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 that 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 IIIR 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, over invoicing 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 over invoicing, 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 over invoice 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:

$$q(T-F-BT) = \frac{Q(T)q(T) - Q(F)q(F) - Q(BT)q(BT)}{Q(T-F-BT)}$$

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 their 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
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
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.