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):

\[
(4) \quad B(\varphi,u;\gamma) = E(\pi^*\varphi,u) - (\varphi - 1)'\pi^*m - \beta
\]

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

\[
(5) \quad \Delta(\varphi^0,u^0,\gamma^0) \equiv [\Delta : B(\varphi^0,u^0,\gamma^0) = 0].
\]
If trade policy does not change between the two periods ($\phi^0 = \phi^*$), $\Delta$ equals one. A rise in $\Delta$ means that trade policy has become less restrictive. It can be shown by totally differentiating equation (5) that a (small) proportional change in $\Delta$ 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 $B$:

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

where $E^R$ is the restricted expenditure function (restricted due to the existence of quantity quota $q$). $\pi$ 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:

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

Proportionate changes in $\Delta$ 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:

$$B(q, \phi, u, \gamma) = E^R(q, \Pi \phi, u) + p'^rq - (\phi-1)'\Pi m - (1-w)(p-p^*)'q - \beta$$

where $w$ is a fraction of rents that accrue to foreigners. Defining liberalization factors $\lambda$ as follows:
\( \lambda = \frac{q_t}{\lambda_p}, \text{ for quota-constrained goods} \)

\( l/\phi, \text{ for tariff-constrained goods} \)

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

\[ \Delta(\lambda^t, u^{0}; \gamma^0) \equiv [\Delta B(\lambda^t/\Delta, u^{0}; \gamma^0) = 0]. \]

The value of \( \Delta \) 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:  

\[ -(B_{q}^{US})' = -\tau p' + [\tau_q - 1/\varepsilon] p'/(1 + \tau_q) \]

where \( \tau \) is the U.S. average tariff, \( p \) is the U.S. import price, \( \varepsilon \) is the aggregate elasticity of demand for quota-constrained goods, and \( \tau_q \) is the U.S. import tariff for textiles and apparel.

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

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*Assuming separability and that international arbitrage equates U.S. import prices \( p \) to Hong Kong export prices \( p' \) in the following manner: \( p = (1 + \gamma_p)(p' + \rho) \) where \( \gamma_p \) is the U.S. import tariff and \( \rho \) is the price of a Hong Kong export license.*
\[(12) \quad -(B^H K_q)^\prime = \frac{p'}{1+(1+\tau_q)\xi} - \rho'.\]

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 \(\Delta\) (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. 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.

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Footnote: For 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).

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. 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

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*Data 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.

*Beverages 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](image)

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.\textsuperscript{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

\textsuperscript{10}Bevan \textit{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 began 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. 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

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11 The import licensing system was abolished in May 1993.