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, 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,
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. 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).

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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):

$$B = (EER_m)/(EER_x) = E_m(1+t+n+t_e)/E_x(1+s+r)$$

(1)

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.

\[
NRP = \left[ \left( \frac{P_A - P_U}{P_U} \right) \right] \times 100
\]

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

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\(^{1}\) Thomas 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.

\(^{2}\) Applied 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).

\(^{3}\) Obtained 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 $RER$:

\[
M_d = \alpha + \beta Y + \delta RER
\]

If parameters $\alpha$, $\beta$, and $\delta$ 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 $\beta$ and price elasticity $\delta$ ($\beta = 1.25$, and $\delta = -1$). In order to obtain a value for constant $\alpha$ 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