beverages and Tobacco are also excluded from the index.

latter are reweighted by their respective shares in domestic manufacturing. Figure 1 depicts the implicit tariff index for manufactured and semi-manufactured goods for Kenya in 1967 and 1972-90. This index indicates a dramatic fall in the nominal rate of protection in Kenya during that period.

Figure 1:
Trade Policy Index for Kenya, 1967 and 1972-90



Source: Statistical Abstract,
various issues

Due to data limitations, we are able to derive the implicit tariff index at the annual level only. Therefore, the index may not be a sufficient guide if we wish to investigate speculative behaviour in response to changes in trade policy. For example, if more than one policy change takes place during one year, they may even out one another in the annual index but still induce speculative behaviour. Yet a quantitative index is important as only it can tell us whether or not trade policy at the aggregate level became any more liberal after a series of relaxations and subsequent tightening of QRs over time.

B. Implicit tariff index versus a narrative of liberalization episodes

Based on changes in trade policy instruments alone, five liberalization episodes can be distinguished for Kenya since the beginning of the 1970s. We will first briefly describe each episode in the form of a narrative of events. The narrative will then be compared with the corresponding implicit tariff index reading in order to find out whether the observable changes

in trade policy are reflected in the index (that is, at the aggregate level), or alternatively, whether the chosen quantitative measure of trade policy picks up known policy changes.

Quantitative import restrictions in Kenya were first introduced in a larger scale in early 1972, following a balance of payments crisis. The first liberalization effort occurred in mid-1973 when a large number of items were derestricted, and bans were removed. Nevertheless, the system as a whole seems to have remained more restrictive than prior to 1972. Efforts towards a further relaxation of import controls were undermined by the oil shock in 1974 and by the simultaneous decline in the agricultural export prices, relative to the prices of imported manufactured goods. Although the implicit tariff index cannot be derived for years 1968-71 in the absence of comparable data, on the basis of the 1967 index it looks as if tightening of QRs in 1972 did not alter much the already high protection levels. The temporary relaxation in QRs in 1973 is clearly picked up by the implicit tariff index.

The coffee boom in 1976-78 induced the second relaxation of import restrictions as there was a temporary windfall in foreign exchange earnings. More licenses were approved in all import categories, particularly in 1978. As private agents were able to recognize that the boom was temporary, they also anticipated that the trade reform was going to be reversed. The implicit tariff indicates a substantial liberalization in 1976-78. By comparing actual exports and consumer imports to a counterfactual (year 1975), Bevan *et al.* (1990) show that the relaxation of quotas was not, however, sufficient to compensate for the extra consumer demand and the resource movements to the boom sectors, coffee and construction. Despite an increase in imports, exports declined, which can be explained by a diversion of resources to meet increased domestic consumption. There was a switch within the tradable goods sector (manufacturing) from exports to import-substitutes. When a Computable General Equilibrium (CGE) model is used to generate an alternative counterfactual, it supports the conclusion that exports were discouraged because of the general equilibrium effects of import controls (Bevan *et al.* 1990). On the one hand, one can conclude that the trade regime was liberalized during the boom, although not sufficiently to meet the increased consumer demand. On the other, the conclusion could be the opposite as the increased consumer demand made the (somewhat relaxed) QRs even more binding, placing the export sector in a more disadvantageous position than before.

In late 1978 when export receipts fell substantially, tighter controls were brought back and an advance import deposit scheme at the Central Bank was introduced to curtail imports

and safeguard external reserves. Importers were required to make a non-interest bearing deposit for six months, ranging from 25 to 100 percent of the cif price of imports. At the end of 1979 the import deposit scheme was relaxed even if there was no improvement in the foreign exchange earnings. As can be seen from Figure 1, tightening of import controls in 1979, when the coffee boom was over, is not reflected in the implicit tariff.¹⁰ A possible explanation for this could be falling incomes. Despite being tightened, QRs become less binding, and the implicit tariff index falls, if there is a sufficient contraction in domestic demand.

The third episode occurred in 1980. As opposed to the previous policy rule of using import restrictions in macroeconomic adjustment, the 1980 reform was an exogenous liberalization of import controls as there was no improvement in the terms of trade, which would have called for liberalization under the endogenous trade policy rule. The relaxation of import controls, which was carried out without compensating devaluation, was aimed at correcting the serious macroeconomic imbalance resulting from adverse terms of trade, and the loss of fiscal control triggered by the coffee boom. In addition to the earlier relaxation of the import deposit scheme, the reform included removal of import bans and non-objection certificates, and a shift of 20 percent of the items in the more restrictive categories to less restrictive ones. Similar shifts of import items to less restricted schedules were supposed to continue during the next few years.

The 1980 relaxation of import restrictions is clearly visible in the implicit tariff index, although it has to be kept in mind that, with falling incomes and demand, the implicit tariff is likely to decline even without any change in trade policy. Despite a complex system of QRs, a majority of items imported to Kenya was not, however, included in any of the schedules in 1980. The authorities were therefore unable to control the amount, or the composition of imports, following the abrupt relaxation of restrictions. In the absence of devaluation, a foreign exchange crisis ensued in September 1980, resulting in an almost complete halt in foreign exchange allocations during the next two months. The reversal of the 1980 liberalization is not picked up by the annual index as the index reading seems to be dominated by liberalization earlier in the same year. The reasons why the index reading for

¹⁰Bevan *et al.* (1990) calculate the implicit tariff index for 1975-80. There is, however, an error in their calculation for 1979. As a result, their index shows tightening of trade policy when there actually was a fall in the implicit tariff from the previous year.

1981 indicates further liberalization are less clear. There are three potential explanations: falling income (which makes QRs less binding), reductions in tariffs implemented in 1981, or decumulation of speculative inventories which were purchased during 1980 (Reinikka 1994).

According to N'geno (1991), the 1980 liberalization was part of a single episode which was reversed by the end of 1984. Many changes in QRs announced by the government in 1980, particularly shifting of import items to less restrictive categories, were not fully implemented. By 1985 the total number of licensed items remained about the same as they were before the reform was initiated, although there were more items in the less restrictive categories. Another measure was a tariff rationalization programme, which was also initiated in 1980 by introducing a 10 percent surcharge on all imports and tariff increases on over 200 items. Higher tariffs were temporarily to compensate the removal of QRs. During the first year 2-90 percent tariff increases were imposed on further 1400 items. In 1982 the average increase in tariffs was 13 percent, to be followed by a reduction in 1983 to the level of 1981. These changes seem to be picked up by the implicit tariff index. After 1984, however, both tariff reductions and their unification were discontinued. The third element of the 1980-84 reform (as defined by N'geno 1991) was direct export incentives, such as an export compensation scheme, duty drawbacks, sales tax rebates, and subsequently nominal devaluations. The effect of these measures remained insignificant, however, mainly due to delays in payments and low levels of the incentives themselves. N'geno also shows that despite nominal devaluations, twice in 1981 and once at the end of 1982, the real effective exchange rate did not depreciate until 1982, and even then real depreciation was minimal.

The failure to liberalize the existing regime in 1980 led to a major reform of the import schedules. New schedules were effective from the beginning of 1982. Unlike N'geno (1991), we consider the 1980 liberalization, and the 1982 reform of import schedules as separate episodes, the latter being the fourth episode in our narrative. Import schedules were completely revised and made more comprehensive. Trade policy became more systematic in discriminating against imports competing with domestic industries and giving priority to imports of intermediate and capital goods. As the 1982 reform contained elements of both tightening (consumer goods) and relaxation (inputs) of import controls, the fourth episode, instead of liberalization, could also be classified as a move towards protectionism. On the basis of Figure 1, it looks as if an easier and less discretionary access to inputs increased

domestic competition so that the implicit tariff continued to fall in the 1980s (with a few exceptions), although less dramatically than in the latter part of the 1970s. This interpretation is reinforced by the changes that occurred in the exchange rate and incomes in the 1980s. Devaluations of the Kenya Shilling became increasingly frequent since 1981, while incomes fell until 1986, strengthening (if not causing) the fall in the implicit tariff.

A renewed liberalization programme of the Kenyan economy was announced in 1986 (Republic of Kenya 1986). Supported by the World Bank lending, the emphasis of the programme was laid on reorientation of trade policies and reduction of regulatory and licensing requirements in industrial activity. The first aid package, on the condition that the Kenya government undertake substantial trade liberalization, was agreed upon for 1988-89, to be followed by another two-year package in 1990-91. This is the fifth episode. Although an import liberalization package was announced in 1988, its implementation did not begin until 1989. Protection was initially meant to be reduced only for capital goods, raw materials and non-competing intermediates. For import-competing goods relaxation of non-tariff restrictions was to be replaced by equivalent increases in tariffs. It is somewhat unclear how accurately tariff surcharges matched the removal of (the tariff equivalents) of discrete quantitative *cum* administrative restrictions. Had the authorities been able to impose tariff increases equal to the removed tariff equivalents of QRs, there would not have been a jump in the price of importable goods.

Streamlining of the import licensing system was much more cautious in the early-1990s than a decade earlier. Although import liberalization was attempted in a larger scale in 1989-90, it was quickly abandoned, and the licensing system remained firmly in place.¹¹ In particular, licensing of imports under Schedule 3, which mainly consist of import-competing and consumer goods, has, until recently, remained discretionary and strictly limited. There were three permanent improvements, however. First, application procedures were made faster and more transparent. Second, access to the No Foreign Exchange (NFE) licenses became considerably easier. Third, licensing for capital and intermediate goods was relaxed (Republic of Kenya 1991a). A simultaneous tariff reform took off better than that of import licensing. By 1991, the number of tariff bands had fallen from 25 to 11, while the maximum rate had declined from 170 to 70 percent. In an effort to ensure macro

¹¹ The import licensing system was abolished in May 1993.

compatibility, tariff reductions were accompanied by changes in fiscal policies, such as increases in the value added tax, which in 1991 ranged from zero to 100 (Republic of Kenya 1991b). The implicit tariff index, for which data extends only up to 1990, indicates trade liberalization in 1989-90.

As import liberalization could not be implemented as effectively as initially expected, emphasis of the reform has been shifted towards export expansion and diversification by improved direct incentives to exporters, and by a more flexible exchange rate policy. Direct incentives to exporters include improvements in the duty/VAT exemption scheme to allow exporters access to inputs at international prices. The export compensation scheme, which has been in existence since 1974 but had proved inefficient, was to be revived. Another direct scheme is the manufacturing under bond for those who export 100 percent of their production. To improve its operation, the scheme was extended so that rejects can be sold in the domestic market. The first export processing zone began operation in 1991 in Nairobi, and a few others are under way to be established. Furthermore, the government made a commitment to continue investing in export infrastructure, such as cargo handling, and reduce and streamline licensing and other procedures. Compared to the past record, exchange rate management has become flexible during recent years. An inter-bank market for foreign exchange is now in operation, and the Central Bank, which used to be the sole buyer and seller of foreign currencies, no longer allocates foreign exchange for commercial imports.

Summarizing, the implicit tariff index shows that protection levels of domestic industries were very high in the early-1970s. A temporary liberalization took place in 1973 but it was soon reversed. Since 1976 there has been a substantial downward trend indicating sustained liberalization which was only temporarily reversed in 1982, 1984 and 1986-87, but has been continued thereafter. Bearing in mind the changes which occurred in incomes and in the exchange rate,¹² only the 1973, 1976-78 and 1988-90 liberalizations can be attributed to changes in trade policy instruments, while the rest (1979-81, 1983, and 1985) may have been caused, or at least reinforced, by other factors than trade policy. Although visible in the index, the 1980 exogenous reform, for example, cannot unambiguously be attributed to trade policy as a simultaneous fall in incomes could have made the QRs less binding. As opposed to the narrative of events, the index shows that the trade regime became more liberal also in

¹² The impact of price controls has largely been eliminated as we have restricted our analysis to semi-manufactured and manufactured final goods (SITC 5-8) and their equivalents in domestic production.

1979 and 1981, whereas the 1982 (*ex ante* ambiguous) reform appears to have been a tightening of controls rather than liberalization. Index readings for 1983 could reflect a fall in tariffs, while that for 1985, in the absence of changes in trade policy, is likely to be due to falling incomes.

Although the index concurs quite well with the narrative of events, we have reason to believe that the extent of liberalization indicated by the implicit tariff index over time, particularly during the latter part of the 1970s, is exaggerated. How can we ascertain that the observed downward trend in the implicit tariff index is not false because the domestic ex factory price index or the import price index, or both, are biased? Alternatively, could it be that the price indices are dominated by other factors so that changes in protection do not at all (or at least not consistently) surface in the index depicted in Figure 1? These questions will be explored in detail in Sections 4,5 and 6.

C. Implicit tariff index versus index of import compression

According to Figure 1, substantial trade liberalization is supposed to have taken place in Kenya since 1976. It was particularly rapid in the latter part of the 1970s but slowed down somewhat in 1980-85. In 1986-88 there seems to have been a temporary but still a modest reversal. How does these readings of the implicit tariff index concur with the measure of import compression (the IIIR) presented by Narasimham and Prichett (1993)? As the latter index has an imposed value of zero for the entire 1970s (observations were used for estimating the constant in the notional import demand equation), it can only be used for comparing average trade regimes in the 1970s and 1980s. Unlike the implicit tariff index, the IIIR for Kenya indicates that imports were more compressed in the 1980s relative to the 1970s, i.e. controls have been tightened rather than relaxed over time.

Moreover, the average reading of the IIIR, i.e. the deviation of actual from notional imports, was 45 percent in 1980-84 and 60 percent in 1985-90. Again, the two quantitative measures give contrasting results for changes in trade policy in Kenya. Contrary to the IIIR,

the average implicit tariff index reading is 84 for 1980-84 and 72 for 1985-90.¹³ In other words, the IIIR indicates a further tightening of trade policy during the latter half of the 1980s, compared to the early part of the decade, while the implicit tariff index shows liberalization.

In order to shed some light on the contradicting results from the two indices we will next investigate the available snapshots of the actual levels of protection in Kenya. Thereafter, we will subject the price indices employed in derivation of the implicit tariff index for a detailed scrutiny.

IV. Actual Levels of Protection in Kenya

This section contains an attempt to assess whether the implicit tariff index (Figure 1) truly reflects changes in the actual level of the implicit tariff over time. The assessment will be based on a few snapshots of the nominal rates of protection (NRP) available for Kenya. The earliest study is by Phelps and Wasow (n.d.) who derive the nominal and effective rates of protection (NRP and ERP) as well as three measures of economic viability, which are factor proportions, profitability at world prices, and world price rate of return (WRR). The latter is a modified measure of domestic resource cost (DRC). The authors use input-output data from the 1968 survey of industry. The survey covered all firms employing more than 50 people (3/4 of total manufacturing at the time). The study was conducted at ISIC (International Standard Industrial Classification) three or four digit level. Domestic prices were obtained from inter East African trade statistics from which unit values were calculated, and from unit values from firms' inputs and outputs. East African export prices, Japanese import and export prices (after a transport cost adjustment) were used as world prices, or, failing all else, the domestic price was deflated by the nominal tariff.

Three main conclusions emerged from the Phelps and Wasow study: (i) the protective system favoured finishing-touch industries, (ii) there was no relationship between factor intensity and either protection or the two other measures of viability, and (iii) the level of

¹³The absolute values of the two indices are obviously not comparable. The IIIR is the percentage difference between the notional and actual demand for imports, while the implicit tariff index is an index number relative to the base year 1982=100.

Table 1:
Protection in Kenya in 1968 (Phelps and Wasow)

Industry	NRP%	ERP%	WRR*
Misc. foods	77	119	-0.37
Milling	46	69	0.50
Canning	17	27	0.65
Soft drinks	10	-11	1.23
Textiles	66	81	0.37
Garments	43	31	0.90
Knitwear	45	72	0.38
Sawmilling, timber	1	-1	1.41
Paper products	36	74	0.36
Furniture, fixtures	19	27	0.58
Pharmaceuticals	15	23	1.28
Chemicals	0	-3	1.31
Misc. chemicals	17	30	1.89
Paint	44	95	0.08
Cement	0	-10	2.06
Glass products	18	29	0.97
Metal products	10	16	1.30
Average**	18	34	0.97

* If WRR > 1, the sector is viable at world prices, although the ranking of sectors is more important than absolute values of WRR.

** Includes all sectors studied, not only those shown in this table.

Source: Phelps and Wasow (n.d.)

effective protection was negatively correlated with profitability at world prices, the average correlation coefficient being -0.65. The protective system is more inefficient the higher the negative correlation between viability and protection. The results of the Phelps and Wasow study concerning the actual levels of protection in Kenya in 1968 are summarized in Table 1. The nominal rate of protection (NRP) was found to vary from zero (several industrial sub-sectors) to 77 percent (miscellaneous foods), while the effective rate of protection (ERP) varied from -78 percent (confectionary) to 173 percent (sugar). The average NRP for all

sectors was found to be 18 percent, the average ERP 34 percent, and the average WRR was 0.97.

As can be seen from Table 1, the results are reported at a fairly disaggregated level (three digit ISIC) and are not, therefore, directly comparable with those of the two subsequent studies on protection in Kenya (The World Bank (1987a), and Maxwell Stamp Associates (1989) whose results will be summarized in Tables 2 and 3 below). There are two reasons why we cannot aggregate the Phelps and Wasow results. First, a few sectors are presented under a code name only as they consisted of sufficiently few firms so that the authors were not allowed to reveal the name of the sector. Second, sectorial weights (the share in total output at world prices) used for calculating the average NRP are not reported. Hence, we cannot derive the non-food, non-beverages and tobacco average implicit tariff which would be the equivalent to our implicit tariff index (as can be done for the two subsequent studies).

A World Bank study (1987a) surveyed 45 firms in ten industrial subsectors, including 106 product lines, in order to obtain the NRP, ERP and DRC for 1985. Information was collected on the quantity and value of sales and inputs, and on labour and capital costs. Hence, the domestic price is the ex factory price received (and reported) by producers, and the world market price is generally the cif import or fob export price of a product. International prices for imported inputs were obtained from the firms. World prices for locally produced tradable inputs and import-substitution outputs were identified from: (i) bills of entry and import invoices approved by the Société Générale de Surveillance, requested for the release of foreign currency by the Central Bank of Kenya, (ii) trade statistics, and (iii) similar studies for several other African countries. In instances of multiple price choice for the same item, the selection was always made in favour of the lowest price. Table 2 summarizes the results.

The NRPs were found to range from a high of 71 percent (electrical and transport equipment) to a low of 22 percent (paper and wood products). The ERPs varied from 312 percent (iron, steel, electrical and transport equipment industries) to 6 percent (paper and wood products). In other words, incentives for import substituting activities and final good production were much higher than those in export industries and intermediate goods and capital goods activities. Using the long term DRC¹⁴ as the measure of efficiency, food processing, beverages

¹⁴The short run DRC assumes that the existing capital stock is a sunk cost, while in the long run DRC both capital and labour costs are treated as variable.

processing, beverages and tobacco were found to be very efficient, whereas cement, glass, iron and steel were grossly inefficient sectors. Although only one industrial activity was found with negative value added at world prices, there is a considerable variability in efficiency both within activities and across industries.

Table 2:
Protection in Kenya in 1985 (The World Bank)

Industry*	NRP %	ERP %	DRC(SR)	DRC(LR)
Food Processing (6,16)	24	111	0.37	0.71
Beverages, Tobacco (3,3)	29	38	0.37	0.88
Textiles, Clothing (7,20)	46	126	0.99	2.13
Leather, Footwear (1,4)	37	80	2.03	2.90
Paper, Wood Products (2,6)	22	6	0.57	1.58
Plastics, Pharmaceuticals (7,13)	48	129	0.76	1.72
Chemicals (8,17)	50	211	0.86	1.46
Cement, Glass (3,5)	30	248	1.99	6.29
Iron, Steel (2,9)	38	312	1.86	5.48
Electrical, Transport Equipment (2,13)	71	312	1.76	3.49
TOTAL (45;106)	33	107	0.69	1.53
Non-Food-Bev-Tob (36;87)	41	137	1.07	2.29

*) The first number in brackets after industrial subsector refers to the number of firms interviewed and the second number refers to product lines covered.

Source: The World Bank (1987)

The World Bank sample was biased in favour of food processing, beverage and tobacco which constituted 78 percent of the sample's value added, while their share in the value added of the industrial sector was only 49 percent (at world prices). As these two subsectors appeared to be efficient, the results of the survey are therefore biased towards efficiency. As our purpose is to find an average level of the NRP for semi-manufactured and manufactured products equivalent to goods classified under SITC5-8 (Standard International Trade Classification), we will have to calculate the average rate from the remaining 22 percent of the sample in terms of value added. This represents 36 firms and 87 product lines. The

production weighted¹⁵ average implicit tariff for semi-manufactures and manufactures turns out to be 41 percent, their average ERP 137, while the long run DRC is 2.29 (Table 2).

How does the level of the implicit tariff compare with average nominal tariffs in Kenya? During the time the World Bank study was carried out the average tariffs were 28 percent for capital goods, 34 percent for intermediate goods, and 55 percent for consumer goods. The standard deviations were 20, 17 and 47 percent, respectively. Note that around 80 percent of imports and close to 70 percent of duties collected applied to goods subject to a duty of 39 percent or less. In other words, imports are dominated by inputs for domestic production. Two different groups of goods emerged from the World Bank sample which consisted of as closely substitutable goods as possible. In the first group the NRP exceeded the scheduled explicit tariff, including such goods as pick-up trucks and passenger motor cars, steel and some consumer goods. In the second group, which included a significant number of goods, the domestic price was - quite surprisingly- much lower than the world price plus the scheduled tariff. The second group includes clothing, beverages, animal feeds etc

Table 3:
Protection in Kenya in 1988 (Maxwell Stamp Associates)

Sub-Sector*	Nominal Tariff Rate	Kenya Customs NRP	UK Customs NRP		
			N-EC	Low	Avg
Food Preparations (55.0%)	55	-21	87	116	102
Textiles & Products (12.3%)	66	50	14	180	97
Iron & Steel Products (11.4%)	44	12	-20	99	39
Paper, Wood, Plastics (9.2%)	48	-23	11	68	39
Leather & Products (3.1%)	45	47	120	22	94
Motor Vehicles (9.0%)	39	262	86	n.a.	n.a.
TOTAL (100%)	53	19	60	112	88
(Tariff Equivalent)		(-34)	(7)	(59)	(35)
Non-Food-Bev-Tob (45%)	50	68	26	107	68
(Tariff Equivalent)		(18)	(-23)	(57)	(18)

*) Percentages in brackets after industrial sub-sector refer to its share in domestic value added.

Source: Maxwell Stamp Associates (1989), Bevan *et al.* (1991)

¹⁵Weighted by shares in value added at world prices.

Using different data sources for both domestic and international prices, Maxwell Stamp Associates (1989) found higher levels of tariff equivalents of QRs and nominal rates of protection for 1988 than the World Bank for 1985. As can be seen from Table 3 above, their base case production weighted average implicit tariff for the six industrial subsectors was found to be 112 percent, while the non-food implicit tariff was 107 percent (tariff equivalents are in brackets). The respective figures for the World Bank study were 33 and 41 percent. In the presence of quotas the implicit tariff obviously varies over time, depending, for example, on changes in domestic production costs, world prices of importables, price controls, domestic demand, the amount of illegal imports and exemptions granted to importers. In addition, the choice of products in the sample will affect the results when protection is uneven amongst and across sectors.¹⁶ The difference between the results revealed by a comparison of Tables 2 and 3 seems to be too wide, at least for the base case, to be explained by import controls, variations in production costs, price controls, or economic conditions over a period of only three years. It is more likely a result of sample choice¹⁷ and the choice of price series by the two studies.

MSA interviewed 113 firms in six industrial subsectors and obtained the domestic ex factory maximum discount price, net of sales tax, for 353 individual products monthly for the calendar year 1988. Weighted by sales values a more accurate weighted average price could be calculated than could otherwise be obtained from a single observation. For world prices they used three sources of data: Kenya Customs cif prices, UK Customs data, and non-Kenyan ex factory prices. The Kenya Customs provided two border prices: the cif price declared by importers, and the customs valuation of the same import consignment. The latter differs from the former where Customs officers have reason to believe that under- or overinvoicing is occurring. Customs valuations were chosen for the world price for the MSA study as they exhibit lower variability over time. Unfortunately, no information is given about the extent of the deviation between the two. Three UK import unit prices were used: weighted average price from all world sources, weighted average non-European Community (EC) price,

¹⁶There is some overlap in the product choice of the two samples. The most prominent difference is that the MSA sample does not contain pharmaceuticals, chemicals, cement, or electrical equipment which are included in the World Bank study.

¹⁷MSA tried to avoid overlap with the World Bank (1987) sample. Their other selection criteria were wide product coverage, inclusion of larger firms and inclusion of sectors where QRs are most prevalent. Their response rate was 85 percent.

and the lowest reported import price for a given good. Finally, for about 50 goods foreign manufacturers were identified and approached for ex factory prices.

There is some difficulty in comparing the 1968 protection levels with the ones in the 1980s as the sectors included and the levels of aggregation vary from study to study. However, it seems that the ERPs (protection of the domestic value added) have increased considerably since 1968, while the increase in the NRPs (the implicit tariff) has been less pronounced. Some sectors, such as textiles and clothing, seem to have retained more or less the same level of the NRP while some others, such as cement and chemicals, have become highly protected only at a later stage. Food processing instead seems to have become less protected and more viable over time.

According to MSA the Kenya Customs and Excise cif import price (customs valuation) data tends systematically to give negative or low tariff equivalents. "In spite of attempts by Customs to prevent false quantity and price declaration the problem is too widespread for the existing *ad hoc* systems to handle, notwithstanding the activities of the shipping inspection agencies" (Maxwell Stamp Associates 1989, Annex1, p. 12). The systematic bias in the import price data is assumed to result from overinvoicing of imports in order to circumvent restrictions on capital controls. The lowest import unit value reported by the UK Customs was therefore preferred and chosen as the base case, resulting in a much higher average implicit tariff (112 percent) than was found in the World Bank study three years earlier (33 percent), or Phelps and Wasow almost 20 years earlier (18 percent). If we compare the results of manufactured goods alone (i.e. exclude food, beverages and tobacco), the difference between the two subsequent studies is slightly less pronounced (107 and 41 percent, respectively). Such a marked deviation between the results only applies to the chosen base case, which uses the lowest UK import price as the world price. The weighted average UK price of manufactured goods imported from non-EC countries yields a much lower implicit tariff of 26 percent, whereas the world average UK import unit value produces a somewhat higher implicit tariff of 68 percent. Incidentally, the latter yields the same result as using the Kenya Customs data.

As we will show in Section 6 below, the lowest international price might not be the most appropriate choice for Kenya, since African countries, due to various reasons such as small markets, tend to have to pay more for their imports than industrialized countries (Yeats 1991a). Furthermore, there is evidence that pre-shipment inspection is efficiently carried out

in most industrialized countries exporting to Kenya and to a number of other developing countries which require such an inspection before releasing foreign exchange for imports. Therefore overinvoicing could be less of a problem in the Kenya Customs data than assumed by MSA. Bearing this in mind, the deviation between the implicit tariffs derived from the two studies might be smaller than what first appears. Although one has to be cautious in comparing the results, as they seem to be very sensitive to sample choice and to the choice of international prices, they seem, nevertheless, to lend some support to the observed changes in the implicit tariff index (Figure 1), i.e. tightening of trade policy in 1986-88 relative to 1985. However, our index is in stark contrast with the evidence from the late-1960s relative to the latter part of the 1980s. The snapshots of the actual levels of protection in Kenya do not confirm the downward trend in the implicit tariff index depicted in Figure 1. Quite the contrary, they indicate that the Kenyan trade regime has become more protective over time (at least until 1988). Finally, it is difficult to compare the snapshots to the index of import compression (the IIR) as there are no observations of the actual level of protection either for the 1970s or the early part of the 1980s.

In the absence of more recent studies, an indirect way of assessing prevailing protection levels in the early-1990s is to examine the premia obtained in the secondary market for Foreign Exchange Bearer Certificates (FEBC), which were introduced by the government in October 1991 as part of its programme to liberalize the trade and exchange system. The FEBC system was operational for about a year. The certificates were purchased in convertible currency at face value by Kenyan residents without limitation and were not subject to exchange restrictions. To encourage Kenyan residents to buy the certificates holders were entitled to use them to pay for imports otherwise restricted, consumer goods in particular. For some time, FEBCs discriminated against exporters who could only acquire them in the secondary market. During temporary shortages of foreign exchange these certificates were almost the only means of paying for imports.

In mid-1992 the premium converged to around 30 percent. Assuming that it is the equilibrium rate, the prevailing tariff equivalent of QRs must have also been 30 percent. If we assume that the average nominal tariff was 53 percent (MSA 1989) in 1992, then the average nominal rate of protection (NRP) would have been 83 percent.¹⁸ It is somewhat

¹⁸The implied implicit tariff is additive rather than multiplicative since import duties are based on the official value of the currency.

higher than the average levels reported by the two studies, except for the MSA base case.¹⁹ As our price data do not extend beyond 1990, it is not possible to compare the tariff equivalent implied by FEBCs with the implicit tariff index. As intermediate and capital goods have priority in access to import licenses and foreign exchange, FEBCs were most likely used to finance more restricted consumer imports. The somewhat high tariff equivalent of 30 percent may therefore reflect the composition of imports using the FEBC market.

V. Testing for Biases in Domestic Deflators

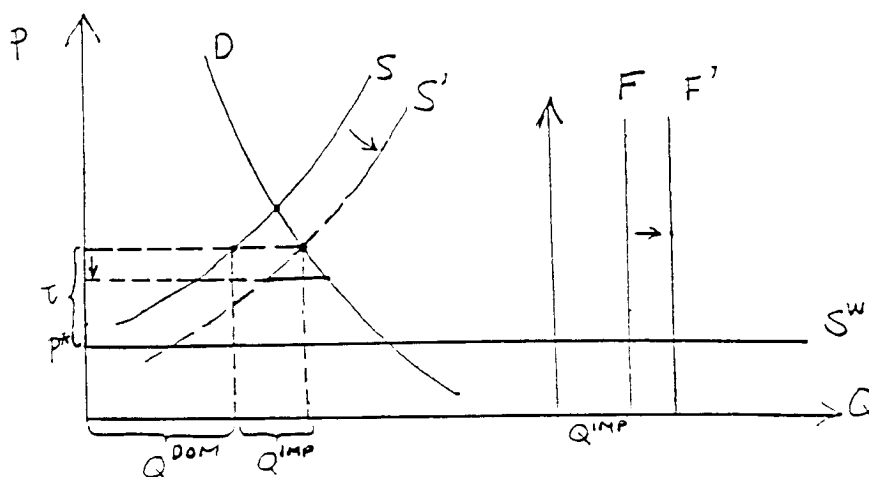
As shown earlier, the narrative of changes in trade policy concurs fairly well with changes in the implicit tariff index, although there are a few deviations. It is rather the extent of liberalization indicated by the index than the direction of annual changes that seems problematic in the light of the other evidence that we have on the protective structure of Kenyan industries. First, the snapshots of actual levels of protection convey a more or less opposite picture of the Kenyan trade regime: tightening of import controls since the late-1960s up to the late-1980s (and even to the early-1990s). Second, the import compression index (the IIIR), which is another quantitative index of trade policy (Narasimhan and Prichett 1993), also indicates increased protection both in the 1980s compared to the 1970s, and in the latter half of the 1980s compared to the early part of the 1980s. Why does the implicit tariff index, which should be one of the most appropriate aggregate measures of trade policy in the presence of QRs, have such a different trend from that indicated by the snapshots of the NRP, the ERP, or the IIIR? In order to answer that question we will have to take a closer look at two deflators used for constructing the implicit tariff index, i.e. the domestic ex factory price and the import price index.

This section will analyze potential biases in the domestic producer price index for semi-manufactured and manufactured goods in Kenya. The base case is the domestic ex factory price, which was derived from the value of manufacturing output and the respective quantity index, and which was used to calculate the implicit tariff index depicted in Figure 1. Our first hypothesis is that incentives for misreporting domestic sales may have increased

¹⁹ The NRP derived using the weighted average UK price for total imports, including food, is also slightly higher.

over time, resulting in incorrectly recorded domestic deflator. Misreporting, if any, is likely to be biased downwards. An increase in underreporting of sales can be triggered by a policy change, such as an increase in taxation, or tightening of price controls. In the presence of capital controls, there may be a further incentive to underinvoice exports. If the share of manufacturing exports increases over time, the share of underinvoiced sales is likely to go up, too.

Figure 2:
*Import Demand and Domestic Supply of Importables
in a Foreign Exchange Constrained Economy*



The second hypothesis is that the ex factory price picks up a falling price level over time as more firms enter and the manufacturing output expands. In the beginning of the period under study (late-1960s and early-1970s) the unit cost was likely to be higher than the long run unit cost as many industries were starting up their activities. In other words, the domestic price index is dominated by the manufacturing sector moving down along its demand curve rather than by relaxation of protection. We illustrate this issue in Figure 2, assuming a foreign exchange constrained economy.

Figure 2 depicts a situation where protection (i.e. the domestic price of importables, $p^* + \tau$) declines even if there is no change in trade policy. The initial equilibrium is at E, given foreign exchange supply constraint F, perfectly elastic supply of imports S^* , and

domestic supply and demand for importables, S and D , respectively. Both demand for imports Q^{IMP} and domestic production Q^{DOM} are determined by F and the domestic price of importables ($p^* + \tau$), where τ is the premium above the world price p^* . Assuming that the demand curve for importables does not shift, a fall in the domestic price (or in τ) can be brought about by an increase in export earnings F , an outward shift of the domestic supply curve S , or both. When domestic supply S shifts to the right, while the foreign exchange constraint and the demand curve for importables remain in place, domestic output Q^{DOM} increases, and the implicit tariff τ (i.e. the domestic price) falls.

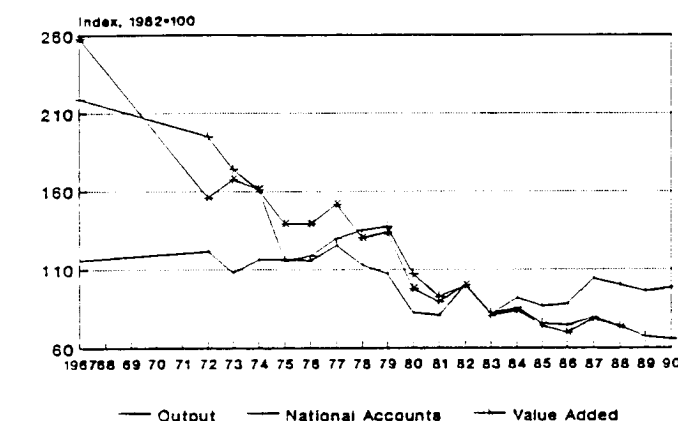
There are basically three ways of testing whether the domestic deflator has a bias. First, alternative price series can be derived from different sources. Inconsistencies can give some indication of the type or the source of the bias. Second, we can trace other policy changes which may dominate changes in price deflators over those in trade restrictions. Policy changes may induce misreporting and hence create a bias in the data. Third, a demand system can be estimated for the Kenyan economy. If the expenditure and price elasticities obtained from the estimation turn out to be implausible, it is likely that the price index in question is biased (assuming that the expenditure series are unbiased). If the price index turns out to be biased, we can proceed by using demand elasticities estimated elsewhere in order to derive a hypothetical domestic price series which can be used to calculate the implicit tariff index.

A. Alternative price series

To test our two hypotheses let us first look at the alternative price series for our base case domestic deflator, the ex factory price obtained using the value of manufacturing output and the quantity index. Two other ex factory price indices can be calculated by using manufacturing value added data from the National Accounts as well as data from the Survey of Industrial Production. The National Accounts report total manufacturing only. All three implicit tariff indices depicted in Figure 3 are therefore calculated on the same basis, i.e. food processing, beverages and tobacco are included. When the total output deflator is used, the implicit tariff index indicates relatively modest liberalization over time, whereas both the National Accounts and the Survey of Industrial Production value added deflators produce a dramatic fall in the index since 1967.

Hence, we are not able to confirm or reject the first hypothesis of underreporting of sales on the basis of the alternative indices derived using the value added instead of the value of output data. Other things being equal, underreporting of sales should produce a similar trend in each index. As price controlled foodstuffs are now included, we would also expect all the indices to be flatter than the non-food index. One explanation for the observed deviation could be the share of foodstuffs which is higher in output than in value added.

Figure 3:
Implicit Tariff Index: Total Manufacturing 1967 & 1972-90



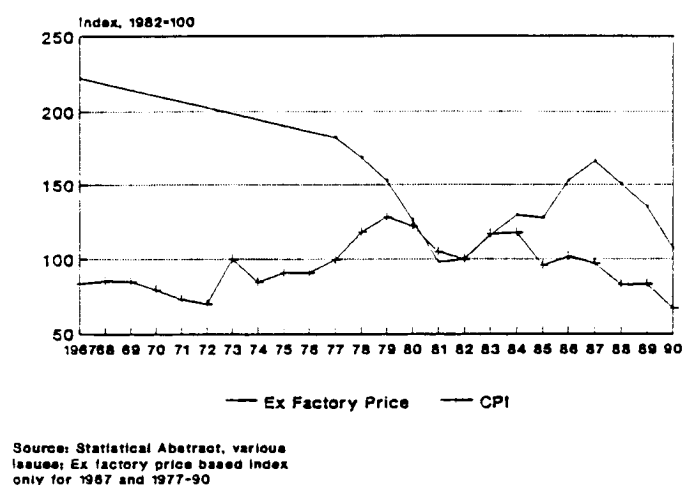
Source: Statistical Abstract,
various issues

The difference, however, is too small to account for the entire discrepancy. Another explanation could be that if the value added price of manufacturing falls relative to input prices (e.g. oil), the output price series will rise faster than the other two. In other words, either increasing overvaluation of inputs, such as overinvoicing of imports, or a faster increase in the price of (imported or other) inputs than that in the domestic value added price could give rise to the observed deviation. In the latter case profits as well as industrial wages must have fallen from the levels of the late-1960s and early-1970s.

For another domestic price comparison we choose clothing and footwear industry because both a producer and consumer price index (CPI) are available for this sector. The equivalent domestic ex factory price is again derived from the value of output and the quantity index of the sector. As can be seen from Figure 4, the implicit tariff indices based on consumer and producer prices of clothing and footwear behave quite differently from one

another.²⁰ The huge fall in producer prices in 1976-81 was not fully passed on to consumers, while the increase in the mid-1980s is only partially reflected in consumer prices. It is very difficult to determine what makes the two series behave so differently, whether it is a data problem in either of the domestic price series, an increase in underreporting of sales in the latter part of the 1970s and in the early 1980s, or retailers not passing price changes on to consumers.

Figure 4:
Implicit Tariff Indices: Clothing and Footwear, 1967-90



The implicit tariff index derived using a CPI series instead of a producer price (Figure 4) is in sharp contrast with our base case (Figure 1). The CPI index indicates that import controls were tightened from 1973 onwards, with the exception of 1974. The coffee boom, for instance, is shown as a tightening of import controls rather than liberalization in the CPI index. Since 1980 its trend has been declining, with the exception of 1983-84 and 1986. In 1990 the index fell to an all-time low level. According to the snapshots of NRPs, protection of textiles, garments etc. has not changed much since the late-1960s. Despite some small variations, readings of the CPI alternative match quite well the snapshots of actual levels of protection, except for the UK import prices for textiles and textile products applied in the MSA study (1989).

²⁰ Years 1968-75 have been omitted from the ex factory price index because comparable data for 1968-71 is not available, and 1972-75 data show extremely high levels of implicit tariff (over 500 percent). This is likely to be an indication of a data problem at low levels of production.

Let us for a moment assume that there is no bias in the domestic deflator but that the ex factory price series is dominated by entry and expanding domestic production. In other words, changes in protection are not observable from the implicit tariff index as they are being swamped by the falling price level as the economy moves down the demand curve. Despite the fact that domestic producers face these prices, the base case implicit tariff index is therefore not a good indicator of trade policy. Were the second hypothesis confirmed, the tradable component of the consumer price index (CPI) would be an obvious alternative. Unfortunately, the Kenyan CPI has also a few shortcomings. First, it is based on the household budget survey of 1974-75 and therefore may not represent subsequent consumption patterns very well. Second, the share of importables relative to nontradables is very small in the CPI. Third, as we pointed out earlier, its decomposition is not compatible with that for imports. Finally, comparison of consumer goods alone would exclude many tradable import-competing goods used as inputs. For all these reasons, if we cannot use the domestic ex factory price, we are left with a few special cases of importables, such as clothing and footwear, for which the CPI is available.

Summarizing, the evidence we obtain from using alternative domestic price series for calculating the implicit tariff index is far from conclusive. First, different data sources seem to yield very different series for producer prices. There is some indication that the recorded value of inputs could be a source of deviation. Second, producer and consumer prices behave very differently over time. In the case of clothing and footwear at least, the former creates a strong declining trend for 1974-81, which is modestly reversed in 1982-87, while the latter indicates almost an opposite trend.

B. Other data which could reveal biases

Let us next look at policy changes that may have impacted on how sales have been reported over time. First, the effects of price controls have largely been eliminated by the choice of industrial sub-sectors. Second, taxation of profits in Kenya has not changed much since the early-1970s. In 1974 the corporate tax rate was raised from 40 percent to 45 percent where it remained until 1988. In three subsequent years it was reduced by 2.5 percentage points each year (International Bureau for Fiscal Documentation). Hence there has been no incentive to

Figure 5:
Share of Exports in Manufacturing Output, 1967 & 1972-90

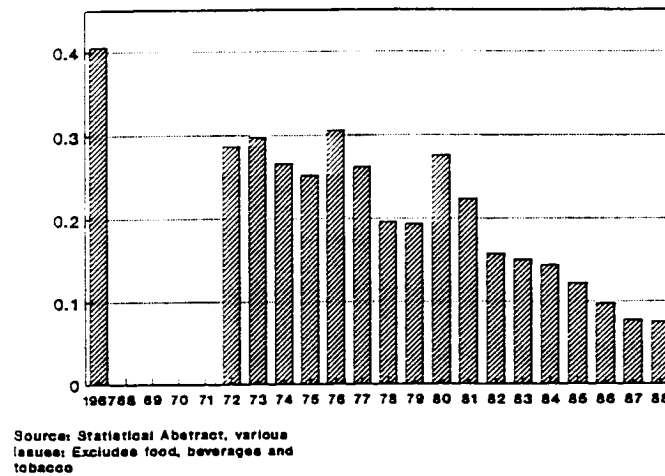
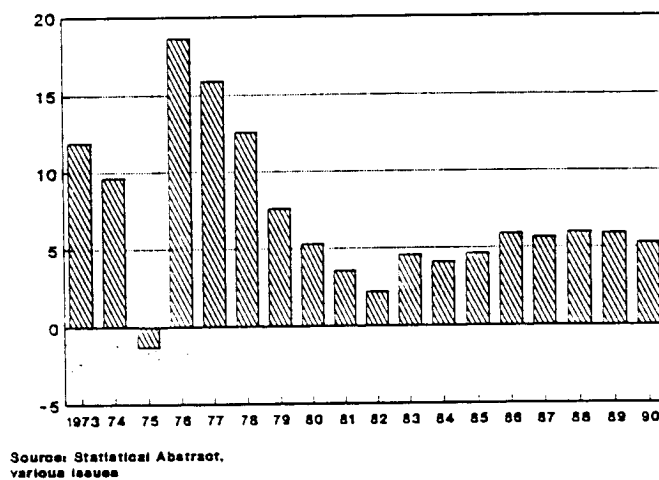


Figure 6:
Manufacturing Growth by Quantity Index (%) in 1973-90



increase underreporting of sales due to changes in the corporate tax rate, except perhaps in 1974.

Underreporting of exports may also produce flawed domestic producer price deflators. As depicted in Figure 5, the share of exports in manufacturing output has fallen considerably since 1967. Hence, assuming that the incentive for underreporting exports has remained constant, there is no reason to believe that increased underreporting of exports has caused a general downward bias in the domestic price. It is, however, possible that the incentive for understating the value of exports has changed over time. It may, for example, be correlated

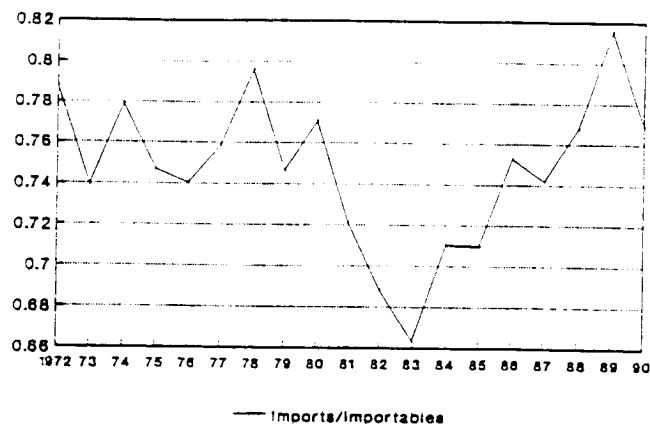
with the black market rate premium so that a peak was likely to have occurred after the attempted coup d'état in 1982.

In order to test our second hypothesis of falling prices as more firms enter and output expands, let us look at the annual growth rate of manufacturing output (calculated from the quantity index). As can be seen from Figure 6, the growth rate was very high in the 1970s, with the exception of 1975. The exceptionally high growth rates coincide with the coffee boom in 1976-78. It is, therefore, quite plausible that the dominant source of change in the domestic price is the expansion of manufacturing production. Larger quantities imply a lower price level which is reflected in the domestic price index. Although positive, the growth rate of manufacturing was considerably slower in the 1980s, as was the decline in the trend in the implicit tariff index (Figure 1). The steepest fall in the share of imports occurred in 1981-83 rather than in 1976-79 as one would have expected on the basis of manufacturing growth. Therefore, we are left with the other explanation, i.e. relaxation of the foreign exchange constraint F having been responsible for the persistence of the import share during the latter part of the 1970s, despite rapid growth in domestic manufacturing. As Figure 8 shows, there was indeed a huge relaxation of F in 1976-78, which gradually returned to its previous level by 1981. Concluding, the large fall in the implicit tariff index in the latter part of the 1970s and during the early years of the 1980s can be explained by a fall in the domestic deflator, which was due to both growth in manufacturing and relaxation of the foreign exchange constraint during the coffee boom.

According to the theory of a constant foreign exchange constraint captured by Figure 2, the share of imports in importables (as well as the domestic price) should fall as domestic output expands. As another test for the second hypothesis, we will examine what happened to the Kenyan share of imports in importables over time. If the share of imports has been falling, assuming a constant foreign exchange constraint, the theory implies that domestic production must have expanded, and the domestic price fallen. The share of imports is depicted in Figure 7.

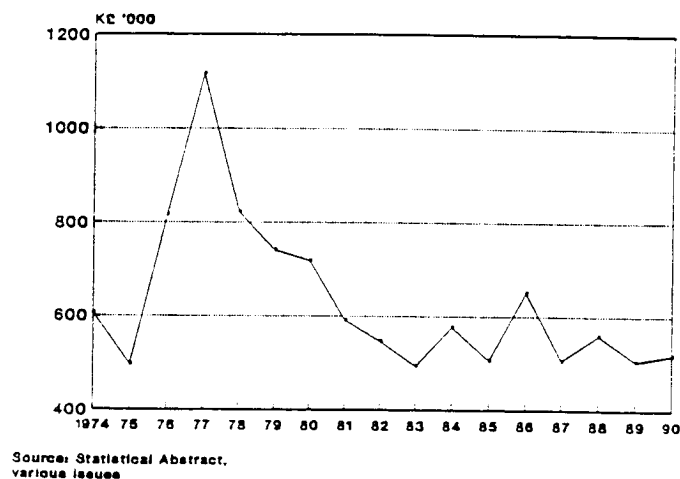
By 1988 the share of imports had regained its mid-1970s level, although in 1989 there was a large peak. As F has remained fairly constant since the early-1980s, except for a small peak in 1986 which coincided with a mini-coffee boom, and domestic production was still expanding, although at a slower pace, we would expect the share of imports to have remained somewhat lower than in the 1970s. Therefore, we cannot explain the trend in the market share

Figure 7:
Market Share of Imports, 1972-90



Source: Statistical Abstract,
various issues

Figure 8:
Export Earnings Deflated by Import Price Index, 1982 Prices



Source: Statistical Abstract,
various issues

of imports during the last few years, including the 1989 peak, in terms of the theory of a foreign exchange constrained economy.

At least two of the peaks in the market share of imports reflect speculative inventory accumulation. As shown in Reinikka (1994), large stocks of durable imports were accumulated in 1978 when private agents, anticipating that the coffee boom was coming to an end, took advantage of temporarily relaxed import controls. Similarly in 1980, when the exogenous trade liberalization was incompatible with exchange rate management, stocks of imported intermediate and consumer durables surged. It is plausible that the 1989 peak also

reflects mistrust on the part of private agents in import liberalization which was initiated during that year.

C. Estimating an aggregate demand system

For the final test of bias in the domestic deflator, we will estimate a demand system for the Kenyan economy, which is assumed to consist of three sectors: exportables, importables and nontradables. Exportables are not consumed domestically. There are two ways to approach the problem. First, we can estimate price and expenditure elasticities, given prices, budget shares (or quantities) and expenditure. If the downward trend in the domestic price is false, we are likely to obtain implausible elasticities (assuming, of course, that the data for expenditure and price of nontradables are unbiased). For example, if the expenditure elasticity indicates that importables are a necessity, or if the elasticity with respect to its own price is positive, we can suspect a bias in the data. Second, if the elasticities turn out to be implausibly high or low, we can use elasticities derived from other studies and, given the price of nontradables, demand for importables and private expenditure, obtain an unbiased price series for importables.

We will use the Nearly Ideal Demand System which can be defined by the following model (Deaton and Muellbauer 1980a,b):

$$(13) \quad w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log(x/P)$$

where w_i is the budget share of good i , p_j is the price of good j , x is total expenditure, and P is a price index defined by:

$$(14) \quad \log P = \alpha_0 + \sum_k \alpha_k \log p_k + \frac{1}{2} \sum_k \sum_l \gamma_{kl} \log p_k \log p_l$$

In many practical situations $\log P$ will be approximately proportional to any appropriately defined price index, for example, $\log P = \sum w_k \log p_k$. The index P can be calculated directly before estimation so that (13) becomes straightforward to estimate.

Parameter γ_{ij} measures the change in the i th budget share following a unit proportional change in p_j with x/P held constant. Parameter β defines whether goods are luxuries ($\beta > 0$) or necessities ($\beta < 0$). Adding up requires:

$$\sum_k \alpha_k = 1, \quad \sum_k \beta_k = 0, \quad \sum_k \gamma_{kj} = 0.$$

Homogeneity is satisfied only and only if for all j :

$$\sum_k \gamma_{jk} = 0,$$

while symmetry is satisfied provided $\gamma_{ij} = \gamma_{ji}$. Unrestricted estimation of equation (13) will automatically satisfy the adding up constraint (one equation to be left out from estimation) so that the NIDS offers opportunity to test homogeneity and symmetry. Apart from expression P , the model can be estimated equation by equation using ordinary least squares. The income elasticity (e_x) and the uncompensated and compensated price elasticities (e_{ii} , e_{ij} , e_{ii}^* , e_{ij}^*) are given by:

$$(15) \quad \begin{aligned} e_x &= 1 + \beta_i / w_i ; \\ e_{ii} &= \gamma_{ii} / w_i - \beta_i - 1; \quad e_{ij} = \gamma_{ij} / w_i - \beta_i w_j / w_i \\ e_{ii}^* &= \gamma_{ii} / w_i + w_i - 1; \quad e_{ij}^* = \gamma_{ij} / w_i + w_j \end{aligned}$$

Expenditure x is the sum of gross investment and private consumption at constant prices obtained from the National Accounts (unlike consumption, investment is not disaggregated for the private sector and government). As the price of nontradables p_n we will use the nontradable part of the consumer price index, CPI,²¹ and the domestic ex factory price is the price of importables p_i . To calculate w_i we use the sum of manufacturing value added and the total value of manufactured imports as proxy for the value of importables,²² which implies

²¹Low income index of consumer prices (Nairobi), except for two categories: (i) clothing and footwear, and (ii) furniture, furnishing, house equipment and household operation.

²²Includes imports under SITC 5-8 and the equivalent categories of domestic manufacturing as the breakdown of imports into government and household consumption extends up to 1988 only.

Table 4:
The Nearly Ideal Demand System for Kenya, Importables

Equation 13: Modelling $w(i)$ by OLS; Sample 1973 to 1990					
Variable	Coefficient	Std.Error	t-value	HCSE	PartR ²
Constant	-2.5134	0.7386	-3.403	0.5678	0.4527
LogP _m	0.3680	0.0877	4.198	0.0872	0.5573
LogP _n	-0.6952	0.1182	-5.881	0.1053	0.7119
Logx-LogP	0.7713	0.1858	4.150	0.1406	0.5516
R ² =0.829569 F(3,14)=22.715 [0.0000] $\bar{O}$ =0.0234911 DW=1.98					
Information Criteria: SC=-7.1113					
Notes: HCSE=heteroscedastic consistent standard error. t-values are calculated on the basis of the unadjusted t-statistic. The F-statistic is against the null that all coefficients = 0.					
$e_x = 3.39$ $e_{ii} = -0.632$ $e_{in} = -3.77$ $e_{ii}^* = 0.462$ $e_{ij}^* = -0.0182$					

that tradables are consumed by the private sector, except for investment. This is a plausible assumption for Kenya.

The first step is to estimate price index P and insert it into equation (13). We will use Stone's approximation for P as defined above, i.e. $\log P = \sum w_k \log p_k$. As there are, by assumption, only two composite consumer goods in the Kenyan economy (importables and nontradables), it is sufficient to estimate equation (13) for importables alone. In other words, the budget share of importables w_i is regressed (using ordinary least squares) against logarithms of real expenditure x/P and prices p_i and p_n (using PC Give version 7 by Doornik and Hendry 1992). A summary of the estimation results appears in Table 4 above.

The model tracks the data well during 1973-90, producing significant t and F statistics. The coefficients are stable and the first order (negative) autocorrelation is small. As can be expected from a well-behaved model, parameter β_i indicates that importables are a luxury good ($\beta > 0$). The expenditure elasticity e_x (all elasticities are evaluated at the mean), however, seems to be far too high, although Blundell, Pashardes and Weber (1989), for example, who use the UK micro-data, obtain expenditure elasticities slightly above 3 for the lowest income group. In all other UK income groups the elasticities are much lower. Prichett (1987) estimates import demand functions using data from some fifty developing countries and finds

a fairly narrow range of estimates for income elasticity, with a median of 1.2. The range of (own-) price elasticities was found to be from -0.8 to -1.0.

Another problem of the NIDS estimation is caused by $\gamma_{in} < 0$ which implies that importables and nontradables are complements instead of substitutes as one would expect at this level of aggregation. In addition to a wrong sign, the uncompensated cross-price elasticity has an implausibly high absolute value, which is clearly out line of some other studies (Deaton and Muellbauer 1980a; Blundell, Pashardes and Weber 1989).²³ The uncompensated own-price elasticity has a correct sign, although its absolute value is on the low side. Lastly, the compensated price elasticities have opposite signs to what one would expect. Their small absolute values indicate that the demand for importables is price-inelastic. In sum, on the basis of the estimated demand system, and assuming that the data for expenditure and price of nontradables are unbiased, there seems to be a bias in the Kenyan domestic price deflator.²⁴ More specifically, either the value of output data, the quantity index for manufacturing, or both can be the ultimate source of this bias.

D. Derivation of hypothetical index

Let us next assume plausible expenditure and price elasticities and derive a hypothetical domestic price series from the demand equation for importables. As the NIDS equation for importables is sensitive to the choice of the constant, we will use the Linear Expenditure System instead, as it does not require similar specification of a constant. Following Stone's approach, a general linear formulation of Marshallian demand could be adopted and adding up, homogeneity and symmetry restrictions be imposed. The Linear Expenditure System (LES) for the two goods consumed domestically would then be:

²³ Adam (1991) estimates a demand system of five assets for Kenya. Some of his price elasticities also have a high absolute value.

²⁴ Using the Kenyan import price index as an alternative price for importables, its coefficient w.r.t. the budget share is not statistically significant.

$$(16) \quad p_i q_i = p_i \gamma_i + \beta_i (x - p_n \gamma_n)$$

$$(17) \quad p_n q_n = p_n \gamma_n + \beta_n (x - p_i \gamma_i)$$

where x denotes the total expenditure, p_i is the price of importables, p_n the price of nontradables, q_i and q_n are the quantities of importables and nontradables, respectively, and β is the marginal propensity to consume so that $\sum \beta_k = 1$ ($k=i,n$). Parameters γ_k ($k=i,n$) are usually interpreted as subsistence quantities for which there is no substitution. The residual, $(x - \sum p_k \gamma_k)$, is allocated between the goods in fixed proportions β_k (Deaton and Muellbauer 1980b). Note that the system is not linear with respect to parameters β_i , γ_i and γ_n which makes the LES more complicated to estimate than the NIDS.

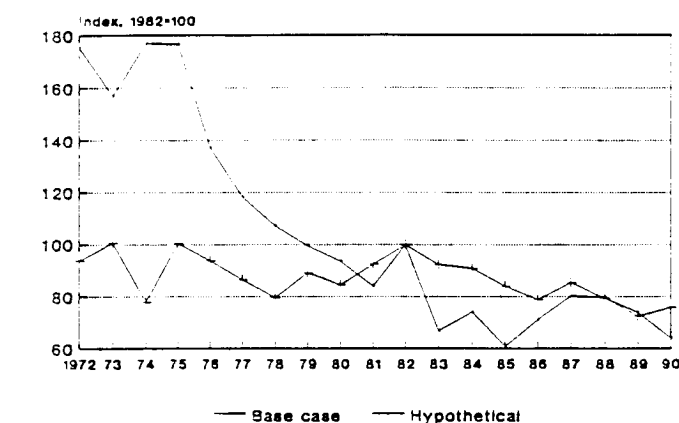
The logarithmic derivatives of Marshallian demands give the total expenditure elasticities e_k ($k=i,n$) and (uncompensated) price elasticities e_{kl} ($k,l=i,n$):

$$(18) \quad e_k = \beta_k / w_k ; \quad e_{kk} = \gamma_k (1 - \beta_k) / q_k - 1 ; \quad e_{kl} = -\beta_k p_l \gamma_l / p_k q_k$$

Given the quantity index for importables q_i (weighted average of the quantity index for domestic manufactured goods and imports) and total private expenditure x , we can solve for a hypothetical domestic price deflator p_i from equations (16)-(17) by assuming plausible values for elasticities, and that the subsistence quantity for importables is zero ($\gamma_i=0$). Figure 9 depicts the base case (as in Figure 1) and an alternative implicit tariff index, using a hypothetical domestic price deflator. The domestic deflator is derived by assuming that $e_i = 1.265$ (valued at the mean) and $e_{ii} = -1$. The latter elasticity follows because we assume $\gamma_i = 0$. The hypothetical implicit tariff index is not very sensitive to the choice of e_i .

The hypothetical domestic deflator yields a very different implicit tariff index compared to the base case. Variations, for example, are less pronounced. The alternative index indicates that Kenyan trade policy was most protectionist in the early-1970s and during 1981-84. The first liberalization episode seems to have occurred in 1974, instead of 1973 as our earlier evidence showed. The second episode was the coffee boom in 1976-78. Tightening

Figure 9:
Hypothetical Implicit Tariff Index 1972-90



Source: Statistical Abstract,
various issues

of trade policy in 1979 is picked up by the hypothetical index. The exogenous reform in 1980 is also shown, as well as its reversal from 1981 onwards. Instead of liberalization, the 1982 reform of import schedules is shown as a tightening of import controls. The hypothetical index also picks up the mini coffee boom in 1986 (by that time recession had also ended). The most recent episode is also shown (1988-89). It was (modestly) reversed in 1990. In sum, the general trend of the hypothetical implicit tariff index, obtained by using plausible elasticities to derive the domestic deflator (instead of using the domestic ex factory price series) seems, in the light of other evidence of Kenyan trade policy, much more credible than the base case.

As we saw above, the hypothetical index concurs well with the narrative of changes in trade policy (Section 2.2). Unlike the index of import compression (IIIR), our hypothetical index indicates a slightly higher level of protection in the 1970s than in the 1980s.²⁵ Further, it shows that trade policy was more liberal during the latter half of 1980s than in the first half.²⁶ This is again in contrast with the IIIR. The hypothetical index also seems to contradict the two snapshots of the actual level of protection in 1985 and 1988, which indicate tightening of policy. As discussed earlier, the deviation between the two snapshots may result from the choice of goods in the samples and from that of international prices rather than from a change in import controls.

²⁵The average reading of the hypothetical implicit tariff index is 90.2 for the 1970s, while that for the 1980s is 86.1 (1982=100).

²⁶The average index reading for 1980-84 is 92.1, while that for 1985-89 is 80.1 (1982=100).

Summarizing, it is quite likely that the domestic producer price, used for constructing the implicit tariff index, contains a bias. This is clearly indicated by the elasticities obtained from the estimation of an aggregate demand system for Kenya as well as by application of alternative domestic price deflators. Recall that the domestic deflator was derived by using the value of manufacturing output and the quantity index for manufacturing. As there was no clear indication that the output data would contain a bias, it is therefore possible that the quantity index for domestic manufacturing is the source of bias. In addition, there is some evidence that falling domestic prices of importables relative to their world prices may, at least to some extent, be due to increased domestic output and relaxation of the foreign exchange constraint. As the latter has been only temporary, its effect on the implicit tariff must also have been temporary.

VI. Reliability of Import Price Indices

Kenyan Department of Customs and Excise reports the (cif) import price index annually at one-digit Standard International Trade Classification (SITC) level.²⁷ If the index had a bias which remained constant over time, it would not distort the implicit tariff index. There is, however, no reason to believe that the bias - if any - would remain constant as incentive for misreporting imports is likely to change over time. In general, the import price index can be biased either upwards or downwards, i.e. import are either overinvoiced to evade capital controls, or underinvoiced in order to minimize payment of import duties. We are mostly concerned about the possibility of increasing overinvoicing over time which may produce the observed downward bias in the implicit tariff index of trade policy (Figure 1). In this section we will examine what evidence is available to confirm or reject this hypothesis.

Overinvoicing of imports (and under-invoicing of exports) can be a profitable activity for two groups of economic agents: Kenyan residents who wish to obtain foreign savings, and foreign-owned firms. If the former group is dominant, changes in the magnitude of

²⁷Figure 1 uses the Kenyan import price indices for SITC 5-8 (weighted by shares in domestic manufacturing) as the average world price. Import categories for crude materials (SITC2) and animal and vegetable oils and fats (SITC4) do not have an equivalent in domestic manufacturing and are therefore left out. Beverages and Tobacco (SITC1) and mineral fuels (SITC3) are also left out from the weighted import price index.

overinvoicing are likely to be positively correlated with the black market premium. If the premium is higher than the prevailing tariff rate, it is more profitable to overinvoice imports than to buy foreign currencies in the black market. When the premium falls below the tariff, overinvoicing is no longer a profitable activity from the individual's point of view. Multinational companies can reduce corporate taxes by removing their profits through transfer pricing to the country where the tax rate is lowest. If the company wants to evade all taxes, overinvoicing of imported inputs is a means to conceal profits. In the latter case, there must be a given level of tariffs which makes tax evasion by overinvoicing unprofitable, i.e. when the excess tariffs exceed the gains derived from non-payment of taxes. There is an additional incentive to overinvoice imported inputs if the subsidiary is partly owned by Kenyans as the latter will share the burden of zero-profit or a loss but the main company will take the entire benefit from overinvoicing. According to a World Bank study (1975), the prevailing tariff structure in Kenya in the early-1970s made transfer pricing only a marginal activity, whereas the incentive to evade taxes by overinvoicing was found to be fairly substantial.

Quantitative import restrictions and foreign exchange controls tend to breed other controls. There is a particular need to control overinvoicing in order to protect external reserves. Pre-shipment inspections of the quantity, quality and price of imports has been carried out for the Central Bank of Kenya since 1972 by private companies in the exporting countries (mainly industrialized market economies). Allocation of foreign exchange to imports has since then required a Clean Report of Findings by the inspecting company. Live animals, fresh fruits and vegetables, crude oil, donors, and the Kenya government are among those exempted from inspection.

It is very difficult to determine the extent to which Kenyan importers are able to overinvoice their imports in reality. On the one hand, the Maxwell Stamp report (1989) assumes that overinvoicing is so wide-spread that the import price index is useless for calculation of the implicit tariff. On the other hand, a report by the United States International Trade Commission (1987), which analyzes pre-shipment inspection programmes of 25 developing countries, including Kenya, at the request of US exporters, does not at all suggest that any kind of overinvoicing is taking place. Overinvoicing would actually require that the Kenyan importer collude with both the (US or other developed countries) exporter and the surveillance company (based in the US or other developed countries) responsible for inspection. Therefore overinvoicing of imports seems to be a more difficult way of capital

flight that underinvoicing exports, as the latter are not subject to such a comprehensive system of inspection. If we assume that the pre-shipment inspection is able to prevent any major capital flight through imports so that there is no distorting effect in the import price index, it is still possible that the value of imports is misreported as the Customs does not require the Clean Report of Findings for the clearance of imports. Instead of overinvoicing, the incentive there is to underreport imports to minimize the payment of duties.

Yeats (1990b) assesses the general accuracy of African trade statistics by comparing the reported export values, plus a transport and insurance cost factor (based on freight and insurance charges actually paid on African exports to the United States), with partner countries' declared import values in 1982-83. Although this study does not shed any light on the magnitude of possible overinvoicing of imports from the OECD to African countries as means of evading controls on holdings of foreign assets, it tells a devastating story about the quality of some other African trade data. The results show that in intra-African trade the average discrepancy between matched export and import values is more than 60 percent. Reported exports at fob prices frequently exceed matched reported cif imports, suggesting that smuggling is widespread, or that importers are underinvoicing to avoid high tariffs or quotas. Overinvoicing of exports is less likely as export subsidies are not widely used in Africa. A large part of smuggled goods may not be reported at either end of transactions so that the found discrepancy points even more strongly to underinvoicing of imports. This inference is further strengthened by the fact that differences in official and parallel market exchange rates were found not to be significantly correlated with discrepancies in trade values.

Large discrepancies were also found when comparing exports from African countries to the matched imports reported by the OECD. For example, export quantities that fall under international commodity agreements tend to be underreported, presumably to evade both quotas and foreign exchange controls. In high-value low-volume goods, such as precious stones, reported imports far exceed exports, suggesting that smuggling occurs on a large scale. Substantial differences were also found in some of the reported unit values, suggesting that exporters are underinvoicing, or do not receive the full value for their goods. Kenya seems to have underreported the value of her exports to the OECD (the difference between imports from Kenya reported by her trading partners and exports reported by Kenyans was 28 percent) and, to a lesser extent, to other African countries (12 percent). Intra-African imports seem to

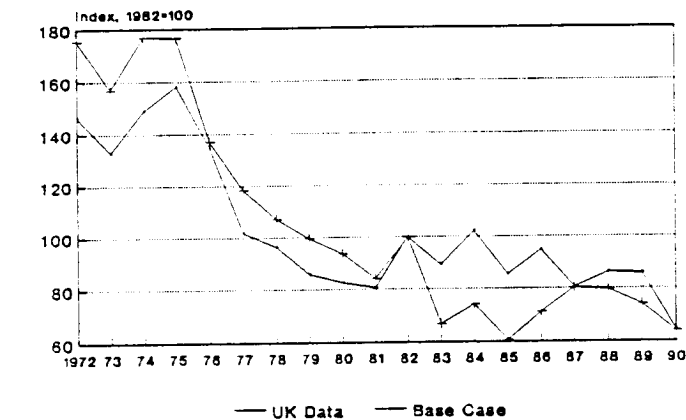
have been underreported. In addition to misreporting, Kenyan trade data may suffer from inaccurate recording of trade flows which are in transit to other countries in the region.

There may be other reasons than overinvoicing for the relatively high import prices recorded in African trade statistics, such as high concentration of import supply on a small number of firms, a small size of export markets, tied foreign aid (donors and the government are exempted from pre-shipment inspection), or corruption involved in import contracts. Analysing import unit values for 1962-87, Yeats (1990a) shows in another study that twenty African former French colonies paid a price premium of 20-30 percent on average over other (developed or developing country) importers for iron and steel imports from France. The study also finds that similar premia were paid by former Belgian, British and Portuguese colonies in Africa for iron and steel imports from their former rulers. Kenya is included in the study of the former British colonies. Another striking result was the extreme variance of average premia paid among countries in any one period and by any one country over time.²⁸ Annual data on the quantity and value of French, British etc. exports of five-digit SITC iron and steel products were used in order to ensure good quality data and as homogeneous products as possible. Even if product or quality differences existed, one would expect that poorer countries would import poorer-quality, lower-price products. A correlation analysis confirmed that market structure and (somewhat less) market size are strongly and significantly correlated with relative prices. Yeats cites other studies that have found similar overpayment by African countries for other imports than iron and steel.

Therefore, it is quite possible that Kenyan import prices really are considerably higher than, for example, the UK import prices used by Maxwell Stamp Associates (1989) as proxy for the world price, and yet there is no major problem of overinvoicing. Variance in excess payment for imports observed by Yeats (1990a) may explain at least part of the decline in the implicit tariff over a given period, but only further research can confirm this inference.

²⁸Only the former French colonies were studied in detail.

Figure 10:
Implicit Tariff Index: UK Import Unit Value, 1972-90



Source: Statistical Abstract,
various issues

Finally, let us construct an alternative implicit tariff using the average UK import unit value (United Kingdom). It is depicted in Figure 10 together with the base case. The UK import unit value produces almost an equivalent decline in the implicit tariff index between 1976-81 as the Kenyan import price index. During 1983-86 instead the UK data indicates much less pronounced liberalization than the Kenyan index. In other words, in the 1970s it does not matter very much which of the two world prices we use, whereas in 1983-86 it indeed seems to make a difference. The attempted coup d'état in August 1982, for instance, might have created an unprecedented incentive to overinvoicing and capital flight in those categories of imports and importers exempted from pre-shipment inspection in the exporting country.

VII. Conclusions

Our choice for the quantitative measure of trade policy for Kenya, the average implicit tariff index, which was calculated as the ratio of the domestic ex factory price index and the import price index, has a strongly declining trend. It implies that substantial trade liberalization has taken place in Kenya since the late-1960s. When we compare the index with other available information on protection in Kenya, we have reason to believe that the index has a bias. First, it does not concur with the snapshots of the actual levels of protection (i.e. nominal and effective rate of protection, NRP and ERP) in Kenya available for years 1968, 1985 and 1988.

These snapshots indicate that protection has been in increase instead of having been reduced since 1968. This is particularly clear when the ERP is used as a measure. The NRP seems to have increased much less but there is no indication that it would have fallen, either. As the variations in the NRP over time are smaller, one has to be cautious when drawing conclusions as the sectoral NRPs are sensitive to the sample choice and to the choice of both domestic and world prices.

Second, a measure of import compression, suggested by Narasimhan and Prichett (1993), indicates that the actual demand for import has been below its notional demand (estimated from an import demand function assuming plausible price and income elasticities) more in the 1980s than in the 1970s. Furthermore, this index shows that the latter part of the 1980s has had tighter import policy than the first part. The implicit tariff index indicates the opposite. Third, even if the narrative of changes in trade policy does not drastically contrast the observed changes in the implicit tariff index, the narrative does not tell anything about the extent of liberalization, which is our primary concern with the implicit tariff index. In other words, on the basis of a comparison with the narrative we can neither confirm nor reject the general trend of the index.

In order to find the source of the bias, we subjected both the domestic deflator and the import price index to a number of tests. It seems likely that the source of bias is the domestic ex factory price for manufacturing. This was clearly in evidence in the elasticities obtained from estimation of an aggregate demand system for Kenya. It is possible that the bias originates from the quantity index for domestic manufacturing which was used to derive the ex factory price series from the value of output. In addition, there is some evidence that falling domestic prices of importables relative to their world prices may, at least to some extent, be due to increased domestic output and relaxation of the foreign exchange constraint. As the latter has been only temporary, its effect on the implicit tariff must also have been temporary.

Using plausible expenditure and price elasticities, we derived a hypothetical domestic deflator from a Linear Expenditure System. The trend in the resulting hypothetical implicit tariff index looks much more plausible than the base case. It also picks up the known policy changes very well (except for 1973-74). Unlike the index of import compression (the IIIR), the hypothetical implicit tariff index shows that the average level of protection was slightly higher in the 1970s than in the 1980s. Further, protection seems to have been at its highest

in 1981-84, while some import liberalization has taken place during the latter part of the 1980s. We argue that the hypothetical implicit tariff index is superior to the IIR as the former is based on direct observation of prices (instead of the real exchange rate) and expenditure data rather than GDP (which may deviate considerably from one another in African economies). Finally, assuming that the 1968 reading was at the level of the early-1970s, the hypothetical index seems to contradict the snapshots of protection levels in Kenya. This might not be such a good approximation, however, as quantitative import controls for balance-of payments purposes were introduced for the first time in a larger scale in the early-1970s.

Contrary to some other studies (Maxwell Stamp Associates, 1989, in particular), we argue that the import price index is less likely to be seriously biased. Pre-shipment inspection is effectively carried out in the exporting industrialized countries in an effort to avoid capital flight. Therefore, overinvoicing cannot be as common as it probably would be in the absence of such inspection. As imports by the government and donor projects are excluded from pre-shipment inspection, there is some scope for overinvoicing, however. Another source of bias is the Customs valuation of imports which may differ from their actual value but the incentive is to under- rather than overvalue. Unfortunately, there is no information about the size of this deviation. Finally, the UK import unit value produced almost an equivalent decline in the implicit tariff index between 1976-81 as the Kenyan import price index. During 1983-86 instead the UK data indicated less pronounced liberalization than the Kenyan index. Therefore, in the 1970s it does not matter very much which of the two world price indices we use, whereas in 1983-86 it seems to make a difference. The attempted coup d'état in August 1982, for example, might have created an incentive to overinvoice for those importers who are exempted from pre-shipment inspection. We conclude that the Kenyan import price index (in the absence of convincing evidence to the contrary) is the most suitable available world price index for Kenyan imports.

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ANNEX 1

This annex will describe how the base case implicit tariff index for Kenya, depicted in Figure 1, is derived. The implicit tariff index is the ratio of the domestic price index of a given group of importable goods to their world (import) price index. The implicit tariff index covers semi-manufactured and manufactured goods (Standard International Trade Classification, SITC 5-8), i.e. food, beverages and tobacco are excluded. Statistical Abstracts, which are the principal source of Kenyan macroeconomic data, do not report wholesale prices for domestic manufacturing. Three different consumer price indices are available but their disaggregation is not comparable to the reported import categories. Therefore, we will use a producer price, i.e. the domestic ex factory price for manufacturing, as the domestic deflator.

The ex factory price is derived using the quantity index of manufacturing production and the value of output for all manufacturing firms. The annual quantity indices for the manufacturing sector are given for (i) food, (ii) beverages and tobacco, and (iii) total manufacturing. The latter category includes the two former ones. Although food processing is an important industrial sector in Kenya, it is excluded from the trade policy index because of a bias in both the domestic and import price of food: the domestic ex-factory price is affected by price controls, whereas the respective import price index is biased by maize imports which fluctuate considerably from year to year. As we will concentrate on semi-manufactured and manufactured goods, beverages and tobacco (SITC 1) are therefore also left out from the index.

The annual quantity index for (non-food, -beverages and -tobacco) manufactured production $q(T-F-BT)$ can be derived by using the following formula:

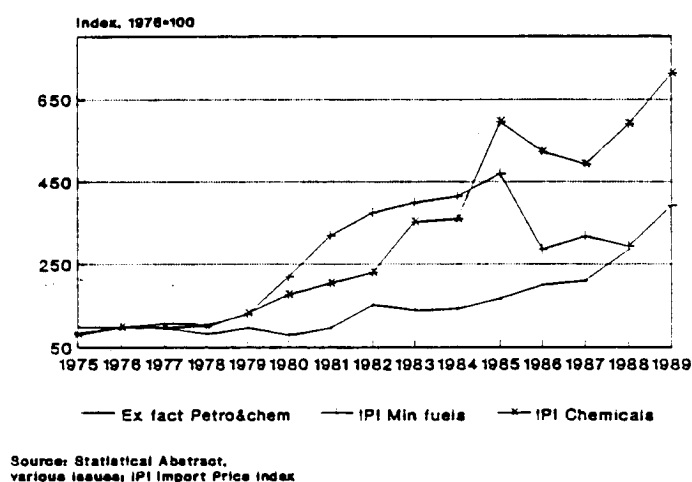
$$q(T-F-BT) = [Q(T)q(T) - Q(F)q(F) - Q(BT)q(BT)]/Q(T-F-BT)$$

where F denotes food processing, BT beverages and tobacco, T total manufacturing, and Q is the current value of output.

Apart from food, another import category that may bias the implicit tariff index is mineral fuels (SITC 3). As the refinery industry is fairly large in Kenya, it is possible that oil prices have a direct effect on the ex factory price of the domestic industrial sub-sector

"petroleum products and other chemicals". In 1976-89, for example, the share of mineral fuels in the value of Kenyan imports varied from 15 percent to 37, and only around 12 percent of fuel imports have been processed products during the recent years. The imported crude oil is refined in Kenya both for domestic use and for exports to the neighbouring countries. "Other chemicals" include consumption goods, such as pharmaceuticals, soap, lotions, tooth paste, shoe polish, matches etc. To find out whether the import price of mineral fuels dominates the output price of "petroleum and other chemical products", we will compare these two price deflators (Figure A1). If changes in the price of oil were found to be dominant, we should either include or exclude both categories from the trade policy index. The import price index for "chemicals" (SITC 5) is also included in Figure A1 for the sake of comparison.

Figure A1:
Import and Ex Factory Price Index for Petroleum and Chemicals 1975-89



As can be seen from Figure A1, the import price index for mineral fuels is clearly different from the domestic manufacturing category of "petroleum and other chemical products". In other words, the price of oil does not directly dominate this domestic industrial sub-sector so that exclusion of mineral fuels (SITC 3) from the weighted import price index (used for calculating the implicit tariff index) is justified. It can also be seen that domestic producers have not been able to increase their prices as rapidly as import prices for chemical products have risen, possibly reflecting the price controls that have affected many of the items under this category. Alternatively, this could be an indication of a faster increase in the price of imported inputs than in the price for domestic output

(as indicated by Figure 3 in the text). This does not, however, mean that domestic manufacturing prices would necessarily be lower than their equivalent import prices. A World Bank study on the Kenyan industrial sector (1987) found that domestic prices for "basic and other chemicals" were 50 percent higher in 1985, on average, than their respective world prices. Alternatively, the observed deviation in domestic and world prices may also be due to the same problem that we have with the implicit tariff index in general.

Import and domestic manufacturing categories have been matched by reweighting the import price indices for different import categories by their respective share in domestic manufacturing. Apart from mineral fuels, import categories for crude materials, inedible (SITC 2), and animal and vegetable oils and fats (SITC 4) have been left out from the reweighted import price index as they do not have a counterpart in domestic production. The corresponding import category for the two domestic industrial sub-sectors "petroleum and other chemical products" and "industrial chemicals" is chemicals (SITC 5).

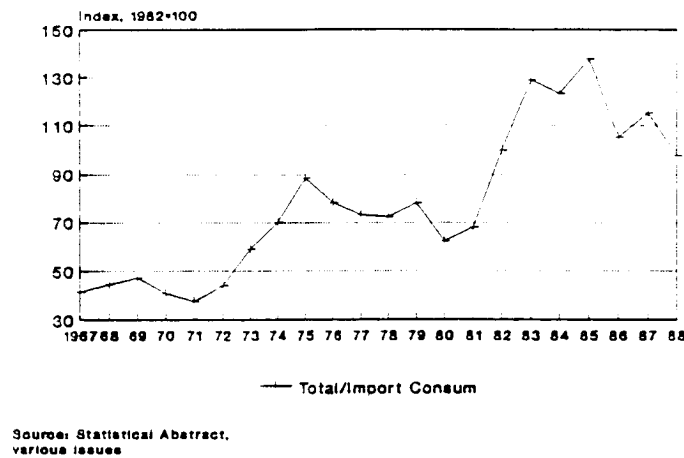
ANNEX 2

In this annex we will derive another quantitative index of trade policy which can capture changes in access to import-competing imports: the ratio of total private consumption to consumption of imports by households (Bevan *et al.* 1990). In principle, this ratio can be calculated either by using quantities or current values but in practice only the latter data are available. Like average relative prices, the import consumption index is not a perfect indicator of trade policy as there are at least two other sources that can cause a change in the index: incomes and the exchange rate. In other words, when incomes go up or fall, or a devaluation is carried out, there will be a change in the index even if no changes in trade policy instruments take place. At the aggregate level, it is much easier to observe changes in incomes or the exchange rate than those in trade policy.

How do incomes, the exchange rate, and trade policy affect the import consumption index? First, when incomes go up, the share of imports in total consumption increases as imports are a luxury good. The import consumption index indicates liberalization, even if there is no change in trade policy. Second, when the exchange rate is devalued, import prices go up (probably by less than devaluation) relative to that of domestic production (which includes nontradables). The demand for imported consumer goods therefore falls, which is reflected as an upward movement in the index. If the index were used as a measure of trade policy (without allowing for the effect of a change in the exchange rate), devaluation would be translated into tightening of import controls. When QRs are used for controlling the balance of payments, devaluations are trade liberalizing in the sense that non-tariff barriers become less binding. If devaluation is carried out to make a given set of QRs compatible in the face of a negative shock, then neither the relative price nor the import consumption index will have to change. Finally, if there is a change in trade policy, that is quotas are tightened, or tariffs are increased, import prices will go up, and demand for imports will fall. In other words, an increase in protection is reflected as an upward movement in the index. Therefore, only when income levels remain unchanged and the exchange rate movements are used for compatibility can an upward or downward movement in the import consumption index be attributed to trade policy.

The import consumption index for Kenya is depicted in Figure A2. Unlike the implicit tariff index (Figure 1), it indicates a considerable tightening of import controls

Figure A2:
Import Consumption Index 1967-88

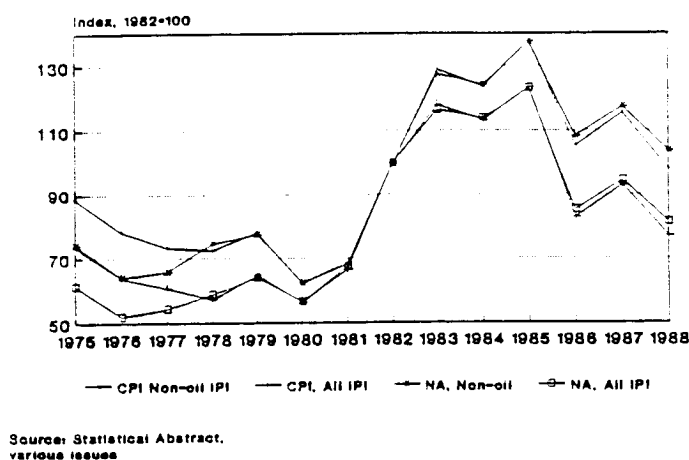


over time. Particularly in 1982-83, there is a large jump in the index. The current value of total private consumption is obtained from the National Accounts and deflated by the lower income consumer price index (Nairobi), while the value of consumption of imports by households is from the end-use analysis of imports for home use, deflated by the non-oil import price index. All data is derived from Kenyan Statistical Abstracts. In the absence of the quantity index for the imports of final goods, we cannot derive this index in pure quantity terms.

There are two possibilities for obtaining the constant series of total private consumption: (i) deflating the current series by the consumer price index, or (ii) using the constant series given in the National Accounts. Similarly, final consumption of imports can be deflated either by (iii) non-oil import price index, or by (iv) the price index for all imports. Figure A3 depicts all four indices, each of which uses a different set of deflators. Before 1979 the choice of deflator seems to matter but thereafter they all show exactly the same changes in the index.

The import consumption index shows a continued fall in the share of imports in total consumption in 1972-75. As the exchange rate and incomes were fairly stable at the time (up to 1974), the index is likely to pick up tightening of import controls. The coffee boom in 1976-78 is shown as liberalization. As the exchange rate remained fixed, this index reading can be attributed either to trade policy, or to rising incomes and the increased demand for imports. The tightening of import controls in 1979 is visible in the index, although it could as well be due to a fall in incomes and reduced demand for imports. The 1980 reform is also shown in the index. It is likely to be due to trade

Figure A3:
Import Consumption Indices 1975-88



liberalization as there was no accompanying devaluation and the change in real income was minimal. A substantial fall in real income per capita coincides with the jump in the index in 1982-83. Again, the jump can be caused by a change in trade policy but as well by falling incomes. Real income per capita began to rise since 1986, reaching the level of the early-1970s in 1989. Despite a modest downward trend, the level of the import consumption index did not return anywhere near to its early-1970s level, however. The Kenya Shilling was devalued by 46 percent relative to the Special Drawing Right (SDR) between December 1986 and December 1989 so that the high level of the index (that is, a small share of imports in private consumption) could reflect increased protection, and/or higher import prices.

Summarizing, in the light of changes that have occurred in the exchange rate and incomes during the period under study, tightening of import controls on final goods 1972-74 and a relaxation in 1980 are the only unambiguous changes that can be discerned from the import consumption index and attributed solely to trade policy. All the other liberalization episodes that are visible in this index of trade policy may as well be due to changes in the exchange rate, and/or incomes. In principle, we could apply income and price elasticities to account for the changes in incomes and the price of imports, and derive the effect of trade policy as residual. Otherwise it is very difficult to use the import consumption index as a quantitative measure of trade policy for a longer period of time when both incomes and the value of domestic currency vary.