

**CREDIBILITY, SPECULATION AND THE SPEED OF TRADE
LIBERALIZATION WITH AN APPLICATION TO KENYA**

*A thesis submitted to the University of Oxford
in partial fulfillment of the requirement
for the degree of Doctor of Philosophy*

Ritva Sinikka Reinikka

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St. John's College

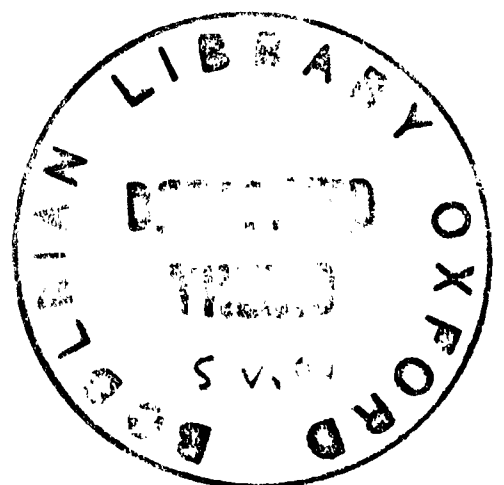
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Centre for the Study of African Economies

Institute of Economics and Statistics

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Abstract

This thesis studies the causes and consequences of the credibility problem in trade liberalization, with a special reference to African economies. The two necessary conditions for credibility are found to be macroeconomic compatibility and time-consistency, while the sufficient conditions are more difficult to identify. A lack of credibility is typically probabilistic as private agents may be uncertain about the government's intentions, or the future terms of trade.

The first part of the thesis develops a theory of economic behaviour in the absence of credibility. Due to private responses, incredibility creates a welfare cost which may arise from (i) non-optimal intertemporal substitution in consumption, (ii) accumulation of stocks of imports, (iii) insufficient relocation of factors, and (iv) deferral of investment. A simple consumption model and two production models are used to assess the magnitude of the welfare cost and to derive a cost curve as a function of the probability of default. A non-monotonic curve with kinks emerges.

Many standard results concerning the speed of liberalization change drastically when the assumption of full credibility is relaxed. Containing consumption costs would typically call for a gradual reform to reduce the incentive to accumulate inventories, while, from the production point of view, a big bang or initial overshooting are preferable. Gradualism is preferable when (i) reserves may otherwise be depleted by speculative imports, forcing the government to abandon the reform, (ii) only incremental devaluation is possible, or (iii) the level of the implicit tariff is unknown.

The second part examines how liberalization episodes can be identified empirically using a quantitative measure of trade policy. The average implicit tariff index, which is the ratio of the domestic deflator to the world price index, is derived for Kenya. As the domestic deflator appears to be biased, a hypothetical implicit tariff index is derived from a Linear Expenditure System. Further, the other empirical study quantifies the social cost of incredibility during four Kenyan reforms. Three hypotheses are tested: (i) speculative accumulation of imports, (ii) deferral of investment, and (iii) increased liquidity in response to perceived uncertainty about future trade policy. The highest welfare cost was incurred during the 1980 reform which was not coordinated with exchange rate management and was therefore incompatible.

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I INTRODUCTION

Economic theory strongly suggests that free trade is welfare—superior to protectionism even though it is seldom observed in practice. There have been many efforts to explain this contradiction between theory and practice. One such explanation is the presence of distortions in factor markets. Other distortions, such as tariffs, can mitigate the adverse effects of an imperfect capital or labour market. Another consideration is income distribution. A redistributive government may use tariffs to transfer income from one group to another, or to favour urban groups by providing protection for domestic manufacturing. Extending the argument beyond domestic economic policy, tariffs can raise national welfare when they are used against a foreign monopolist, or they can prevent dumping by foreign competitors who want to expand their exports by driving domestic producers out of business.

Protectionism to promote domestic import—substituting industries has failed to sustain economic growth, which has made unilateral trade liberalization as opposed to a reciprocal bargaining process, such as the GATT, commonplace in developing countries. In Asia and more recently in Latin America governments have voluntarily chosen the policy of unilateral trade liberalization which also enjoys a relatively wide support among the domestic private sector. In Africa, relaxation of import restrictions has been less willingly accepted by both the government and the private sector. Liberalization packages have often been imposed upon African countries by donors as a standard condition for external financial assistance. As liberalization has been undertaken involuntarily, its implementation has often been less than satisfactory.

When a decision in favour of a more liberal trade regime has been taken, the question of the optimal speed of liberalization arises. As indicated earlier, in the absence of distortions free trade is the optimal policy. As a corollary, the faster the economy moves towards free trade, the better. This applies even if the adjustment is costly. Distortions, however, may interact in such a way that the elimination of one, while the others remain, leads to an inferior outcome. In other words, if factor market distortions cannot be removed as quickly as import controls can be dismantled, a gradual reform may become preferable to a big bang.

The above analysis applies only when the trade reform is perceived to be fully credible by the private sector. When liberalization lacks credibility, many standard results change. There are a number of reasons why both gradualism and a big bang may suffer from a lack of credibility. These reasons will be analyzed extensively in this thesis. For the moment, let us look at the earlier example of a distorted economy where it was argued that gradualism can be a preferable strategy of liberalizing foreign trade, provided that the private sector fully believes that the reform will be carried out as preannounced. Under imperfect credibility, a gradual reform will not have the same favourable effect on intertemporal decisions, such as private saving. (Assuming credibility, the future price of importables is expected to fall which makes private agents increase their saving.) Instead of saving more, a lack of credibility induces private agents to spend more in an effort to hedge against the higher expected price in the future. Alternatively, uncertainty concerning the permanence of the reform may make them refrain from desired action, such as investment in exportables, until uncertainty concerning future trade policy has been resolved. Both types of behaviour have a welfare cost.

What does empirical research conclude about the speed of liberalization and credibility? There are three recent empirical studies on trade liberalization in

developing countries. The first study is by the World Bank (Michaely *et al.* 1991) which covers 19 countries, although none of them is from Sub-Saharan Africa.¹ The second is by Whalley (1989) who includes three African countries: Kenya, Nigeria and Tanzania.² The third study by Frimpong-Ansah *et al.* (1991) analyzes trade performance, particularly exports, in Sub-Saharan Africa from a wider perspective than just trade liberalization. It includes six case studies: Tanzania, Nigeria, Zimbabwe, Ghana, Cote d'Ivoire and Kenya.

The evidence produced by the World Bank is unambiguously in favour of strong and fast trade liberalization. A summary of the study concludes (Papageorgiou *et al.* 1990):

"Reform can work anywhere, regardless of initially unfavourable circumstances, and without serious short-term drawbacks. Governments with highly distorted trade regimes need not fear the consequences of a well-designed liberalization program ...The program should be bold and it should start with a bang. Any quantitative restrictions should be rapidly dismantled. When appropriate, the program should begin with a substantial real depreciation of the currency. And there must be a stable macroeconomic environment. Almost every program that has followed these four simple rules has succeeded."

The World Bank study found that successful liberalizations which were launched under adverse macroeconomic circumstances had to be strong and fast. Similarly, a radical reform is required for long term sustainability if the initial trade regime was

¹The 19 countries studied are Argentina, Brazil, Chile, Colombia, Peru, Uruguay, Indonesia, Korea, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Greece, Israel, Portugal, Spain, Turkey, and Yugoslavia.

²The 11 countries studied are Argentina, Brazil, China, Costa Rica, India, Kenya, Mexico, Nigeria, The Philippines, Republic of Korea, and Tanzania.

based on pervasive quantitative restrictions (QRs), or if there is a record of failed reforms in the past. Political stability was found to be a necessary condition for the long term survival of liberalization, whereas neither external pressure nor the presence of unemployment seemed to affect sustainability. An unhealthy balance of payments did not seem to prevent launching of a successful reform but a subsequent shrinking of external reserves usually led to its reversal. Contrary to the balance of payments effect, the initial inflationary fiscal deficit was strongly associated with an abortive reform, whereas expansionary fiscal policies at a later date did not affect long term sustainability of the reform. A quick positive response in the export sector was usually observed, thanks to relaxation of import controls and real depreciation rather than to specific export promotion measures.

The main criticism of the above World Bank study is a lack of any consistent measure of trade policy to allow a comparison of experiences of different countries (Collier 1993; Greenaway 1993). Only a subjective index of liberalization was derived by the authors of each country study. Despite the absence of a common quantitative criterion for identification of liberalization episodes, the study draws far-reaching conclusions and offers advice for policy-makers.

According to Whalley (1989), Latin American, Asian and African countries differ in their experiences of trade liberalization. In Latin America, initial and rapid liberalization in the 1960s and 1970s proved to be unsustainable in the longer run. He argues that the recent episodes have a better chance of not being reversed due to an intellectual change away from import-substitution. In the Newly Industrialized Countries (NICs) in Asia trade liberalization has been much more incremental as well as more persistent. In some Asian countries liberalization involves a sequential process which spans over twenty years or more. The recent episodes are largely an acceleration of the previous periods. In Africa, however, the turnaround is recent,

sharper and more vigorous compared to liberalizations elsewhere. An important factor underlying these liberalizations is conditionality by the International Monetary Fund and the World Bank.

Finally, Frimpong-Ansah *et al.* (1991) found that export performance in Sub-Saharan Africa is generally poor, with very little change in the structure of exports over time. Both domestic policies, such as pricing of export commodities below the world market prices resulting in reduced export volumes, and external factors, such as deteriorating barter terms of trade and protectionism in developed countries, are found to have contributed to the poor performance.

The issue of credibility is largely omitted by the empirical studies discussed above. The only reference to credibility made in the World Bank study is its emphasis on the importance of preannouncements in sustaining a reform and the signalling effect of a big bang. Sustainability can be endangered by government-specific factors, such as inflationary fiscal deficits when the reform is initiated, but also by factors that are not under government control, such as a fall in reserves at a later date due to negative external shocks, or private speculation induced by a lack of credibility. Despite numerous recommendations to governments contemplating liberalization, the study does not discuss whether it was a mistake to launch the reforms that failed, or in other words, whether their failure created substantial welfare costs to the economy. Nor does it advise whether liberalization should be gradual or postponed in cases where the necessary conditions for long term survival – or credibility – are not being met, particularly as a record of past failures was found to adversely affect future attempts.

Whalley considers African reforms to be sharper, vigorous and potentially more fragile, implying that a more incremental, or gradual approach would be more

sustainable in the long term. He does not, however, attribute the fragility to a lack of credibility, not at least explicitly. Similarly, the credibility problem is only implicitly present in the Frimpong–Ansah *et al.* study. They conclude that in Sub–Saharan Africa urban groups tend to be favoured at the expense of the rural population, for example, by pricing policies or government spending. If the trade regime (overvalued exchange rate *cum* quantitative import restrictions) reflects the balance of political power, then it might be difficult to remove the distortion without first changing the balance of power. There must be either a change of government, or a serious economic hardship to make the reform credible. In the opposite case a trade reform which adversely affects urban people may lead to even greater distortions being created during the compensation process.

Summarizing, the World Bank recipe for countries with pervasive quantitative restrictions, such as most Sub–Saharan African economies, is to remove them once–and–for–all. According to the political economy view, the prevailing distortions reflect the balance of political power, and only a change in this balance can produce a credible big bang. If both views are accepted, the conclusion must be that without an accompanying political change the credibility problem will inevitably result when applying the big bang recipe in Africa.

This thesis has three main objectives which arise from the shortcomings of previous research on trade liberalization in developing countries. First, empirical research has not always been firmly grounded in theory. Therefore, a considerable part of this thesis will be devoted to developing a theory of economic behaviour in the absence of credibility and its implications for the speed of liberalization. Second, empirical studies have been non–quantitative. This is why we will make an effort to identify liberalization episodes by using a quantitative measure of trade policy. Third, the credibility problem of government policies in general has not been empirically

quantified. We will therefore carry out a study on Kenyan trade reforms, in which we show that reforms have suffered from a lack of credibility with the private sector, and calculate the social cost created by the credibility problem.

Throughout this thesis the concept of trade policy refers to a collection of policy instruments at the government's disposal, affecting the amount and composition of imports and exports. Such instruments are typically tariffs, quantitative and value quotas, administrative import or export restrictions, rebates, retention schemes, direct subsidies, and so forth. As our empirical reference is Sub-Saharan Africa, trade liberalization is often the same as import liberalization. Export incentives and dual exchange rates having been negligible in the African context, trade liberalization is synonymous with a fall in the average implicit tariff, which is the total effect of nominal tariffs and the tariff equivalents of non-tariff import restrictions on the domestic price of importable goods.

Although exchange rate management was not explicitly included in the above definition of trade policy instruments or trade liberalization, it is intimately linked to both of them, and will be extensively discussed throughout this thesis. First, devaluations in developing countries tend to be trade liberalizing rather than payments improving, as trade policy instruments are widely used as an adjusting macroeconomic variable to restore the balance of payments, following a negative external shock (Collier and Joshi 1989). Second, devaluations often involve a change in the allocation mechanism of foreign exchange which may also have a trade liberalizing effect. Third, devaluation may be required to make trade liberalization compatible with other macroeconomic policies and to prevent it from becoming incredible to the public.

This thesis will be in two parts. Part One reviews and extends the theory of private behaviour in the absence of credibility, and analyzes its implications on the speed of reform. The theoretical part will analyze both the causes and consequences of incredibility in trade liberalization. We will distinguish both necessary and sufficient conditions that the trade reform has to meet in order to be credible to the public. It will be shown that the nature of necessary conditions is typically probabilistic. The consequences include the type and magnitude of welfare costs that arise from private response to a reform which is perceived to lack credibility. Apart from additional adjustment costs, created by a lack of credibility, it may also endanger the entire survival of the liberalization process.

Chapter II contains a taxonomic review of literature on trade liberalization and incredibility. The necessary conditions for credibility will be analyzed in depth, and the existing models will be classified according to their source of incredibility, and according to the type of welfare cost incredibility is assumed to create.

Chapter III will develop simple models to capture the consumption and production costs created by a lack of credibility. New features relative to the existing consumption models are an explicit inclusion of uncertainty and that of unavailability of consumer credit to finance speculative action. Stocks of imports, if accumulated, must be financed by consuming less of the exportable good. The latter adaptation makes the models more suitable for the analysis of the economies with rationed credit markets.

As to the welfare costs created by incredibility on the production side, we will first examine how costly reallocation of capital is affected by uncertainty. In order to determine the social cost incurred due to non-optimal output, the case where private agents anticipate a policy reversal will be compared with its

perfect—credibility counterfactual. Thereafter, we will examine how uncertainty about the future returns to capital affects investors' decisions when they have an option of acquiring domestic but not foreign liquid assets. Firms may prefer to accumulate inventories of imports until uncertainty concerning returns to physical investment has been resolved.

Chapter IV analyzes the speed of trade reform both under perfect credibility and in its absence. First, the optimal speed of reform will be determined when the labour market has a Harris—Todaro—type distortion. Effects on income distribution will also be studied in the case where both capital and labour markets have a distortion but private agents believe that the reform will be sustained. Second, the simple consumption model, developed in the previous chapter, will be applied to the analysis of the speed of reform under financial repression. Third, another taxonomy of the literature will be developed according to the speed of liberalization which the available models explicitly or implicitly suggest. Finally, we will analyze the implications of speculation for the speed of reform, and look at some consequences of temporary aid as a means to enhance the credibility of the reform.

Part Two contains an empirical analysis of the credibility problem in trade liberalization. Kenyan data will be used throughout the empirical part. First, we will derive a quantitative index of trade policy for Kenya. Then follows an assessment of the type and magnitude of the social cost created by the private perception that the reform will not be sustained. As argued above, previous empirical work on trade liberalization has highlighted the need for finding unambiguous criteria for identification of liberalization episodes in the aggregate data over time, or across countries.

Chapter V offers an introduction to the evolution of Kenyan trade policy. Chapter VI attempts to develop a quantitative method for empirical identification of liberalization episodes at the aggregate level. The implicit tariff index, which is our candidate for such a quantitative indicator of trade policy, will be derived for Kenya. It will be compared to other available measures of protection as well as to a narrative of changes in trade policy. We will also examine the validity and reliability of this index as an indicator of trade policy.

Chapter VII contains a quantitative assessment of private speculation during Kenyan trade reforms which have been perceived to lack credibility. The following hypotheses will be tested: (i) stocks of durable imports go up shortly before private agents anticipate that the reform will be reversed, (ii) investors prefer to defer investment in physical plant by accumulating inventories of imports, and (iii) the economy becomes increasingly liquid due to waiting in investment, and higher demand for credit to finance stock accumulation. Finally, a summary and conclusions can be found in Chapter VIII.

PART ONE: THE THEORY OF ECONOMIC BEHAVIOUR IN THE ABSENCE
OF CREDIBILITY AND THE SPEED OF TRADE REFORM

Part One contains a theoretical analysis on the credibility problem in trade liberalization and the speed of reform. This part has three main themes. First, we will review the existing literature on the topic by presenting three different taxonomies. The review also yields the two necessary conditions for credibility, time-consistency and macro compatibility of the reform. Both conditions are likely to be of probabilistic nature. As to time-consistency, private agents are uncertain about the true intentions of the government that undertakes the reform (Engel and Kletzer 1987). In the case of macro compatibility, a deterioration in the terms of trade may make an initially compatible reform incompatible (Froot 1988).

Second, simple models will be developed in order to capture the welfare cost of incredibility so that total cost curves can be sketched for both consumption and production. The empirical reference for the stylized facts of the models is Sub-Saharan Africa. The probabilistic nature of incredibility will also be explicitly included in the models. Finally, the discussion on the speed of liberalization covers both perfect and imperfect credibility. It will be shown that when the assumption of perfect credibility is removed, the policy implications concerning the speed of reform may change dramatically. Foreign aid which is used to enhance credibility of liberalization may also have an effect on its optimal speed.

II MODELLING THE CREDIBILITY PROBLEM IN TRADE LIBERALIZATION: A TAXONOMIC REVIEW

This chapter will provide a review of how the credibility problem associated with trade liberalization has been analyzed in theoretical economic literature.³ We will develop two taxonomies of the existing models in this chapter, while a third taxonomy can be found in Chapter IV where the speed of liberalization will be discussed. First, the models will be classified according to their source of incredibility. Three broad categories can be distinguished: the ones that address the time-consistency problem, those in which the trade reform is incompatible with other macroeconomic policies, and those which do not specify the source of incredibility. Time-consistency and macroeconomic compatibility are the necessary but by no means sufficient conditions for credibility in trade liberalization. The sufficient conditions are much more difficult to identify. Even if the necessary conditions are being met, there is a continuum of other reasons that may create a credibility problem, such as the number of years to the next election, or an expected shift in the balance of political power. The two necessary conditions will be discussed in detail in Sections 2.1 and 2.2.

This review will cover twelve models that address various aspects and consequences of incredibility in trade reform. They are mostly intertemporal frameworks where incredibility acts as a distortion in the future product market. The existence of the distortion biases resource allocation and intertemporal consumption decisions. In the

³Other recent surveys on trade liberalization in developing countries are Dornbusch (1992) and Rodrik (1992).

first category there are five models that consider time—inconsistency of trade reform by endogenizing government policy. Several types of government are postulated to underlie the time—consistency problem, or more precisely various perceptions are held by private agents concerning the type of government they face. Some assume that private perceptions are perfectly certain, while others contain an element of uncertainty.

The second category contains three models which can be applied to the analysis of macroeconomic compatibility. As in the case of time—inconsistency, compatibility with other macroeconomic policies, such as fiscal, monetary and exchange rate policy, can be either deterministic or stochastic. The stochastic case with uncertainty about the future terms of trade is clearly more relevant in the context of African economies which are prone to external shocks. Moreover, publicly available data may have serious time lags, quality problems, or the cost of extracting information may be too high to private agents. Therefore some uncertainty is likely to prevail whether or not liberalization will remain macro compatible over time.

In the third category (Section 2.3) there are four models which assume a truly liberalizing government whose policy lacks credibility in the private sector for an unspecified reason. Two of the models assume that the necessary and sufficient conditions are being met only in period one and that private agents are perfectly certain that the reform will collapse in the beginning of period two. Such reforms lack credibility but there is no uncertainty. In the other two private agents are faced with uncertainty, be it due to time—inconsistency or incompatible macro economic policies. Uncertainty is captured by the concept of subjective probability of collapse, which may or may not be different from the objective probability.

The second taxonomy of the same models will be presented in Section 2.4. It will be according to the type of welfare cost, i.e. whether the cost arises from consumption

or production, and whether it is created by speculative action, or by a lack of expected and desirable action on the part of private agents. We will also take a closer look at the formal definition and magnitude of welfare costs both in consumption and production.

2.1 Time-Inconsistency as a Source of Incredibility

Models that focus on time-inconsistency do not consider government policy as exogenously given to the model but make it endogenous by specifying an objective function for the government, which maximizes it under the constraints imposed by private equilibrium behaviour. Incredible macroeconomic policies may stem from the fact that the government and the private sector have different objective functions. But even if the government maximizes the social welfare function, and the public is aware of it, the problem of credibility due to time-inconsistency can arise. A policy is said to be dynamically inconsistent when a future policy decision that forms part of an optimal plan, formulated at the initial stage, is no longer optimal at a later date. By preannouncing a future policy the government tries to implement the first-best outcome but if it is incredible, it creates a time-inconsistency which acts as an additional distortion in the economy. Hillier (1989), for example, points out that time-inconsistency arises because the government has too few instruments to achieve the first-best solution, but also because at least one of the mix of policies to be used has effects on private behaviour for more than one period.⁴

⁴Persson (1988) provides a survey on incredibility in relation to monetary and fiscal policy, macroeconomic public finance and policy coordination internationally and by political parties.

Time-inconsistency was first discussed by Kydland and Prescott (1977) in a two-period optimal tax model with investment. It would be socially optimal for the government to deviate from the preannounced policy of taxing both labour and capital and to tax only capital in period two. Since capital is in place in period two it can be taxed without creating a distortion. If the government's announcement in period one concerning its future policies is credible to private agents, it can improve social welfare by fooling them, instead of carrying out the precommitted policy. In such a case, investment will be higher and a non-distortionary tax policy can be implemented in period two. If the public does not, however, believe the announcement, i.e. the policy announcement is incredible, private agents will calculate their optimal saving decision on the assumption that only capital will be taxed in period two. Then the government has an incentive to follow the consistent or dynamic programming solution. Capital accumulation and utility are lower than in the precommitted solution. Similarly, Calvo (1978) shows that the monetary authority can always impose a lump-sum tax by discreetly increasing the money supply and, once the private sector has formed expectations, is tempted to do so. It is a levy on already accumulated nominal government debt by surprise inflation.

Another seminal contribution is by Barro and Gordon (1983) who consider a case where, once the private sector has set wages and prices, the government is tempted to disinflate less than initially announced. If their one-shot game is repeated a finite number of times and the private agents move first, the *ex post* optimal policy is the only subgame perfect Nash equilibrium. An infinite number of repetitions allows the government to build up a reputation which can substitute for preannouncements and lower the cost of incredibility. However, there are many possible reputational equilibria and the government and atomistic private agents should be able to coordinate on one of them. The models of infinitely repeated games with full information do not, however, predict any problem for a new government in

acquiring credibility, neither do they explain deviations from zero inflation and full employment outcome. Introduction of incomplete information (for a survey see Driffill 1988) and learning mitigate some of these problems, including the coordination problem between the government and the atomistic private sector.

Rogoff's (1985) stochastic rational expectations model contains a principal-agent problem in which monetary policy has short-term real effects because of nominal wage contracts. He shows that society can be better-off if the monetary authorities place a larger weight than society on the time-consistent inflation rate stabilization relative to employment stabilization. He shows further that the weight should not be infinite, since the central bank would then end up responding inappropriately to supply shocks, allowing them to pass entirely through employment.

In an effort to elucidate the political economy of the credibility problem, Alesina and Tabellini (1988) show that political institutions and political behaviour affect the optimal policy rules, temptation to deviate from them and the mechanism of their enforcement. Asymmetry of information between voters and policy makers about the latter's competence or external shocks is sufficient to create an incentive to deviate from optimality before elections. With two parties that have conflicting goals, the median voter hypothesis leads to time-inconsistency in policies before and after elections. Both groups tend to attract the median voter by similar policies from which they have an incentive to deviate after elections.

We will next analyze the nature of the time-consistency problem that can arise when the government attempts to reform its trade policies. Four cases will be distinguished where either the action or different characteristics of the government give rise to policy incredibility perceived by the public.

2.1.1 A Redistributive Government

A benevolent government which takes the private sector's expectations into account when choosing its policy is called Pigovian. Compared to a Pigovian government, the extent of time-inconsistencies in economic policy can be either reduced or enhanced by a redistributive government. An application of the latter to trade liberalization is a static game analyzed by Staiger and Tabellini (1987). Their model is based on the idea that time-consistent trade policy in the presence of a benevolent government with redistributive goals involves more protection than the optimal policy. In other words, time-inconsistency due to the existence of a redistributive government⁵ explains why protection persists. As labour is assumed to allocate first before the government sets the tariff (or simultaneously), the optimal trade policy is time-inconsistent and therefore lacks credibility with the owners of domestic factors of production. The government's inability to precommit to free trade forces it to adopt a policy of protection.

In a standard model of a small open economy with two traded goods x and y , sector-specific capital and mobile labour N , the government uses tariffs t to redistribute income, subsequent to an adverse terms-of-trade shock. Surprise protection is more effective and a less costly means of redistribution, but the government will not be able to systematically surprise the private sector with more protection than expected. Irrespective of the government's announcement, the optimal policy may not be credible and the post-shock relocation of labour across sectors incorporates the expectation of trade restrictions t^e . Intersectoral labour mobility is assumed to come only at cost. More specifically, its marginal product

⁵The government is assumed to maximize a social welfare function where the weights attached to the direct utility of different types of workers are proportional to the size of the group.

falls by fraction $(1-\lambda)$ whenever it moves. Staiger and Tabellini show further that a time-consistent tariff policy is preferred to a time-consistent production subsidy.

The expected wage differential, subsequent to an external shock that lowers the world price of the importable good by an amount ϵ , can be written as:

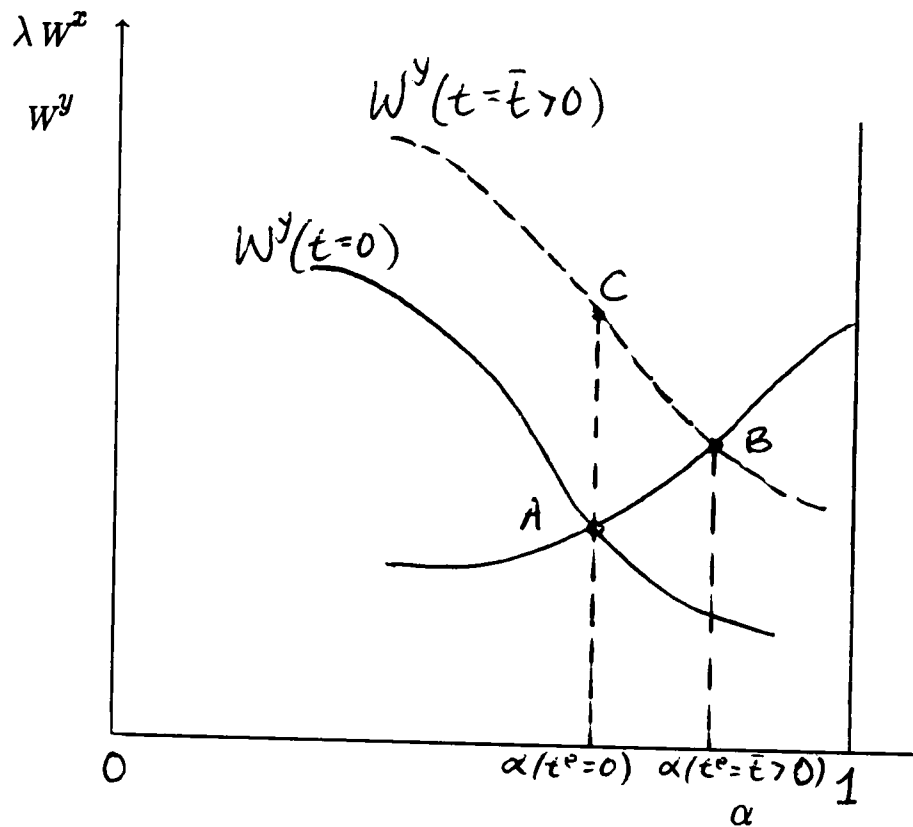
$$(2.1) \quad W^{ye}/W^{xe} = (1-\epsilon)(1+t^e)f'(N^y(t^e))/f'(N^x(t^e))$$

where $f'(N)$ denotes the physical marginal product of labour. In equilibrium the expected wage differential is constrained by $1/\lambda \geq W^{ye}/W^{xe} \geq \lambda$. After all relocations the fraction α (in efficiency units) remains in the importable sector, i.e. $N^y = \alpha$. Labour which has relocated in the exportable sector has a marginal product equal only to a fraction λ , i.e. $N^x = (1-\alpha)\lambda + 1$ as the quantity initially in each sector has been normalized to equal unity. Fraction α is determined endogenously in response to the expected wage differential which can be rewritten as:

$$(2.2) \quad W^{ye}/W^{xe} = (1-\epsilon)(1+t^e)f'(\alpha)/f'[(1-\alpha)\lambda + 1]$$

Figure 2.1 illustrates different allocations of labour when free trade prevails (A), the tariff is fully anticipated (B), and when the tariff is unanticipated (C).

Figure 2.1. Redistributive Government, Time-Inconsistency, and Allocation of Labour between Importable and Exportable Sector.



Source: Staiger and Tabellini (1987)

Given concavity of the production function, W^y is decreasing in α . The wage that can be earned by moving to the exportable sector is given by an upward sloping curve λW^x . If tariffs are not anticipated (and not imposed), A is the equilibrium. If they are fully anticipated, B is the equilibrium since W^{ye}/W^{xe} is strictly an increasing function of the expected tariff. At B fewer workers have relocated from the importable sector to the exportable one. If the actual tariff is unanticipated, the private sector will fail to offset the impact of tariffs on the resulting wage differential and hence on income distribution. The equilibrium of the economy is then at C. Labour allocation is unaffected and the wage differential is reduced by the full amount of the tariff. The equilibrium must lie on the locus of combinations of wage differentials and fully anticipated tariffs. The point which is chosen on this locus depends on the government's ability to influence workers' expectations. Any incentive to provide surprise protection at such a point tends to undermine the credibility of policy announcements and may preclude it from being a feasible equilibrium point available to the government.

It is further shown that when the government can make a binding commitment, the optimal tariff policy is either free trade or the imposition of a sufficiently high tariff that prevents any sectoral reallocation of labour from taking place. In the latter case, the issue of credibility obviously does not arise at all. It is shown that for any reduction ϵ in the world price, $0 < \epsilon < 1$, free trade must be the optimal policy if the cost of relocating is not too large, i.e. λ is close enough to one. If there is no credible mechanism with which to bind itself, the government cannot influence workers' expectations by pre-announcing a tariff policy. It cannot credibly commit to any trade policy which, *ex post*, would not be optimal. Therefore the government has to take the expected tariff t^e as given when it optimizes with respect to the actual tariff t . By assumption, the fraction of labour that remains in the importable sector α depends on t^e . Hence, the sequence of decisions implies that the allocation of labour is given to the government when it chooses the actual tariff.

In the case of free trade the government has an incentive to surprise domestic labour by protection. The time-consistent tariff is determined by two conditions: first, that the tariff is fully expected, and second that the marginal gain from unexpected protection is equal to its marginal cost. It can be shown that the time-consistent tariff is strictly positive. Hence, when free trade is optimal, the time-consistent equilibrium will involve a strictly positive level of protection but the same income distribution that would prevail with free trade. Note that welfare would be higher if precommitment to free trade were possible.

To conclude, Staiger and Tabellini show that time-inconsistency of trade policy can explain why protection prevails despite overwhelming empirical and theoretical evidence in favour of free trade. What they set up is a one-shot game where the domestic labour force moves first and chooses the allocation of labour between the sectors, based on the expected level of protection. The government's announcement

to pursue free trade is not credible to the public since it is known to be of a redistributive type and would have an incentive to later deviate from the preannounced policy. The optimal time-consistent tariff is therefore strictly positive.

2.1.2 Self-Concerned Public Spending

In a monetary model of the balance-of-payments, Daveri (1989) analyzes a circumstance in which trade liberalization, initiated in order to get rid of the microeconomic static inefficiency, is bound to fail, despite fully informed and rational private agents and government. The source of incredibility is the self-concerned government trying to raise its revenue by unexpected inflation as a non-distortionary means of finance for its expenditure. Imposing a higher actual tariff t than what was preannounced t^* allows the government to obtain more revenue through an inflation tax. This works through an increase in the nominal demand for money, causing an equivalent increase in the price level (Mussa 1976). Note that the model assumes that the tariff revenue will not change following trade liberalization, which is a reasonable assumption for African economies.

The exchange rate is assumed to be a function of tariffs, i.e. macroeconomic compatibility of the reform is guaranteed by depreciation. Time-inconsistency in this one-shot game reflects the conflicting goals of the players. The presence of conflicting goals is equivalent to a distortion which interacts with another distortion, trade restrictions. Both parties prefer to liberalize but the public resists being deceived by the government which tries to increase the revenue at its disposal by an inflation tax, once rational people have built up their real cash balances. The utility functions of the government and the private sector can be expressed as follows:

$$(2.3) \quad UG = -a(\hat{t} - \hat{t}^*)^2 + b(\hat{p} - \hat{p}^e); \quad a, b > 0$$

$$(2.4) \quad UP = -c(\hat{p} - \hat{p}^e)^2 - d(\hat{t} - \hat{t}^*)^2; \quad c, d > 0$$

where a and b are the government's marginal cost of not achieving liberalization and its marginal utility of running unexpected inflation, and c and d are the private sector's marginal cost of being deceived and that of not achieving liberalization. The price level is denoted by p , superscript e stands for expectations, and $\hat{}$ means rate of variation. It can be shown that $(\hat{p} - \hat{p}^e) = (\hat{t} - \hat{t}^e)$. Substituting this into equations (2.3) and (2.4), and solving for the first order conditions we obtain the following result:

$$(2.5) \quad \hat{t}^e = \hat{t} = \hat{t}^* + b/2a$$

Because of its self-concerned policies, the government is unable to commit itself to future policies, and private agents play first. Since they resist being fooled, they expect the tariff cut to be permanently less than the announcement. The public optimizes its payoff function with respect to the expected tariff, whereas the government maximizes with respect to the actual tariff. In a Stackelberg static game the government and the private sector are caught in a prisoner's dilemma: whatever move private agents play, it turns out to be optimal for the government to cut tariffs less than promised.

In this type of economy, building up credibility may be costlier than without self-concerned public spending. Therefore, not only a reduction in expenditure but a change in the composition of government budget has to precede a successful trade liberalization in order to establish the policy-maker's reputation as true liberalizer.

2.1.3 Uncertainty Concerning the Type of Government

An innovation of the model by Engel and Kletzer (1987) is introduction of uncertainty to the analysis of time—inconsistency in trade liberalization. At the time a trade reform is implemented, the public does not know for sure what type of a government it faces, i.e. whether the government is of a redistributive type, or a true liberalizer. In other words, there is uncertainty whether or not the time—consistency problem arises. The private sector is typically faced with such an uncertainty when the government is newly—elected. This model is a move away from an on—off situation where incredibility does not involve any uncertainty, such as the models reviewed earlier in this chapter, and two models by Calvo (1987, 1988) which will be discussed in Section 2.3.

Engel and Kletzer set up a signalling game where incredibility arises from the uncertainty whether or not the government in power will impose a tariff that creates a divergence between the effective domestic interest rate and the world rate of interest. Credibility is endogenized by a learning process where the private sector updates its prior beliefs using optimally the information conveyed by their observations (see Section 3.1.2 for details). It is shown that in the presence of learning, the case for non—liberalization becomes weaker than in the case of incredibility but no uncertainty (Calvo 1987, 1988). Furthermore, when learning is introduced, the private sector must be more skeptical initially for imposition of the tariff to be superior to free trade. There is also an upper bound on the number of periods in which a tariff will be chosen by a true welfare—maximizing government.

The model is a two—period small open economy where the imported good alone is consumed but not produced domestically. The exported good generates an income stream for a representative household which maximizes the expectation of a sum of

utility $V(c)$ of current consumption c , discounted at the world rate of interest r . The public either has access to the international capital market, or the existing controls are evaded. Private agents believe that the government maximizes the welfare of the economy with a positive probability λ less than unity. Such a government would initially choose free trade but, due to the credibility problem, a tariff ($p-1$) may yield a higher level of household utility. The alternative is a false government which follows a rule: impose a tariff next period with a positive probability q , or choose free trade with probability $(1-q)$.

The government is a true Pigovian welfare-maximizer which does not seek to imitate another type but lacks, nevertheless, credibility within the private sector which is dubious about the type of the government they face. Trade liberalization is considered as a finite time policy game between two players with asymmetric information: the government knows its own type but the public is uncertain about it. Note that trade policy is assumed to be endogenous with respect to the private sector's expectations. The initial beliefs are taken as given but they are assumed to be common knowledge for both players as is the way they are updated throughout the game.

The household solves the following problem:

$$\begin{aligned}
 (2.6) \quad & \max_{c_1, x, \bar{c}_2, c_2} \{ V(c_1) + \beta[\pi V(\bar{c}_2) + (1-\pi) V(c_2)] \} \\
 \text{s.t.} \quad & p_1 c_1 \leq y + x + R_1 \\
 & p \bar{c}_2 \leq y - (1+r)x + R_2 \\
 & c_2 \leq y - (1+r)x,
 \end{aligned}$$

where c_1 is consumption in period one, $\bar{c}_2$ planned consumption in period two in the event of a tariff in that period, and c_2 that under free trade, r denotes the interest rate in the economy, $\beta (= 1/(1+r))$ is the discount factor, and π is the subjective probability that tariffs will be imposed in period two. If π is zero, then free trade achieves the first-best allocation of consumption, whereas if π equals unity, then the tariff achieves the first-best. When $0 < \pi < 1$, there will be a welfare loss due to the intertemporal distortion in consumption created by a lack of credibility.

Since the government knows its own type, its objective function in the case of free trade ($P = 1$) and when tariff is imposed ($P = p$) is:

$$(2.7) \quad \max W_P(\pi) = V(c_1) + \beta V(c_2)$$

$$\begin{aligned} \text{s.t.} \quad & V'(c_1) = P\varphi V'(c_2) \\ & c_1 + (1+r)^{-1}c_2 = y(1 + (1-r)^{-1}) \\ & \varphi \equiv \pi(1/p) + (1-\pi) \end{aligned}$$

where $\varphi \equiv$ the ratio of the world market discount factor to the domestic effective discount factor (≤ 1). It can be shown that $W_1(\pi)$ achieves a maximum for $\pi = 0$ and is monotonically decreasing in π , whereas $W_p(\pi)$ has a maximum in $\pi = 1$ and is monotonically increasing in π . It can also be shown that if the private sector believes in period one that the probability of a tariff in period two is above the critical value π^* ($> 1/2$), the true government will impose a tariff in the first period.

For positive values of π , the imposition of tariff in period one can partially offset the intertemporal distortion, but it simultaneously introduces an additional atemporal welfare loss. In a one-good model there always exist possible priors for which a

tariff in period one is better than free trade, but when consumption of both goods is introduced, free trade may or may not be a superior policy for all prior beliefs. With learning the government eventually adopts free trade, even though restricted trade may be optimal initially.

An example of supply-side models that assumes asymmetric information concerning the type of government is Rodrik (1989c) who assumes that macroeconomic policies are compatible, but that there is uncertainty whether or not the time-consistency problem arises. The public is unable to distinguish a genuinely liberalizing government from a redistributive one for which foreign assistance provides a motive to mimic the liberalizer for a while.⁶ Hence, foreign aid makes it more difficult for the liberalizing government to reveal its true type. Due to incomplete information the extent of liberalization is assumed to signal the government's type to the public. Therefore achievement of credibility will always require a large reform.

Similarly to Engel and Kletzer, Rodrik depicts a small open economy which produces an exportable good and imports all consumption and investment goods. There is no inflow of capital, except for the possibility of foreign aid, which is contingent on the undertaking of a trade reform. All investment and consumption decisions are taken in period one. No changes in behaviour are possible when the true intentions of the government have been revealed. More precisely, private agents have a prior probability $(1-\pi)$ regarding the likelihood that the reform will be reversed. The probability π is said to depend on "history and other characteristics of society". The consumer's budget constraint stipulates that the present discounted value of net income must equal expenditure:

⁶Andersen (1989) analyzes incentives and credibility related to policy announcements and implementation of disinflationary policies under asymmetric information.

$$(2.8) \quad E[1+t, \delta(1+T), W] = f(k, l) - i + tE_1 + B + \delta[F(k+i, l) + TE_2]$$

where t and T denote first- and second-period tariff respectively, W stands for welfare, i is investment, the term tE_1 and TE_2 are the lump-sum transfers from tariffs, B is the foreign aid in period one, and δ is the discount factor. Note that tariffs in this model are equivalent to a consumption tax, which does not give rise to any static efficiency costs in production. Indeed the liberalizing government would then have no reason to pursue its policy but it is assumed to do so nonetheless. Rodrik concentrates on intertemporal sources of welfare loss arising purely from a lack of credibility. Since foreign borrowing is ruled out, expenditure and income must balance each period. For period one we have:

$$(2.9) \quad (1+t)E_1 = f(k, l) - i + tE_1 + B$$

Consider a trade reform where t is reduced to zero so that foreign aid flows in. The government simultaneously announces that T will be zero as well. The public, however, does not believe that the reform can be sustained. The credibility problem arises from inability on the part of the public to distinguish whether the government in power is a true liberalizer or just a redistributive one which has to set t equal to zero in order to obtain the foreign transfer. The latter type maximizes the welfare of its favoured group subject to a minimum welfare level of the less-favoured group.

In the absence of foreign aid, the least cost transfer from one group to another in terms of efficiency can be achieved by setting the tariffs equal in both periods. A redistributive government and a liberalizer would reveal themselves by their choice of trade policy in the initial period. Foreign aid may give rise to a pooling equilibrium where a redistributive government finds it beneficial to pretend to be a liberalizer and will set t equal to zero (as does the liberalizer) but it can choose the

second period tariff optimally. Pooling will be a possible equilibrium when foreign aid is sufficiently large to render the welfare of the favoured group higher than without pooling.

2.1.4 Endogenous Government with Uncertainty about Winners and Losers

Another type of uncertainty is introduced by Fernandez and Rodrik (1990) who endogenize trade liberalization policies implemented by the government to be a political process where a majority determines whether or not a reform will be undertaken. In this political economy approach, akin to Alesina and Tabellini (1988) discussed earlier, the presence of uncertainty about winners and losers creates a bias towards the status quo, which typically is protection in developing countries, be it for fiscal, redistributive, or other reasons. This type of uncertainty can prevent a trade reform from being adopted at all, even if it may prove to be welfare-improving *ex post*.

The government policy, regardless of whether it is credible or incredible, cannot be carried out if the majority of people will not support it. Temporariness is initially caused by time-inconsistency of government policies, and if the public rejects the reform, it never takes off. Fernandez and Rodrik also show that there may be cases where a reform will be rejected even though it may have been embraced had it been perceived permanent. Alternatively, when temporary benefits are perceived to be sufficiently high, some incredible reforms may be supported in the full knowledge that they will be temporary and will be reversed in the future. Note that there is no uncertainty whether or not the time-consistency problem arises but individuals are uncertain how well they will fare in the new sector.

The model is again a standard two-period trade model with one mobile factor, labour. Reallocation of labour has a cost of human capital investment, which consists of two components: θ , a known general sunk investment cost incurred prior to switching sectors, and c_i , an unknown individual-specific cost incurred only upon actually switching sectors. The latter is revealed only if the general sunk cost is incurred but the distribution of c_i , $f(c)$, is assumed to be known. Let us define P' as the relative price of the two goods, exportable x and importable y . If workers in the protected sector y , and of course then also in the export sector x , are to support the reform, provided they perceive it to be permanent, then P' must satisfy:

$$(2.10) \quad v(P')[(w'_x(1+\delta)-\theta)F(c^*) - \int_0^{c^*} cf(c)dc + (w'_y(1+\delta)-\theta)(1-F(c^*))]$$

$$> v(P^0)w_y^0(1+\delta)$$

where $v(\cdot)$ denotes indirect utility of a risk-neutral individual, δ is the discount factor and w stand for wages. The term in square brackets is the expected income from the reform for an individual initially in sector y . The right-hand side is his utility under protection.

It can be shown that there are cases where the reform would have been accepted under certainty but is rejected when uncertainty prevails about how workers will fare under the reform. Those who remain in the previously protected sector y after the reform have a lower real wage than before. If they outnumber the workers in the export sector, then the government is forced to abandon the reform in the second period. In such a case, forward-looking individuals realize that the first-period decision presents a choice between protection and a temporary reform. If the expected period-one utility is higher than what it would be under protection,

private agents will support this short-lived liberalization. Note that there is no cost involved in the model when shifting labour back to its initial sector. Human capital, once acquired, will not decay.

There is an asymmetry between time-consistency of protection and time-consistency of reform. In the case where the people initially choose to reject the reform, they will continue to do so, since no new information is revealed in the absence of workers' incurring θ . An initially rejected programme is rejected for ever. But a reform, once instituted, can be abandoned at a later stage. Hence, there is a tendency to status quo which usually in developing countries is protection. The main policy implication derived from the model is that a large reform will be needed to get individuals to respond in a desired manner. A large reform implies a wider wage differential between the sectors, inducing more people to switch over to the export sector and give hence more credibility to the reform. It is also argued that the model captures the empirical observation that autocratic regimes can get reforms initiated easier, reforms that may become approved *ex post* despite an *ex ante* hostility.

2.1.5 Summary

Time-inconsistency, which is one of the two necessary conditions for credibility in trade liberalization, has been endogenized in four different ways in the literature. First, if the government is known to be of a redistributive type, as in the model by Staiger and Tabellini (1987), the time-consistency problem is unavoidable as the government has an incentive to later deviate from preannounced liberalization. As a consequence of rational expectations and the correctly perceived incredibility of liberalization, protection will persist. This approach involves neither policy-maker's

incoherence, nor public misconception, or distrust, and both the government and the public are assumed to have full information. As labour moves first and relocates using the expected tariff as its decision variable, the government has to take it as given when choosing the actual (optimal) level of protection.

Second, in Daveri's model (1989) the government and private agents have conflicting goals as the former is self-concerned in public spending. The least distortionary means of raising additional government revenue is to run unexpected inflation after private agents have accumulated their real cash balances. Although conflicting goals between players alone do not create a time-consistency problem, it is their interaction with trade distortions that produces a failure of trade liberalization even if both the government and private agents prefer to liberalize. As a higher than expected tariff requires an increase in nominal money balances, which is proportional to the increase in the price level, by liberalizing less the government can levy an inflation tax in order to obtain more revenue. Therefore, elimination of trade restrictions is not the optimal policy as long as the other distortion persists, i.e. the government having an ever-positive marginal utility of spending, while lump sum taxation is not available, and public spending does not benefit the private sector.

Third, Engel and Kletzer (1987) and Rodrik (1989c) move away from the perfect information case by assuming that private agents cannot for sure discern the type of government. They perceive some subjective probability less than one that the government is a true liberalizer. In the former model the government is of a Pigovian type, while in the latter foreign aid may give a redistributive government an incentive to mimic the liberalizer for a while. The innovation of this approach is that incredibility is not equal to temporariness of the reform but that it represents genuine uncertainty to the private sector. The uncertainty is about whether or not

trade liberalization is a time-consistent policy. Even if import liberalization is time-consistent, entrepreneurs contemplating relocating to the export sector may be faced with another uncertainty as the government may subsequently decide to tax the export sector once it has grown sufficiently.

Finally, in the model presented by Fernandez and Rodrik (1990) the government policy may or may not be time-inconsistent but there is no uncertainty about it amongst the public. In this case a lack of credibility, if any, is equal to the reform being seen as temporary. Instead, a different type of uncertainty is postulated: individuals are uncertain about how well they will succeed once they have transferred to the export sector. This uncertainty may prevent an *ex post* beneficial reform from taking off at all, despite the fact that the policy of lower protection would be fully time-consistent. Furthermore, a time-inconsistent reform may be voted in, provided that its temporary benefits are perceived to be high enough. The government policy is endogenous to the number of expected winners as the model assumes majority voting.

In our subsequent analysis of the credibility problem in trade liberalization, particularly in Chapter III, we will adopt the uncertainty approach to government policy. It is an empirically more relevant case, not least in the African context, than assuming that private agents have rational expectations concerning the permanence of the reform. There are two justifications for assuming uncertainty rather than temporariness of policy. First, external aid, which frequently accompanies trade reform packages in Africa, may cause confusion about the real intentions of the government, and therefore, create uncertainty (see Section 4.1 for a discussion on the roles of aid in trade liberalization). Second, even if the same government remains in power for an extended period, its composition and policies may change over time (with or without an imminent inflow of aid), creating a similar

uncertainty about the permanence of its new policies as in the case of a newly-elected government.

As will be shown below, macroeconomic incompatibility is also likely to be random, reinforcing the case for adopting the uncertainty approach to the credibility problem in trade reform. In Chapter III, we will capture uncertainty by using the concept of subjective probability. As opposed to the objective probability, it is particularly well justified when time-inconsistency causes the lack of credibility. As trade reforms are fairly infrequent, there is seldom a sufficient history of observations required for rational expectations, or for the correct perception of the objective probability of default (see Section 3.1.1 for a discussion about subjective and objective probabilities).

2.2 Incompatible Macroeconomic Policies

The other necessary condition for credibility is compatibility of the reform with other macroeconomic policies. Trade liberalization may not be perceived sustainable by the public due to misguided policies, such as insufficient exchange rate adjustment, or slack fiscal policies.⁷ A lack of credibility is equivalent to a

⁷Bevan *et al.* (1991) illustrate the problems involved in practice when determining the appropriate level of depreciation relative to a reduction in the implicit tariff in Kenya. Assume that the consumption weighted implicit tariff is 40 percent, and its production weighted equivalent is 112 percent (adopted from the study by Maxwell Stamp Associates 1989). Suppose that the government wants to switch the implicit tariff into a uniform explicit tariff of 20 percent (by abolishing quotas and setting the scheduled tariff at 20 percent for all imports) and to carry out a compensating devaluation. The exchange rate has then to be devalued by 17 percent in order to compensate the consumer ($(1+0.4) = e(1+0.2)$; exchange rate $e = 1.17$). For producers such a package implies a fall of 34 percent, on average, in the price they receive for their output ($1 - (1.2 \cdot 1.17 / 2.12) = 0.34$). However, there is a wide dispersion also in the set of production-weighted implicit tariff rates in Kenya. As a result, some industries may experience a steeper cut in the producer price while others may actually raise their prices due to depreciation. We can conclude that even if the exchange rate is used to maintain compatibility, the convergence of the production-weighted implicit tariff towards the consumption weighted implicit tariff is uncompensated by the exchange rate changes. If the implicit tariff dispersion is substantial, some activities may gain more from depreciation than they lose because of dismantling protection.

distortion in the structure of intertemporal relative prices on which private agents base their consumption and production decisions. In general, compatibility of trade liberalization may be ensured by the following accompanying policies: (i) The exchange rate moves freely to maintain the balance of payments equilibrium; (ii) Gradual implementation of the reform to accommodate a slow movement of the exchange rate; (iii) Temporary foreign aid associated with the reform is used to reduce the money supply in order to counterbalance a reduction in the demand for money caused by trade liberalization; (iv) Temporary foreign aid is used to bridge the gap in the balance of payments to allow a large trade reform but a slow exchange rate adjustment; (v) Fiscal reform or credit restrictions are used to prevent the reform entering the unsustainable space.

As in the case of time-consistency, macro compatibility is also more likely to be a probabilistic concept rather than an on-off situation as negative external shocks, random changes in productivity, or private responses to changes in relative prices may render an initially compatible trade reform incompatible. In the next two sections we will review three models which are useful in the analysis of macro compatibility. In the first model trade policy is endogenous and used as adjusting variable to external shocks instead of monetary policy or exchange rate management. If private agents perceive that the shock is temporary they also know that liberalization will be temporary. Note that if liberalization is carried out without any change in the terms of trade, it has to be made compatible either by adjusting the exchange rate or reducing the money supply. The two other models in our review are probabilistic, allowing for a possibility that subsequent random shocks make the reform incompatible.

2.2.1 Endogenous Trade Policy and External Shocks

Bevan *et al.* (1990a) consider endogenous trade policy in a small open economy model where the policy-maker responds to trade shocks by liberalizing or tightening trade policy. A developing country which adheres to a fixed exchange rate policy, and whose reserves have been exhausted by previous negative shocks has often no other choice but to tighten trade policy in order to ration its scarce foreign exchange when export prices fall or import prices rise. There are three goods in the model: exportables x , importables m and nontradables n . The exchange rate and the money supply are assumed to be kept fixed. The economy can be characterized by the following four equations. First, the private budget constraint equates income from domestic production r and lump-sum transfers with consumer expenditure e :

$$(2.11) \quad r(p_x^* \epsilon, p_m, p_n) + (p_m - p_m^*) z_m = e(p_x^* \epsilon, p_m, p_n, u)$$

where $z_m(p_x, p_m, p_n, u) = e_m(p_x, p_m, p_n, u) - r_m(p_x, p_m, p_n)$ denotes the net compensated demand for the importable good, u stands for utility, ϵ for the exchange rate, and p for price. The second equation is the equilibrium condition for nontradables:

$$(2.12) \quad z_n(p_x, p_m, p_n, u) = 0.$$

Monetary equilibrium is presented by:

$$(2.13) \quad e(p_x^* \epsilon, p_m, p_n, u) = ac$$

where a is the velocity of money and c is the money balance of a representative consumer. Finally, trade policy is implemented either by an import tariff or a quota. The latter can be defined either in volume terms, or as the c.i.f. value of imports.

$$(2.14) \quad p_m = (1+t)\epsilon p_m^*; \quad \text{or} \quad z_m = \bar{m}; \quad p_m^* z_m \leq \bar{v}$$

Endogenous variables of the model are u , p_m and p_n , whereas p_m^* and p_x^* are determined by the world markets. The tariff rate t and the two quotas $\bar{m}$ and $\bar{v}$ are the trade policy instruments available to the government. Bevan *et al.* also apply the model to compare the effects of a terms of trade deterioration under two other policy rules: endogenous exchange rate and endogenous money supply.

Let us take a closer look at the endogenous trade policy model. By totally differentiating equations (2.11), (2.12) and (2.14), we can analyze how the endogenous variables p_m , p_n and u are affected by a fall in export prices when trade policy is the adjusting variable to restore equilibrium. The effect of a terms of trade change on t is not unambiguous. If the initial distortion is weak, it can be shown that an increase in p_x^* triggers trade liberalization — a lower value of t — and, conversely, trade policy is tightened if p_x^* falls. The effect on the price of nontradables and on the output of exportables are ambiguous, while the output of importables goes up, and both relative prices p_x/p_m and p_n/p_m fall.

The effect of an increase in the import price p_m^* is also investigated. In this case income and substitution effects work in opposite directions, and the effect on p_n is ambiguous. If the income effect dominates, then p_n falls like in the case of a fall in the export price. All the real effects instead are in the same direction. A quantity quota produces a paradoxical result: the price of importables p_m (in terms of exportables) falls when the world relative price p_m^*/p_x^* rises. If the quota is defined in terms of the c.i.f. value of imports, the utility loss is shown to be $(1+t)$ times as large as in the case of import rationing by volume where t is the initial value of the implicit tariff rate.

Summarizing, many familiar results of the terms of trade deterioration are upset when trade policy is assumed to rely on quotas instead of tariffs, or when trade policy changes endogenously in response to trade shocks. There are two asymmetries between export and import price changes. First, income and substitution effects reinforce each other in the former case, while working in opposite directions in the latter. Second, in the case of import rationing by value, the direct effect of a terms of trade deterioration is reinforced in the case of an import price increase by implicit tightening of trade controls.

Incredibility of trade liberalization can be analyzed in the Bevan *et al.* model in two ways. First, when trade policy is the adjusting variable, the government will liberalize trade in the face of a positive external shock. If the private agents recognize that the shock is temporary, they know with certainty that liberalization is also temporary and will be reversed when the shock, an export boom for example, is over. The only uncertainty initially concerns the length of the boom. Second, the credibility problem is further aggravated if the temporary liberalization enters the zone of incompatibility. As the transaction demand for foreign currency is proportional to the value of imports, it implies that foreign reserves cannot be less than the transaction demand (Bevan *et al.* 1990b). A half-space can be defined in which policies are feasible in the sense that reserves R are sufficient:

$$(2.15) \quad R \geq \gamma(e_m - r_m).$$

where $0 < \gamma < 1$. Policies that are otherwise compatible can become infeasible if they lead to a fall in reserves so that equation (2.15) is no longer satisfied.

2.2.2 Uncertainty Concerning the Terms of Trade

Froot (1988) uses a two-period general equilibrium model for a small open economy to derive a rational expectations equilibrium where the current account, welfare and the probability of collapse of trade liberalization are endogenous.⁸ The economy produces and consumes two goods, an exportable and an importable, the latter being protected by tariffs. In this framework, it is possible to investigate both the intertemporal incentives in consumption and the distortions in output, which are generated by the expectations that the reform may not last for the second period. In other words, there exists an objective probability of collapse which the public is able to perceive perfectly well so that the subjective probability is equal to the objective one (on this point see Section 3.1.1 for details).

Private agents do not have access to the external capital market. Instead, all foreign borrowing is conducted by the government in the beginning of period one. Subsequently, the government finances any current account deficit z from its reserves (initial reserves plus borrowing). The same reserves are also used to shield the private sector from unanticipated external shocks. The current account deficit is therefore the sum of that chosen by the private sector and that created by a random shock μ , $\mu \sim N(0, \sigma_\mu^2)$. Hence it is the possibility of negative external shocks that makes the duration of trade liberalization uncertain.

Private agents anticipate that trade liberalization will be reversed with probability λ , which depends on the minimum level of reserves R_{min} , the variance of the unexpected external shock σ_μ^2 , and on the current account deficit z :

⁸A similar model has also been used by Svensson and Razin (1983) and Edwards and van Wijnbergen (1986).

$$(2.16) \quad \lambda = P(R_{min}, \sigma_{\mu}^2, z) = \text{probability } \{\mu > R - R_{min} - z\}$$

If the reserves R fall under a critical floor R_{min} , tariffs will be reimposed at their pre-liberalization level with probability one. In fact, this assumption is quite restrictive because trade liberalization is treated as intrinsically temporary. By removing tariffs in an uncertain economy (due to external shocks μ), the government creates a potentially incompatible macroeconomic situation, which can only be restored by reimposing the pre-liberalization tariff. By assumption the government is denied an alternative policy to restore compatibility, such as depreciation of the exchange rate. Allowing another policy instrument would avoid incompatibility despite the removal of tariffs.

The economy is described by equations (2.17)–(2.20):

$$(2.17) \quad E(\pi, D\Pi, W) = q(p_m, p_x) + DQ(P_m, P_x) + T + t$$

$$(2.18) \quad T = D\bar{\tau}(E_2\Pi_1 - Q_1)$$

$$(2.19) \quad t = \tau_1(E_1\Pi_1 - q_1)$$

$$(2.20) \quad z = -q^* + E_1\Pi^*$$

Equation (2.17) is the intertemporal budget constraint for the economy, expressed by using standard expenditure E and revenue functions q and Q . Small case letters stand for period one and upper case for period two, π and Π denote the price indices and D is the discount factor. From equation (2.18) we can see that T represents the revenues generated by the expected future tariff $\bar{\tau} = \lambda\tau_p$. Equation (2.19) defines t as the transfer from temporary first-period tariffs as a second-best tool for reducing

the distortion induced by a lack of perfect credibility. Finally, equation (2.20) gives the current account deficit evaluated at international prices.

Froot shows first that there is a welfare loss due to a non-zero probability of a reversal from free trade in period two, attributable to the compensated substitution effects in consumption and to a shift in the output mix with fewer exports and more importables. Then he uses the model to show, by totally differentiating equation (2.17), that a marginal first-period tariff tends unambiguously to improve welfare. There is also a unique welfare-maximizing first-period tariff which is increasing in λ . In other words, the higher is the probability of failure, the greater is the distortion in the consumption rate of interest, and the more it is worth the cost of incurring the intratemporal cost of introducing a temporary tariff, which will reduce the distortion in the real consumption rate of interest. For any given level of credibility, the government can raise welfare by liberalizing more slowly. Tariffs today will offset the suboptimal reduction in the real consumption rate of interest caused by positive expected tariffs tomorrow. Therefore, the incentive to save increases and the current account improves.

The change in welfare resulting from a change in τ_1 is given by the following equation:

$$(2.21) \quad E_W dW/d\tau_1 = [\tau_p D\lambda \Pi_1 E_{21} \pi_1 + \tau_1 (E_1 \pi_{11} + \pi_1 E_{11} \pi_1 - q_{11})] /$$

$$(1 - \bar{\tau} D \Pi_1 C_W - \tau_1 \pi_1 c_W) = \tau_p D\lambda J + \tau_1 c / (\cdot)$$

where the term $J = \Pi_1 E_{21} \pi_1$ in the numerator is the intertemporal substitution effect. Although it arises from the introduction of a new first period tariff it raises welfare, provided the cost of intratemporal distortion c created by the first period

tariff is less than J and that the denominator $(\cdot)$ is positive. By setting $dW = 0$, Froot shows that there is a unique welfare maximizing temporary tariff which is strictly positive.

To derive the optimal speed of trade liberalization, there are three equations in three unknowns: the probability of collapse of the liberalization λ , the optimal temporary tariff τ_I^* , and the current account deficit z . First, a linear approximation of the probability function (2.16) is used⁹:

$$(2.16') \quad \lambda = P(R_{min}, \sigma_\mu^2, z) = a_g + a_4 z$$

Second, the optimal tariff is given by¹⁰:

$$(2.22) \quad \tau_I^*(\lambda) = a_g \lambda.$$

To determine whether the optimal first period tariff is higher than the expected tariff, we can write $D\lambda\tau_p = -\tau_I^*c/J$. If the intratemporal cost c is high compared to the intertemporal benefit, then the optimal tariff is likely to be smaller than the expected tariff for period two (and smaller than the pre-liberalization tariff). In the opposite case, it is possible that the optimal tariff is greater than the expected tariff. Note that Froot sets a limit on the absolute magnitude of distortions in order to avoid the larger income effects that would swamp the substitution effects under study.

⁹ $a_g = a_g(R_{min}, \sigma_\mu^2)$: $\partial a_g / \partial R_{min} < 0$, $\partial a_g / \partial \sigma_\mu^2 > 0$

$a_4 = a_4(R_{min}, \sigma_\mu^2)$: $\partial a_4 / \partial R_{min} > 0$, $\partial a_4 / \partial \sigma_\mu^2 > 0$

¹⁰ $a_g = -\tau_p D\Pi_1 E_{21} \pi_1 / (E_1 \pi_{11} + \pi_1 E_{11} \pi_1 - q_{11}) > 0$

Third, a function is defined, which allows us to see how changes in first-period tariffs affect the current account as λ varies. Using the budget constraint (2.17) and the equation for the current account (2.20) we have¹¹:

$$(2.23) \quad z(\tau_1, \lambda) = a_1 \lambda - (1/2) a_2 \lambda^2 - a_6 \tau_1 - (1/2) a_7 \tau_1^2$$

Figure 2.2 captures equations (2.16'), (2.22) and (2.23):

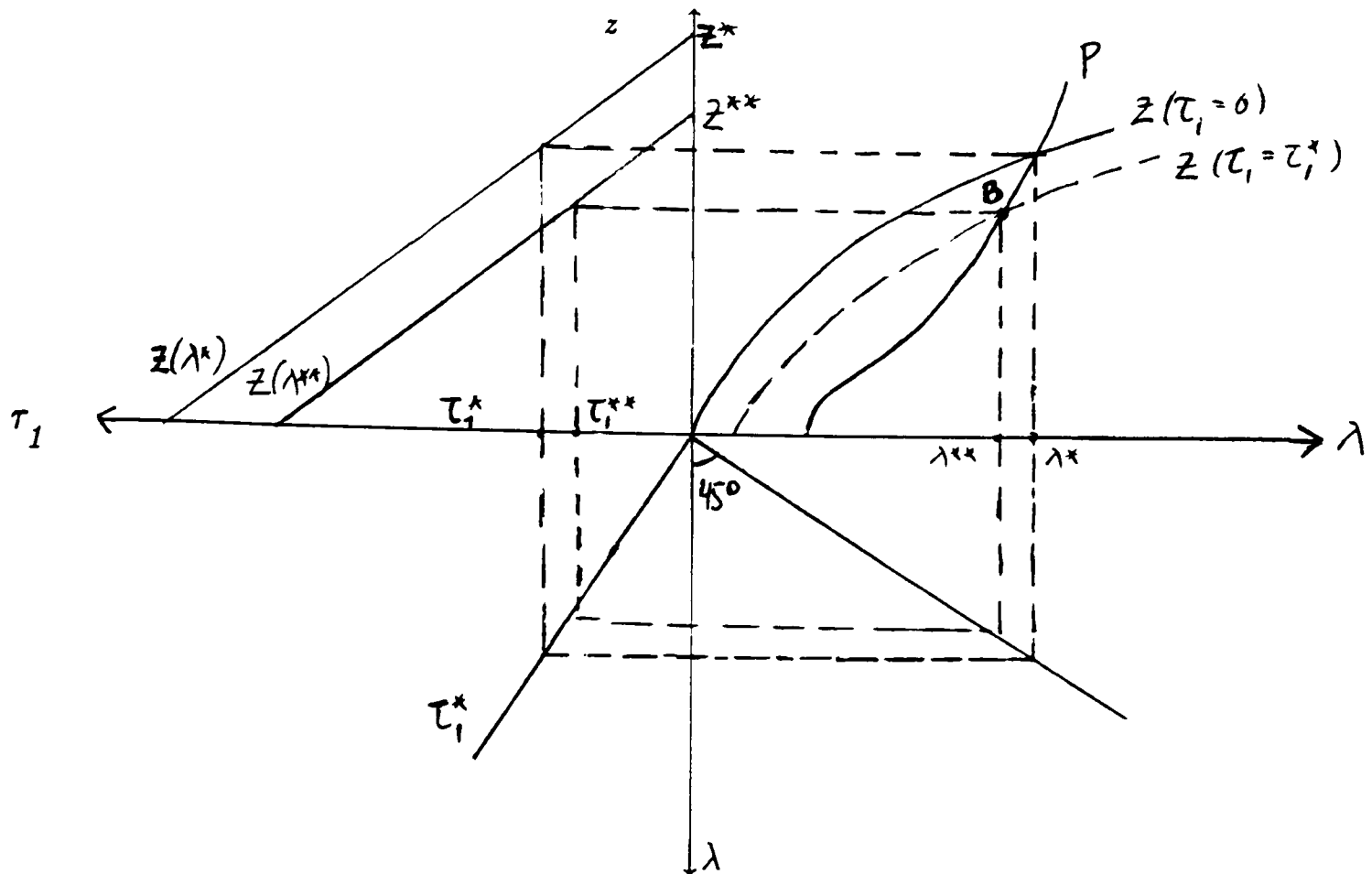
$$^{11}a_1 = \pi E_{12} \Pi_1 D > 0$$

$$a_2 = -\pi c_W \tau_p D (E_2 \Pi_{11} + \Pi_1 E_{22} \Pi_1 D - Q_1) / (1 - \bar{\tau} D \Pi_1 c_W) > 0$$

$$a_6 = -(\pi - \tau_1 \pi_1) (E_{11} \pi_1 + \bar{\tau} D c_W \Pi_1 E_{12} \pi_1) / (1 - \tau_1 \pi_1 c_W - \bar{\tau} \Pi_1 C_W) > 0$$

$$a_7 = -q_{11} + E_1 \pi_{11} - c_W (\pi - \tau_1 \pi_1) (E_1 \pi_{11} + \pi_1 E_{11} \pi_1 - q_{11}) / (1 - \tau_1 \pi_1 c_W - \bar{\tau} \Pi_1 C_W) \geq 0$$

Figure 2.2. Welfare Maximizing Solution to Current Account Deficit,
Probability of Collapse and Optimal Temporary Tariff.



Source: Froot (1988)

If liberalization is slow rather than instantaneous, the z curve shifts down in the first quadrant, defining a new intersection with the P curve. The third quadrant (clockwise) gives the optimal temporary tariff curve τ_1^* . In the upper left quadrant, the value of optimal tariff is translated into a correspondent current account deficit. Now it is possible to find the value of optimal tariff which yields the fixed point B . At B τ_1^{**} , z^{**} , and λ^{**} will give the optimal speed of liberalization, the optimal current account deficit and the resulting degree of credibility, given the underlying parameters R , σ_μ^2 , and R_{min} . It is easy to show that $0 < z^{**} < z^*$, $0 < \lambda^{**} < \lambda^*$,

and $0 < \tau_1^{**} < \tau_1^*$. Hence, a liberalization programme which removes tariffs directly and has less than perfect credibility can be improved upon by slowing the speed at which tariffs are reduced.

Froot applies his framework to analyze a case where reserves are rationed by the government. Then the public cannot obtain loans without it affecting the domestic interest rate. It can be shown that interest rates will fall (under a certain condition) as a result of higher temporary tariffs τ_1 . The benefit to raising τ_1 comes from a decline in the interest rate. The cost of such a policy is the temporary distortion that tariffs induce. Hence, gradual liberalization, or a reduction in the speed of liberalization will ease pressures on the current account constraint, which can result in reductions in the domestic interest rate as well as improvement in credibility.

An important contribution of Froot's analysis is to make macro compatibility stochastic by introducing random external shocks. Analogous to the model by Engel and Kletzer (1987) on time-inconsistency, Froot justifies for the case of macro incompatibility why we have to analyze uncertainty rather than temporariness (probabilities of default between zero and one instead of zero or one) when we discuss a lack of credibility in trade liberalization. Unlike Engel and Kletzer, Froot assumes rational expectations so that the objective probability of collapse is equal to the subjective probability perceived by private agents (see Section 3.1.1 for a further discussion). Nonetheless, even in the model by Engel and Kletzer, as private agents learn, the subjective probability approaches the objective one.

There are two important limitations to Froot's framework. First, it does not allow for any other policy instrument to the government than reversal of liberalization to restore potential macro incompatibility, following a negative shock. Liberalization is therefore assumed to be intrinsically temporary. Although it is common in

developing countries that changes in the exchange rate are politically difficult to implement, and that the governments can apply only a relatively slow speed of devaluation (which would call for a slow opening-up of the current account as well), the framework applied by Froot is a long-term one. Therefore it should allow the government exchange rate management as a policy tool so that imminent depletion of reserves would not necessarily mean a return to the initial level of trade restrictions.

Second, the probability of collapse is not only a function of external reserves, the current account deficit and the likelihood of a negative shock but also a function of the extent of trade liberalization. The more the policy-maker liberalizes in period one, the more the terms of trade have to improve (in the absence of the exchange rate management), and the bigger will be the perceived probability of collapse. Therefore one cannot calculate the optimal tariff for a given level of the probability of collapse as the choice of tariff itself affects the probability.

Another model that considers unexpected external shocks is Dornbusch (1990) who attempts to explain how the public forms a judgment about credibility of stabilization programmes. He uses the example of exchange rate stabilization but the analysis can be easily interpreted in terms of trade liberalization. A number of characteristics of stabilization situations are identified to help predict the *ex ante* probability of a reform. Incidentally, Dornbusch argues that repeated games and reputation are suitable for the analysis of ongoing policy situations, such as monetary policy, but a one-shot game is more useful to illustrate isolated stabilization/liberalization episodes. Success by definition implies that there is no repeat. If the reform fails, there will be another one, but there is no reputation building at work. In the context of African trade reforms this view is hardly justified. Trade liberalization has been on and off the agenda for at least two

decades, although demands and attempts to reduce protectionism intensified in the 1980s. Particularly, where the same government has remained in power for long, it has accumulated a reputation, either voluntarily or involuntarily.

The policy maker minimizes a loss function composed of the expected cost of programme failure and the adjustment cost, such as real wage or real spending cuts, which are politically costly.

$$(2.24) \quad \min_A pK + \lambda A^2/2$$

$$s.t. \quad p = p(x > R + \alpha A) = \int_{\psi}^{\infty} f(x)dx; \quad \psi = \alpha A + R$$

where $f(x)$ denotes the density function of the random shock. The programme fails if net foreign exchange disbursements $F = x - \alpha A$ exceed available reserves R . There are two components in F , a random one x and a component that depends on adjustment effort A . The probability of failure p is the probability of net foreign exchange disbursements in excess of reserve holdings. We can derive the first order condition:

$$(2.25) \quad Kf(\psi)\partial\psi/\partial A = -\lambda A$$

i.e. the marginal cost of adjustment λ is proportional to the level of adjustment effort. The marginal benefit $-K\partial p/\partial A$ results from the reduction in the expected cost of programme failure. The equilibrium *ex ante* probability of programme failure can then be written:

$$(2.26) \quad p^* = p^*(\overset{+}{\lambda}, \overset{-}{K}, \overset{-}{\alpha}, \overset{-}{R}, \overset{?}{a})$$

which indicates that the probability of collapse is a function of the marginal cost of adjustment λ , the cost of failure K , the coefficient α , which expresses the impact that the adjustment effort has on the net foreign exchange disbursements, available reserves R , and that of characteristics of the distribution of x , denoted by a . The properties of p^* can be summarized as follows:

- i)* A higher marginal cost of adjustment λ , in polarized societies particularly, implies a higher probability of programme failure;
- ii)* The higher the cost of failure K , the lower is the probability of collapse p . Many previous failed attempts usually imply a low cost of failure;
- iii)* With a triangular distribution of the random shock, a higher responsiveness of the net foreign disbursement to adjustment effort implies a reduced optimal adjustment effort and a lower probability of programme failure,
- iv)* Reform failure is less likely the higher the initial stock of reserves R ;
- v)* The effect of increased volatility on adjustment and on the probability of collapse is ambiguous. If the reserves are relatively large, the optimal adjustment effort may decline so that the probability of collapse rises in the absence of sufficient adjustment effort.

In addition, the effects of capital return flight to the perceived probability of programme failure are investigated in the model. In a Stackelberg game the government selects its adjustment effort, then the private sector takes the capital return decision, and finally the trade shock is realized. The impact of supportive speculation turns out to be uncertain. Failure in period one creates a need to stabilize/liberalize in the future with new adjustment costs and hence worse initial conditions. Failure breeds failure since the declining reserves weaken the future chances, and hence credibility of the reforms.

The Dornbusch model contains both elements of macro incompatibility: inappropriate adjustment effort — due to political costs — and a subsequent terms of trade shock which may deplete foreign exchange reserves. What the model does not explain is the observed propensity to delay the reform. Dornbusch suggests that a deterioration of economic conditions may lower the political cost of the adjustment effort and hence lower the probability of failure.

2.2.3 Summary

As shown by Bevan *et al.*, endogenous trade policy implies temporary liberalizations. The only exception is if the positive shock which initially prompted the reform is permanent. If private agents have rational expectations concerning the type of the shock, they are also able to correctly anticipate the fate of the reform. More generally, a necessary condition for the credibility of trade liberalization is macroeconomic compatibility. Therefore, if there is no change in the terms of trade when the reform is undertaken, compatibility has to be brought about by a simultaneous devaluation, or by a reduction in the money supply. Temporary foreign aid, for example, allows the government to buy back domestic currency in exchange of foreign currency, provided aid will not increase public spending.

As the future terms of trade are uncertain, an initially compatible liberalization may subsequently become incompatible if a negative shock, permanent or temporary, hits the economy. The case in point is the model by Froot (1988) who unnecessarily restricts the government's response to a complete reversal of the reform instead of allowing for exchange rate management as an alternative policy instrument. He assumes rational expectations so that both the government and the public attach the same objective probability to the occurrence of such a shock.

However, if the data which private agents or the government use to extract information is scarce, of a poor quality, untimely, or too costly, the use of a subjective instead of an objective probability in the analysis of incredibility is justified. This issue has a particular relevance in the African context. Finally, Dornbusch (1990) includes both elements of macro incompatibility in his model of credibility. First, adjustment is insufficient to match the fall in the domestic price of importables. Second, a negative terms of trade shock may subsequently deplete the reserves. Both variables increase the *ex ante* probability of collapse perceived by private agents.

2.3 Models with an Unspecified Source of Incredibility

Our review contains four models which analyze the credibility problem in trade liberalization but do not specify its source in any way. In two of the models the public anticipates that the reform will last for a given time but that it will, immediately after the time has elapsed, be reversed with probability equal to one (Calvo 1987, 1988). In other words, this approach does not involve any uncertainty, only temporariness of policy as the probability of default is first zero and subsequently jumps to one at time T . The two other models adopt an approach where the private sector perceives a subjective probability of default (van Wijnbergen 1985, Rodrik 1989b). It may or may not be different from the objective probability of reversal.

Calvo (1987, 1988) sets up two consumption models in order to assess the welfare costs of incredibility. As pointed out above, the lack of credibility is equal to the expectation that trade liberalization will be temporary. There are no restrictions on the capital account, and consumers do not face any credit constraint. Because of

incredibility, individuals base their decisions on future prices that are different from the preannouncement made when the (strong and fast) reform was initiated. Even if the government did not reverse its policies and continued free trade forever, the social cost would remain the same since it is the calculations of individual households that matter, and private agents would have reduced saving, or accumulated inventories of imports by the time they would find out about their mistake.

One of Calvo's models (1987) focuses on the harmful effects of capital mobility when it is combined with intertemporal substitution in consumption, while the other (1988) assesses the social cost of temporary policy in the presence of storable goods. If the capital account is liberalized when the public considers trade reform to be short-lived, the new access to foreign funds will cause excess importation of durables. Excess importation will result in a welfare loss.

Consider a small open economy with two traded goods, an importable and an exportable. A representative, infinitely lived household consumes the importable good only. In the intertemporal substitution model constant consumption x during the liberal period is larger than that after the tariffs have been brought back, denoted by z . In the inventory accumulation model, intertemporal substitution is ruled out but consumers respond to the perceived temporariness of liberalization by storing the imported good. Tariffs on the importable good ($p-1$) are assumed to be handed back in a lump-sum way.

Let us have a closer look at the inventory accumulation model. A representative household maximizes constant consumption c subject to its budget constraint. The optimal consumption path is constant because the interest rate on international bonds r is assumed to be equal to the subjective rate of time preference in

consumption. As there is no uncertainty about the future collapse of the reform, the liberal era is expected to last for $T (> 0)$ periods with probability one. The budget constraint therefore becomes:

$$(2.27) \quad K + Y + G - Z - c \int_0^T e^{-rt} dt - pc \int_\tau^\infty e^{-rt} dt = 0$$

$$(2.28a) \quad p_t = 1, \quad 0 \leq t \leq T$$

$$(2.28b) \quad p_t = p > 1, \quad t > T$$

where K denotes the present value of the initial holdings of the international bonds, Y stands for that of the income stream from the exportable good, and G is the present value of lump-sum transfer from tariffs, $G = (p-1)c \int_\tau^\infty e^{-rt} dt$. To maximize its consumption subject to equation (2.27), the representative household must choose the depletion time τ of the stock of importables Z optimally ($Z = \tau c$). The maximum consumption then is:

$$(2.29) \quad c = r(K + Y) / [e^{-rT}(\ln p + 1/p) + 1 - e^{-rT}].$$

With the assumption of intertemporal substitution instead of storability, the shorter the liberal period T , the larger are aggregate consumption and the current account deficit during T . This is because the opportunity cost of consumption in terms of future utility diminishes as T gets shorter. The impact of a change in T on welfare is ambiguous, however. It is obvious that the effect of the distortion goes to zero when T goes to zero, or T goes to infinity, and the maximum cost of reversed liberalization lies somewhere between them. Simulations show that the worst length of liberal era could represent quite a long period of time.

The intertemporal substitution model can be modified by introducing a nontraded good which is produced by combining labour and importables. A temporary

liberalization policy induces an appreciation of the real exchange rate in the interval $[0, T]$, followed by a permanent depreciation. A relatively large movements in the real exchange rate may reflect a low degree of credibility, i.e. a short liberal period. Another modification assumes a monetary (instead of a real) economy where consumption is subject to a cash-in-advance constraint (instead of a tariff). The government preannounces the exchange rate, but depreciation is expected at time T . As a result, the current account deteriorates and the real exchange rate appreciates. Finally, static supply-related gains from trade are allowed for so that free trade increases exports, but the harmful effects of a temporary relaxation in trade policy are not done away by this addition.

In Section 2.3.2 we will return to the two models by Calvo when the formal definition and magnitude of welfare costs in consumption will be examined. In addition, Chapter III will contain two modifications of the inventory accumulation model. Unlike Calvo, we will assume that consumers are uncertain about the permanence of the reform, be it for suspected time-inconsistency, or for a possibility of a negative shock which would make the reform incompatible. Consumers perceive a subjective probability of collapse. The government is a true liberalizer in the sense that it will not decide the period one tariff on the basis of private behaviour but goes ahead with the reform. Another deviation to Calvo is that consumers do not have access to credit. In order to accumulate stocks in period one they have to forego consumption of the other good. Both modifications will make the model more applicable to African economies where aid or insufficient macroeconomic data, for example, may render trade liberalizations uncertain, and where consumer credit is seldom available.

In Section 3.3.2 the option of stock accumulation will also be introduced to an asset demand model which is reminiscent of a model by van Wijnbergen (1985).

Uncertainty regarding the permanence of the reform is assumed to affect investors' decisions so that the otherwise welfare-improving liberal policies may prove to be harmful. Van Wijnbergen demonstrates that incredibility confers an option value to foreign exchange compared to other available assets: physical capital in the export sector or in the protected sector. Investment in physical plant is irreversible, whereas foreign currency holdings make it possible to defer commitment until trade policy in period two has been revealed. Unless the trade reform is perfectly credible, investment will fall and capital flight will take place. Our subsequent modification in Chapter III will assume absence of foreign exchange as an alternative asset.

At the beginning of period one, the government announces a permanent trade liberalization. Unsuccessful previous attempts lead the private agents to believe that at probability π the reform will be reversed. No reason, however, is given to explain why the previous reforms have failed. The former protected import-substituting sector ceases to be a profitable investment opportunity in period one, and the choice is made between the export sector and foreign savings. The model produces a threshold probability which makes the investor indifferent between investing in physical plant in the export sector and foreign exchange. If firms do not have access to foreign savings, as we will assume in Chapter III, stocks of imports can be an attractive and fairly liquid asset as an alternative means to defer relatively irreversible investment in physical plant.

Finally, the framework presented by Rodrik (1989b) allows for hysteresis in economic reforms that are less than perfectly credible (also Dixit 1989, and McDonald and Siegel 1986). The reason for incredibility is not explicitly explained. Private investors withhold investment since capital is reversible only if a sunk cost of entry and exit is incurred. Rodrik argues that if investment is not forthcoming reforms are less likely to prove sustainable, i.e. the probability of collapse π is a

decreasing function of investment response, although the model itself takes π as given.

Rodrik derives an equation which links the response of a representative investor to the magnitude of the reform, the *ex ante* probability of collapse, and to the entry and exit costs. Tariffs must be cut sufficiently so as to reduce the difference in yields between domestic and foreign investment, or alternatively between import—substituting and export—oriented sectors. Furthermore, the reform must be large enough to compensate both for the cost of capital reallocation and for the likelihood of policy reversal. Therefore, getting prices right through trade liberalization can play a secondary role in determining the level of investment. At worst it may prove harmful if it aggravates instability. Hence, the conclusion is that reform packages which emphasize policy stability and sustainability are likely to bring greater payoffs in terms of investment and growth than those which focus on economic liberalization alone. We will employ a similar framework in our assessment of the magnitude of the welfare cost of incredibility in production in Section 3.3.

2.4 Welfare Costs of Incredibility

This section will analyze different types of welfare costs created by incredible trade reforms. First, we will propose a simple taxonomy of the twelve models covered in this review according to the type of social cost they postulate. Three of the models address costs arising from consumption decisions, while the rest consider those arising on the production side. Furthermore, incredibility either induces costly action on the part of consumers or investors, or it prevents private agents from acting optimally from the social point of view, such as carrying out sufficient

reallocation of factors. Second, we will examine how the models define and formalize the social cost as well as how they assess its magnitude both in consumption and production.

2.4.1 A Taxonomy According to the Type of Welfare Cost

A useful way to illustrate the potential welfare costs related to trade reforms under less than perfect credibility is to construct a simple two-by-two matrix presented in Table 2.1. We distinguish consumption and production costs on the one hand, and those induced by costly action or non-action, on the other.

Table 2.1. A Taxonomy According to the Type of Social Cost of
Incredible Trade Liberalization.

CONSUMPTION COSTS		PRODUCTION COSTS
ACTION	Intertemporal substitution ¹²	Foreign exchange holdings ¹³
	Accumulation of inventories ¹⁴	
NON- ACTION		Insufficient relocation of labour ¹⁵
		Insufficient relocation of capital ¹⁶
		Insufficient relocation of production ¹⁷

The upper left cell contains models that analyze consumption costs due to speculative action. Consumers substitute intertemporally in anticipation of a higher future price so that consumption during the liberal period is higher than that after the expected default. In the upper right cell the harmful action is accumulation of foreign savings by investors as a means of deferring investment in productive assets, such as physical plant in the export sector. The lower right cell contains a majority

¹²Calvo (1987), Engel and Kletzer (1987), Froot (1988).
¹³Van Wijnbergen (1985).
¹⁴Calvo (1988).
¹⁵Staiger and Tabellini (1987), Fernandez and Rodrik (1990).
¹⁶Rodrik (1989b), Dornbusch (1990).
¹⁷Daveri (1989), Froot (1988), Rodrik (1989c), Bevan *et al.* (1990a).

of the reviewed models. They all depict non-action as response to incredibility on the supply-side. Factors of production will not be sufficiently relocated, following a trade reform which may not be sustained.

There are no models that would fall in the cell where consumption costs are created by non-action. However, we can think of at least one type of such an inaction cost created by a lack of credibility. The rationale for trade liberalization is to increase real income. When the expected permanent income goes up the household's present consumption increases (and there will be a boom in investment). The underlying assumption is that consumers have access to credit to finance the increased consumption against their future income. But if private agents consider that the reform will be short-lived instead of permanent, the welfare-improving consumption effect will not materialize. This inaction on the part of consumers implies a welfare loss in the form of lower than optimal current consumption.

2.4.2 Definition and Magnitude of Consumption Costs

We will next examine formal definitions of welfare costs created by incredibility as well as how their magnitude has been assessed. In the stock accumulation model by Calvo (1988) the welfare cost is the difference between the optimal consumption with and without incredibility, c and c^* respectively. Optimal consumption under incredibility c is given by equation (2.29), while the welfare-maximizing constant consumption under perfect credibility is $c^* = r(K+Y)$. In other words, the social cost ϕ is defined as the loss of consumption due to accumulation of stocks of durable imports:

$$(2.30) \quad \phi = 1 - c^*/c = 1 - 1/[e^{-rT}(\ln p + 1/p) + 1 - e^{-rT}]$$

The cost of temporary liberalization turns out to be a function of the tariff rate $(p-1)$, the interest rate r , and of the (exogenously) expected duration of the liberal period T .

For simulations of the intertemporal substitution model, the cost of a temporary liberalization is defined as a value of θ that solves the following condition:

$$(2.31) \quad W(0, \theta) = W(T, 0)$$

$W(0, \theta)$ is the utility associated with a smaller consumption $c_t = (1-\theta)(y+rk_0)$ than the optimal constant consumption $(y+rk_0)$. In other words, the cost θ is equivalent to a consumption tax caused by the distortion of temporary policy. We can write the following equation:

$$(2.32) \quad \int_0^{\infty} [(1-\theta)^{(1-\alpha)}(y+rk_0)^{(1-\alpha)} / (1-\alpha)] e^{-rt} dt = \\ \int_0^T [x^{(1-\alpha)} / (1-\alpha)] e^{-rt} dt + \int_T^{\infty} [z^{(1-\alpha)} / (1-\alpha)] e^{-rt} dt$$

where x denotes constant consumption during the liberal period and z that thereafter. From (2.32) we obtain:

$$(2.33) \quad (1-\theta)^{(1-\alpha)} = [1 - (1-q)^{(1-\alpha)} e^{-rT}] / [1 - (1-q) e^{-rT}]^{(1-\alpha)},$$

where $q = p^{-1/a} < 1$.

The value of T that maximizes the consumption cost θ satisfies:

$$(2.34) \quad e^{-rT^*} = [1 - q^{1-\alpha} - (1-\alpha)(1-q)] / [\alpha(1-q)^{1-\alpha}(1-q)]$$

The maximum welfare cost turns out to be independent of the rate of interest, it only depends on the price distortion p and the elasticity of marginal utility α . Recall that in the model with storability, the cost is not only a function of the tariff rate but depends on the interest rate and the length of the liberal period T as well. When the marginal utility of consumption α approaches to zero or infinity, the cost of non-optimal intertemporal substitution in consumption goes to zero. In the former case ($\alpha = 0$), there is perfect intertemporal substitutability of consumption, and the household is indifferent about the time profile of consumption over intervals when the price is constant. For example, it can obtain the optimum by setting x at a constant level during $[0, T]$ and c equal to zero afterwards, and there is no welfare cost due to temporary policy. In the latter case ($\alpha = \infty$), it is optimal to choose a constant consumption path independently of relative prices.

The welfare cost, which is measured as the proportional loss of consumption compared to credible liberalization, turns out to be very high in simulations based on the two models. Moreover, inventory levels are unrealistically high, often several times the annual GNP so that there are many periods after a reform when no purchases are made at all. Extensions to include gains from trade increasing production of exportables, consumption of both exportables and importables (in fixed proportions) or imperfect durability do not eliminate the adverse effects of intertemporal substitution or inventory accumulation.

Introduction of imperfect durability into the inventory accumulation model, however, considerably reduces the optimal depletion time of stocks. Simulations show that a one percent increase in the rate of depreciation results in a 25 percent

shortening in the depletion time. When the rate of decay approaches infinity, no stocks will be held. Similarly, if the stock reproduces itself at the rate r , private agents are indifferent between holding bonds or a stock of durables, and the cost would again be zero. In the intermediate cases, the costs of trade liberalization are positive, but there is no *a priori* reason to believe the costs to be a monotonic function of durability. In general, simulations show higher costs of temporary policy in the presence of storability than in the case of intertemporal substitution. When the storage costs and consumption of both goods in fixed proportions (the inventory model abstracts from substitution in consumption as well as from the gains from trade) are allowed for, welfare losses still remain quite sizable. Although the existence of storage costs reduces the social opportunity costs, it contributes to the total cost of temporary policy.

It is plausible to expect that an explicit inclusion of uncertainty concerning the future trade policy should improve the predictions of the model. When there is a possibility that the government policy will persist, even if it is not perfectly credible, consumers may become less willing to store large amounts of imports. We will explore this further in Section 3.2.

2.4.3 Definition and Magnitude of Production Costs

Production costs created by the credibility problem are defined quite vaguely in many of the reviewed models, while some have quite specific formulas. Let us examine two fairly explicit cases. Both models assume an exogenous probability of collapse but do not allow the government any other role than a shift to a more liberal policy regime, and a possible reversal. First, recall the model by Rodrik (1989c) who assumes asymmetric information concerning the type of government

which may mimic a true liberalizer in anticipation of an aid inflow. He defines the certainty—equivalent level of the anticipated second—period tariff $\bar{T}$, and then, by differentiating equations (2.8) and (2.9) in Section 2.1.3, derives the following expression for welfare which is unambiguously negative at the positive levels of $\bar{T}$:

$$(2.35) \quad dW/d\bar{T} = [\delta^2/\theta(1+\varphi)]\bar{T}E_{22} \leq 0$$

where

$$\begin{aligned} \theta &\equiv (E_W - \delta\bar{T}E_{2W}) > 0; \\ \varphi &\equiv [(1+\bar{\tau})/\bar{i}][-\delta E_{22}\{1 + \bar{T}[\delta E_{2W}/(E_{1W} + \delta E_{2W})]\}] > 0. \end{aligned}$$

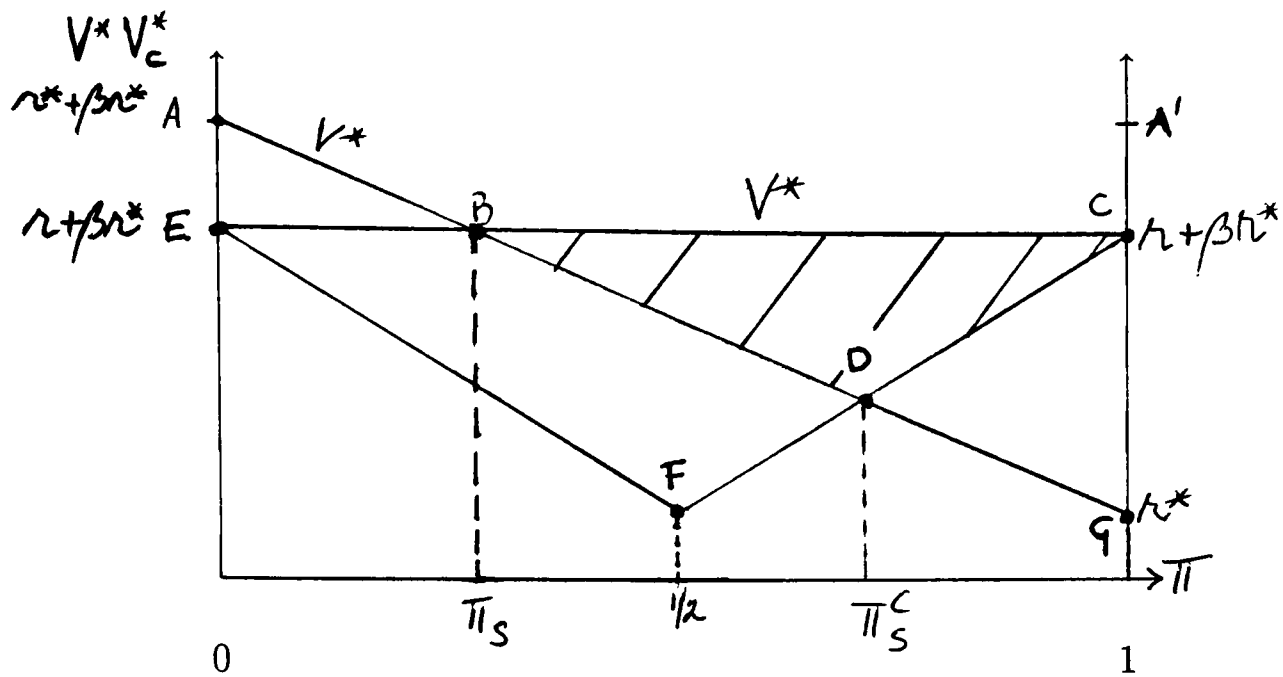
An explicit expression for the welfare cost associated with the lack of credibility is found by a first—order Taylor approximation. Letting $\Delta W \cong W(\bar{T}) - W(0)$ represent the difference between the welfare levels under imperfect and full credibility Rodrik obtains:

$$(2.36) \quad \Delta W \cong [\delta^2/\theta(1+\varphi)]E_{22}\bar{T}^2 < 0$$

We can see that the cost is proportional to the square of the anticipated tariff $\bar{T}$, and it is larger the stronger is intertemporal substitutability in consumption E_{22} . In other words, the consumption rate of interest is reduced artificially, resulting in sub—optimal levels of saving and investment.

Second, as discussed in Section 2.3, van Wijnbergen (1985) calculates an option value for foreign exchange as a function of the probability at which a trade reform is expected to collapse. The option value is the difference between the maximum value of wealth with the possibility of deferring commitment either to the export sector, or the import—substituting sector, and that when precommitment is unavoidable. The problem is presented in Figure 2.3.

Figure 2.3. Option Value of Foreign Exchange as a Function of Probability of Reform Collapse in Period 2.



Source: Van Wijnbergen (1985)

The private cost of incredibility is not, however, the same as the option value of foreign exchange. Quite the contrary, the presence of option value reduces the private loss. The maximum wealth under full credibility would be $r^* + \beta r^*$, i.e. point A in Figure 2.3. Without access to foreign exchange, it is always optimal to invest in the export sector, which would yield $r^* + \beta(1-\pi)r^*$. In this case the loss perceived at the time when the reform takes place ($=\beta\pi r^*$) is a monotonically increasing function of π , represented by $ADGA'$. Availability of foreign exchange, even if it must be precommitted, reduces the investor's welfare loss by CDG . The option value further reduces it by BCD . In other words, the area $ABCA'$ represents the expected private loss of uncertainty when foreign currency confers the option value.

Let us now analyze the social cost of incredibility. Since the government is a true liberalizer, the total wealth of society would be $r^* + \beta r^*$ times the amount of investment I . But the lack of credibility induces the private agents to invest their

capital in foreign exchange in period one, until uncertainty concerning the permanence of trade reform has been resolved. The (riskless) yield of foreign currency r being, by assumption, lower than return to physical capital in the export sector, the welfare cost can be defined as $(r^* - r)I$.

Summarizing, this chapter presented a review of twelve theoretical models which analyze various aspects and consequences of the credibility problem in trade liberalization. On the one hand, the review was structured around the two necessary conditions for credibility, i.e. time-consistency and macroeconomic compatibility. On the other, the type of welfare cost was used as a taxonomic device in order to classify the models. As was pointed out on several occasions, incredibility of trade policy may either be certain or uncertain to private agents. In the former case, the reform is considered as temporary, while in the latter its persistence is considered possible, with a given probability attached to this possibility. If the public has rational expectations, they perceive the objective probability of collapse, whereas without rational expectations they will have to rely on a subjective probability. Regardless of its degree of uncertainty (including its absence), incredibility creates various types of social costs. Costs in consumption can arise from non-optimal intertemporal substitution, or accumulation of speculative stocks. In production relocation of factors of production may be prevented, or investment deferred as response to incredibility.

The objective of the next chapter is to develop simple models which will jointly capture the total social cost of trade reform suffering from incredibility with the private sector. We will modify and extend three models presented in this review to make them more applicable to Africa-type economies. First, uncertainty will be introduced into the consumption model with inventory accumulation (Calvo 1988). We will also assume that consumers do not have access to credit. In order to finance

excess stocks of imports, they have to forego consumption of the other good. Second, the hysteresis model of relocation of capital (Rodrik 1989b) will be extended to evaluate the cost of incredibility. Third, the investment deferral model (van Wijnbergen 1985) will be modified so that investors do not have access to foreign exchange but can accumulated stocks of imports as a means of deferring investment in physical plant. A discussion on the probabilistic approach to uncertainty in trade liberalization will precede.

III UNCERTAINTY AND SIMPLE MODELS TO CAPTURE THE SOCIAL COST OF SPECULATION IN AFRICA-TYPE ECONOMIES

This chapter will develop simple models to capture the social cost created by uncertainty about the permanence of trade liberalization. The models will make an attempt to capture salient features of low-income economies, particularly those of Sub-Saharan Africa. As was shown in the previous chapter incredibility may or may not imply uncertainty to private agents. In the case of time-inconsistent liberalization, Engel and Kletzer (1987) justify the uncertainty approach (instead of perceived temporariness of trade policy) by assuming asymmetric information. The public does not know for sure what type of government they face, although people learn over time, while the government obviously knows its own type.

Similarly, Froot (1988) justifies the assumption of uncertainty in the case macro incompatibility by including the possibility of random external shocks in the future. An initially compatible reform may become incompatible due to an adverse terms-of-trade shock. Froot assumes that private agents have rational expectations, i.e. both the government and the public correctly perceive the objective probability of default. In the model by Engel and Kletzer the public learns so that the subjective probability perceived initially approaches the objective probability of collapse.

In this chapter we will also adopt the uncertainty approach to incredibility. In our models the private sector is not able to perceive the objective probability of reform collapse as there may either be uncertainty about the true intentions of the government (which receive aid and is subject to donor conditionality), or insufficient data correctly to determine the probability of future incompatibility. The rest of the chapter will be organized as follows. Section 3.1 will first summarize how uncertainty can be formally modelled. We will then take a closer look at the subjective probability of policy reversal and its effects on the behaviour of private agents. Learning and other attempts to endogenize the exogenous (constant) probability of default will also be discussed. Section 3.2 contains three models which abstract from gains from trade in order to concentrate on intertemporal consumer behaviour. New features relative to the existing literature (Calvo 1987, 1988) are explicit inclusion of uncertainty into the models and that of unavailability of consumer credit to finance speculative action. Stocks of imports, if accumulated, must be financed by consuming less of the exportable good. The latter adaptation makes the models more suitable to the analysis of economies with rationed credit markets.

Section 3.3 first extends a model by Rodrik (1989b) to account for the social cost of incredibility to production. The model assumes costly reallocation of the existing capital stock and examines how it is affected by the expectation that the reform may not be permanent. The social cost arises from a lack of desirable private action in response to the reform. Second, we will look at how uncertainty about future returns to capital affects investment decisions. Unlike in the model by van Wijnbergen (1985), investors do not have access to foreign savings but have an

option of deferring investment in physical plant by accumulating inventories of imports. Finally, Section 3.4 summarizes by combining the three different types of welfare costs.

In the first consumption model private agents are assumed to perceive a rate of decay of liberalization, while the rest of the models adopt a probabilistic approach to uncertainty. In order to keep the models as simple as possible we will use exogenous or constant probabilities alone and will not attempt to endogenize them. Welfare costs incurred due to a non-optimal private response both in consumption and production will be found by comparing the case where private agents anticipate a policy reversal with its perfect credibility counterfactual.

3.1 Probabilistic Approach to Uncertainty

Uncertainty is commonly modelled as probabilistic risk, particularly as an exogenous probability of reform collapse, given by historical facts. The concept of objective probability is based on the view that past data and current market signals are a reliable guide to the future and that economic phenomena are defined over some objective probability distributions (Machina 1987). In other words, averages calculated from the past observations cannot persistently differ from the time averages of the future outcomes. By the same token, a series of unsuccessful trade reforms in the past increases the probability of default for the current liberalization.

There is, however, extensive evidence that when individuals have to estimate probabilities for their decision making they will make systematic errors (Machina

1987). This has led to the concept of subjective probability, interpreted in terms of degree of conviction or relative frequencies. If subjective probabilities differ in the short run from the objective ones, a learning process can be introduced. Bayes' rule is a common way to model a learning process, despite the empirical observation that people tend to underweigh prior information and overweigh current data.

It is plausible to expect that people associate the subjective probability of failure π_s with fairly infrequent events, such as trade liberalization. In ongoing policy situations, such as monetary policy and inflation, it is more natural to assume that private agents have rational expectations without a systematic error. If the trade reform is macro incompatible, however, it is rational to anticipate a collapse by the time external reserves will be run down. Then the subjective probability is equal to the objective, true probability of default π_o . When time-inconsistency is the source of incredibility, then the subjective probability is more likely to be different from the objective one. This is because the time-consistency problem is likely to be more difficult to detect in the absence of sufficient history of observations.

While assessing the welfare costs of incredibility, we may distinguish two types of costs. First, a welfare loss is caused by the presence of a positive subjective probability ($\pi_s > 0$) when the objective probability is zero ($\pi_o = 0$), and liberalization persists. Such an uncertainty can induce accumulation of inventories of durables, or may prevent factors of production from relocating between the sectors. The welfare cost can be derived by comparing this case to the situation where π_s is equal to zero. Second, the objective probability is likely to be an increasing function of the subjective probability. A high π_s may jeopardize the persistence of liberalization by increasing π_o . For example, if private investment is

not forthcoming after a liberalization episode has been initiated, the subjective probability of default is likely to increase over time (Rodrik 1989b). This may induce further speculative behaviour, such as stockpiling, which, in turn, drains the external reserves and increases the objective probability of reversal. A perfect credibility counterfactual ($\pi_0 = \pi_s = 0$) can be used to derive the welfare cost of an incredible reform.

A slightly different analytical device is Arrow's state-preference model where uncertainty is captured by mutually exclusive and exhaustive states of nature. Given the fixed set of states, a state-payoff bundle will be chosen, each of which specifies the outcome the individual will receive in every possible state. Individuals then may, or may not, assign subjective or objective probabilities to different states (Machina 1987).

Apart from the concepts of objective and subjective probability, there is a third post Keynesian way of looking at uncertainty. Davidson (1991) argues that regardless of whether objective relative frequencies can be shown to have existed, or subjective probabilities exist today, economic agents believe that between the moment of decision and its payoff, unforeseeable changes will happen, and therefore, the future is not calculable. Introduction of hysteresis,¹⁸ or higher order irreversible time derivatives as state variables into static models does therefore nothing else but makes them dynamic. According to Davidson, the concept of hysteresis is more relevant to inanimate objects (where it has been borrowed from) than to evolution

¹⁸Hysteresis is defined as the failure of an effect to reverse itself as its underlying cause is reversed (Dixit 1989).

of society, and therefore, it cannot deal with the historical and societal changes which create true uncertainty for decision makers.

Uncertainty concerning trade policy is different from, say, uncertainty about tax policies in the sense that the former is not constantly on the government's policy agenda. Therefore, if investors remain liquid and wait, uncertainty about relative prices will eventually be solved at least for a while. Waiting will not solve the uncertainty related to those policies that are permanently on the agenda. As opposed to waiting, speculative action, such as accumulation of inventories of imports, has to take place before uncertainty has been resolved. Otherwise it will be too late to take advantage of a temporarily low import price in case the reform fails.

3.1.1 Exogenous Probability of Collapse

The credibility problem which involves uncertainty can be modelled by assuming that in every period private agents perceive some subjective probability of reform collapse π_t . From this probability there is a mapping to the expected price $E_t(p)$ on which private agents base their decisions, such as accumulation of stocks for future consumption. The subjective probability can behave in different ways. The simplest case is where π_t is assumed to be constant over time, not subject to revisions. To predict what action private agents might take in the presence of the constant probability, we have to define explicitly how we assume to be moving in time, i.e. whether we are looking forward through time from the initial period t_0 , or whether we refer to the probability at various points of time when the outcomes of the previous periods have been revealed.

We can distinguish three cases where the subjective probability of collapse π can said to be constant over time. First, the probability remains the same in every period, $\pi = \bar{\pi}$. Let us view the problem as from t_0 and assume that as soon as the government announces a trade reform the public becomes dubious and perceives a constant probability of collapse $\bar{\pi}$. The mapping from the constant probability to price expectations can be described by assuming that a discrete random variable $\underline{t}$ follows geometrical distribution and takes integer values 1,2,3,... without upper limit. Let $\underline{t}$ be the number of periods, and time T such that during $(T-1)$ periods there has been no reversal but by the time T the tariffs are brought back with the probability $P(t=T) = (1-\bar{\pi})^{(T-1)}\bar{\pi}$, $T = 1,2,\dots$. The increase in the expected price over time can then be expressed by the following equation:

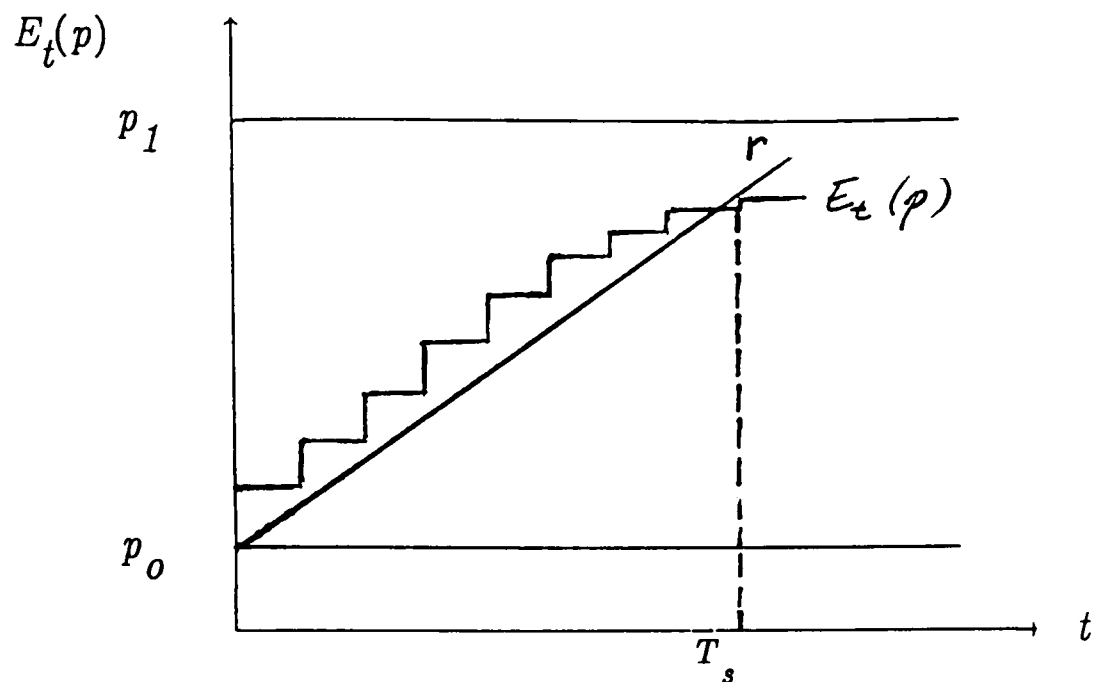
$$\begin{aligned}
 (3.1) \quad E_T(p) &= p_o + \bar{\pi}[1 + (1-\bar{\pi}) + (1-\bar{\pi})^2 + \dots + (1-\bar{\pi})^T]\tau \\
 &= p_o + \tau\bar{\pi}\sum_0^T (1-\bar{\pi})^n; \quad T = 1,2,3,\dots
 \end{aligned}$$

where p_o denotes the price of importables at which liberalization is carried out. The point in time when the acquired stocks will be exhausted can be determined by the intersection of the expected price curve and the curve for the opportunity cost as expressed in equation (3.2):

$$(3.2) \quad p_o(1+r)^{T_s} = p_o + \tau\bar{\pi}\sum_0^{T_s} (1-\bar{\pi})^n.$$

We cannot solve for T_s analytically from equation (3.2) but it would be possible to carry out simulations. A graphical solution is depicted in Figure 3.1, where p_1 denotes the tariff inclusive price which prevailed before the reform (or will prevail if the reform is reversed).

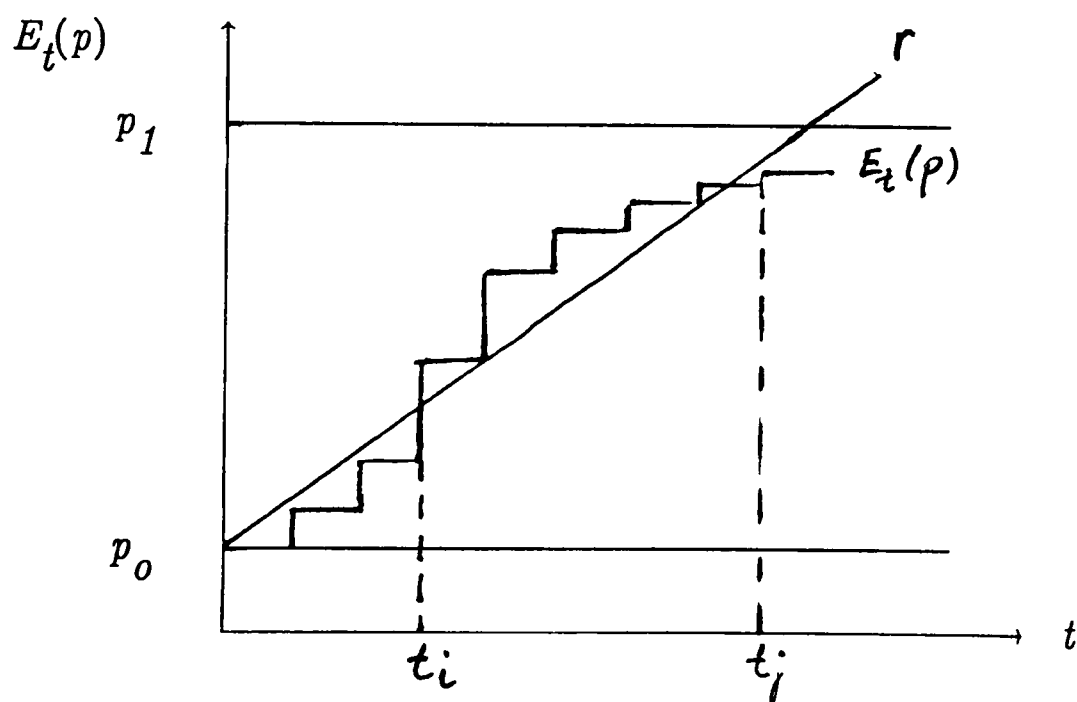
Figure 3.1. Constant Probability of Collapse and Accumulation of Stocks.



If the expected price is sufficiently high relative to the real interest rate r , private agents accumulate inventories at t_0 when the reform takes place. The size and the depletion time of these stocks T_s is determined by the probability of collapse $\bar{\pi}$, the interest rate r and the level of tariffs τ . At the beginning of the next period t_1 , uncertainty for the initial period has been solved. If the reform did not collapse during the first period, the decision problem for a representative agent remains the same. His optimal choice requires again a stock for T_s periods. Since he has already an accumulated stock for $(T_s - 1)$ periods as left-over from period t_0 , his sole purchase will be the amount required for consumption during a single period. Summarizing, with a positive subjective probability of collapse which remains constant over time ($\pi = \bar{\pi}$) there will be a large initial accumulation of stocks when liberalization takes place, provided the interest rate, or the return to alternative assets, is sufficiently low. Thereafter purchases and consumption will not deviate from one another while the level of the stock is kept constant.

Second, π_t itself can be non-constant but the expectations formed initially when trade is liberalized remain unchanged over time. In other words, the public forms an opinion at t_0 of the future events concerning the announced reform and does not revise it over time. In the case depicted in Figure 3.2, the representative agent expects that the reform is likely to last t_{i-1} periods before its collapse becomes imminent. The probability remains then high for a number of periods $(t_k - t_i)$ until vested interests in the reform have become sufficiently entrenched, and π can fall again. As the initial probability of reversal and the expected future price are relatively low, it does not pay off to store durable goods until at the end of period t_{i-1} just before the probability jumps up at t_i . The size of the stock depends on π , τ , r , and on the duration of the period when the probability remains high. Thereafter, there is no further incentive to stockpile either because the reform has collapsed or, if it persisted beyond t_k , π is no longer sufficiently high. Unless the reform collapses before the end of t_{i-1} , the optimal choice remains the same when uncertainty is resolved over time.

Figure 3.2. Unchanged but Non-Constant Probability of Collapse and Accumulation of Stocks.

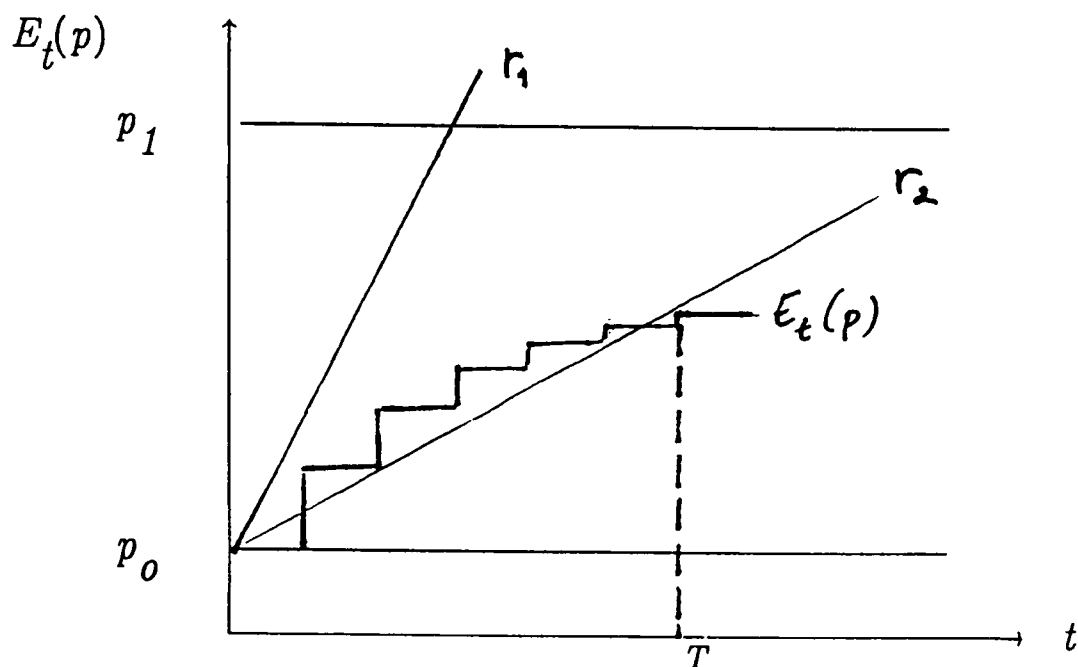


Summarizing, there will be no speculative action in the short run after the trade reform has been initiated. Subsequently, private agents become more dubious and anticipate a policy reversal which induces them to purchase a stock of durables for $(t_j - t_i)$ periods. No purchases are made until the entire stock is depleted. From period t_j onwards purchases will equal consumption. We can formally write the expected price as a function of the subjective probability, viewed as from t_0 :

$$\begin{aligned}
 (3.3) \quad E_1(p) &= p_o + \pi_1 \tau \\
 E_2(p) &= p_o + (1 - \pi_1) \pi_2 \tau \\
 E_3(p) &= p_o + [1 - (1 - \pi_1) \pi_2] \pi_3 \tau \\
 &\dots \\
 E_T(p) &= p_o + [1 - \dots (1 - \pi_1) \pi_2] \pi_3 \dots \pi_T \tau.
 \end{aligned}$$

The third possibility for a constant probability is when the expectations are rolled over (Figure 3.3). The public believes that during the first period the chance of collapse is π_o , one period ahead π_1 , two periods ahead π_2 etc. If the reform survives until period t_1 , then people believe that the collapse occurs during that period with the previous probability π_o , the next period with π_1 and so forth. In this case no stocks will be purchased at all if it is not done when the reform first takes place. At a sufficiently low interest rate r_2 the optimal stock to be acquired initially is for T periods. The decision problem remains invariant, and private agents will hold a constant stock over time. Except for the initial large purchase of durables at t_0 , purchases will equal consumption thereafter.

Figure 3.3. Roll—Over Probability of Collapse and Accumulation of Stocks.



Uncertainty, as we have described it here, is somewhat similar to assuming that the policy in question will only be temporary. Nevertheless, private agents who want to take advantage of temporarily cheap import prices do have to stock before uncertainty has been fully resolved. Uncertainty becomes more genuine when it is made endogenous to a number of variables, many of which are unknown *ex ante*. How would private behaviour, accumulation of inventories in particular, be affected if expectations were revised? *A priori* revision of π 's can be in either direction. Hence, it is possible gradually to acquire confidence in the reform and revise π 's downwards until at some stage the new trade regime becomes perfectly credible. Alternatively, π 's can be revised upwards, implying that, over time, the public considers it more and more likely that the reform will be reversed. It may be that the coming elections are the cut-off point at which the private agents believe with probability one that the reform will be abandoned. There are several signals that private agents can extract in order to revise their expectations. The next section

will investigate how revisions of the subjective probability affect inventory decisions.

3.1.2 Revision by Learning

Chapter II considered different types of government private agents may face. We distinguished a purely liberalizing government that emphasizes efficiency gains, a redistributive government which uses tariff revenue, or its license policy to favour certain groups. A Pigovian government is a true welfare maximizer that is willing to retain a temporary tariff, if it is welfare improving. Finally, there may be a government whose utility function differs from that of the private sector in one way or another. Private economic agents may also be uncertain about the type of government they face. A lack of credibility in the government's announcement of liberal trade policy is represented by a set of beliefs that the private sector holds about the type of government. The households can learn and update their prior beliefs when actual policies are revealed by time. This is usually modelled by Bayes' rule.

Engel and Kletzer (1987) apply learning to a two-period model with incredibility and intertemporal substitution in consumption. Households are assumed to face a government that can either be a true welfare maximizing or a false non-Pigovian government. The latter does not, however, imitate any other type. Knowing how private agents consume and save the true government chooses between a tariff and free trade optimally, given the posterior beliefs of the private sector. Priors and the

structure of the model are common knowledge, it is only the households that are uncertain whether the observed trade policy is due to a true or a false government.

If private agents are skeptical about the permanence of the reform and, consequently, save less in anticipation of higher prices in the future, retention of the tariff is the optimal policy for period one. Hence, the prior probability π_0 that a tariff will be imposed can be expressed:

$$(3.4) \quad \pi_0 = q(1-\lambda_0) + \lambda_0$$

where λ_0 is the prior probability that the government is the true type. The true government chooses the tariff with probability one, whereas the false one is assumed to do so with probability q . Once it has been revealed that the tariff will indeed be imposed in period one, we can apply Bayes' rule to obtain the posterior that the government is the true type:

$$(3.5) \quad \bar{\lambda}_1 = \lambda_0 / [q(1-\lambda_0) + \lambda_0]$$

If the true government is always assumed to choose free trade in the second period, then the posterior π_1 , the subjective probability that a tariff will be in place in period two, can be expressed:

$$(3.6) \quad \pi_1 = q(1-\bar{\lambda}_1)$$

In other words, π_1 is the product of the probability that the false government imposes a tariff and that of it being in power. Consumption decisions for both

periods are made in period one after the trade policy has been revealed. Because the true government has full information — including its own type — it will choose the optimal trade policy for period one knowing how consumers update their priors. Engel and Kletzer show that with learning households have to be initially more skeptical about the government being the true type before it is induced to impose the tariff in period one. They also show that with learning the government eventually adopts free trade, even though a tariff is optimal initially.

Learning reduces the probability of collapse over time, provided that the government is a true liberalizer. Consider, for example, the earlier case of unrevised but non-constant probabilities where π_t is low at first but increases later, inducing an accumulation of inventories, and after some time falls again to low levels. If the government can affect the subjective probability and the expected price by its own behaviour (as private agents learn), the expected gain from holding stocks — at a given level of tariffs — may fall short of the return to alternative assets, and no stocks will be bought at all. In the case where π_t is equal to a sufficiently high constant $\bar{\pi}$ over time (or the probability is rolled over) so that a stock is purchased immediately after the reform, introduction of learning will not affect the initial behaviour. Subsequently, however, the constant-stock-for-ever prediction derived from the unrevised $\bar{\pi}$ ceases to be optimal. Hence, introduction of learning makes predictions of private behaviour more realistic.

3.1.3 Other Ways of Endogenizing the Subjective Probability

Let us first look at how the *ex ante* probability of collapse π , i.e. the probability of collapse perceived at the time of liberalization, can be endogenized. Dornbusch (1990) argues that π is a function of the marginal cost of adjustment to the government (e.g. unemployment), the cost of failure, the impact (responsiveness) that the adjustment effort has on trade balance or fiscal position, the level of available reserves, and that of characteristics of the distribution of a terms-of-trade shock. For example, failure is more likely when the initial stock of reserves is low. A high marginal cost of adjustment, in polarized societies particularly, and a low cost of failure imply a higher probability of collapse. Many previously failed attempts usually indicate a low cost of failure.

The determinants that explain the *ex ante* probability of collapse are the same ones whose dynamics trigger its revisions over time. Signals that private agents extract to revise their expectations can come from data on foreign exchange reserves, external balance, or import statistics. A surge in unemployment can also signal to the public that the political cost of implementing the reform is becoming too high, causing an upward revision in π . A precarious and worsening external balance, or a jump in the level of stocks are indications of increased imports.¹⁹ The probability of collapse is then likely to be revised upwards, accelerating the growth of imports and

¹⁹Bevan *et al.* (1991) note that due to data lags observations of inventories in Kenya run several months behind events. Therefore, a more useful proxy for inventory accumulation is bank lending to the manufacturing sector and domestic trade. These data are available on a monthly basis. An investigation of the lag structure shows loans to lead inventories by 6 months, providing early information on planned changes, and potentially on the effects of the credibility problem.

inventories since the same capital gain from inventories now accrues over a shorter period of time. Reduced availability of certain imported goods in the markets may also indicate that hoarding is taking place. This can affect expectations of other market participants so that they revise their own subjective probability upwards.

Rodrik (1989b) suggests that the subjective probability of default π is a decreasing function of investment response to the reform. Private agents revise their expectations concerning the permanence of liberalization and the future relative price of tradables as information about investment response to the reform becomes available. The higher is investment, the more there are entrenched interests in sustaining the reform. A substantial fiscal deficit may give a signal that private investment is crowded out, and that the government will have to resort to trade taxes to raise sufficient revenue. Then the *ex ante* probability of collapse π will be revised upwards and the reform is less likely to prove sustainable. The latter intuition regarding the fiscal deficit is formalized as follows:

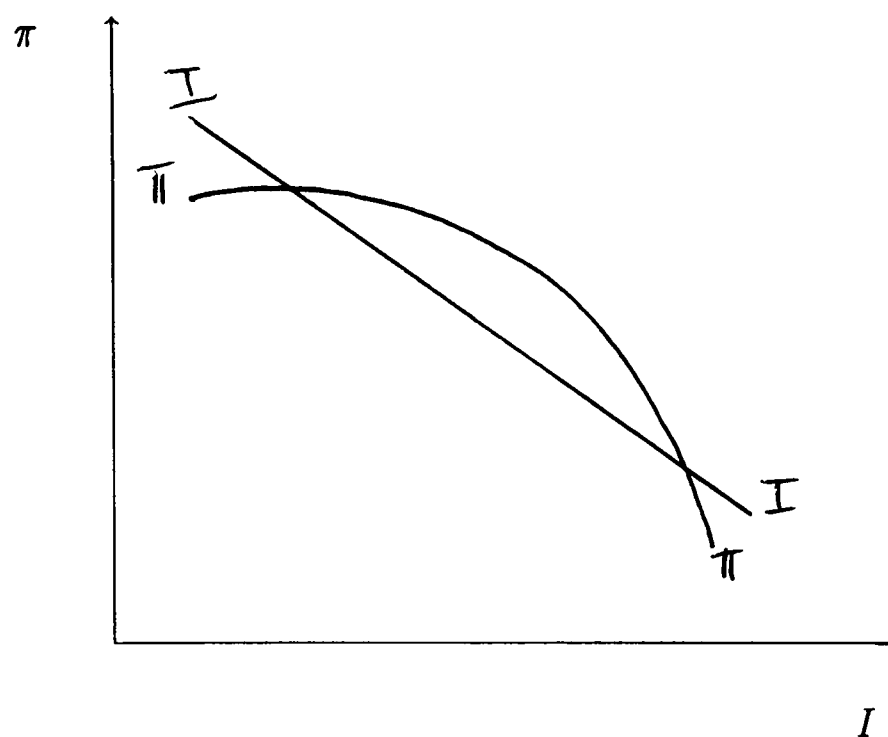
$$(3.7) \quad \pi = \text{prob} (\mu \geq \bar{\delta} + \tau y) = G(\bar{\delta} + \tau y)$$

where μ stands for public expenditures, $\bar{\delta}$ is the critical level of fiscal deficit that triggers the private sector's disbelief in the persistence of the reform, τ denotes the average tax rate on national income y , and G ($G' < 0$) is the density function. Higher investment increases the tax base by expanding the production capacity. The aggregate income y can be linked to investment I via the economy's incremental capital-output ratio (ICOR) $k = \Delta I / \Delta y$. Then we can write the probability of collapse π as a decreasing function of investment I by totally differentiating equation (3.4) and inserting k :

$$(3.8) \quad d\pi/dI = G'\tau/k < 0.$$

Both π and I are decreasing functions of each other. According to Rodrik, the negative slope of the two curves leads to an indeterminacy of outcome, depending on the second derivatives. The resulting multiple equilibria entail either high investment and low probability of collapse, or low investment and high probability of default. This is depicted in Figure 3.4.

Figure 3.4. Incredible Liberalization and Investment: Multiple Equilibria.

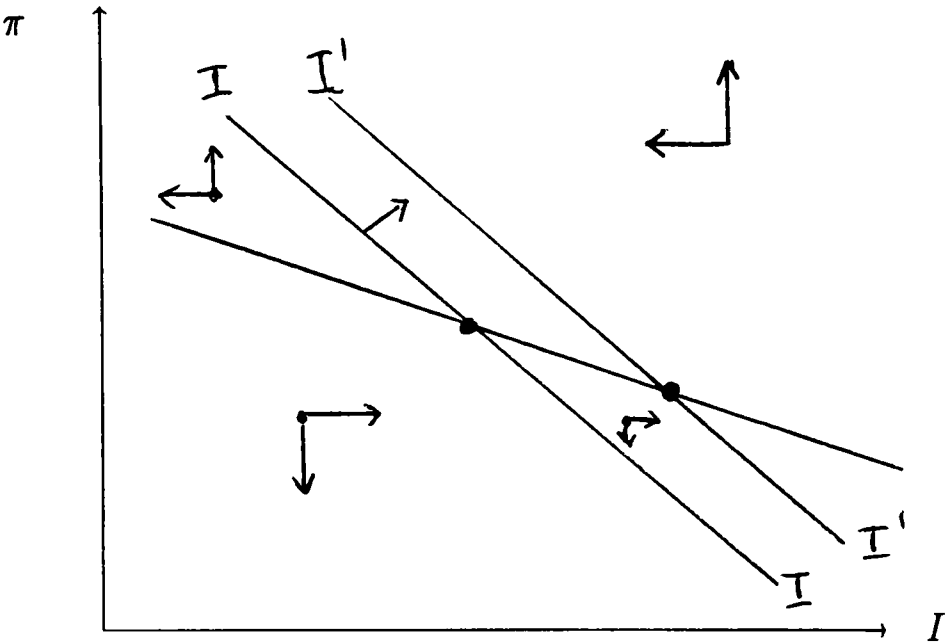


Source: Rodrik (1989b)

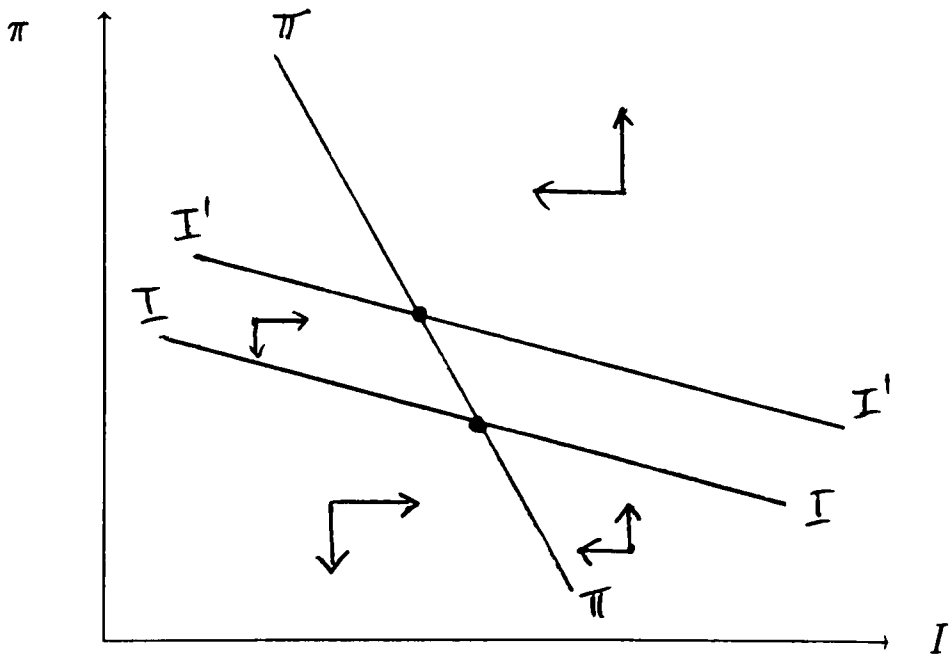
Let us have a closer look at the two equilibria which are depicted separately in Figure 3.5. In case (a), where the locus of investment is steeper than that of the subjective probability, a (large) reform would yield in equilibrium a higher level of investment and a lower subjective probability of policy reversal. In case (b)

investment is highly sensitive to π , and vice versa, so that a (large) reform would increase π and reduce investment. As the phase diagrams show, only (b) is a stable equilibrium, whereas (a) is unstable. Therefore, the problem of multiple equilibria does not really exist. Note that the investment locus in (b) can shift downwards as well so that the reform increases investment and reduces the probability of collapse.

Figure 3.5. Incredible Liberalization and Investment: Multiple Equilibria.



(a)



(b)

Summarizing, private agents recalculate their inventory holding decision when new information becomes available. Every upward revision of π_s increases the likelihood of accumulation of inventories. A further depletion of reserves speeds up the process. Compared to unrevised expectations, a sufficiently large upward revision means larger stocks after the initial accumulation. If π_s is revised downwards, stocks will also be reduced.

As discussed earlier, the objective probability of reversing the reform π_0 is likely to be an increasing function of π_s . For example, if the initial π_s is high enough to induce speculative behaviour, and the accompanying drop in reserves triggers a further upward-revision in it, more inventories will be acquired at an accelerating speed over time. Because of that the reserves fall at an increasing speed. Their maintenance would require a larger depreciation than would have initially been the case. A large depreciation may be politically infeasible, so that the only policy measure the government is left with is reversal of the reform in order to avoid a complete run-down of its external reserves. Hence, an upward revision of the subjective probability π_s can jeopardize persistence of the entire liberalization by increasing the objective probability π_0 . It is therefore in the government's interest to try and keep the earlier π_s 's low and from being revised upwards until sufficient economic interests in the reform have been entrenched.

3.2 Models for Consumption Cost

In this section we will set up simple frameworks to analyze the welfare cost of incredible trade liberalization to consumption. We will abstract from static gains from trade and concentrate on assessing the adverse effects of speculative behaviour. Private agents suspect that the trade reform under way may be reversed, and imports are temporarily cheaper. Temporary cheapening of imports is possible when trade liberalization is either time-inconsistent, macro incompatible, or made compatible by virtue of foreign aid (in order to allow a large reform but slow exchange rate adjustment). Consumption costs are created either by a deviation from the optimal consumption path, or by a deviation from the optimal purchases relative to consumption, i.e. accumulation of stocks. The two basic cases we will model are:

- (i) one importable consumer good, perfect capital market and storability
- (ii) consumption of both exportables and importables, absence of consumer credit and storability

Two models by Calvo (1987, 1988), summarized in Chapter II, are our starting point. One of the models analyzes non-optimal intertemporal substitution in consumption resulting from an expected change in the price level. The other imposes constant consumption over time but allows for storability of importables. Recall that Calvo assumes the public to be perfectly certain that the reform will collapse at time T . While relying on Calvo's basic intuitions regarding the sources of welfare costs when liberalization is perceived temporary by the private sector, our analysis deviates in two major respects.

First, we will introduce uncertainty concerning sustainability of the reform. Private agents attach a subjective probability to a reversal of reform in period two. It is different from the objective (rational expectations) probability, which we assume to be equal to zero. The government is neo-classical, i.e. it is a true liberalizer. Uncertainty may be created by either incomplete information in the private sector concerning the type of government, as suggested by Engel and Kletzer (1987), or it may be due to inavailability of sufficient data to determine whether or not the reform remains compatible in the face of future external shocks (as in Froot, 1988), although he assumes rational expectations so that the objective probability is equal to the subjective probability). As we will examine private speculative behaviour during the first of the two periods, it does not matter very much what we assume about the type of the government as long as it liberalizes trade in period one (i.e. the government is not Pigovian which would take expected private behaviour into account and use period-one tariffs if they improved welfare). The welfare cost, if any, is incurred regardless of what the government does in period two. Prior to application of the subjective probability, we will model a situation where private agents perceive "a rate of decay" at which they believe liberalization erodes over time. Thereafter the probabilistic approach will be adopted.

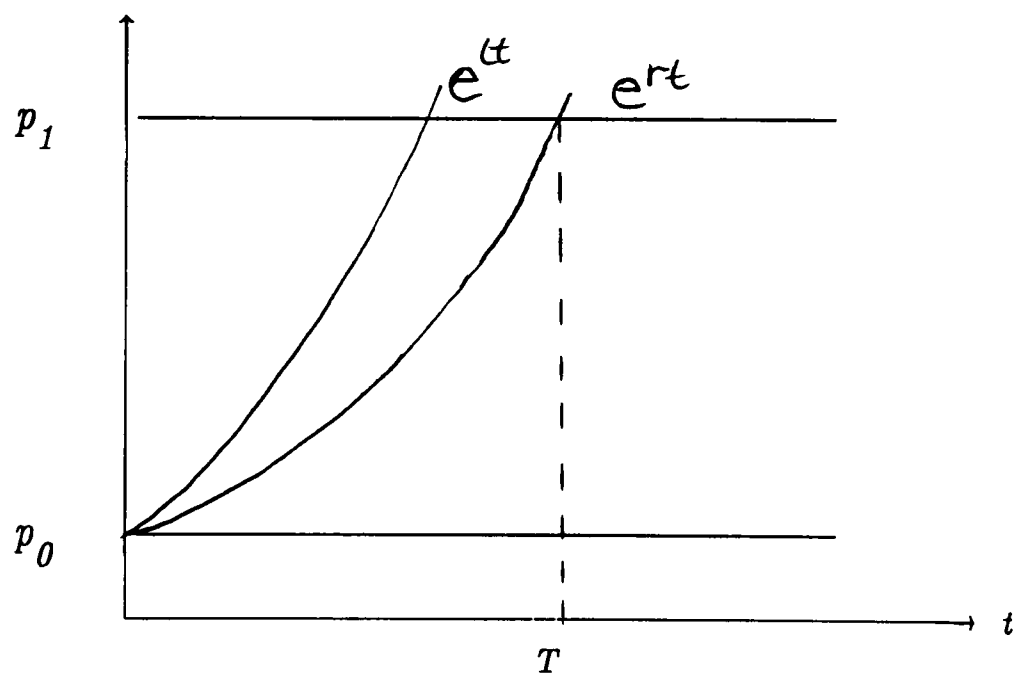
Second, in many low-income countries, particularly in Africa, consumer credit is not readily available. Unrestricted access to the credit market with horizontal cost of borrowing may well reflect the realities of Latin America, perhaps even those of franc zone African economies, but is certainly less applicable to Eastern and Southern African countries, where such a credit market is absent. In sum, we would expect that inclusion of uncertainty and unavailability of consumer credit would make some of the unrealistic predictions of Calvo's models more plausible.

3.2.1 Storability with Access to Capital Market

3.2.1.1 Rate of Decay of Credibility

Consider a small open economy that consumes an importable and produces an exportable good. The latter is not consumed domestically but it yields a constant income stream. Let us assume that private agents perceive a rate of decay l at which they believe trade liberalization will erode over time. If l is higher than the world interest rate r , consumers will accumulate a stock of importables at the moment the reduction in tariffs takes place. This is depicted in Figure 3.6. If l is less than r , there will be no accumulation of inventories, and the existence of the rate of decay does not have any effect on private behaviour.

Figure 3.6. Rate of Decay of Credibility and Accumulation of Stocks.



The optimal consumption path c is constant, if we assume that the interest rate on international bonds r is equal to the subjective rate of time preference in

consumption. In one—instant liberalization, the optimal depletion time of stocks T is determined by the intersection of the horizontal line p_1 , which stands for the future price of importables, and the interest rate curve e^{rt} . Note that the future price p_1 is equal to the pre—liberalization price. In other words, when curve e^{rt} intersects with p_1 , it is the point in time when the public anticipates the reform to collapse. According to Figure 3.6, it pays off to stock beyond that point up to time T . This can be expressed by the following equation:

$$(3.9) \quad p_0 e^{rT} = p_1,$$

which yields us $T = \ln(p_1/p_0)^{1/r}$. The amount of stocks Z that a representative household accumulates can then be expressed by $Z = cT$, or $Z = c \cdot \ln(p_1)^{1/r}$, where the period one price has been normalized to equal unity.

Despite a different assumption regarding the type of credibility erosion process, we obtain exactly the same optimal depletion time T as Calvo (1988) derived for his one—instant liberalization case. Recall that Calvo assumes that trade liberalization will be reversed when an exogenously given time has elapsed (in the one—instant case it happens instantaneously), and that just before the elapse private agents purchase a stock of durables.

We can calculate the welfare cost of an incredible trade reform from the budget constraint of an infinitely—lived representative household:

$$(3.10) \quad y/r + G - \ln(p_1)^{1/r} c - p_1 c \int_T^{\infty} e^{-rt} dt = 0$$

where y is the flow of income from exports, and G , $G = (p_I - 1)c \int_T^{\infty} e^{-rt} dt$, is the lump-sum transfer from tariffs. Purchases are resumed only when the stock is depleted. Note that the debt incurred for the purchase of inventories is assumed to be paid back over the entire time horizon ($0 \leq t < \infty$). The optimal consumption under imperfect credibility is then:

$$(3.11) \quad c = y / [1/p_I + \ln p_I]$$

Again the consumption path is the same as in Calvo (1988). The result is not so surprising if we recall that the public loses faith in free trade upon its imposition, very much in the same way as in Calvo's one-instant case. The world interest rate r and the level of tariffs alone determine the optimal depletion time for inventories, whereas the rate of decay has no role in it. The welfare cost can be defined as the deviation between the optimal consumption when stocks are held [$c = y / (1/p_I + \ln p_I)$] and that under perfect credibility ($c^* = y$):

$$(3.12) \quad \theta = 1 - c/c^* = 1 - 1/[1/p_I + \ln p_I]$$

The welfare cost turns out to be a function of the level of tariffs alone and independent of the interest rate which, by assumption, has to be smaller than the rate of decay.

The rate of decay could be extended into more complex models of consumer behaviour. We will not pursue it further, however, as the subjective probability of policy reversal is a more useful device for modelling uncertainty. Therefore, the

probabilistic approach, as described in Section 3.1, will be adopted in the rest of this chapter.

3.2.1.2 Subjective Probability of Reversal

Abstracting from the supply-related gains from trade, let us consider a utility maximizing household which has access to credit. The household faces an inventory holding (or consumption smoothing) problem in the presence of uncertainty concerning the permanence of a trade reform undertaken by the government. Provided the probability of default is high enough relative to the interest rate and level of tariffs, the household will accumulate a stock s of durable consumer good c during the liberal period in anticipation of a policy reversal back to protectionism. A risk-neutral consumer is willing to borrow and will buy a stock equal to period two consumption if $r = (1+\rho) < (1+\pi\tau)$, where ρ is the (positive) interest rate on the alternative asset, τ is the (implicit) tariff rate and π the subjective probability of trade reform being aborted. Of course, there will be no stock accumulation if private agents expect the gain from holding inventories to be lower than the positive interest rate. For example, if π is equal to unity, then for a risk-neutral consumer the critical value of τ is equal to ρ , i.e. the tariff rate equals the interest rate. If π is equal to 0.5 instead, then the critical value of τ is 2ρ . If we allow for risk-aversion, the consumer will borrow and stock even if τ is less than ρ or 2ρ , respectively. The greater the degree of risk-aversion, the more likely the representative agent is to purchase inventories at a given probability of collapse.

Allowing for uncertainty, intertemporal substitution in consumption and accumulation of stocks, the optimization problem of the household can be expressed as follows:

$$(3.13) \quad \begin{aligned} \max \quad & u_1(y_1 + b - s) + \beta[(1 - \pi)u_2(y_2 - rb + s) + \pi u_2((y_2 - rb + T)/p_2 + s)] \\ & b; s \geq 0 \end{aligned}$$

where u denotes an additively separable utility function, b is borrowing in period one, β is the world discount factor, and T denotes a lump-sum transfer from tariff revenue. Income flows y_1 and y_2 are derived from the exportable good which is not consumed domestically. If unlimited access to credit at a constant interest rate were assumed, the representative consumer would have an incentive to borrow far beyond his budget constraint during the first period and sell during the second period. We want to exclude this possibility, and therefore assume that the interest rate r is an increasing function of borrowing b in order to obtain an interior solution for stock accumulation. Uncertainty about income is assumed to be resolved by the time private decisions concerning purchases and consumption are taken. The price of the exportable good is normalized to equal one. The price of the imported consumer good c in period one can also be normalized to equal one, i.e. $p_1 = 1$, whereas in the second period it is $p_2 = 1 + \tau$ with probability π and $p_2 = 1$ with probability $(1 - \pi)$.

It is straightforward to determine the welfare cost created by a less than perfectly anticipated future tariff by solving the above utility maximization problem with

perfect credibility (when no stocks are accumulated) and by comparing the resulting consumption and utility levels with those in the presence of binding uncertainty, i.e. when inventories are purchased.

Let us first examine the case where the existence of π induces the representative agent to buy a stock s . We can write the first-order conditions for problem (3.13) as follows, assuming lump-sum transfers from tariff revenue:

$$(3.14) \quad u_1'(\cdot)ds = \beta u_2'(\cdot)ds$$

$$(3.15) \quad u_1'(\cdot)db = \beta[u_2'(\cdot)db(r + br')(1 - \pi + \pi/p_2)]$$

where ' denotes the first derivate. Assuming a specific form for the utility function, the optimal stock s^* and the optimal borrowing b^* can be solved from equations (3.14) and (3.15).

Let us next derive consumption levels c_1 and c_2 in the absence of uncertainty and speculative stocks. A simple iso-elastic utility function is assumed:

$$(3.16) \quad \max_b (y_1 + b)^{1-\alpha}/(1-\alpha) + \beta(y_2 - rb)^{1-\alpha}/(1-\alpha)$$

where α is the elasticity of marginal utility ($\alpha > 0$). We obtain the following first-order condition:

$$(3.17) \quad (y_1 + b) = [\beta(r + br')]^{-1/\alpha} (y_2 - rb)$$

where interest rate r is a function of borrowing b and $'$ denotes the first derivative.

Comparison of the two cases, i.e. perfect and imperfect credibility, is made easier by a numerical example. Let us assume that the implicit tariff is 100 percent ($\tau=1$)²⁰, the elasticity of marginal utility α is 0.5, the discount factor is $\beta = 0.9091$ and that a collapse is perceived to be equally likely as persistence of the reform ($\pi=0.5$). In addition, we assume that the interest rate for consumer credit is an increasing function of borrowing. The following simple linear relationship is assumed:

$$(3.18) \quad r = 1.1 + 0.003b$$

Table 3.1 summarizes the results of the above numerical example for both perfect credibility and uncertainty concerning the permanence of the reform.

²⁰For example, in Kenya the average implicit tariff for six industrial sub-sectors is estimated at 112 percent (Maxwell Stamp Associates, 1989).

Table 3.1. Consumption under Perfect and Imperfect Credibility
when Credit is Available.

	Certainty	Uncertainty
$\bar{c}_1$	100.0	104.89
$\bar{c}_2$	100.0	86.69
b	—	+38.90
s^*	—	34.01

Notes: $\tau=1$; $r=1.1+0.003b$; $\alpha=0.5$, $\beta=0.9091$, $\pi=0.5$, y_1 and $y_2=100$;
 $b<0$ saving, $b>0$ borrowing in period 1

With constant income levels $y_1 = 100$ and $y_2 = 100$ units, for example, and in the absence of a credibility problem, the representative household will consume 100 units of the importable good during both periods. In other words, consumption equals constant income as the consumption rate of interest and the saving rate are equal by assumption (in the absence of borrowing), and prices do not change between periods. Assuming uncertainty ($\pi=0.5$) but retaining all the other assumptions, the optimal borrowing in period one is 38.9 units, and an optimal stock s^* is 34.01 units. Consumption in period one $\bar{c}_1$ is 104.89 units, while consumption in period two $\bar{c}_2$ is 86.69 units.

Inserting the optimal consumptions into the utility function, the cost of incredibility turns out to be 0.8 utility units out of 38.2 units attainable under perfect credibility.

Hence the welfare cost is 2 percent. This is a considerable cost compared, for example, to the empirically derived costs of protection²¹ but lower than the cost obtained from simulating a model by Calvo (1988).

What did we achieve by modifying Calvo's model which assumes incredibility without uncertainty and a perfect capital market (which is equal to assuming a constant interest rate)? The main advantage is that we can introduce uncertainty in a relatively simple consumption model. Adoption of the two-period framework, however, does not reduce the prediction for the current account deficit in period one and the size of the stocks which remain unrealistically high, if perfect capital market is assumed. The representative agent has an incentive to borrow excessively in period one and sell in period two. To make the model more plausible we assumed that the interest rate is an increasing function of borrowing. To obtain an even more plausible prediction of consumer behaviour, our next model will focus on a case where both exportable and importable goods are consumed but households' access to credit is restricted so that inventories of importables, if accumulated, must be financed by reducing domestic consumption of the exportable good.

The assumption that consumers do not have access to credit gives a more realistic description of many developing countries where capital markets are rationed. For example, there is a major difference in the openness of capital markets between

²¹Harberger (1959), for example, estimated that the welfare costs of protection in Chile was 2.5 percent of GNP. Smith and Venables (1988) show that a reduction in intra-EC trade barriers would increase welfare, defined as the sum of profits and consumer surplus, by 0.64 percent of base year (1982) consumption. Trade liberalization is assumed to take the form of equiproportionate reductions in intra-EC tariff equivalent trade barriers. The size of these reductions is chosen so that the direct cost saving achieved by the policy is equal to 2.5 percent of the value of base level intra-EC trade.

Latin America and anglophone Africa. The main idea behind the two models by Calvo is to show how considerable openness in the capital market can be harmful when trade liberalization lacks credibility. The model which will be developed in the next section is more applicable to Sub-Saharan Africa where consumer credit is unavailable but private agents still accumulate inventories of durables during a liberal trade regime which lacks credibility. Stock accumulation takes place in spite of an increasing interest rate and a high opportunity cost.

3.2.2 Absence of Consumer Credit and Storability

In this section we assume a two-sector economy where both the exportable and importable goods are consumed. The time horizon is again two periods. The government adopts a liberal import policy in period one, but private agents believe that liberalization will be reversed with subjective probability π in period two so that the pre-liberalization tariff τ is reimposed. We assume, however, that the government is a true liberalizer and that it keeps the tariff at zero in period two as well. If the product of the tariff and the subjective probability of reversal is sufficiently high, consumers will buy stocks of the importable good during the liberal period. They do not have access to a capital market, however, which implies that the accumulation of stocks must be financed by consuming less of the exportable good.

The private sector is represented by a single household that has an additively separable utility function, u . The marginal cost of stock-holding is not horizontal as in Calvo (1988) but increasing as any new unit of stocks costs the consumer more in

terms of foregone consumption of the exportable good. Consumption of the importable and exportable good are denoted by c_i and x_i ($i=1,2$) respectively, y_i stands for income and s for stocks. We can think of s as being an asset with zero rate of return but with a positive capital gain. For the exportable good purchases equal consumption, whereas for the importable good purchases and consumption differ in both periods. To find the optimal size of the stock we can formulate the following intertemporal utility maximization problem for the representative household:

$$\begin{aligned}
 (3.19) \quad & \underset{c_1, x_1, c_2, x_2, s}{\text{max}} \quad u_1(c_1 - s, x_1) + \beta u_2(c_2 + s, x_2) \\
 & \text{such that} \quad c_1 + x_1 \leq y_1 \\
 & \quad \quad \quad p_2 c_2 + x_2 \leq \bar{y}_2 \\
 & \quad \quad \quad c_1, x_1, c_2, x_2 > 0 \\
 & \quad \quad \quad s \geq 0; \quad 0 < \pi < 1
 \end{aligned}$$

The price of the exportable good is determined by the world market, and can be normalized to equal unity. The same applies to the importable good in period one, whereas in the second period its price p_2 is equal to $1+\tau$ ($= p$) with probability π , and to unity with probability $(1-\pi)$. The domestic discount factor then becomes $\beta[\pi/(1+\tau) + (1-\pi)]$ which is smaller than the world discount factor β . If we think beyond the two periods, it is easy to see that the domestic discount factor decreases over time since the expected price of good c goes up.²² Because consumers substitute

²²See also Ferraguto (1991) who formulates utility maximization over time as an optimal control problem.

more and more intertemporally, we can conclude that the resulting welfare loss is a monotonically increasing function of the duration of uncertain liberalization. Period two income is given by:

$$(3.20) \quad \bar{y}_2 = y_2 + \pi \tau c_2^\pi$$

Private agents do not, however, recognize this but treat the period two income $\bar{y}_2$ as exogenously given, when they choose their optimal consumption. Equation (3.20) holds for the market equilibrium.

We can solve the problem by using dynamic programming. This yields us the optimal stocks as a function of income y , the discount factor β , tariffs τ and the probability of collapse π :

$$(3.21) \quad s = s(y_1, \bar{y}_2, \beta, \tau, \pi)$$

Let us assume an additively separable utility function of simple iso-elastic form:

$$(3.22) \quad \max_{c_1, x_1, c_2, x_2, s} [(c_1 - s)x_1]^{1-\alpha}/(1-\alpha) + \beta[(c_2 + s)x_2]^{1-\alpha}/(1-\alpha)$$

For the second period the household will solve the following problem:

$$(3.23) \quad \max_{c_2, x_2} [(c_2 + s)x_2]^{1-\alpha}/(1-\alpha) \quad s.t. \quad \bar{y}_2 \geq p_2 c_2 + x_2$$

The optimal purchases of the two goods are:

$$(3.24) \quad x_2 = \bar{y}_2/2 + p_2 s/2 \quad c_2 = \bar{y}_2/2p_2 - s/2$$

We are able to compute the value of the objective function as a function of s for each of the two possible prices of importable good. When the trade reform persists ($p_2 = 1$), the optimal value is $\beta(\bar{y}_2/2 + s/2)^{2(1-\alpha)}/(1-\alpha)$, while if it is aborted ($p_2 = 1 + \tau = p$) the optimal value is $\beta p^{1-\alpha}(\bar{y}_2/2p + s/2)^{2(1-\alpha)}/(1-\alpha)$.

For period one, the representative household solves the problem:

$$(3.25) \quad \max_{c_1, x_1} [(c_1 - s)x_1]^{1-\alpha}/(1-\alpha) \quad s.t. \quad c_1 + x_1 \leq y_1$$

This gives us the optimal purchases:

$$(3.26) \quad x_1 = y_1/2 - s/2 \quad c_1 = y_1/2 + s/2$$

The optimal stock of durables can then be derived from (3.27). Note that consumers are assumed to discount future consumption at the world rate, i.e. they stock rather than substitute intertemporally.

$$(3.27) \quad \max_s \quad (y_1 - s)^{2(1-\alpha)} + \pi \beta p^{1-\alpha} (\bar{y}_2/p + s)^{2(1-\alpha)} \\ + (1-\pi) \beta (\bar{y}_2 + s)^{2(1-\alpha)}$$

The equation we obtain for the optimal stock cannot, however, be solved explicitly:

$$(3.28) \quad \pi\beta p^{1-\alpha}(\bar{y}_2/p + s)^{1-2\alpha} + (1-\pi)\beta(\bar{y}_2 + s)^{1-2\alpha} - (y_1 - s)^{1-2\alpha} = 0$$

How can we interpret this result? There are three forces at work when a decision concerning the optimal stock is taken, and the size of the stock results from interaction of these forces. First, the presence of the discount rate β (< 1) implies, in general, a preference for consuming now rather than later. The optimal stock would be negative but we have eliminated that possibility ($s \geq 0$). Simulation of equation (3.28) shows that the higher β is, the larger is the stock s . Second, the consumer is willing to transfer income from periods of high income to those when income is lower (consumption smoothing). In order for there to be a positive stock, income in period one must exceed the present value of period two income. Third, the importable good is expected to be more expensive in the second period which gives rise to storage. By simulating equation (3.28) we can see that s is an increasing function of p , τ and π . Finally, the higher is the elasticity of marginal utility α , ceteris paribus, the smaller is the stock s .

Let us illustrate the magnitude of the welfare cost again by an example. Assuming that the elasticity of marginal utility α is 0.75, the world discount factor β is 0.95, the probability of collapse is perceived to be equally likely as the persistence of the reform ($\pi = 0.5$), the implicit tariff is 100 percent ($\tau = 1$, or $p = 2$), and income in period one y_1 is 100 units, we can derive the optimal stock from equation (3.28). Assuming further that the representative household expects its period two income to be 110 units (instead of 100 units) because of anticipated transfers from tariff revenue, inventories of imported durables at the end of period one will be 16.2 units

(or 16.2 percent of the GNP), and consumption in period one 41.9 units of each good. In this example the critical probability of default π_c to trigger stock accumulation is 0.15.

In period two, when private agents realize that the reform is not reversed (and their income is 100 units since there are no transfers), purchases of imports will be 41.9 units while its consumption is 58.1. As to the exportable good, 58.1 units will be purchased and consumed. In the absence of the credibility problem, there would be no accumulation of inventories and income would be evenly spent on both goods, i.e. 50–50 in each period. Comparison of the results under perfect and imperfect credibility is summarized in Table 3.2.

Table 3.2. Consumption under Perfect and Imperfect Credibility
in the Absence of Credit.

	Certainty	Uncertainty	
c_1	50	58.1	(purchases)
c_1-s	50	41.9	(consumption)
x_1	50	41.9	(consumption)
c_2	50	41.9	(purchases)
c_2-s	50	58.1	(consumption)
x_2	50	58.1	(consumption)
s	—	16.2	

Notes: $\alpha=0.75, \tau=1, \beta=0.95, \pi=0.5, y_1=100, \bar{y}_2=110$

As before, we can now calculate the welfare loss by inserting the optimal consumption levels into the utility function. The social cost of inventory accumulation turns out to be much lower than before, i.e. 0.5 percent of the total attainable utility under credibility. Instead of limiting our analysis to the above example alone, more simulations could be carried out to see how consumption costs are affected by different π 's as well as by different values of other parameters. We will not carry out any further simulations, however, as our simple example is able to convey the basic idea how consumer behaviour changes in the presence of uncertainty.

It is useful to compare the predictions of the present model with those derived from the perfect capital market and one consumer good version. Depending on the level of tariffs, the probability of collapse and the interest rate, the optimal stock in the former model would be either zero or the entire period two consumption. In the model without access to consumer credit, however, the interest rate becomes endogenous, and we are able to obtain an interior solution to the stock holding problem. Predictions for the level of stocks relative to GNP and the welfare cost become more realistic. Despite the fact that our model is very simple, consumption in period two comes from both stocks and purchases. Incredibility increases purchases of the importable good in period one and reduces them in period two, but will not drive them to zero. At the aggregate level, some agents in the economy typically have access to capital and some do not. The latter group will have to make purchases in both periods, while the former can accumulate stocks during the liberal period. This model is therefore more applicable in the context of Sub-Saharan Africa where consumer credit is restricted but private agents still accumulate speculative inventories of durables during a more liberal trade regime which lacks credibility and creates uncertainty.

3.3 Models for Social Cost on the Supply Side

In this section we will model two different types of production costs that can arise from a lack of credibility in trade reform. As before, we will assume that private agents do not have rational expectations, i.e. they do not perceive the objective probability of collapse. In order to simplify the comparison between credible and incredible liberalization, we will again assume that the government is a true liberalizer. In the first model, there is an adverse effect on reallocation of factors. In particular, we will look at the effects on capital relocation from import–substitution to the export sector. Uncertainty about the persistence of the reform can lead to inaction by capital owners because the relative price change may not be sufficient to compensate for the adjustment costs of shifting to another sector as well as for those caused by a possible reversal. Second, a lack of confidence in liberal trade policies will affect investors' behaviour when they decide about new investment. Reallocation is assumed to take place by letting capital depreciate in the contracting sector, and directing all gross investment to the expanding sector. Note that reallocation by depreciation does not involve adjustment costs. As there is no access to foreign savings, investors can defer investment in physical plant by accumulating inventories of imports until uncertainty concerning future returns has been resolved.

There are two models that are particularly helpful when analyzing the adverse effects of incredibility on reallocation of capital. The first is Dixit (1989) who concentrates on volatile world prices and costly capital mobility. He finds the optimal reallocation using the theory of option pricing. An asset is willingly held by the investor when its return and the expected capital gain exceed the return

obtainable from an alternative asset. Furthermore, the total value of each capital unit is the expected marginal product in the initial sector, i.e. preserving the initial capital allocation forever, plus the option value of moving to the other sector. A unit of capital is moved if its total value in the new sector exceeds that in the initial sector, plus the adjustment cost. Solving the option pricing problems yields the values of the two real assets, and the rules for exercising the options, i.e. the output prices that trigger entry and exit. Uncertainty combined with costly relocation of capital yields hysteresis, i.e. a zone of inaction where no shift of resources takes place, unless the price change is large enough to cross the band of inaction.

The second model is Rodrik (1989b) who applies the idea of hysteresis to trade liberalization. The model assumes that a policy reform increases the return to capital in the export sector, whereas the return in the import–substituting sector remains the same as before. The investor is assumed to own one unit of capital which at the time of reform is invested in the import–substituting sector. He can either leave it there or shift it to the export sector in response to the reform. If shifted, the expected value of capital in the latter sector must exceed that in the former sector plus the adjustment cost. If the anticipated policy reversal is sufficiently small, the unit of capital once shifted can be expected to stay put in the export sector. But if the expected change in the return is large enough, it is likely to be moved back to the import–substituting sector. Rodrik derives an equation that relates the size of the reform – which is equal, by assumption, to the size of a potential reversal – to the cost of capital mobility and to the *ex ante* probability of sustainability. The reform must be large enough not only to make the two returns comparable but also to compensate for the adjustment costs as well as for the possibility that it has to be shifted back in case of reversal.

The model for deferral of investment is reminiscent of van Wijnbergen (1985) who assumes access to riskless foreign savings and irreversible capital. Unlike van Wijnbergen, we will assume that investors do not have access to foreign assets but availability of foreign exchange for imports makes accumulation of imported intermediate goods and consumer durables an attractive alternative to investment in physical plant. Particularly in Sub-Saharan Africa capital controls have been retained when foreign trade is liberalized, but importers typically gain an easier access to foreign currency during a liberalization episode.

3.3.1 Uncertainty and Reallocation of Capital

Consider a two-sector model for a small open economy which produces an importable good c and an exportable good x , the former being protected by tariffs τ . Good x is the numeraire, and the world prices of both goods are normalized to equal unity. Other factors than capital are constant and kept in the background. Hence the fixed capital stock K stands for all factors which can be moved at a cost across the sectors. Production can be modelled by means of a revenue function $R(P, M)$, where P is the price vector, M is the amount of capital allocated in the export sector and $(K-M)$ is that in the protected sector. F and G are standard Cobb–Douglas production functions for exports and imports, respectively:

$$(3.37) \quad R(P, M) = F(M) + G(K-M)$$

where $F(M) = F_o M^\delta$ and $G(K-M) = G_o (K-M)^\gamma$. We are interested in the total cost of inaction caused by a lack of credibility and will, therefore, examine the effects on

total allocations between the two sectors. Trade liberalization is assumed to reduce the output price of the import–substituting sector from $p_c = 1+\tau$ to $p_c = 1$. The representative capital owner, who is uncertain about the permanence of the reform, has to decide whether or not to shift capital to the export sector.

The value of capital when none of it is shifted to the export sector in response to the reform can be expressed:

$$(3.38) \quad V_o = [R(1, \bar{M}) + \pi(V_o^R - V_o)]/\rho$$

where $\bar{M}$ is the initial allocation of capital, $(V_o^R - V_o)$ stands for the capital gain in case of policy reversal and ρ is the interest rate. Solving for V_o and substituting $V_o^R = R(1+\tau, \bar{M})/\rho$ into equation (3.38), we obtain:

$$(3.39) \quad V_o = (\rho + \pi)^{-1} [R(1, \bar{M}) + \pi R(1+\tau, \bar{M})/\rho]$$

The value of shifting part of the capital to the export sector can be expressed:

$$(3.40) \quad V_I = [R(1, M_n) - \pi(V_I - V_I^R)]/\rho$$

where M_n is the new capital allocation after the reform and $(V_I - V_I^R)$ denotes the capital loss in case of reversal to those who have responded to the reform. When the possible reversal is large so that a shift back to import substitution is expected, the value of the capital stock is:

$$(3.41) \quad V_I^L = (\rho + \pi)^{-1} [R(1, M_n) + \pi R(1+\tau, \bar{M})/\rho - \pi \theta(M_n - \bar{M})]$$

where θ denotes the cost of moving a unit of capital back to the protected sector. Note that there will be no shift back if the reform persists. We assume that in case of shifting back all capital will return to its original sector.

To make it worthwhile for capital to relocate the net value of real assets in the export sector must exceed that in the import—substituting sector:

$$(3.42) \quad V_1^L - \epsilon(M_n - \bar{M}) \geq V_o$$

where ϵ denotes the adjustment cost of a unit of capital moved from the protected to the export sector. By substituting (3.39) and (3.41) into (3.42) we obtain:

$$(3.43) \quad R(1, M_n) \geq R(1, \bar{M}) + [\rho\epsilon + \pi(\epsilon + \theta)](M_n - \bar{M})$$

According to the above inequality the revenue created by the new allocation of capital must exceed the sum of the revenue created by capital remaining in the import—substituting sector, adjustment costs and compensation for a possible reversal.

Let us further illustrate this result by a simple example, assuming that $\delta = 1/2$ and $\gamma = 1/2$:

$$(3.44) \quad F(M) = 2M^{1/2}; \quad G(M) = 2(K-M)^{1/2}$$

If we assume that τ is equal to unity, i.e. the (uniform) implicit tariff rate is 100 percent, then the initial (optimal) allocation of capital between the two sectors is

$1/5K$ in the export sector and $4/5K$ in the import—substituting industries. In case of abrupt trade liberalization which is perfectly credible and does not involve adjustment costs, the optimal allocation of capital would be $1/2K$ in both sectors. Let us further assume that the fixed capital stock is 100 units. Then the initial allocation is 20 units (or percent) in the export sector and 80 units in the import—substituting sector, and the optimal allocation in the absence of adjustment costs and uncertainty would be 50 units in both sectors.

It is straightforward to calculate what the optimal allocation in the presence of adjustment costs but without uncertainty would be. The net present value of profits can be written:

$$(3.45) \quad \Pi(M^*) = 2(M^*)^{1/2}/\rho + 2(K-M^*)^{1/2}/\rho - \epsilon(M^* - \bar{M})$$

Suppose the real interest rate is 2.5 percent, and the sunk cost associated with a move of one unit of capital to the production of exportables is 15 percent of the cost of installed capital ($\epsilon = 0.15$). Then profits will be maximized when 28.7 units of capital are moved to the export sector, or the amount of capital in the export sector M^* is 48.7 units and that in the import—substituting sector ($K-M^*$) is 51.3 units. In other words, the presence of adjustment costs ($\epsilon = 0.15$) prevents only 1.3 units of capital from being reallocated in response to the reform. This is 4.3 percent of the total amount of capital that would have been shifted without mobility being costly. The higher the adjustment cost, however, the smaller is the amount of capital shifted due to the reform.

By maximizing (3.46) with respect to M_n we obtain the entrepreneur's optimal response to the reform in the presence of uncertainty concerning sustainability of the reform:

$$(3.46) \quad \max_{M_n} 2M_n^{1/2} + 2(K - M_n)^{1/2} - [\rho\epsilon + \pi(\epsilon + \theta)](M_n - \bar{M}).$$

Let us assume the same entry cost as before, an exit cost of 10 percent of the value of installed capital ($\theta = 0.1$) when the move is reversed, and a low probability of collapse, such as 10 percent ($\pi = 0.1$). Then 20.1 units of capital will be shifted to production of exportables. If π is 20 percent, only 12.5 units will be shifted. An increase in the likelihood of default will eventually prevent all relocation of capital. When π is 0.5, for example, or collapse is considered to be as likely as success, no capital at all will be shifted away from the formerly protected sector. Note that sufficiently high adjustment costs will prevent relocation of capital also at lower probabilities than $\pi = 0.5$.

Summarizing, the higher the probability of collapse, the less will capital reallocate in response to the reform. This implies that at higher probabilities a large reform — i.e. abrupt rather than gradual — is required to induce investors to respond to it. If capital is sector-specific so that adjustment costs are relatively high, even very low probabilities become prohibitive. Because of the credibility problem, relocation of capital in favour of the export sector is not sufficient from the social viewpoint. The total loss of production over time can be calculated as the difference between the net present value of output under perfect credibility and that under uncertainty:

	$\pi = 0.1$	$\pi = 0.2$	$\pi = 0.5$
Loss of Output	0.4%	1.4%	4.7%

The largest possible welfare cost (4.7 percent) in terms of lost output is considerably higher than the average empirical results concerning the cost of protection relative to GNP (see footnote 21). Note that it is not directly comparable to the consumption cost derived earlier as the latter was expressed in terms of utility units.

3.3.2 Deferral of Investment

In some cases, such as during temporary export booms, deferring investment by means of foreign savings is likely to be beneficial both from the private and social point of view. Unlike an increase in permanent income, transient income is, to a large extent, saved which temporarily loosens financial constraints in a controlled economy. An investment boom results, causing a fall in the rates of return and pushing up the cost of capital goods, particularly if the private sector is not allowed to hold foreign assets (Bevan *et al.* 1990b). Deferral combined with access to foreign savings would then even out the investment boom for a longer period of time, preventing a large fall in the rental to capital.

Our last model will address a situation where deferral of investment is detrimental from the social point of view as there is no positive shock or investment boom in the economy. We will restrict the analysis to depreciation investment, following a trade reform which is perceived to lack credibility. A representative investor is assumed to

have no access to foreign savings but can invest either in the export or import—competing sector, in a low—yield but riskless domestic financial asset, or accumulate inventories of imported goods because foreign exchange is available for imports. Inventories are preferred if their expected return exceeds the domestic interest rate, or the expected return to physical capital, adjusted by the risk premium if the investor is risk—averse.²³

Van Wijnbergen (1985) derives an option value to foreign exchange when investment in physical capital is irreversible and risk—neutral entrepreneurs are uncertain whether or not the liberal trade policy will last. Unlike van Wijnbergen, we assume that the supply of foreign savings is restricted but foreign currency can be obtained for imports. This is a more relevant assumption for Sub—Saharan Africa where capital controls are usually retained during trade liberalization episodes but access to foreign exchange is relaxed. When the real interest rate on domestic financial assets is low (or negative), investors prefer to accumulate stocks of importables as a means to defer investment. At the beginning of period one a truly liberalizing government announces and implements a (large) reduction in protection of the import—substituting sector. As we assumed in Sections 3.2 and 3.3.1, private agents suspect that the reform may be reversed by the beginning of period two with the subjective probability π . We assume that investment takes effect immediately and is productive for two periods and ignore any salvage value. The values of the different assets can then be expressed:

²³In Zambia, for example, the foreign exchange auction, initiated in October 1985 and combined with trade liberalization, became incredible to the private sector around mid—1986, inducing accumulation of inventories which considerably exceeded gross fixed capital formation in 1986. The manufacturing sector was able to increase borrowing to finance these purchases. As a result they bid more and more for foreign exchange so that the Kwacha kept falling in value until the auction *cum* liberalization had to be reversed in 1987 (Bates & Collier 1993).

$$(3.47) \quad V_{IS} = r + \beta\pi r^* + \beta(1-\pi)r$$

$$(3.48) \quad V_{EP} = r^* + \beta\pi r + \beta(1-\pi)r^*$$

$$(3.49) \quad V_S = \beta\pi\tau + \beta r^*$$

$$\beta < 1; \quad 0 \leq \pi \leq 1$$

where r^* (r) is both the rate of return in the export sector if the reform persists (fails) and that in the import-substituting sector if the reform fails (persists), $r^* > r$. Unlike foreign savings, stocks are a risky asset. Their yield is zero but the expected capital gain is $\pi\tau$. It is obtained in the beginning of period two, provided the reform fails, and investment in physical capital will then be made in the sector that turns out to be favoured by the government policy in the beginning of period two. β (< 1) is the discount factor.

It is easy to see from equations (3.47)–(3.49) that, with all probabilities π , it is more profitable to invest in the export sector than in import-substitution. At probabilities lower than the critical level $\pi_c = r^*/\beta(r^* + \tau - r)$, there will be no deferral of investment and investment in physical capital in the export sector will be chosen as anticipated by the liberalizing government.²⁴ At π_c , however, the investor becomes indifferent between deferral and the export sector, and when the probability of collapse is higher than π_c , all investment will be deferred until uncertainty has been resolved. If the reform persists in period two, investment will be made in the export sector, whereas in the case of reversal it is made in

²⁴Note that if τ is sufficiently small ($\tau < [(1-\beta)r^* + \beta r]/\beta$), the critical value of π_c becomes greater than unity. This obviously implies that investment in the export sector is preferred to stockpiling of imports throughout the relevant range of the subjective probability, i.e. $0 \leq \pi \leq 1$.

import–substitution. Assume, for example, that the discount factor β is 0.91, the return to capital in the favoured sector r^* is 10 percent, while that in the other sector r is zero, and the implicit tariff is 100 percent ($\tau = 1$). Then the critical probability to induce accumulation of stocks is as low as 10 percent. At lower probabilities ($\pi < \pi_c$) the welfare cost would be zero since the private investor acts according to the policy–maker’s (truly liberalizing) intentions. At π_c the cost jumps up since all depreciation investment is deferred by accumulating stocks which yield a zero social return. The social cost of holding stocks in period one instead of investing in the export sector is therefore $\delta K r^*$, where δ denotes depreciation and K is the capital stock. The social cost associated with accumulation of imports is higher than that resulting from the use of foreign savings as a means of deferring investment.

More generally, the flexible accelerator model of investment is a dynamic investment model with adjustment costs that can be thought of as the perfectly–certain–world equivalent for the model of uncertainty and deferral of investment. In the flexible accelerator model even a small change in relative prices translates into a change in returns to different physical assets and sets in motion an investment process in order to yield a desired capital stock K^* in that sector. By assuming increasing marginal cost of adjustment, the capital stock which the firm thinks at time t that it would like to possess at time $(t+m)$ depends on existing levels of capital stock. The capital stock to be ordered at time t has to satisfy:

$$(3.50) \quad I_o(t) = \lambda[K^*(t, t+m) - K(t+m-1)] + \delta K(t+m-1)$$

where λ , a positive constant less than unity, denotes adjustment costs, and δ stands for depreciation. It can be shown that the capital stock to be held at time $(t+m)$, when adjustment costs are taken into account, is given by a convex combination of the desired capital stock and the actual capital stock the investor knows it will possess at time $(t+m-1)$ (Nickell 1978):

$$(3.51) \quad \bar{K}(t, t+m) = \lambda K^*(t, t+m) + (1-\lambda)K(t+m-1)$$

In the presence of uncertainty, the price shift in period t must be large enough to make investment in the export sector an option, particularly if the subjective probability of collapse is high. Otherwise the policy change will trigger no investment at all but investors prefer to wait and will hold liquid assets until uncertainty has been resolved.

3.4 Total Welfare Cost of Incredibility

In this chapter we have developed three simple frameworks to analyze the welfare costs of private speculation resulting from incredible trade liberalization. This section will combine these costs into two cost curves: one in utility units for consumption, and the other in output units for production. The credibility problem itself may be created by incompatible macroeconomic policies, or by the time-consistency problem due to actions or characteristics of the liberalizing government. A trade reform supported by foreign aid may also give rise to a lack of credibility if the private sector is in doubt about the government's ability or

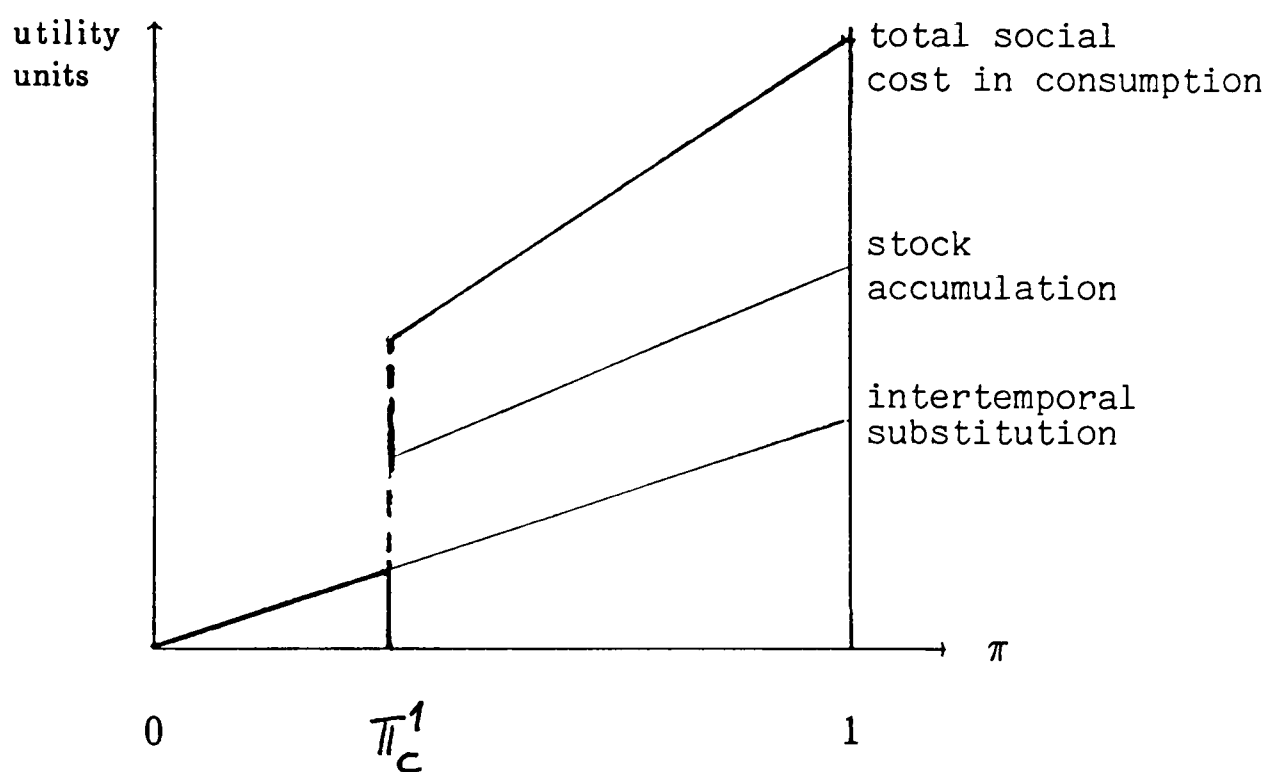
willingness to continue the reform after the aid flow has stopped. Even if the necessary conditions are being met, there are many other factors that can create a lack of credibility in the permanence of the reform. In addition, incredibility may or may not involve uncertainty. If private agents are uncertain about the permanence of the reform, they observe either the objective (actual) probability of default (rational expectations), or attach a subjective probability to a reversal of the reform in the future. Our analysis adopted the latter approach, implicitly assuming a possibility of time—inconsistency, or inavailability of sufficient data which makes macroeconomic compatibility of the reform stochastic. The government was assumed to be a neo—classical liberalizer.

Our analysis makes a distinction between consumption and production costs arising from incredibility. In consumption, if imports are perceived to be temporarily cheaper, welfare costs arise from sub—optimal intertemporal substitution or from deviations in purchases relative to consumption, i.e. accumulation of stocks of durable goods. In production, social costs can result either from sub—optimal relocation of resources in anticipation that protectionism may return after a liberal period, or from waiting in investment until uncertainty has been resolved. Without access to foreign savings firms are also likely to accumulate inventories of imported goods as a means of deferring investment in physical plant.

Based on the analysis in Section 3.2, we can define the consumption cost as an increasing function of the subjective probability of collapse π with a jump. The rate of increase, however, is not the same throughout the interval $0 \leq \pi \leq 1$. First, the

cost of sub-optimal intertemporal substitution is monotonically increasing in π .²⁵ At low probabilities, the speculative holding of stocks is likely to be nil. When π reaches a critical level there is a jump when stocks are purchased, given the levels of tariff and interest rate. Hence, below π_c^1 there are no costs related to inventories (but there is sub-optimal intertemporal substitution) and above π_c^1 the cost of holding stocks increases monotonically. After the jump the total cost curve is at a higher level, and its rate of increase accelerates. An example of the total cost curve is shown in Figure 3.8 (assuming a risk-neutral representative agent):

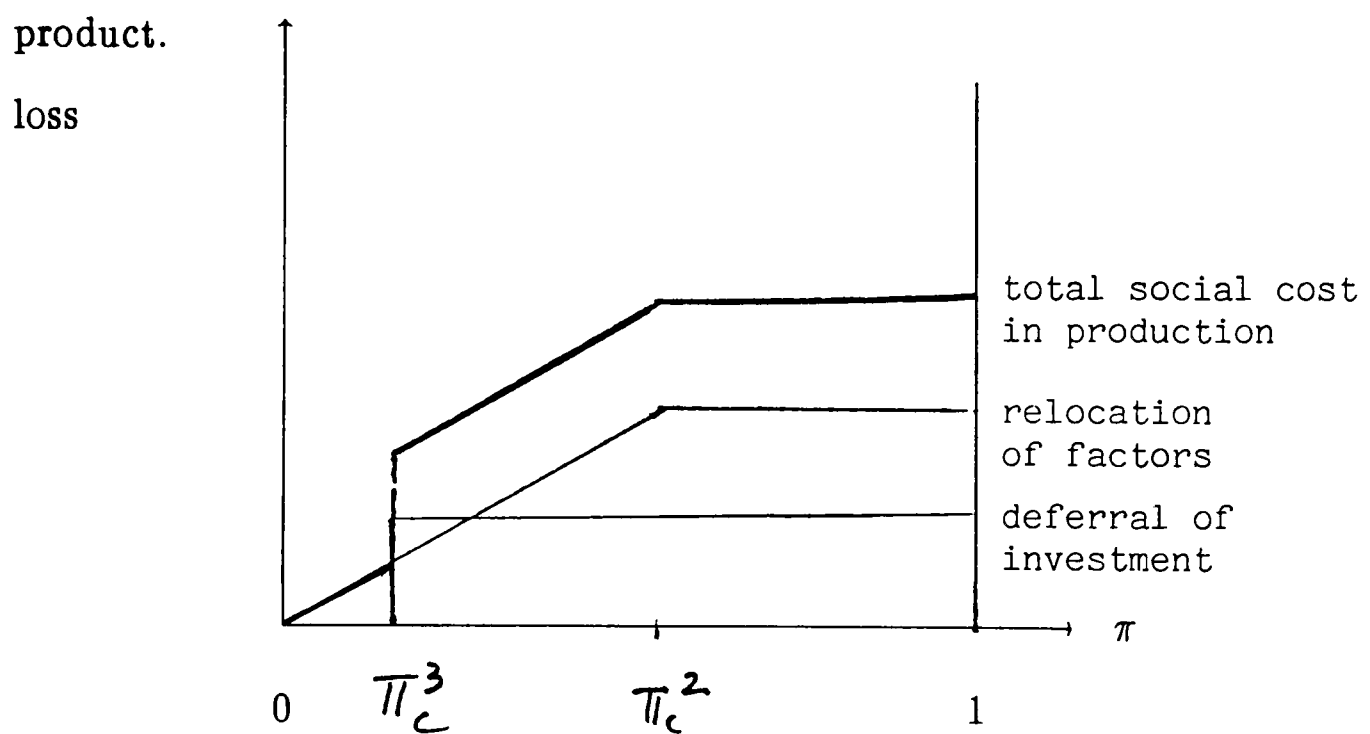
Figure 3.8. Total Social Cost in Consumption.



²⁵It is also possible that a critical probability exists below which no intertemporal substitution in consumption takes place. Such a probability is likely to be low so that the expected price change will not be sufficient to trigger any change in consumption over time.

On the production side, when π increases, the anticipated return to capital in the export sector relative to the formerly protected sector becomes less attractive. The incentive to relocate resources diminishes, increasing the welfare cost monotonically in π up to another critical value π_c^2 at which no reallocation of factors takes place and the welfare cost reaches its maximum level. As to deferral of investment, at low probabilities, given the level of tariffs, the social cost would be zero since private investors will act according to the policy-maker's intentions and invest in exportables. At a third critical value of the subjective probability π_c^3 the cost jumps up since all investment is deferred by accumulating stocks which yield a zero social return.²⁶ When the two types of social costs in production are summed up, a non-monotonic pattern with kinks emerges. An example is depicted in Figure 3.9.

Figure 3.9. Total Social Cost in Production.



²⁶One could also sketch a model in which high probabilities of policy reversal would result in investment in import substitution rather than in accumulation of inventories.

When we combine the total social cost created in both consumption and production, a complex pattern with kinks, far from being monotonic in π , appears. Since consumption costs are measured in utility units and production costs in loss of production, a straightforward comparison of the two types of welfare costs is not possible.

IV THE SPEED OF TRADE LIBERALIZATION

The speed of economic reform is an important consideration when control regimes in Africa and elsewhere are being dismantled.²⁷ It is an especially prominent issue with regard to liberalization of foreign trade. A typical feature of unilateral relaxations of import controls, commonplace in Africa since the early 1980s, is that they lack credibility in the private sector. As the credibility problem is the focus of this thesis, it will also be used to structure our discussion about the speed of liberalization, i.e. merits and demerits of an abrupt versus a gradual reform. Another important issue in economic reform is sequencing of liberalization. Sequencing refers either to the order in which various markets are liberalized,²⁸ or to the order of dismantling various trade policy instruments.²⁹ From the view point of credibility, however, the speed of liberalization is a more pertinent question than sequencing, and therefore, the latter will not be included in our discussion.

This chapter is organized as follows. Section 4.1 will examine the speed of liberalization when reforms are perfectly credible. Until recently, the lack of credibility was not given much prominence in the analysis of trade liberalization, and the assumption of perfect credibility dominated economic models. A

²⁷For example, Choksi and Papageorgiou (1986). For a discussion of demerits of economic liberalization see Banuri (1991).

²⁸For example, given the different speeds at which the goods and capital markets adjust, opening the current account first and the capital account only after some time is usually recommended (Edwards 1984).

²⁹It is usually recommended that a trade reform start with a reduction, or a removal of quantitative restrictions, temporarily replaced by tariff surcharges (in the absence of sufficient devaluation) in order to avoid large and sudden changes in relative prices. The next step in the sequencing of trade liberalization is unification of and subsequent reduction in tariffs (Thomas and Nash 1991a).

well-known result of these models is that, in the absence of both distortions and incredibility, instantaneous liberalization is superior to gradualism from the viewpoint of welfare. Introduction of adjustment costs, which have traditionally been modelled as Ricardo–Viner (sector-specific) behaviour, does not change the basic results: with a slow reallocation of capital but perfect credibility it is optimal to eliminate tariffs instantaneously (Mussa 1984). The result holds even if the adjustment costs are an increasing function in the pace of adjustment. In second-best situations where the factor markets have distortions (in addition to trade restrictions), gradualism can be shown to be superior to a big bang. The retention of a temporary tariff mitigates the adverse effects of the other distortion which cannot be dismantled as quickly as import restrictions.

We will develop two extensions of an intertemporal, two-good model, originally presented by Edwards and van Wijnbergen (1986), who analyze the optimal speed of trade liberalization in the presence of a capital constraint but perfect credibility. The first of our two extensions will incorporate a labour market distortion which cannot be removed instantaneously. We will investigate whether or not the result that gradualism is superior to a big bang continues to hold in the case of a distorted labour market. In addition, we will study the effects of trade liberalization on income distribution and employment in a similar framework when both labour and capital markets are distorted.³⁰ The second extension uses the simple consumption model developed in Chapter III to derive the welfare consequences of a gradual versus abrupt reduction in the consumption tax under financial repression and full credibility. It will be shown that our simple framework is sufficient to produce the basic result of the model by Edwards and van Wijnbergen, without explicitly specifying the entire general equilibrium.

³⁰These issues are also discussed in Reinikka–Soininen (1990)

In Section 4.2 we will consider whether the previous results concerning the speed of liberalization should be altered when the necessary and sufficient conditions for credibility are not being met. First, a taxonomy of the models of trade liberalization and incredibility (reviewed in Chapter II) will be presented according to the speed of liberalization they explicitly or implicitly suggest. The models contain arguments for three different speeds: gradualism, a big bang, and an initial overshooting from the intended level of the reform. Some of the models advocate preconditions that should be met before liberalization can be undertaken. Second, the implications of the welfare costs of speculation, as derived in Chapter III, will be examined regarding the speed of reform. Third, in the absence of compensating devaluation, external aid is frequently used to make strong and fast import liberalization compatible with other macroeconomic policies in order to enhance its credibility. The discussion will be concluded by looking at some consequences of temporary aid from the viewpoint of the optimal speed of an aided reform.

4.1 Models Assuming Perfect Credibility

Let us assume for a moment that the necessary and sufficient conditions for credibility are being met, i.e. the reform is perfectly credible to the private sector. We can distinguish at least three instances where gradualism may be a preferable policy compared to the general result of superiority of an instantaneous removal of import restrictions. First, employment considerations may make the government favour gradualism in the process of dismantling protection. Unemployment has obviously an adverse effect on welfare but its emergence and the associated short term costs may also reduce the chance of the reform's survival. The extent to which unemployment goes up will be affected by characteristics of different sectors, mobility of factors and speed of the reform. If, for example, the import-substituting

sector is highly capital-intensive and the export sector labour-intensive, then employment is likely to be less severely affected, even if the reform is strong and fast.

The notion of labour mobility can have different interpretations. On the one hand, immobility can refer to a low quit rate. Then unemployment may not rise very much, despite a fall in the relative price of output of the import-competing sector. Workers will accept lower wages if the propensity to hire in the exportable sector is smaller than the quit rate. On the other hand, immobility may refer to sector-specificity of the labour force. Then labour would neither be substituted for capital, nor hired by the other sectors, and the shed labour would remain unemployed. Lastly, the government may be more sensitive to high peaks of unemployment than to its persistence at lower levels, i.e. to the lost man-years, and would, therefore, favour gradualism. The welfare cost, however, comes from the loss of production which depends on both the duration and level of unemployment.³¹

Another consideration that is likely to affect the speed of reform is income distribution. The main short run impact of trade liberalization on income distribution arises from its effect on employment. In the absence of compensation mechanisms, the unemployed will suffer the largest income loss. When the relative price changes in favour of exportables, lay-offs can be expected due to a sudden fall in profitability of the import-substituting sector. This might be unacceptable to a government whose power base is the urban population. The severity of unemployment depends on the ability of the export sector to expand and to absorb labour. This is particularly true in the case of macro incompatible reform when a

³¹The empirical findings of a World Bank study (Michael *et al.* 1991) covering 19 countries and 36 liberalization episodes suggest that (i) liberalizations have not generally done much harm to employment, (ii) an emergence of unemployment during the liberalization episode, for whatever reason, has not been significant in determining the fate of the reform, and that (iii) much adjustment of employment seems to take place within individual sectors.

reduction in the implicit tariff takes place without depreciation. If compatibility – and credibility – are maintained by depreciation, the import–competing sector will not immediately reduce employment. The export sector becomes more profitable and will instead bid labour away from the other sectors, making the labour relocation less painful. This is of course true in a highly aggregate model only. When protection is not uniform, the sub–sectors will be differently affected. Owners of other (sector–specific) factors in manufacturing of exportables and in agriculture will benefit from the dismantling of protection. If the export sector is labour intensive, the long run effect is likely to be increased demand for labour, higher wages and a higher share of labour in GNP.³²

In second–best situations the policy–maker can temporarily mitigate the effect of a distortion in a factor market by adopting a gradual rather than an abrupt reform. Assume that the capital market has the distortion. The rationale for the second–best result is that, once trade liberalization is perfectly credible, a temporary retention of the tariff induces more savings than would be the case in abrupt liberalization. The welfare gain results from an expected fall in the future price level, which increases current savings and relaxes the capital constraint due to controls in the domestic financial market, or to a limited availability of foreign savings. The question remains, however, whether another policy instrument than trade reform would be more appropriate in bringing about the required change in the price level. As we will show in the next section, in the presence of a labour market distortion, which cannot be removed instantaneously, a temporary retention of the tariff is also likely to mitigate adverse effects of the distortion.

³²The empirical study by the World Bank (Michael *et al.* 1991) looked at the distributional effects by income level, the share of wages in national income, and the relative change of low versus high wages. Since adverse effects on employment were absent, the main source of potential deterioration of income distribution was eliminated. The number of liberalization episodes when a deterioration seems to have occurred equals the number of improvements. In the rest of the sample, there is either a mixed outcome or insufficient evidence to draw any conclusions. The study claims that only in one country out of 19 was the reform aborted because of unemployment and adverse distributional effects.

4.1.1 Welfare and Employment Effects of Liberalization with Distorted Factor Markets

Policy advice concerning economic liberalization ranges from a quick and comprehensive removal of all controls, or instant liberalization but only in carefully selected sectors to a gradual removal of distortions. The aim of this section is to study whether the existence of a labour market distortion and unemployment, or income distribution considerations constitute a case for gradualism in trade liberalization. In this analysis the reform does not suffer from a lack of credibility. The basic argument in favour of gradualism in a second-best situation is due to Edwards and van Wijnbergen (1986) who demonstrate that gradualism is superior to abrupt trade liberalization in the presence of a foreign borrowing constraint.³³ Our model adopts a similar framework but differs in several respects from the previous work.

First, we will concentrate on the effects of trade liberalization in a dual economy which has a sector-specific minimum wage of the Harris–Todaro type (1970) and urban unemployment in period one. We assume that the rigid urban wage, unlike tariffs, cannot be removed instantaneously.³⁴ As Edwards (1989) points out, the common assumption that the labour market is free of distortions may constitute a restrictive assumption for their analysis of optimal speed of trade liberalization. Our aim is to incorporate unemployment created by a sticky urban wage and to examine whether the Edwards and van Wijnbergen result holds when the distortion is in the

³³Haaparanta and Kähkönen (1986) extend their model to account for the nontraded sector and wage indexation.

³⁴There must some exogenous reason why wages adjust slowly, i.e. even if no trade reform is carried out in period one, the rigid urban wage will erode by the beginning of period two. One such reason could be nominal wage rigidity. It takes time for the price level to go up as there is a maximum inflation that the economy can tolerate (or create) during a given period of time.

labour market instead of the capital market. Recall that in an otherwise distortionless world, an instantaneous reduction in tariffs would unambiguously be welfare-improving. This also holds when factors of production are sector-specific. In other words, if tariffs are the only distortion in the economy, adjustment costs on their own do not constitute a case for gradualism. In a second-best situation, the potential welfare cost associated with a reduction in the import tariff will depend on whether it mitigates or magnifies other market distortions.

Second, we will model a situation where, in addition to a labour market distortion, investment is affected by financial repression. The latter makes the marginal domestic loan rate higher than the world interest rate, i.e. the distortion is equivalent to an investment tax. We can think of the deficit in the balance of payments (although not explicitly modelled) being reduced at the expense of investment. We will determine the implications of trade liberalization and the interaction of distortions on unemployment, and on the utilities of various income groups in order to find out whether adverse effects of an abrupt reform on income distribution, in the presence of factor market distortions, constitute a case for gradual liberalization. Hence, our welfare analysis will not abstract from income distribution but will consider the recipients of each type of factor income in the two sectors of the economy as a separate group. Finally, as the domestic discount factor is assumed to be exogenous, the current account becomes endogenous, and the effect of a tariff cut on it can be determined.

4.1.1.1 Welfare with a Sticky Urban Wage

Consider a small open economy with two traded goods, an import-competing urban good x_m , which is protected by tariffs τ , and an exportable rural good x_a .³⁵ The

³⁵The good x_m can also be interpreted as a Hicksian composite good which, for example, consists of import-competing manufacturing and exportable mining. A

economy's time horizon is two periods. Investment I takes place in the first period and enhances the urban productive capacity in the second period. The factors of production are urban capital K , sector-specific natural resources or land A , and sectorially mobile labour L . The good x_m alone is used for investment. In period one the labour market is constrained by the urban minimum wage $\bar{w}_m^1$ which is higher than rural wage w_a^1 .³⁶ Following the original Harris–Todaro model, workers are risk-neutral. We define wages and prices in terms of the agricultural good. In other words, we assume that wage negotiations are based on the price of food, which has an important share in consumption in low-income countries. Both the agricultural and manufactured good are, however, in the consumption basket of an individual consumer.

The production side of our model is a Ricardo–Viner framework which is applicable for the short and medium term rather than for a very long run, with other factors than labour also becoming mobile between the sectors. As Edwards (1989) points out, the Ricardo–Viner framework is perhaps the easiest way to model the adjustment costs of trade liberalization. On the demand side, consumers maximize an intertemporal utility function subject to a budget constraint so that the present value of expenditure does not exceed lifetime wealth. Preferences are assumed to be weakly time-separable (Svensson & Razin 1983, Edwards & Ostry 1989). Linearly homogeneous subutility functions are homothetic and the consumer can be expected to minimize within-period spending to achieve a given level of utility. This allows us to apply the exact price indices p and P instead of nominal aggregates. Hence, we can use the present value expenditure functions which have a useful property that

reduction in tariffs must then be accompanied by an equivalent rise in export tax.

³⁶The original Harris–Todaro assumption of a politically determined urban minimum wage has been justified, for example, by the efficiency wage hypothesis (Stiglitz 1976, Yellen 1984). Hence productivity is considered more important in the urban than the rural sector. Another line of argument is that the higher urban wages were essential to the newly-independent governments, particularly in Sub-Saharan Africa, in order to create a stable urban population faithful to the new regime. Adverse economic conditions have, however, made it extremely difficult to sustain these wages, and they have begun to fall in recent years.

the partial derivative of $e(\cdot)$ with respect to the price of a good yields the Hicksian compensated demand for that good (Dixit & Norman 1980).

The government is assumed to be able to credibly commit itself to adopting a more liberal trade regime, but does it in a gradual fashion. A reduction in tariffs (explicit or implicit) takes place in period one, while all trade restrictions will be removed in period two. The counterfactual for our analysis is a big bang which abolishes tariffs instantaneously for both periods. The equilibrium of a small country can be demonstrated by an intertemporal budget constraint which states that the present value of lifetime expenditure is equal to the sum of the present value of revenue in both periods. Our intention is to find out whether the Edwards—van Wijnbergen result (1986) regarding the superiority of gradual liberalization holds when the distortion is in the labour market instead of the capital market being financially depressed and constrained by a limited access to foreign borrowing. We will set up a model where in period one real wage rigidity prevails in the urban sector. We also assume that investment goods are exempted from tariffs, income is equally distributed and the tariff revenue is collected and handed back in a lump—sum fashion in the first period. δ^* stands for the real world discount factor and u denotes the *ex post* utility of a representative consumer. Then the budget constraint of our economy becomes:

$$\begin{aligned}
 (4.1) \quad & e[p(1+\tau, 1), \delta^* P(1, 1)]u = \Pi_m^1(1+\tau, \bar{w}_m^1, K, A_m) - I(\delta^*) + \\
 & \delta^* \Pi_m^2(1, w_m^2, K+I(\delta^*), A_m) + \Pi_a^1(1, w_a^1, A_a) + \delta^* \Pi_a^2(1, w_a^2, A_a) \\
 & - \bar{w}_m^1 \Pi_{mw}^1 - w_a^1 \Pi_{aw}^1 - \delta^* w^2 (\Pi_{mw}^2 - \Pi_{aw}^2) + \tau [e_{(1+\tau)} u - \Pi_{m(1+\tau)}^1]
 \end{aligned}$$

where Π_j^i ($i = 1, 2; j = m, a$) denotes the convex sectorial profit function of owners of the sector-specific factors. Labour income can be derived as the negative partial derivative of Π_j^i with respect to the wage. The last term on the RHS of equation (4.1) is the lump-sum transfer from tariff revenue. Total differentiation of equation (4.1) yields (see Annex 4.1 for details):

$$(4.2) \quad \gamma du/d\tau = \begin{array}{cc} (A; +) & (B; -) \\ -\bar{w}_m \Pi_{mw(1+\tau)}^1 & + [-w_a^1 \Pi_{aww}^1 dw_a^1/d\tau + \\ & \tau(e_{(1+\tau)}(1+\tau)^u - \Pi_{m(1+\tau)}^1(1+\tau))] \end{array}$$

where $\gamma = (e - \tau e_{(1+\tau)}) > 0$. The real wage rigidity reduces urban output below optimal but a temporary tariff mitigates its distorting effect by increasing urban production. Hence the first term (A) is positive. The second term (B) is negative and consists of two components: (i) reduction in employment and production in agriculture due to the tariff and (ii) the static welfare loss from lower imports. From equation (4.2) we can see that when the initial tariff is sufficiently large, the negative term B will dominate the welfare effect. In such a case, a tariff cut would improve welfare. If A is dominant, the result is reversed and welfare will deteriorate when trade is liberalized. Finally, we calculate the optimal temporary tariff from equation (4.2).

$$(4.3) \quad \tau^* = [\bar{w}_m \Pi_{mw(1+\tau)}^1 + w_a^1 \Pi_{aww}^1 dw_a^1/d\tau] / [e_{(1+\tau)}(1+\tau)^u - \Pi_{m(1+\tau)}^1(1+\tau)]$$

Provided the effect of a small tariff cut on the earnings of urban workers is greater than that on rural labour,³⁷ the optimal tariff τ^* is positive, which proves that

³⁷ $-\bar{w}_m \Pi_{mw(1+\tau)}^1 > w_a^1 \Pi_{aww}^1 dw_a^1/d\tau$.

gradualism is superior to abrupt liberalization under urban real wage rigidity. In the opposite case τ^* is negative, and the optimal policy is to subsidize imports. Note that in the absence of labour market distortion in period two the optimal tariff is zero and a uniform wage and full employment prevail. To conclude, we have derived the condition under which the Edwards–van Wijnbergen (1986) result of superiority of gradualism under a foreign borrowing constraint holds for the Harris–Todaro labour market.

4.1.1.2 Employment, Distribution, and Current Account with Labour and Capital Market Distortions

In this section we assume the government not only imposes restrictions on trade by levying a tariff τ on imports but has, in addition, a monopoly over the banking system so that it can ration the domestic capital market. Hence, the marginal domestic loan rate ρ is higher than the world market interest rate ρ^* . Borrowing for investment is rationed, which is equivalent to it being taxed, even if this policy partially offsets the benefit that the domestic industry derives from tariff protection. The revenue from tariffs and the differential between the two interest rates is assumed to be redistributed back to consumers in a lump–sum fashion during the same period as they are collected, i.e. in period one. We make the empirically relevant assumption for many low–income countries that the transfers benefit the urban sector alone. There are no other taxes or government spending.

As a consequence of trade liberalization, the level of urban employment in period one falls, whereas in the rural areas it improves. The urban employment rate λ falls because the sectorial wage differential becomes wider. The effect on the level of urban unemployment is ambiguous, however. In the beginning of period two the

sticky urban wage has been removed, and full employment of urban labour prevails. Despite our assumption that external trade is completely liberalized in period two, the effects of a small reduction in τ in period one are nevertheless felt in the second period. The effect is carried over by the tariff-inclusive price of the investment good x_m . Consequently, in period two the economy-wide wage is higher than it would have been without the tariff cut in period one. Employment and output in agriculture fall, whereas urban production expands due to higher investment. Had we assumed that investment be exempted from tariffs, a reduction in τ in the first period would have no effect on the supply side in period two.

The equilibrium of a small country can be presented by intertemporal budget constraints which state that the present value of lifetime expenditure in each income group is equal to the sum of their present values of revenue in both periods. Transfer payments from the government are assumed to be targeted to urban consumers. More specifically, we assume that capitalists are excluded from the transfers so that redistribution benefits urban workers only. The equilibrium of our economy is expressed in equations (4.4)–(4.7) where $e(\cdot)$ denotes the expenditure function and u the *ex post* utility of various groups of income-earners.

$$(4.4) \quad e^{Km}[p(1+\tau, 1), \delta^* P(1, 1)]u_{Km} =$$

$$\Pi_m^1(1+\tau, \bar{w}_m^1, K, A_m) - I(\delta, \tau) + \delta \Pi_m^2[1, w_m^2, K+I(\delta, \tau), A_m]$$

$$(4.5) \quad e^{Lm}[p(1+\tau, 1), \delta^* P(1, 1)]u_{Lm} = -\bar{w}_m^1 \Pi_m^1 - \delta^* w_m^2 \Pi_m^2 + (1/\delta - 1/\delta^*) I(\delta, \tau)$$

$$+ \tau [e_p^{Km} u_{Km} + e_p^{Lm} u_{Lm} + e_p^{Aa} u_{Aa} + e_p^{La} u_{La} + I(\delta, \tau) - \Pi_{mp}^1]$$

$$(4.6) \quad e^{Aa}[p(1+\tau, 1), \delta^* P(1, 1)]u_{Aa} = \Pi_a^1(1, w_a^1, A_a) + \delta^* \Pi_a^2(1, w_a^2, A_a)$$

$$(4.7) \quad e^{La}[p(1+\tau, 1), \delta^* P(1, 1)]u_{La} = -w_a^1 \Pi_{aw}^1 - \delta^* w_a^2 \Pi_{aw}^2$$

To examine the implications of a small tariff cut ($d\tau < 0$) on welfare of the four classes of income recipients, we will totally differentiate equations (4.4)–(4.7). Equation (4.4') in a reduced form captures the four different channels through which trade liberalization ($d\tau < 0$) affects the welfare of urban capitalists:

$$(4.4') \quad e^{Km} du_{Km} = \overset{(-)}{\Pi_{m(1+\tau)}^1} d\tau + \overset{(+)}{(\delta \Pi_{mK}^2 - 1) I_\tau} d\tau + \overset{(-)}{\delta \Pi_{mw}^2} dw^2 - \overset{(-)}{e^{Km} \left(\frac{1}{1+\tau} \right) u_{Km}} d\tau$$

The first intratemporal term on the RHS is negative, reflecting the lower value of urban total production of x_m . The net investment effect, expressed by the second term on the RHS is positive because the present value of additional earnings from investment in period two is greater than reduced consumption in period one due to higher investment. The third term is negative, reflecting the higher wage level that workers have to be paid. The last term is positive as the cost of their own consumption of x_m is lower in period one.

There is another way to interpret equation (4.4'). From the viewpoint of urban capitalists, a tariff reduction, which is equal to a cut in the producer price, magnifies the negative welfare effect created by the minimum wage. Real wages remain at their previous levels, whereas rents have to bear the entire brunt of liberalization. Second, the negative effect of the capital market distortion is magnified by an increase in investment. But the higher future price of the urban good relative to period one induces more production in period two, and therefore the negative welfare effect from the minimum wage is mitigated. The latter dominates

the net investment effect. Third, a tariff cut in period one magnifies the negative welfare effect through a higher wage to be paid to the workers in period two. The interacting distortion here is the tariff which is imposed upon investment goods as well. A lower price increases investment, and a larger capital stock in period two bids wages up. Finally, we know that the imposition of tariffs shifts consumption from period one to period two because consumers substitute intertemporally. A tariff cut reduces the relative price of the urban good in period one and hence mitigates the distortion.

Since urban capitalists consume good x_m less than they produce it (all income groups consume x_m), and if the net investment effect is relatively small, their welfare moves to the same direction as the shift in tariff, i.e. $du_{Km}/d\tau > 0$. In this case, intertemporal welfare of urban capitalists deteriorates when trade liberalization takes place.

The effect of a small cut in tariffs on the average utility of rural land-owners is derived by totally differentiating (4.6).

$$(4.6') \quad e^{Aa} du_{Aa} \quad \begin{matrix} (-) & & (-) & & (+) \\ = -L_a^1 dw_a^1 - e_{(1+\tau)}^{Aa} u_{Aa} d\tau - \delta^* L_a^2 dw^2 \end{matrix}$$

The utility of rural land-owners is positively affected by the reduced sectorial wage bill and a lower cost of their consumption basket in period one. The negative effect comes from the last term: a higher wage to be paid in period two. Following the previous line of analysis, a tariff cut mitigates the negative welfare effect of the urban minimum wage, which is felt in agricultural wages as well. The consumption distortion created by the existence of a tariff is mitigated by relaxing it. The magnifying intertemporal influence of a tariff reduction comes from the period two wage increase.

It is plausible to assume that the intratemporal labour market effect dominates the corresponding intertemporal one. If so, the welfare of rural land—owners changes in the opposite direction to the tariff, i.e. $du_{Aa}/d\tau < 0$. Trade liberalization then causes an improvement in the intertemporal welfare of rural land—owners.

Total differentiation of (4.7) gives us the following equation to determine the welfare consequence of a tariff cut on rural labour:

$$(4.7) \quad e^{La} du_{La} = \overset{(?)}{(L_a^1 - w_a^1 \Pi_{aww}^1)} dw_a^1 + \overset{(?)}{\delta^* (L_a^2 - w_a^2 \Pi_{aww}^2)} dw_a^2 - \overset{(-)}{e_{(1+\tau)}^{La} u_{La}} d\tau$$

There appear to be three sources of influence on the utility of rural labour: (i) the net effect of a lower rural wage on the total wage income in period one, (ii) the present value of the net effect of a higher wage on the total wage income in period two and (iii) the positive effect of a lower consumer price for x_m . If the demand for rural labour is relatively inelastic, then term (i) is negative and term (ii) is positive. Furthermore, labour demand in agriculture is likely to be higher in period two than period one ($L_a^2 > L_a^1$) because the relative price of x_a is higher in period two. On the other hand, it is reasonable to assume that the intratemporal effect of a tariff cut on the rural wage exceeds the intertemporal one ($dw_a^1 > dw_a^2$). In such a case terms (i) and (ii) may more or less even out, and we would be left with the positive consumption effect. The welfare of rural labour therefore shifts in the opposite direction as the tariff, i.e. $du_{La}/d\tau < 0$, that is it improves when tariffs are lowered.

To examine how a small reduction in the tariff rate affects the utility of urban labour, we will totally differentiate equation (4.5).

$$\begin{aligned}
(4.5') \quad & \begin{matrix} (+) & & (-) & & (-) & & (+) \end{matrix} \\
& e^{Lm}(1-\tau C_{Lm})du_{Lm} = \bar{w}_m(-\Pi_{mw}^1(1+\tau))d\tau + m_1 d\tau - \delta^* w^2 \Pi_{mw}^2 dw^2 \\
& \begin{matrix} (-) & & (+) & & (-) & & (+) \end{matrix} \\
& - \delta^* \Pi_{mw}^2 dw^2 + \delta^* w^2 (-\Pi_{mwK}^2) I_\tau d\tau - e_{(1+\tau)}^{Lm} u_{Lm} d\tau + (1/\delta - 1/\delta^*) I_\tau d\tau \\
& \begin{matrix} (-) & & (+) & & (+) & & (+) & (+) \end{matrix} \\
& \tau [C_{Km} e^{Km} du_{Km} + C_{Aa} e^{Aa} du_{Aa} + C_{La} e^{La} du_{La} + I_\tau d\tau + \sigma d\tau]
\end{aligned}$$

where σ denotes the own substitution derivative of the imports of x_m in consumption,³⁸ C is the pure income effect $[= e_{(1+\tau)}/e]$ and m_1 stands for imports in period one. The first two terms on the RHS affect negatively the welfare of urban workers: (i) a lower total wage bill in period one³⁹ and (ii) reduced transfers from tariff revenue at the initial level of imports. The next two terms combined are of ambiguous sign since (iv) a higher wage is in period two welfare-improving but simultaneously (iii) it reduces employment. The next three terms are positive: (v) increased demand for labour in period two due to increased investment, (vi) a cheaper consumption basket, and (vii) higher transfers from the investment tax. The sign of the last term (viii) is ambiguous and depends on whether the negative income effect of urban capitalists is sufficiently large to offset the positive income effects from the rural sector as well as the increase in investment demand and the substitution effect.

³⁸ $\sigma = e_{(1+\tau)}^{Km}(1+\tau)u_{Km} + e_{(1+\tau)}^{Lm}(1+\tau)u_{Lm} + e_{(1+\tau)}^{Aa}(1+\tau)u_{Aa} +$

$e_{(1+\tau)}^{La}(1+\tau)u_{La} - \Pi_{mw}^1(1+\tau) < 0.$

³⁹Unlike in the original H-T model, the unemployed are assumed to remain in the cities and rely on other members of the same income group.

The net effect of a small reduction in tariffs on the welfare of urban labour is equivocal and depends on which of the above terms dominate. For example, if the increased wage income in period two, the cheaper consumption basket in period one, higher transfers from investment controls and those from the higher level of imports exceed the losses from lower wage income in period one as well as a smaller tariff rate, then the positive terms dominate the change in the *ex post* utility of urban workers. Their welfare moves in the opposite direction to tariffs, $du_{Lm}/d\tau < 0$, and trade liberalization therefore improves it. But if the lower level of production reduces employment to a large extent (together with reduced transfers from tariffs), then urban workers are likely suffer from trade liberalization.

Finally, we will derive the effect of a reduction in tariffs on the current account. It is sufficient to study one period only since trade must be balanced over the entire time span, i.e. $CA^1 + \delta^* CA^2 = 0$. We choose CA^2 for the simplicity of analysis. Note that the parentheses of the third term on the RHS of equation (4.5) give the expression for the current account in period one. Equation (4.8) defines the current account for period two:

$$(4.8) \quad CA^2 = e_1^{Km} u_{Km} + e_1^{Lm} u_{Lm} + e_1^{Aa} u_{Aa} + e_1^{La} u_{La} \\ - \Pi_{m1}^2 [1, w^2, K + I(\delta, \tau), A_m]$$

Total differentiation of (4.8) yields:

$$(4.8') \quad \begin{array}{cccc} (-) & (+/-) & (+) & (+) \\ dCA^2 = C_{Km} e^{Km} du_{Km} + C_{Lm} e^{Lm} du_{Lm} + C_{Aa} e^{Aa} du_{Aa} + C_{La} e^{La} du_{La} \\ \\ (-) & (+) \\ - \Pi_{mpw}^2 dw^2 - \Pi_{m1K}^2 I_\tau d\tau \end{array}$$

where C is the pure income effect. In the case where trade liberalization improves the utility of urban workers and the positive income effect in rural areas and that of a higher wage in period two are sufficiently large,⁴⁰ the trade balance will be negatively affected in period one and improve in period two. If the rural income effect, the impact of a higher period-two wage and the positive effect on the utility of urban labour are small, the result is reversed so that $dCA^1/d\tau < 0$ and $CA^2/d\tau > 0$.

Summarizing, this section has demonstrated that gradual trade liberalization can be superior to an abrupt removal of (explicit or implicit) tariffs in the case of an imperfect labour market. The result obtains when the effect of a tariff cut on the earnings of urban workers is greater than that of rural labour. The superiority of slow pace is driven by the fact that the labour market distortion, unlike tariffs, cannot be removed instantaneously. In other words, if the labour market distortion were permanent, there would not be a case for gradualism but permanent protection would be optimal. We obtain the result that gradualism is welfare-improving only because the sticky urban wage is assumed to be temporary but not as easily removed as tariffs.

Similarly, income distribution and employment considerations may constitute a case for gradualism when labour and capital market distortions interact. Due to a reduction in tariffs, the relative price of the agricultural good increases, which is likely to improve rural welfare, although the result is not unambiguous. Urban

⁴⁰ $C_{Aa}e^{Aa}du_{Aa} + C_{La}e^{La}du_{La} + C_{Lm}e^{Lm}du_{Lm} - \Pi_{mpw}^2 dw^2 > -C_{Km}e^{Km}du_{Km} + \Pi_{m1K}I_\tau d\tau.$

capital—owners are likely to suffer from trade liberalization, whereas the *ex post* utility of urban labour, a group often favoured in transfer payments by governments in low-income countries, can go either way. In other words, the welfare of urban labour may still improve, despite a fall in urban production. The urban population often protests during the liberalization episodes, and too sharp a deterioration in its welfare may cause the reform to be abandoned. Urban employment falls in period one whereas the effect in the rural areas is the opposite. The effect on the level of urban unemployment in period one is ambiguous, however. In period two urban employment and output rise relative to abrupt liberalization in period one but are adversely affected in the rural sector. Whether the current account improves or deteriorates depends on the effect on rural income, utility of urban labour, and on the impact of the wage increase in the second period.

The results regarding distribution of income are due to the assumptions of a temporarily sticky urban wage, and financial repression, which affects investment in period one. They would not obtain if the distortions were permanent. The welfare-improving effects come from a temporary retention of the tariff, which mitigates the adverse effect of the sticky urban wage on production, and increases savings, hence relaxing the constraint on investment, as private agents anticipate the price of the importable good to be lower in period one. Note that the assumption of perfect credibility of liberalization is crucial in the case of a capital market distortion as the beneficial effect on saving would be absent without it. With the perception that the reform will not be sustained, private agents would spend more in period one (instead of saving more) as they expect the price of importables to go up in the future. A temporary labour market distortion alone does not have a similar intertemporal effect as the capital market constraint. Therefore, in the absence of credibility, the positive effect of a temporary tariff in period one would still hold. In period two urban production would be too high as the expectation of a

higher output price would have induced too much investment (when unrestricted by finance) in period one.

The next section will present another modification of the model by Edwards and van Wijnbergen (1986) by using the simple consumption model of Chapter III. It will be shown that the result in favour of gradualism in the presence of a capital constraint can be derived without specifying the entire general equilibrium. We will also continue discussion about how this result changes when liberalization is not perceived fully credible by private agents.

4.1.2 An Application of the Simple Consumption Model under Financial Repression

In the previous section we incorporated a distorted labour market into a model by Edwards and van Wijnbergen (1986) who develop a two-period general equilibrium framework with a distorted financial market in order to examine the welfare consequences of gradualism versus abrupt trade liberalization which is perfectly credible to the public. In this section nothing will be added to the model but instead we will reduce it into a simple consumption model. This allows us to highlight what really drives the results of the model. The main critique is the crucial role of credibility for the outcome. As many liberalization episodes, previously in Latin America, and at present in Africa, suffer from a lack of credibility, we will examine how this lack alters the results obtained for the speed of liberalization.

Foreign borrowing is assumed to be limited, and domestic savings are insufficient. This is reflected in a higher than the world market interest rate for investors. Hence the implicit investment tax is a transfer abroad, while consumers are constrained by the world market interest rate. Incidentally, the analysis of gradualism under

perfect credibility by Edwards van Wijnbergen and that of incredibility by Calvo (1987) are analogous (the latter model was reviewed in Chapter II). Calvo assumes that private agents know with certainty that the reform will collapse, and hence there will be an increase in the price of imports in the future, whereas in the former model the public is fully confident that the reform will be carried out in a gradual fashion, implying an equivalent fall in the future price of imports.

In the Edwards and van Wijnbergen model a temporary retention of the tariff, which is equivalent to the expected fall in the price level, induces consumers to save more. This loosens the capital constraint and allows more investment. The same logic can be applied to Calvo's model where incredibility is the distortion. Due to an expected increase in the price level, consumers save less so that less funds are available for investment (assuming a foreign borrowing constraint). Again, a temporary retention of the tariff can prevent the intertemporal increase in the price level and mitigate the negative effects of incredibility. Inclusion of gains from trade does not alter the basic result. Analogously, we will show that explicit inclusion of the production side is not required for the Edwards and van Wijnbergen result, and that the simple consumption model derived in Chapter III is sufficient to the analysis of welfare consequences of gradual liberalization. Instead of tariffs the government's trade policy instrument is a sales tax.⁴¹

Although the foreign borrowing constraint seems an appealing explanation for a distorted financial market, the essence of the Edwards and van Wijnbergen model, however, is standard financial repression with insufficient savings in the economy. Saving and loan rates are kept apart by the government so that potential savers face a lower interest rate than investors. The first best solution with increased saving would be achieved by removing the separation of the two markets.

⁴¹Edwards and van Wijnbergen (1986) also note this possibility but argue that consumption taxes are administratively difficult to impose in developing countries.

Without trade liberalization, or when it is abrupt and sustained, the discount factor in domestic consumption is equal to the world discount factor β^* , assuming that the world prices of both goods have been normalized to equal unity. Hence, intertemporal consumption decisions depend on the world interest rate alone. When a gradual reform is carried out, the domestic discount factor becomes temporarily $\beta = \beta^*/(1+\tau)$, i.e. it is a function of the world interest rate and the domestic relative price over time. When the gradual reform has been completed, the discount factor returns back to β^* . In the presence of a positive tariff the domestic discount factor β is smaller than the world discount factor β^* . In other words, the real consumption rate of interest goes up temporarily, increasing savings and hence relaxing the adverse effect of the external borrowing constraint, or financial repression with insufficient domestic saving. As the interest rate investors face is higher than that for consumers, higher savings in the domestic economy will lower it, inducing more investment. An anticipated decline in the tariff therefore mitigates the distortion in the capital market.

The Edwards and van Wijnbergen result is conditional to investment taking a disproportionate share of adjustment burden to the external borrowing constraint. As mentioned earlier, this applies to a more general case of financial repression as well. If a market clearing interest rate above world levels would apply to consumers and investors alike, the argument for the superiority of temporary tariff disappears, despite the fact that it has a favorable effect on the consumption rate of interest.

Let us assume that the entire income is derived from exports, whereas the consumer good is not produced domestically but imported. This is equivalent to abstracting from the gains from trade, except for the increase in saving and investment. The representative consumer maximizes his utility subject to a budget constraint:

$$\begin{aligned}
(4.9) \quad & \max_{c_1, c_2} \quad u(c_1) + \beta^* u(c_2) \\
& s.t. \quad pc_1 + c_2/r - \bar{y}_1 - \bar{y}_2/r = 0
\end{aligned}$$

where $\beta^* = 1/r$ is the world discount factor which applies to consumption. The world interest rate is denoted by ρ so that $r = 1 + \rho$. At constant level of income and prices there is constant consumption over time. The tariff level is τ , while $\bar{y}_1$ and $\bar{y}_2$ are the income levels, and $p = 1 + \tau$ is the period one price of imports inclusive of temporary tariff. Note that income levels under gradualism differ from those in instant liberalization. In the former instance there are lump sum transfers from tariff revenue in period one and higher income in period two due to increased investment. The solution to problem (4.9) yields the optimal consumption for each period c_i ($i=1,2$) as well as the optimal current account surplus/deficit b :

$$\begin{aligned}
(4.10) \quad & c_1^* = c_1^*(\bar{y}_1, \bar{y}_2, \tau, r) \\
& c_2^* = c_2^*(\bar{y}_1, \bar{y}_2, \tau, r) \\
& b = \bar{y}_1 - pc_1^*
\end{aligned}$$

Using the same iso-elastic utility function as in Section 3.2, and assuming that the elasticity of marginal utility $\alpha = 0.5$, we can rewrite the utility maximization problem:

$$\begin{aligned}
(4.11) \quad & \max_{c_1, c_2} \quad 2c_1^{1/2} + 2\beta^* c_2^{1/2} \\
& s.t. \quad pc_1 + c_2/r \leq \bar{y}_1 + \bar{y}_2/r
\end{aligned}$$

The optimal consumption and saving levels under gradualism are:

$$\begin{aligned}
 (4.12) \quad c_1 &= (r\bar{y}_1 + \bar{y}_2)/(p^2 + pr) \\
 c_2 &= p^2(r\bar{y}_1 + \bar{y}_2)/(p^2 + pr) \\
 b &= (p\bar{y}_1 - \bar{y}_2)/(p + r)
 \end{aligned}$$

In the case of abrupt liberalization ($p=1$), where income is lower in both periods ($y_1 < \bar{y}_1$; $y_2 < \bar{y}_2$) as transfers are absent, and there is no increase in investment, the consumption levels are respectively:

$$\begin{aligned}
 (4.13) \quad c_1 &= (ry_1 + y_2)/(r+1) \\
 c_2 &= (ry_1 + y_2)/(r+1).
 \end{aligned}$$

In order to compare the gradual reform to the abrupt one, we will have to express $\bar{y}_1$ and $\bar{y}_2$ as function of y_1 and y_2 , i.e. in terms of income levels when no transfers or increases in the capital stock have taken place. First, income available to the consumer in period one under gradualism is the sum of revenue from exports (not consumed domestically) and transfers from tariff revenue:

$$(4.14) \quad \bar{y}_1 = y_1 + (p-1)(r\bar{y}_1 - \bar{y}_2)/(p^2 + pr)$$

The consumer allocates $\bar{y}_1$ between consumption and savings. Second, the income available in period two is the sum of export revenue, savings from the previous period, including the accrued interest as well as the increased income generated by the incremental capital stock:

$$(4.15) \quad \bar{y}_2 = y_2 + \delta(p\bar{y}_1 - \bar{y}_2)/(p+r)$$

where $\delta = (1+\rho_K)$, and ρ_K is the return to capital which is higher than the world interest rate ρ . By solving equations (4.14) and (4.15) simultaneously, we obtain the income levels for a gradual reform in terms of those of abrupt liberalization.

$$\begin{aligned}
(4.16) \quad \bar{y}_1 &= \{(p^2 + rp)/(p^2 + r) \\
&\quad + \delta p^2(p-1)(p+r)/(p^2+r)[(p+r+\delta)(p^2+r) - \delta p(p-1)]\} y_1 \\
&\quad + \{(p-1)(p+r)/[(p+r+\delta)(p^2+r) - \delta p(p-1)]\} y_2 \\
\bar{y}_2 &= (p+r)[\delta p^2 y_1 + (p^2+r)y_2]/[(p+r+\delta)(p^2+r) - \delta p(p-1)]
\end{aligned}$$

We can again use a numerical example to illustrate the effects of different speeds of liberalization. Let us first assume that income in both periods is 100 units, $y_1 = y_2 = 100$, the world interest rate ρ is 10 percent ($r = 1.1$), return to capital ρ_K is 18 percent ($\delta = 1.18$), the implicit tariff is 100 percent ($\tau = 1$, or $p = 2$), and the world discount factor $\beta (= 1/r)$ is 0.91. In other words, the relatively high level of protection is retained in period one under gradualism but the government announces, and the public believes in the announcement, that free trade will obtain from the beginning of the second period. The resulting consumption is 52.2 units in period one and 156.4 units in the second period. The corresponding consumption levels in the abrupt case, where the high protection level ($\tau=1$) is removed instantaneously, are 100 units in both periods. The utility of the latter case (38.2 utility units) is higher than in the former (37.2 utility units), implying that abrupt liberalization is superior to gradualism when the initial high protection level is retained.

If we assume that the temporary tariff under gradualism is lower than before liberalization, for example $\tau = 0.3$, then the consumption levels are 83.8 units in period one and 123.7 units in period two. Now welfare under gradualism is found to be higher than if protection were dismantled abruptly.

Summarizing, the basic Edwards and van Wijnbergen result remains the same in our simple consumption model, i.e. gradualism is welfare-superior to abrupt

liberalization in the presence of financial repression, provided the temporary tariff is at (or close to) its optimal level. The temporary tariff increases income in period two by inducing more savings and investment in the first period.

Table 4.1 depicts the sources of welfare costs arising from different anticipations regarding the future trade policy, i.e. the future price of importables. The capital market may or may not be distorted, and the expected change in the tariffs is either upwards (incredible trade liberalization) or downwards (gradual liberalization which is credible).

Table 4.1 Expectations Regarding Trade Policy, Capital Market
and Private Speculative Behaviour.

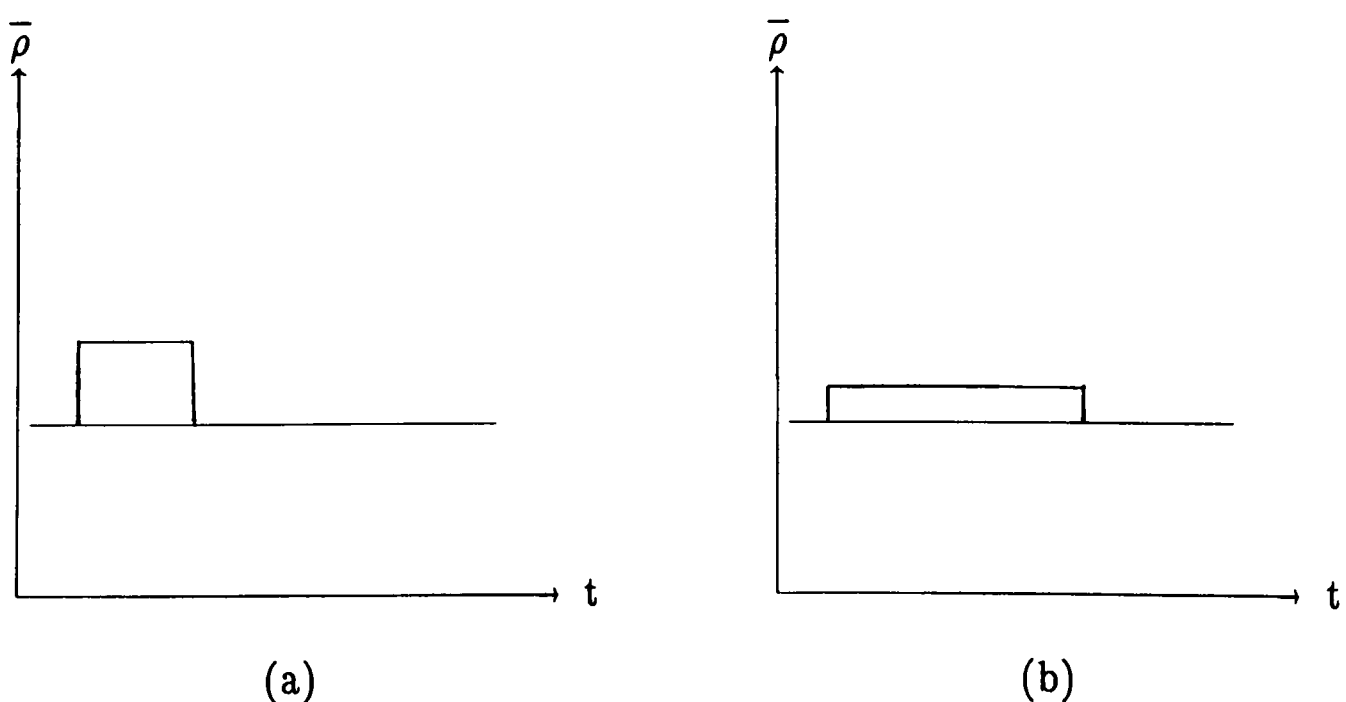
Anticipated		
CAPITAL MARKET		
Price Change	Undistorted	Distorted
Up	Accumulation of stocks (Calvo 1988).	Low investment and income due to a high interest rate and accumulation of stocks.
Down	Inventories are run down as other assets become more profitable.	Investment increased by a temporary tariff (Edwards & van Wijnbergen 1986).

The lower left cell in Table 4.1 is particularly interesting from the viewpoint of gradualism and incredibility. In the Calvo (1988) model, which is the upper left cell, the demand for assets shifts out of money to inventories, whereas in the case of

gradual (and credible) liberalization with perfect capital market they shift from inventories into money in anticipation of lower import prices in the future. With the optimal initial amount of money and inventories, the two are equally costly. If we start from a socially sub-optimal situation, where a capital market distortion prevails, then the two cases are not analogous. Abrupt liberalization with incredibility (upper right cell) is more costly than gradualism, where the Edwards and van Wijnbergen type (optimal) temporary tariff mitigates the adverse effect of the distortion (lower right cell). What gradual trade liberalization does in the lower right box is to change the price level over time to mitigate the exogenous nominal interest rate ceiling in the credit market. We can express the policy in another way: Since the economy does not save enough, the government liberalizes trade in order to get the price level down. This policy is assumed to be credible to the private sector, and therefore it induces additional savings and temporarily relaxes the constrained capital market.

We can describe the behaviour of real consumption rate of interest $\bar{\rho}$ in a "quick" and "slow" gradualism in Figure 4.1:

Figure 4.1. Real Consumption Rate of Interest and Gradual Trade Liberalization.



If the price of importables changes very slowly (b), the benefit will be spread out over time whereas a very quick gradualism (a) will cause a short but rather sharp rise in the real interest rate. The trade-off, i.e. the optimal speed of liberalization, is derived by comparing their discounted values. If there is a strong preference for having the benefit sooner rather than later, then the optimal policy is to bring the price down quite rapidly.

In the monetary approach to balance of payments, in the long run, a tariff does not have an effect on the balance of payments, but does have an effect — under fixed exchange rate — on the country's foreign exchange reserves (Mussa 1976). In the short run, the real demand for money falls when there is a reduction in the tariff, and the excess real balances finance more consumption at a given level of money supply. The excess of nominal expenditure over nominal income creates a balance of payments deficit. Subsequently, the money supply begins to fall, too, because the government has to use the foreign exchange reserves to cover the deficit. If the economy has sufficient reserves (or an external aid flow) to buy up the excess money supply, there will be no need to devalue or, alternatively, to abandon the reform. But often the foreign exchange reserves are precarious in low-income countries and in order to sustain the reform, depreciation is inevitable. Hence, the fall in the price level initiated by trade liberalization is temporary since the policy-maker has to adjust the exchange rate. It may happen that a period of falling prices will be followed by a period of rising prices. The beneficial effect of temporarily increased savings will then be offset by an adverse effect when excess consumption occurs in anticipation of higher prices in the future.

Finally, there must be better instruments to be assigned to the implementation of financial liberalization than a trade reform. One such policy is running a permanent budget surplus which yields a permanent financial liberalization instead of a

temporary one, achieved by gradual trade liberalization. What actually happens in the Edwards and van Wijnbergen type liberalization is a move from macro compatibility to incompatibility. Tariffs are reduced without any accompanying policy, such as devaluation. The question then is: How will compatibility be restored? In the absence of ample reserves, there will inevitably be a reversal of liberalization, or a devaluation. If this is anticipated by private agents, the negative effect on saving will write off the initial welfare-improving effect of a temporary tariff.

The next section will relax the assumption of perfectly credible liberalization. More specifically, we will examine whether or not the speed of liberalization should be different in the presence of incredibility from the results concerning the speed of reform which does not suffer from a credibility problem.

4.2 The Speed of Trade Reform When It Lacks Credibility

In the case of credible reforms the public believes the government's preannouncement, be it for gradualism or abrupt liberalization. Both consumers and producers are assumed to respond to any small change in the prevailing or expected relative prices. As we saw above, the general result is for instantaneous liberalization. The result holds in the presence of adjustment costs as well. Employment, income distribution, and distortions in the factor markets may justify a deviation from the general rule, i.e. gradualism is preferred to abruptness.

Introduction of less than perfect credibility brings several new considerations in the analysis of trade liberalization, and the private response to such a reform can be very different. Private agents may, for example, engage in speculative action, entirely absent from a perfectly credible reform, or inaction despite a change in relative prices. A lack of credibility is an additional distortion in the economy.

Depending on its interaction with other distortions, the optimal policy prescription, which would hold under credibility, may change. Moreover, incredibility entails completely new arguments for choosing the speed of liberalization, which range both in favour of and against a big bang. This section will make an attempt to summarize all arguments put forward both for abrupt and gradual liberalization which is perceived to lack credibility in the private sector.

We will distinguish six cases which may give rise to a different choice of the speed of liberalization, when the reform suffers from a lack of credibility. First, incredibility does not necessarily involve uncertainty so that consumers and producers respond to it as if they were responding to any fully expected change in the relative price. A social cost arises, however, from undesirable action induced by the expected rise in the future price of importables, such as non-optimal intertemporal substitution, or accumulation of inventories of imports. Gradualism is able to mitigate the social cost by reducing the incentive to store.

Second, a more genuine case of incredibility involves uncertainty which may change private behaviour even more radically. While the case for stock accumulation remains basically the same, owners of the factors of production may find it beneficial to wait until the uncertainty has been resolved. With incredibility but no uncertainty there is no reason to wait as the private sector can continue investing in import-substitution. As pointed out earlier, trade policy differs from other policies, which are constantly on the government's agenda, such as taxation, in the sense that by waiting uncertainty can be resolved, at least for a while. While waiting, investors may prefer to shift their assets into foreign exchange, or into stocks of importables, whereas capital and labour remain in the import-substituting sector instead of moving to the export sector. A large reform is required to overcome inaction, or to prevent waiting.

Third, the choice of the speed of liberalization under perfect credibility is between gradualism (a slow reform) and abruptness (intended liberalization is carried out at once), whereas incredibility may call for a third option, an overshoot of liberalization. In other words, the initial reform is larger than what is intended in the long term. Overshooting will be further discussed below.

Fourth, inclusion of incredibility allows one to analyze problems faced by a new government. Without a sufficient history of observations, private agents may be suspicious about the type of government in power. This creates uncertainty whether or not its policy is time-consistent. Gradualism, or a retention of the temporary tariff, mitigates the distortion if incredibility is unavoidable and cannot be remedied, say, by carrying out a large reform, which would reduce the subjective probability.

Fifth, the assumption of full credibility conceals the fact that many models of trade liberalization are inherently macro incompatible. Trade restrictions are dismantled without a compensating change in other macroeconomic policies so that there is a sudden fall in the price of importables. If compensating devaluation, or a reduction in the money supply to accompany a large reform can only be slow, gradualism is preferable. Otherwise liberalization is likely to become incredible, and, without sufficient reserves, it may have to be reversed in the future. Similarly, negative exogenous shocks can also render an initially compatible reform incompatible.

Finally, in the absence of sufficient accompanying policies, temporary aid is often used to make a large reform macro compatible. Aid may indeed restore the credibility of an incompatible reform but at the same time it may introduce another uncertainty concerning the government's true intentions.

We will next present a taxonomy of the models of trade liberalization according to the speed of liberalization. A summary of implications of the welfare costs of incredibility will follow. Lastly, consumer and investor behaviour in an aided trade reform will be briefly analyzed.

4.2.1 A Taxonomic Review

Although many of the models covered in this review do not address the issue of the speed of liberalization, it is still possible to present a taxonomy of three different speeds the models explicitly or implicitly suggest, i.e gradualism, a big bang and an overshoot. In addition, a few models set preconditions to undertaking liberalization in order to avoid the social cost of incredibility. The taxonomy is depicted in Table 4.2.

Table 4.2 A Taxonomy of Models According to the Speed of Liberalization.

<u>Gradual</u>	<u>Big Bang</u>	<u>Overshoot</u>
Engel&Kletzer(1987)	Rodrik (1989b)	Rodrik (1989c)
Froot (1988)	Fernandez&Rodrik (1991)	
Bevan et al.(1990a)	Bevan et al.(1990a)	
— slow depreciation	— large devaluation	
<u>PRECONDITIONS FOR LIBERALIZATION:</u>		
<u>Capital controls</u>	<u>Fiscal Reform</u>	<u>Other</u>
Calvo (1987,1988)	Daveri (1989)	Staiger&Tabellini(1987)
van Wijnbergen (1985)		Dornbusch (1990)

As indicated in the upper left cell, there are three models that recommend gradualism. First, the model by Engel and Kletzer (1987) highlights the harmful effects of incredibility on consumption. A Pigovian government chooses a temporary tariff if it is able to reduce the cost of non-optimal intertemporal substitution in consumption. It is also shown that, in the presence of learning, the case for non-liberalization becomes weaker. Second, Froot (1988) shows that a temporary tariff is welfare-improving compared to an abrupt liberalization in the absence of credibility. As was pointed out in Chapter II, free trade is not the optimal policy in this framework. Denying the government the option of exchange rate management, negative external shocks will eventually render trade liberalization incompatible, and as a consequence, the reform will be aborted. Trade liberalization is therefore at best temporary, and Froot's argument is only for a smaller tariff.

Third, there are cases when macroeconomic incompatibility may call for a gradual reform. For example, if the exchange rate cannot adjust sufficiently for political reasons (as in many African economies), or fiscal policies are slack, a gradual reform can prevent liberalization from becoming incredible, or from being aborted. Although developed for the analysis of macroeconomic and trade policy in response to temporary shocks, the model by Bevan *et al.* (1990a) can also be used for the study of incredibility in trade policy, when there are no external shocks to the economy. The model would call for gradualism if the economy would otherwise enter the zone of macroeconomic incompatibility. Abrupt liberalization reduces the domestic price of importables and thereby the demand for money more than a gradual reform. An excess supply of money leads to a balance of payments deficit, unless the money supply is reduced, or the demand for money maintained by depreciation. If there will be no devaluation at all, a gradual reform may prolong the depletion time of reserves but cannot prevent it from happening eventually. When a slow depreciation is politically feasible but a quantum devaluation is not,

then gradualism is superior to abrupt liberalization as the only sustainable way to reform.

Similarly, when trade policy is being used as the adjusting macroeconomic variable in response to external shocks instead of the exchange rate or monetary policy, the government will liberalize trade in the face of a positive shock to the economy and tighten trade policy when the shock is negative (Bevan *et al.* 1990a). If private agents recognize that the shock is temporary, then they know with certainty that liberalization will be reversed when the export boom is over. The only uncertainty they face is the duration of the boom. Hence, in the case of endogenous trade policy, a slow pace of liberalization is as incredible to the public as a big bang. As was shown in Chapter III, the social cost of stock accumulation is, however, likely to be smaller under gradualism, whereas the supply response in favour of the export sector is unlikely to take place in either case.

Rodrik (1989bc) is the one who most strongly advocates a big bang (upper middle cell).⁴² He examines the adverse effects of trade liberalization on reallocation of capital and comes to a conclusion which is against "the conventional wisdom of gradualism". He considers a slow reform harmful when capital exhibits hysteresis so that small changes are insufficient to induce a shift of capital to the export sector. Unlike in the perfectly credible case, the presence of adjustment costs, combined with a lack of credibility, causes exogenous shocks to alter the steady-state equilibrium of the economy because the behaviour of the private sector can be affected by uncertainty, even when economic agents are risk neutral. Applying hysteresis to trade liberalization, when factor mobility involves adjustment costs, uncertainty about the duration of trade reform partly or fully prevents the desired

⁴²See also Rodrik (1989a).

reallocation of resources. It is therefore argued that only a sufficiently large reform induces the desired supply response which may not be reversed even if there were a subsequent reversal of the reform.

There two qualifications to the above result. First, if a big bang is macro incompatible, and private agents correctly perceive it, the reform is likely to induce accumulation of stocks of imports. The cost of such speculation has to be compared to the benefit of a large reform. Second, a large reform does not necessarily guarantee a favourable investment response if investors prefer to wait. In addition, the time—consistency problem may not be solved as the government can have an incentive to increase taxation on the export sector.

Fernandez and Rodrik (1991) assume majority voting and suggest that a large reform will be needed to get individuals to approve it. People are uncertain how they will fare after a move to another sector. A big bang increases the return in the export sector, and given the cost of moving, increases the number of people willing to make the move. Finally, we have included the model by Bevan *et al.* (1990a) also in this category since it would call for a big bang, provided exchange rate management were not politically constrained.

In Rodrik (1989c) a true liberalizer which chooses to reduce tariffs slowly would be confused with a redistributive government (the upper right cell). To be able to signal effectively, a liberalizer must subsidize imports up to the point where the intertemporal price distortion is equal to the cost it would otherwise suffer under pooling. This is particularly the case when an accompanying foreign transfer, contingent on undertaking the reform, is above a given minimum. In other words, the presence of aid calls for overshooting the reform in order to avoid incredibility. The more serious the credibility problem is, the more likely it is that a

sharp break with the past will be viewed as attractive. The argument is that credibility is intimately linked to the magnitude of reform and, by implication, to the pace at which it is carried out. Policy overshooting may have the consequence of distinguishing a genuinely reform-minded government from its redistributive counterparts.

There are a number of models that do not suggest any clear policy conclusion regarding the speed of reform. They propose instead various preconditions that have to be met before a reform is undertaken. First, Calvo (1987, 1988) demonstrates how incredible liberalization can be socially costly with an unrestricted capital account. He suggests that restrictions be imposed on credit expansion (or on durable imports) prior to liberalization. Van Wijnbergen (1985) allows access to foreign savings as a means of deferring investment, while waiting for uncertainty concerning trade policy to be resolved. Similarly, capital controls could prevent temporary capital flight due to a removal of protection. As was shown in Chapter III, firms may still have other means of deferring investment even if capital controls are being implemented.

Staiger and Tabellini (1987) and Daveri (1989) address the question why protectionism persists rather than what the optimal speed of liberalization would be. In the former model, time-inconsistency is caused by the presence of a redistributive government. Without a shift in political power protectionism will persist. In the latter case a fiscal reform, including a change in the composition of the government budget, must precede a successful trade reform. Finally, Dornbusch (1990) examines variables that underlie the subjective probability of reform failure but does not extend his discussion to the speed of reform.

4.2.2 Implications of Welfare Cost of Speculation on the Speed of Reform

In Chapter III we derived the total social costs of incredibility, resulting from speculative action or inaction in response to a trade reform. This section will summarize their implication for the speed of adjustment. First, a gradual reform is likely to be associated with a relatively low social cost created by private action, such as stock accumulation, while that in a big bang or overshooting will be substantial. From the production point of view, gradualism (which is equivalent to a small reform, at least when it is initiated) leads to inaction, i.e. to insufficient reallocation of factors of production to the export sector. Similarly, in new investment the return to capital in the exportables sector is likely to remain too low to attract investors who prefer investing either in the import—substituting sector, or remaining liquid until uncertainty has been resolved. Hence, an abrupt reform is needed from the production point of view to overcome the credibility problem but, failing this, it has the negative side—effect of creating an incentive for consumers and entrepreneurs to accumulate inventories of importables.

Therefore, the question is which of the three speeds of liberalization has the highest benefit net of welfare cost. Unfortunately, Chapter III is not able to provide a full answer to that question for two reasons. First, it does not assess the welfare loss of gradualism or overshooting in terms of efficiency. Second, consumption and production costs are expressed in different units which prevents a straightforward comparison of costs. However, we can say that even if the welfare cost of inaction (non—reallocation of factors and non—investment) was higher under gradualism than that of speculative action (stock accumulation, in particular) under an abrupt reform, the latter cost may occur sooner than respective benefits are being felt, and exhaust the reserves, forcing the government to abandon the entire reform. Unless the shift in production happens before the return of protectionism and will not be

reversed thereafter, it is the (smaller) cost of speculative action that dominates the fate of the reform, and gradualism or even non-liberalization is called for. Similarly, if the capital stock in place is sector-specific, the adverse consequences of abrupt but incredible liberalization may dominate.

To avoid some of the negative effects of uncertainty, gradualism may be superior to instantaneous liberalization, provided devaluation is not ruled out as a policy instrument. It may well be the case that the private sector is first and foremost skeptical about the government's ability to forecast what the appropriate amount of devaluation would be to sustain a big bang. In Africa where trade liberalization typically involves removal of quotas and other quantitative or administrative restrictions, the corresponding implicit tariff levels may be unknown and far from being uniform. Supported by external aid to compensate losers and vulnerable groups for negative effects, a relatively large initial devaluation is undertaken at the same time as a gradual trade reform is initiated. Gradual reductions in protection will enable the government to reach a new equilibrium without the uncertainty that depreciation turns out to be too small relative to the reduction in the implicit tariff. Gradualism results in a temporary balance of payments surplus and guarantees that the reform cannot become incompatible.

This approach has two advantages. First, the private sector will no longer be in doubt whether depreciation or reversal will be chosen by the government (to shift the economy back to the compatibility locus $L'L'$ as depicted in Figure 4.2). Investors, for example, have no reason to wait but can invest in physical capital without a need for a temporary deferral. If the export sector becomes profitable when the reform is launched, it will become even more profitable over time. Second, a reduction in the price level is expected, leading to decumulation — rather than accumulation — of inventories of consumer durables. This, too, contributes to the payments surplus.

If external reserves were large enough, they could sustain a large reform, despite speculative accumulation of inventories, and allow time for the production response to take place. For example, if depreciation is politically constrained so that it can only take place gradually, a big bang will unavoidably be incompatible and is expected to fail by the private sector. A large reform will not necessarily solve the time—consistency problem and guarantee a favourable investment response. It may be perfectly rational from the part of private agents to expect increased taxation of the export sector — once the productive capacity is in place — as the government replaces import tariffs by export taxes as its source of revenue. A big bang liberalization may well result in a drop in investment due to waiting and anticipation of increased future export tax.

Alternatively, if overshooting were able to eliminate uncertainty, and hence incredibility, there would be no speculative hoarding of imports or waiting, only the anticipated positive response in production, and the efficiency cost of overshooting. A large reform may be able to convince the private sector that the government is indeed willing to incur the political cost of implementing the reform so that the initial subjective probability of default decreases. As a matter of fact, when the government, whose intentions are not fully known to the public, announces the adoption of a gradual reform, the announcement itself will not convey any new information to private agents. A redistributive government would obviously like to reap the benefits of a more efficient economy, brought about by a shift of resources to the export sector, but without incurring the cost of changing the relative price. Such a government has an incentive to announce a gradual reform (if believed) and, subsequently, to deviate from it when the desired shift of resources has taken place. But rational agents recognize the time—consistency problem and do not want to be fooled. Hence, a genuinely liberalizing government may find it difficult to use the gradual strategy in the absence of credibility, even if it otherwise would be a sensible policy.

As to the welfare costs and the speed of incredible liberalization, the trade-off is therefore between non-optimal intertemporal substitution in consumption *cum* the socially-costly hoarding of imports, on the one hand, and the beneficial shift of resources to the export sector, on the other. Hence, it is important for the liberalizing government to assess the anticipated consequences of incredibility in advance. If adverse effects are likely to endanger the entire reform, the government has either to find measures to enhance the credibility of its policies, counter the expected speculative action by using some other policy instruments, adopt a gradual approach, or to postpone the implementation of the reform until the social cost of incredibility can be expected to be smaller.

The benefits of getting the subjective probability smaller by shifting capital to the export sector through parastatals, for example, are sensitive to the *ex ante* probability of default. Furthermore, it may be more important for the government to get the probability down in the short term rather than to worry about the more distant expectations. Depending on how high is the propensity to store intermediate goods relative to consumer durables, credit policy can be targetted either to the manufacturing sector, import trade, or both. Another instrument to counter private speculation would be to modify the regulations and charges applied to importation.

4.2.3 Aid and the Speed of Trade Liberalization

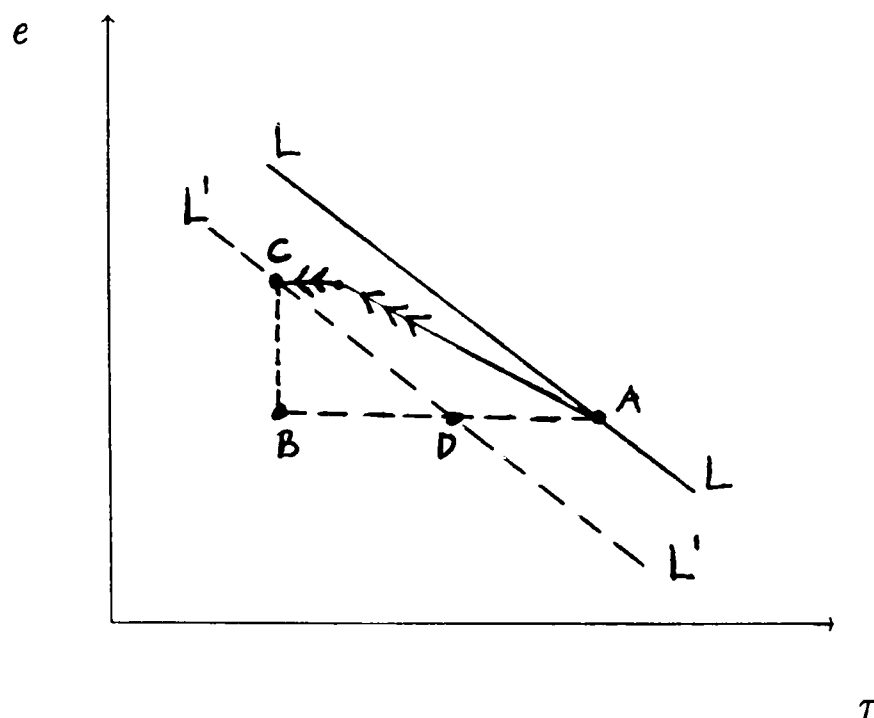
Can temporary external aid make a strong and fast reform credible? As was discussed above, a bold reform is more likely to induce a desired supply response and would therefore be preferable to gradualism. A big bang which is made compatible by virtue of temporary foreign aid temporally cheapens imports, giving

rise to speculative private behaviour. Foreign aid can actually play a dual role in trade liberalization. First, it may enhance the credibility of a large reform when, for political reasons, currency depreciation cannot be of equal magnitude. Nevertheless, consumers still have an incentive to accumulate stocks of importables. Investors instead, convinced that tariffs can be permanently kept at lower levels thanks to external aid which allows politically feasible gradual depreciation, will, as expected by the policy-maker, shift resources to the export sector. The only uncertainty that remains is whether consumer speculation will drain the reserves so as to erode credibility and adversely affect investors' confidence.

Second, aid can be a source of time-inconsistency and actually make the private sector suspicious about the permanence of the reform (Rodrik 1989c). Liberal trade policies are expected to last as long as aid flows in, but are anticipated to be reversed once aid has dried up, particularly if no major political changes accompany the reform. The political cost for the government of sustaining the reform after the aid flow has stopped is perceived to be too high. In this case an aided trade liberalization is likely to be harmful by giving rise to speculative behaviour by both consumers and investors.

When a big bang trade liberalization is made macro compatible by temporary foreign aid, it does not make any difference to the consumer — unlike the investor — whether tariffs are reimposed or currency is depreciated after the aid flow has stopped. In both cases, trade liberalization temporarily cheapens imports, inducing speculative consumer behaviour when import prices are low. We illustrate the issue in Figure 4.2.

Figure 4.2. Consumption and Investment Decisions under Aided Trade Liberalization.



LL is the compatibility locus between the exchange rate e and the level of protection (implicit tariff) τ . An aided trade reform shifts the economy temporarily to point B . When aid runs out there will be a shift back to the locus either via a reversal of the reform, or via depreciation. In the latter case, aid allows for a large and sustained reduction in protection, while currency depreciates only gradually. But aid also shifts the locus itself to the left by reducing the money supply, provided the government will not increase spending. Hence, over time the economy shifts back from B to the new compatibility locus $L'L'$.

For the consumer it is sufficient to expect a return to $L'L'$ in order to induce speculation, whereas for the investor it is crucial to know where on the locus the economy will end up (point C , D or somewhere inbetween). In other words, the entrepreneur is facing the decision whether to invest in the export sector (depreciation and low tariffs) or in the import-substituting sector (appreciated currency and high protection). Uncertainty is likely to prevent capital from being

relocated and to defer investment until there is sufficient information where on the locus $L'L'$ the economy will end up. If a gradual devaluation is actually carried out while aid flows in, it is possible that the subjective probability of collapse π is reduced to the extent that investors will no longer defer their investment decisions. Whether the revised probability is sufficiently low to convince the investors to take action depends on the initial level of π .

The case of overshooting devaluation *cum* gradual trade liberalization, presented in Section 4.2.2, can also be depicted in Figure 4.2. A quantum devaluation and a small initial trade reform (relative to devaluation) takes place so that the economy moves from point A to point E . Thereafter import controls are being relaxed gradually so that eventually point C is reached.⁴³

⁴³Simulating a standard CGE model for a small open economy, except for import quotas, Collier and Gunning (1992) show that a big bang trade liberalization, which is made compatible by a compensating devaluation, reduces investment for a given savings rate as the subsidy enjoyed by unrationed capital good imports is removed. In the case of quantum devaluation—*cum*—gradual relaxation of QRs, investment maybe further reduced as the relative price of import—substitution to exportables falls only slowly over time when the gradual reform progresses. Even in the absence of incredibility, investors may prefer to wait until there has been a sufficient change in the relative price and remain liquid before shifting to the export sector. When external aid is used to ensure compatibility, the subsidy on capital goods is being removed only slowly over time as the currency depreciates gradually (in the short run the subsidy is extended to all imports). Temporary aid has, however, a Dutch disease spending effect in favour of nontradables. Finally, a big bang trade liberalization tends to create unemployment which is aggravated with aid.

ANNEX 4.1

We can solve for the allocation of labour, rural wage and for the urban rate of employment λ from the simultaneous equations (A4.1)–(A4.3), $\forall i, \forall j$

$$(A4.1) \quad L_j^i = -\Pi_{jw}^i$$

$$(A4.2) \quad L_m^1 + L_u^1 + L_a^1 = L; \quad L_m^2 + L_a^2 = L$$

$$(A4.3) \quad w_a^1 = \lambda \cdot \bar{w}_m^1, \text{ where } \lambda = L_m^1 / (L_m^1 + L_u^1)$$

where L is the fixed total labour supply, the subscript u denotes unemployment, $j, j = m, a$ stands for the sector, and $i, i = 1, 2$ for the period. Substitutions yield:

$$(A4.2') \quad -(\Pi_{mw}^1 / \lambda) - \Pi_{aw}^1 = L; \quad -\Pi_{mw}^2 - \Pi_{aw}^2 = L$$

$$(A4.3') \quad w_a^1 = \lambda \cdot \bar{w}_m^1$$

Note that in what follows investment is not exempted from tariffs, that is $I = I(\tau, \delta)$. Totally differentiating (A4.2') and (A4.3) and applying Cramer's rule we can determine how a small change in tariffs affects the endogenous variables:

$$dw_a^1 / d\tau > 0$$

$$d\lambda / d\tau > 0$$

$$dw_a^2 / d\tau < 0$$

$$[dw_a^2 / d\tau = 0, \text{ when } I = I(\delta^*)]$$

$$dL_m^1/d\tau = -\Pi_{mwp}^1 > 0 \quad dL_a^1/d\tau = -\Pi_{aww}^1 dw_a^1/d\tau < 0$$

$$dL_m^2/d\tau = -\Pi_{mww}^2 dw^2/d\tau - \Pi_{mwK}^2 I_\tau < 0$$

$$dL_a^2/d\tau = -\Pi_{aww}^2 dw^2/d\tau > 0$$

The effect of a small change in the tariff on the level of unemployment in period one is ambiguous and depends on several elasticities.

$$dL_u^1/d\tau = [-L_m^1/(\lambda)^2]d\lambda/d\tau + (1 - 1/\lambda)\Pi_{mwp}^1 \lesseqgtr 0$$

Properties of the profit functions Π_j^i yield us the effects on rentals to sector-specific factors r and l , and on outputs x . p denotes the price of the urban good, $p = 1 + \tau$.

$$dr^1/d\tau = \Pi_{mKp}^1 > 0$$

$$dr^2/d\tau = \Pi_{mKK}^2 I_\tau > 0$$

$$dl_m^1/d\tau = \Pi_{mA_p}^1 > 0$$

$$dl_m^2/d\tau = \Pi_{mA_K}^2 I_\tau > 0$$

$$dl_a^1/d\tau = \Pi_{aAw}^1 dw_a^1/d\tau < 0$$

$$dl_a^2/d\tau = \Pi_{aAw}^2 dw^2/d\tau > 0$$

$$dx_m^1/d\tau = \Pi_{mp_p}^1 > 0$$

$$dx_a^1/d\tau = \Pi_{apw}^1 dw_a^1/d\tau < 0$$

$$dx_m^2/d\tau = \Pi_{mp_K}^2 I_\tau < 0$$

$$dx_a^2/d\tau = \Pi_{apw}^2 dw^2/d\tau > 0$$

PART TWO : APPLICATION TO KENYA

The second part of this thesis will apply the theoretical analysis of trade liberalization and incredibility, developed in part one, to Kenyan reforms. Part Two contains two main lines of empirical investigation. First, we will make an attempt to define a quantitative index of trade policy (Chapter VI). Ideally, such an index should be able to tell us whether or not given changes in trade policy instruments surface at the aggregate data. In other words, the index should be able to indicate when there was a liberalization episode, and when it was either completed (or stopped before completion), or reversed. As we argued in the Introduction, there is an urgent need to improve the methods for identifying liberalization episodes. Otherwise it will be very difficult to arrive at any definite conclusions in comparative studies, whether using time-series analysis, or cross-sectional analysis. Previous studies on trade liberalization have suffered precisely from this problem (for example, Michaely *et al.* 1991).

Second, we will empirically assess the welfare costs of private speculation during Kenyan trade reforms (Chapter VII). In practice private agents have a wider range of choices of speculative action, when the reform is perceived to be short-lived, than those suggested in the simple models developed in Chapter III. There is a trade-off between the cost of speculation and the risk involved. For example, holding excess import licenses is a less costly means of ensuring access to additional imports before the collapse of a reform than accumulation of actual imported goods, but it entails a higher risk in the form of future devaluation or tariff increases. Little empirical work

has been carried out which quantifies the adverse effects of the credibility problem in trade liberalization. We will therefore attempt to assess these effects in Kenyan trade reforms since the mid-1970s. A brief summary of the evolution of Kenyan trade policy will introduce Part Two (Chapter V).

V EVOLUTION OF KENYAN TRADE POLICY : AN INTRODUCTION

5.1 Macroeconomic Events and Trade Responses

Since the early-1970s Kenyan macroeconomic history has been dominated by terms-of-trade shocks, both positive and negative. In response to these shocks, import restrictions have been actively used as the adjusting variable. In 1973-74 the Kenyan economy was hit by the first oil shock with a quadrupling of oil prices and a 30 percent increase in other import prices. Another negative shock, a drought, occurred at the same time. The oil shock created a balance-of-payments crisis in 1974 as the current account deficit doubled and the balance of payments moved from zero to a deficit of 3.9 percent of GDP (Bevan *et al.* 1990b). Real growth, which had been above six percent on average during the previous decade, was reduced to around one percent in 1975, while GDP per capita became negative. Despite increased foreign borrowing, external reserves fell, while inflation accelerated. The government reacted to the shocks by tightening of import controls and curtailing domestic credit to the private sector in order to reduce imports, and by introducing an export subsidy of 10 percent and a refund scheme of import duties on inputs in order to stimulate exports.

The stagnation (as well as attempts to stabilize the economy) was ended by the international coffee (and tea) boom in 1976-78. The current account deficit was turned into a surplus of over 10 percent. In period 1976-79 the terms of trade gain was equivalent to 24 percent of 1975 GDP (Bevan *et al.* 1990b). The windfall was not taxed away by the government but the producer price, paid predominantly to

small-holders, rose almost as much as the world price of coffee. The boom was correctly perceived to be temporary by private agents. Bevan *et al.* (1990b) found that the private savings rate out of the windfall was over 60 percent. Much of the investment went to import-substitution which increased by over 50 percent in 1975–83. While the private sector saved during the temporary windfall, the government increased spending which it was not able to curtail when the boom was over. Therefore, the Kenyan economy emerged from the 1970s with a serious macro imbalance.

Following the second oil shock in 1979 both the domestic and external deficit were substantial. The recession was at its deepest in 1981–82 when the budget deficit reached 9.5 percent of GDP, the current account was in deficit by 12 percent of GDP, and real growth fell back to less than 2 percent in 1982. Foreign borrowing increased from 35 percent of GDP in 1978 to almost 65 percent in 1986, while the corresponding debt service ratio rose from less than 10 percent of exports of goods and services in 1978 to 39 percent by 1987. The government made an attempt in 1980 towards structural adjustment in order to rectify the chronic imbalances and slow growth. An essential ingredient of the reform was dismantling of protection. Unlike in the 1970s, when trade policy was endogenous, the 1980 relaxation of import controls was exogenous, as there was no improvement in the terms of trade. As we will show in Chapters VI and VII, the trade reform quickly collapsed due to extensive private speculation, and without much impact on the protective structures.

The period 1980–85 can be described by macroeconomic disequilibrium and low growth. The average annual GDP growth was only 3.3 percent in 1980–84. Food imports were of a substantial magnitude during the first part of the 1980s, reaching their peak in 1984 when there was a severe drought.

A revival of growth was initiated by a mini coffee boom in 1986. Coffee prices rose by 39 percent in 1985–86 but fell back close to their initial level during the following year. Although the boom faded rapidly, inflows of foreign savings supported the average annual GDP growth rate of 5.6 percent during 1986–89. External aid was granted on the condition that the government undertake trade liberalization and deregulation of economic activity, particularly investment. The average fiscal deficit was 4.9 percent in 1986–90. The external balance alternated between surpluses (1986, 1989) and deficits (1985, 1987–88).

Real GDP growth fell to 4.3 percent in 1990 and to 2.2 percent in 1991. A renewed structural adjustment programme, which was initiated in 1986 but actually implemented only at the end of the decade, did not proceed as smoothly as expected by the donors. Commitments of balance-of-payments support were therefore postponed in late 1991, and have only recently (April 1993) been resumed. At the same time there was external pressure for a political change as well. The squeeze on foreign exchange made both the domestic and external balance deteriorate. In March 1993 there was a temporary setback as the government renounced most liberalization measures achieved until then under the structural adjustment programme. Since May 1993, however, the Kenyan economy has undergone further liberalization, including major changes in exchange rate management and the dismantling of import controls.

The next three sections will briefly describe the evolution of Kenyan trade policy. A discussion of trade liberalization episodes will, however, be left for Chapter VI.

5.2 Non-Tariff Import Restrictions

Quantitative restrictions are a relatively recent phenomenon in Kenyan foreign trade policy. During the colonial era they were practically non-existent, while tariffs were imposed mainly to raise revenue for the government. Import licensing was first introduced in the late 1950s to provide modest protection to domestic producers. At independence the government adopted a deliberate industrial strategy based on import-substitution — a recommendation by the World Bank at the time — but import licensing was not yet extensively used. In the 1960s imports entered Kenya either under Open General License or required a Specific Import License (SIL). The proportion of imports affected by SILs varied between 13 and 37 percent of the value of home consumption (The World Bank 1975). Since the establishment of the East African Community (EAC) in 1967, licensing remained the only protective means available to the government as tariffs were subject to common external tariff policy of the EAC.⁴⁴

The main objective of the import licensing system was to speed up industrialization. Five different types of controls were used. First, imports of given manufactured goods were permitted only if their price was above a certain unit price. This control has an in-built incentive to over-invoice imports and to raise domestic prices. Second, quotas were imposed on a range of imports, and often allocated to importers on the basis of past performance. This practice allowed some existing importers to become monopolies as they were protected both from domestic and foreign competition. Third, an approval by specific bodies was required. Fourth, in order to Kenyanize wholesale trade, the Kenya National Trading Corporation was granted the sole right to import certain goods, particularly foodstuffs. Finally, imports of

⁴⁴The East African Community, which consisted of Kenya, Tanzania and Uganda, collapsed in 1977.

many food products and locally produced goods were totally banned (The World Bank 1975).

Following the balance of payments crisis in late 1971, a considerable tightening of import restrictions was carried out. For the first time trade policy became an endogenous instrument of macroeconomic management with the prime aim of saving foreign exchange. The crisis led to introduction of a number of fairly indiscriminate import quotas and foreign exchange controls (instead of allowing the currency to depreciate). The aim was to ban or restrict all "unnecessary imports", i.e. luxury goods and imports of goods which were locally produced. In other words, the side-effect of using trade policy as a macroeconomic instrument was an increased protection of existing domestic industries as well as protection of luxury items not yet produced in Kenya.

The increased importance of quantitative restrictions in protection and foreign exchange rationing over time can be illustrated by the growth of the number of licensed items. In 1964 the number of items under license was only 69, in 1972 it had risen to 228 (the total number of items produced in Kenya was 688 at the time), in 1975 up to 472, while by 1980 and thereafter the number has remained at around 2700 (The World Bank 1975; N'geno 1990). Manufactured goods (equivalent to the Standard International Trade Classification, SITC categories 6 and 8) have always had the largest number of items under license. Protection has also been very effective in reducing the proportion of consumer goods in total imports from 34 percent in 1960 to 11 percent in 1987. Imports of intermediates increased from 39 percent to 61 percent during the same period, reflecting the fact that the protectionist policy against imports of finished goods and in favour of intermediate inputs failed to stimulate the use of domestic raw materials.

Until very recently, all private sector imports to Kenya required a license to receive a foreign exchange allocation. Licenses that were valid from three to six months were issued jointly by the Ministry of Commerce, the Ministry of Industry, the Ministry of Finance, and the Central Bank.⁴⁵ Licensing has been administered according to schedules, which establish explicit priorities for importables. The schedules have been modified over time. After the latest revision, the three main import schedules are (Republic of Kenya 1991a):

- I High priority capital goods, raw materials and intermediate inputs imported freely through virtually automatic licensing and foreign exchange allocation;
- II Items of relatively high priority (food, oil, fertilizer) but a prior approval from the relevant government ministry or agency is required. These approvals are, in general, of technical nature.
- III Sub-categories A–B consist of finished goods, both luxury goods and goods produced domestically. The Schedule is used for protection and for balance of payments control, and therefore, receives a residual foreign exchange allocation. Items on IIIC (currently only 12 items) are restricted for health, security and environmental reasons.

⁴⁵In February 1993 the government announced that it planned to liberalize the import licensing system by abolishing the Import Management Committee (IMC) and Foreign Exchange Allocation Committee (FEAC). Provision of foreign exchange and import processing authority was to be delegated to the commercial banks, which were allowed to establish an inter-bank market for foreign exchange. Even before the new system was in operation, the government announced a reversal of liberalization in March 1993. The IMC and FEAC were not, however, reinstituted, and in practice only No-Foreign-Exchange (NFE) import licenses were being approved. In May 1993 there was a new announcement to abolish import licensing. The Central Bank will no longer deal with allocation of foreign exchange for commercial imports. An importer is required to complete an Import Declaration Form and arrange the finance of imports with commercial banks. Pre-shipment inspection of imports will continue to be carried out, however.

Import licenses that require no foreign exchange allocation (NFE) were usually granted for imports under Schedule III. Under the NFE system, importers use foreign currency obtained through other channels than the Central Bank. As Kenyans have not been able to own foreign currencies or foreign securities, nor maintain bank balances abroad,⁴⁶ declaration of the source of funds has been required, at times in the form of an official affidavit. Nevertheless, enforcement of these rules has not been very effective, and it seems obvious that the NFE system has contributed to the parallel market premium of the Kenyan shilling over time. Since 1991, a NFE license no longer requires information about the source of funds. While in 1990, 1.7 percent of the total value of imports was brought in under the NFE, in 1991 the respective figure had gone up to 2.8 percent. The latter is around one quarter of the total imports of consumer goods. During the first quarter of 1992, for example, when the foreign reserve position was weak, practically all consumer goods which were granted a license were imported under the NFE.

For a long time, the practice in import licensing used to be that the Exchange Controller monitored allocation of foreign exchange by the Central Bank with reference to a global allocation determined in the beginning of each year, based on

⁴⁶Exporters, for example, have until recently been requested to surrender all their foreign exchange to the Central Bank. In October 1991 the Government introduced Foreign Exchange Bearer Certificates (FEBC) as part of its programme to liberalize the trade and exchange system. The certificates could be 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, the holders were entitled to use them to pay for imports otherwise restricted (consumer goods in particular). However, FEBCs discriminated against exporters who could only acquire them in the secondary market. After a year of effective operation the system run into problems. In August 1992 a full retention of foreign exchange was allowed for exporters of non-traditional goods. A fifty-percent retention right was given to traditional exporters in October 1992, while a similar arrangement became effective for services in February 1993. Retention rights were temporarily suspended in March 1993, when the entire liberalization programme was denounced, but have since then been returned. Exchange rate management has become increasingly flexible during the early-1990s. In 1993, for example, the Kenya shilling has been devalued twice (by more than 20 percent each time) in order to bring it closer to the inter-bank rate.

projections of inflow of foreign exchange and the demand for imports. The global allocation was then assigned for each week. For example, in financial year 1985/86 the weekly allocations by the Central Bank were 52 percent for Schedule I, 44 percent for Schedule II, and only 4 percent for Schedule III (The World Bank 1987). As these figures indicate, the demand for imported finished goods appears to be heavily suppressed in favour of local industry. Although the weekly allocations of foreign exchange to schedules were subsequently abandoned, the pattern of actual releases did not change much.

According to a World Bank study (1987) the main ground of rejecting licenses for goods on Schedule I and II is overstocking. Stockpiling is said to be controlled by obtaining general market information. However, quantitative data on rejections of license applications on these grounds are not available. Stockpiling of licenses by importers is reported to have been widespread before the application procedures were computerized in the late-1980s. It is obviously more cost-effective from the importers point of view to avoid stock-outs both in inputs and final goods by stocking licenses than actual imports. To curtail multiple license applications a charge of two percent of the amount of the invoice was introduced in 1992.

5.3. Nominal Tariffs and Their Dispersion

In general, quantitative restrictions have exacerbated the effects of nominal tariffs rather than made them redundant in Kenya, although many items have also been found to have "water in the tariff" (The World Bank 1987). In 1970, for example, the average nominal tariff was 18 percent of the value of total imports. For consumer goods the average nominal tariff was 30 percent, for intermediate goods 18 percent, and for capital goods 13 percent. By 1987 the mean scheduled tariff rate for

capital goods had risen to 28 percent with a standard deviation of 20 percent. The figures for intermediate goods were 34 and 17 percent, and for consumer goods 55 and 47 percent, respectively.

The Kenyan tariff system has allowed exemptions by the Ministry of Finance, although clearly less so than some other Sub-Saharan African countries. Imports for infrastructure and donor funded projects have typically been exempted from tariffs. Financially weak parastatals have also been granted a remission on occasion. Even some private sector enterprises have benefitted from exemptions but this information is not publicly available. The collected tariff revenue has been around 14–18 percent of the total value of imports during the recent years.

5.4 Incentives to the Export Sector

The system of export compensation was established in 1974 to compensate exporters for duties paid for imported inputs. Currently, 20 percent of the export value is paid for the producers of eligible manufactured goods. There is no general duty drawback scheme but the firms eligible for the manufacturing-under-bond system have been entitled to imported inputs duty free (but they are not entitled to export compensation). Implementation of both of these schemes has been poor so that in practice the incentives have been ineffective.

In the late-1980s, when it became obvious that import restrictions could not be liberalized as quickly as initially expected, the emphasis of donor conditionality was shifted to improving direct export incentives. More flexible exchange management was the other objective which, to a large extent, has been achieved by mid-1993. Direct export incentives have included improvements in the import duty/VAT

remission scheme, construction of export processing zones, development of air cargo handling facilities, and establishment of the Kenya Exporter Assistance Scheme to provide technical assistance for exporters.

VI IDENTIFYING TRADE LIBERALIZATION EPISODES : AN EMPIRICAL STUDY ON KENYA

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,⁴⁷ 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.

⁴⁷Although quantitative restrictions (QRs) are not necessarily the same as non-tariff barriers (NTBs), the two terms will be used interchangeably in the text.

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, for example, whether value or quantity quotas are being applied. In Africa, foreign exchange rationing for balance of payments purposes is closely linked to import controls which primarily 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 (Michael 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 1 (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 (the sum of imports and exports over GDP), the 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.

6.1 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 case refers 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 briefly review two categories of measures, relative prices and other quantitative measures, that can be used as objective indicators of trade policy.

6.1.1 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):

$$(6.1) \quad B = (EER_M)/(EER_X) = E_M(1+t+n+t_e)/E_X(1+s+r)$$

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 (6.1) 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. Therefore, the bias index is equal to the implicit tariff

index, or the average Nominal Rate of Protection (plus one), which refers to the proportional difference between domestic and international prices. 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 this is not necessarily the case: domestic production may be increasingly dominated by consumer goods, while imports are more and more 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.

6.1.2 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,⁴⁸ (*iv*) measure of the deviation of countries' actual trade pattern from the pattern predicted from a model of resource–based comparative advantage⁴⁹, and (*v*)

⁴⁸Thomas 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.

⁴⁹Applied 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.

the real price distortion.⁵⁰ (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 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 :

$$(6.2) \quad M_d = \alpha + \beta \cdot y + \delta \cdot RER$$

If parameters α , β and δ were known, equation (6.2) 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

⁵⁰Obtained 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.

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 for years 1980–84 is 45 percent and 60 percent for years 1985–90 relative to the restrictions that prevailed in the 1970s. Note that the IIIR is imposed to be zero for years 1970–79. In Section 6.2.3 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. Due to normalization, it cannot be used for the 1970s, however. Another setback is that 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 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. In addition, the index uses the real exchange rate instead of direct observation of prices. The real exchange rate is measured (by the IMF) by comparing the domestic consumer price index with the US wholesale price index, measured in a common currency. As discussed in Section 6.1.1, it is not a good proxy for the domestic relative price of nontradables to tradables when the endogenous trade policy rule is 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. The IIR is also 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 Δ 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):

$$(6.3) \quad B(\varphi, u; \gamma) \equiv E(\pi^* \varphi, u) - (\varphi - 1)' \pi^* m - \beta$$

where φ denotes the vector of tariff factors, which equal the proportional mark-ups over world prices π^* so that $\pi = \pi_i^* \varphi_i$ 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, β is trade surplus, and γ denotes all the exogenous variables other than trade policy. Equation (6.4) implicitly defines Δ , which is the trade restrictiveness index (TRI):

$$(6.4) \quad \Delta(\varphi^1, u^0, \gamma^0) \equiv [\Delta : B(\Delta \varphi^1, u^0; \gamma^0) = 0].$$

If trade policy does not change between the two periods ($\varphi^0 = \varphi^1$), Δ equals one. A rise in Δ means that trade policy has become less restrictive. It can be shown by totally differentiating equation (6.4) 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 :

$$(6.5) \quad B(q, u; \gamma) = E^R(q, \pi, u) + p'q - (p-p^*)'q - \beta$$

where E^R is the restricted expenditure function (restricted due to the existence of 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:

$$(6.6) \quad \Delta(q^1, u^0; \gamma^0) \equiv [\Delta: B(q^1/\Delta, u^0; \gamma^0) = 0].$$

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 (6.6).

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

$$(6.7) \quad B(q, \varphi, u; \gamma) \equiv E^R(q, \Pi^* \varphi, u) + p'q - (\varphi-1)' \Pi^* m - (1-w)(p-p^*)'q - \beta$$

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

$$(6.8) \quad \lambda \equiv \begin{cases} q_i & \text{for quota-constrained goods} \\ 1/\varphi_i & \text{for tariff-constrained goods} \end{cases}$$

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

$$(6.9) \quad \Delta(\lambda^1, u^0; \gamma^0) \equiv [\Delta: B(\lambda^1/\Delta, u^0; \gamma^0) = 0]$$

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 (6.7) yields the following expression for the shadow price of quotas from the U.S. point of view:⁵¹

$$(6.10) \quad -(B_q^{US})' = -\bar{\tau}p' + [\tau_q - 1/\epsilon]p'/(1+\tau_q)$$

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.

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

$$(6.11) \quad -(B_q^{HK})' = p'/[(1+\tau_q)\epsilon] + \rho'.$$

⁵¹Assuming separability and that international arbitrage equates U.S. import prices p to Hong Kong export prices p^* in the following manner: $p = (1+\tau_q)(p^*+\rho)$ where τ_q is the U.S. import tariff and ρ is the price of a Hong Kong export license.

Equation (6.11) 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 (6.10) and (6.11). 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 serious practical inadequacy of the tariff equivalent (i.e. the implicit tariff) as a measure of trade restrictiveness.

Despite the qualifications stated in Section 6.1.1, and the criticism presented by Anderson and Neary (1991), the implicit tariff index is still 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.⁵² 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

⁵²Annex 6.2 derives another candidate for a quantitative measure of trade policy which is the ratio of total private consumption to consumption of imports by households.

levels of the implicit tariff are rarely available for African economies. There are, however, indirect means of obtaining an index proxy for it.

The purpose of the rest of this chapter 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.⁵³ In Section 6.2 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) the IIR measure of import compression developed by Narasimhan and Prichett (1993).

A few snapshots of the actual levels of protection, both the 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 6.3 will examine whether these snapshots concur with the changes in trade policy as indicated by the implicit tariff index, the narrative, or by the IIR. Section 6.4 contains an assessment of the quality of domestic price deflators available for constructing the implicit tariff index. Finally, Section 6.5 examines the reliability of corresponding import price indices, Section 6.6 summarizes.

⁵³Other studies on Kenyan trade liberalizations include Ikiara (1987), Bevan *et al.* (1990, 1991), and N'geno (1991).

6.2 Implicit Tariff Index as a 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 our discussion the implicit tariff index will consistently refer to the average implicit tariff index for Kenyan manufactured and semi-manufactured goods (SITC 5–8), and it will be calculated by using the average domestic ex factory price and its world price equivalent.

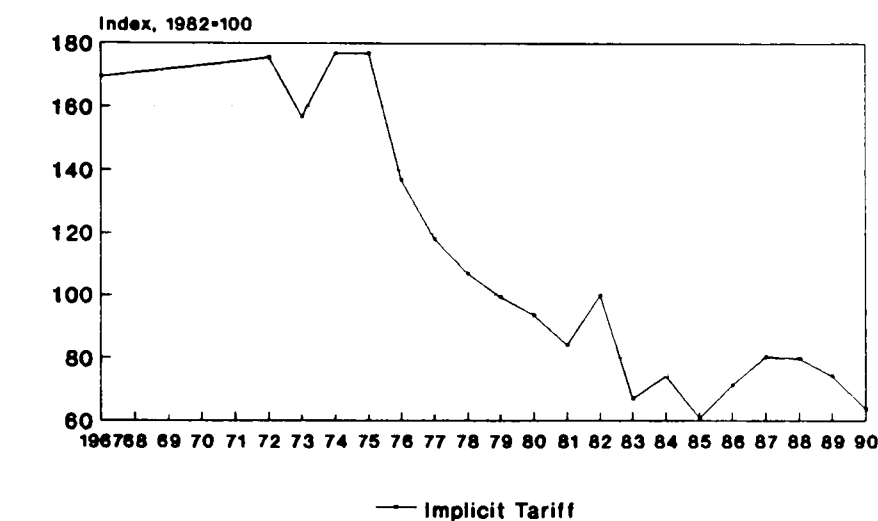
6.2.1 Derivation of Implicit Tariff Index for Kenya

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 6.1 for details).⁵⁴

⁵⁴Data 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.

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.⁵⁵ 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 latter are reweighted by their respective shares in domestic manufacturing. Figure 6.1 depicts the implicit tariff index for manufactured and semi-manufactured goods for Kenya in 1967 and 1972–90.

FIG 6.1. TRADE POLICY INDEX FOR KENYA
1967 & 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.

⁵⁵Beverages and Tobacco are also excluded from the index.

6.2.2 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 briefly describe these episodes in the form of a narrative of events. The narrative will then be compared with the implicit tariff index readings 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.

As indicated in the previous chapter, 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.* (1990b) 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, i.e. 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.* 1990b). 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, putting 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 6.1, tightening of import controls in 1979, when the coffee boom was over, is

not reflected in the implicit tariff.⁵⁶ A possible explanation for this could be falling incomes. Despite being tightened, QRs become less binding, and the implicit tariff 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 a 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

⁵⁶Bevan *et al.* (1990b) 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.

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 1981 indicates further liberalization are less clear. There are two potential explanations: falling incomes, which make QRs less binding, and reductions in tariffs implemented in 1981.

According to N'geno (1990), 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, however. 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. It looks as if an easier and less discretionary access to inputs increased domestic competition so that the implicit tariff continued to fall (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.⁵⁷ In particular, licensing of imports under Schedule 3, which mainly consist of import-competing and consumer goods, has, until very 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 many instances, tariff reductions were accompanied by 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 was 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

⁵⁷As described in footnote number 45 in Chapter V, the import licensing system was abolished in May 1993.

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 has so far proved inefficient, is 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 in Kenya has become very 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 that occurred in incomes and in the exchange rate,⁵⁸ 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 1979 and 1981, whereas the 1982 reform appears

⁵⁸The 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.

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 6.1? These questions will be explored in detail in Sections 6.3 – 6.5.

6.2.3 Implicit Tariff Index versus Index of Import Compression

According to Figure 6.1, 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 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 (the observations were used for estimating the constant in the 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 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 for the 1980s. Contrary to the IIIR, the average implicit tariff index reading is 84 for 1980–84 and 72 for 1985–90.⁵⁹ 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 further liberalization.

6.3 Actual Levels of Protection in Kenya

This section contains an attempt to assess whether the implicit tariff index (Figure 6.1) 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), which is a modified measure of domestic resource cost (DRC). They 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.

⁵⁹The 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.

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 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 6.1. 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.

Table 6.1. 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.)

As can be seen from Table 6.1, 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 1987, and Maxwell Stamp Associates 1989 whose results will be summarized in Tables 6.2 and 6.3 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 (1987) 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 6.2 summarizes the results.

Table 6.2. 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,Pharmaceutic. (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 (?,9)	38	312	1.86	5.48
Electrical,Transp Eq.(?,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 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 DRC⁶⁰ as the measure of efficiency, food 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.

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 SITC 5–8 (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 weighted⁶¹ 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 6.2).

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

⁶⁰The 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.

⁶¹Weighted by shares in value added at world prices.

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.

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. Their preferred (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, and the amount of illegal imports. In addition, the choice of products in the sample will affect the results when protection is uneven amongst and across sectors.⁶² The difference between the results revealed by a comparison of Tables 6.2 and 6.3 seems to be too wide, at least for the base case, to be explained by the sample choice, or by variations in production costs, import or price controls, or economic conditions over a period of only three years. It is more likely a result of a different choice of price series by the two studies.

⁶²There 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.

Table 6.3. Protection in Kenya in 1988 (Maxwell Stamp Associates).

SUB-SECTOR*	NOMINAL TARIFF RATE	KENYA CUSTOMS NRP	UK CUSTOMS N-EC	LOW	NRP 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%) (Tariff Equivalent)	53	19 (-34)	60 (7)	112 (59)	88 (35)
NON-FOOD-BEVER-TOBACCO (45%) (Tariff Equivalent)	50	68 (18)	26 (-23)	107 (57)	68 (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)

MSA interviewed 113 firms in six industrial subsectors⁶³ 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

⁶³MSA 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.

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, 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) is 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, Annex 1, 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 6.5 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 1991b). 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 6.1), i.e. tightening of trade policy in 1986–88 relative to 1985.

In general, the snapshots of the actual levels of protection in Kenya do not confirm the downward trend in the implicit tariff index depicted in Figure 6.1. Quite the

contrary, they indicate that the Kenyan trade regime has become more protective over time (at least until 1988). The snapshots seem to be in accordance with the index of import compression (the *IIIR*) for the comparison between the 1970s and the 1980s but not for that between the first and the second half of the 1980s.

Finally, 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.⁶⁴ It is somewhat higher than the average levels reported by the two studies, except for the MSA base case.⁶⁵ As our price data do not extend beyond 1990, it is

⁶⁴The implied implicit tariff is additive rather than multiplicative since import duties are based on the official value of the currency.

⁶⁵The NRP derived using the weighted average UK price for total imports, including food, is also slightly higher.

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 reflect the composition of imports using the FEBC market.

6.4 Testing for Biases in Domestic Deflators

As shown earlier in this chapter, the narrative of changes in trade policy concurs fairly well with changes in the implicit tariff index, although there are a few deviations for some years. 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 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 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 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 6.1. Our first hypothesis is that incentive for misreporting domestic sales may have increased 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.

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 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 6.2, assuming a foreign exchange constrained economy.

Figure 6.2. Import Demand and Domestic Supply of Importables
in a Foreign Exchange Constraint Economy.

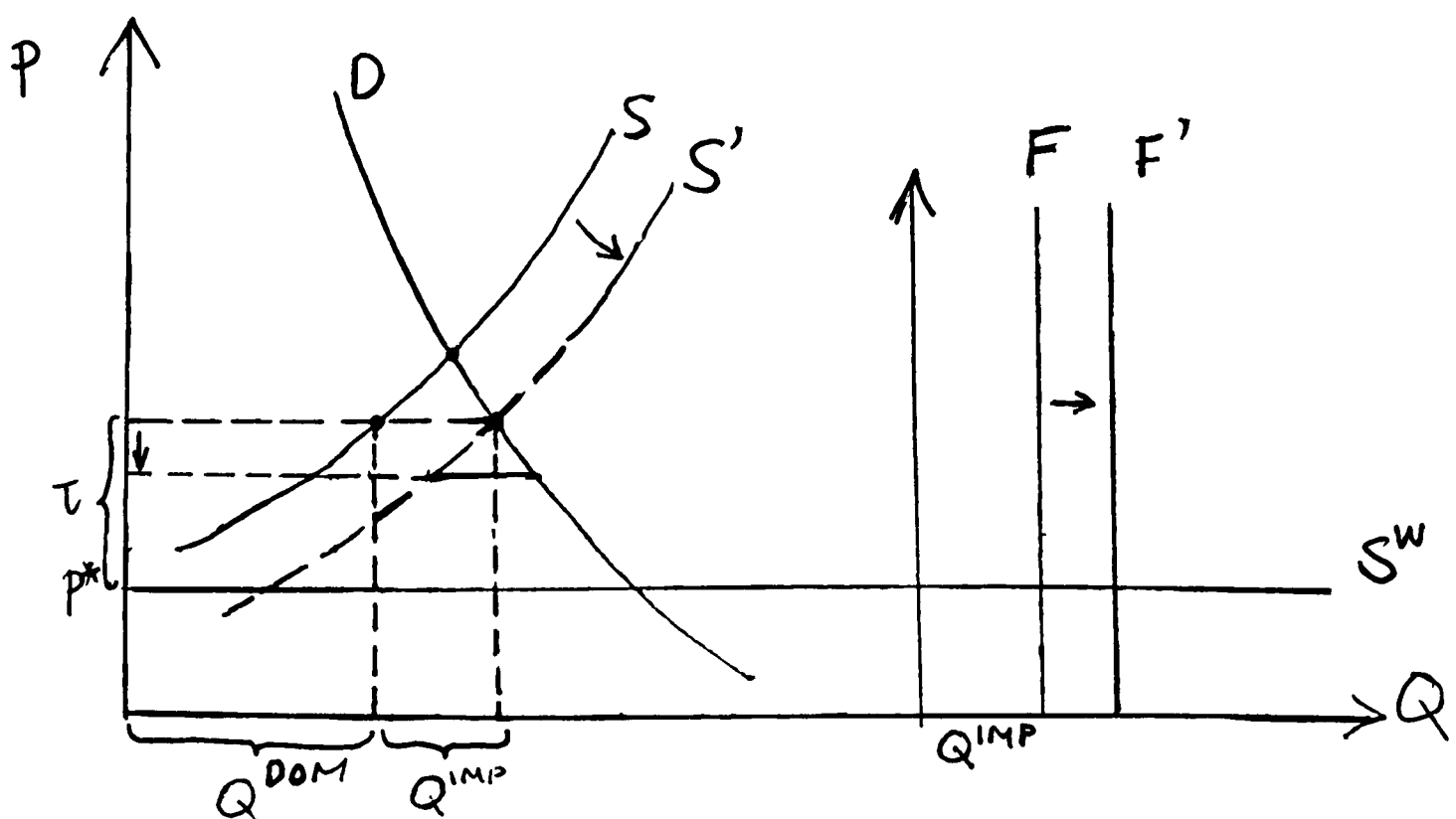
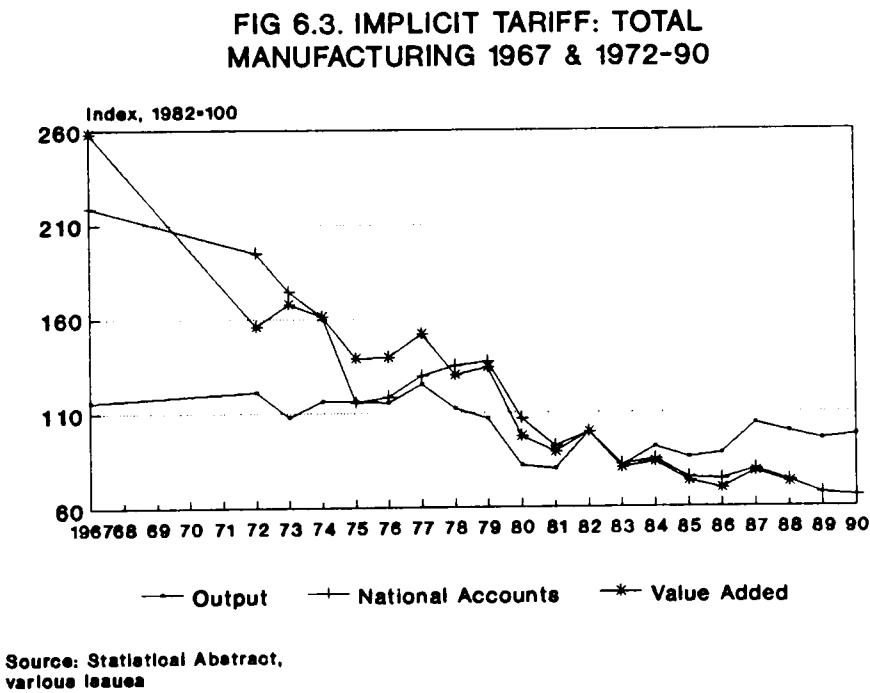


Figure 6.2 depicts a situation where protection (i.e. the domestic price of importables, $p^* + \tau$) declines even if there is no change in trade policy. The initial equilibrium is at E , given foreign exchange supply constraint F , perfectly elastic supply of imports S^* , and domestic supply and 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 a 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.

6.4.1 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 6.3 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.



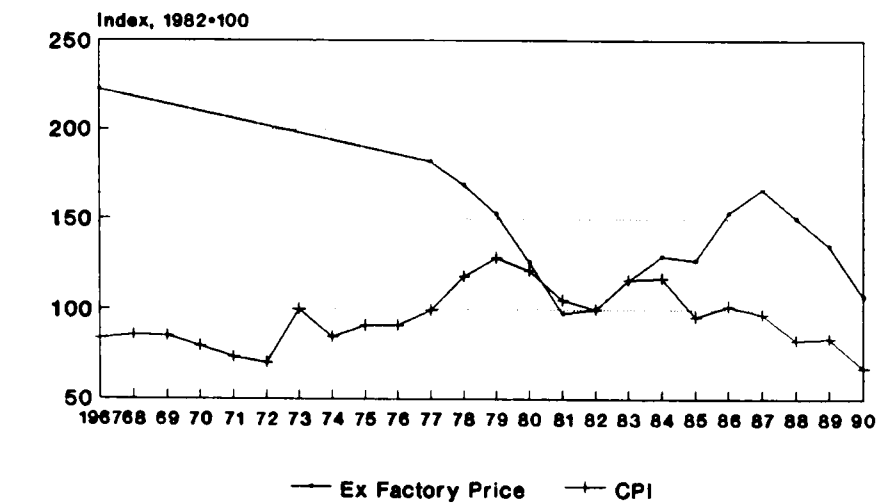
Hence, we are not able to confirm or reject the first hypothesis of underreporting of sales on the basis of the alternative indices derived using the value added instead of the value of output data. Other things being equal, underreporting of sales should

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. 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 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 6.4, the implicit tariff indices based on consumer and producer prices of clothing and footwear behave quite differently from one another.⁶⁶ 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.

⁶⁶Years 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.

FIG 6.4. IMPLICIT TARIFF INDICES:
CLOTHING & FOOTWEAR, 1967-90



Source: Statistical Abstract, various
issues; Ex factory price based index
only for 1967 and 1977-90

The implicit tariff index derived using a CPI series instead of a producer price (Figure 6.4) is in sharp contrast with our base case (Figure 6.1). 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.

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. Despite the

fact that domestic producers face these prices, the implicit tariff index is therefore not a good indicator of trade policy, and the tradable component of the consumer price index (CPI), for example, would produce a more appropriate index. Unfortunately, the Kenyan CPI has 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 a 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, producer and consumer prices seem to 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 indicated almost an opposite trend. Second, different data sources yield very different series for producer prices. There is an indication that the valuation of inputs may contain a bias.

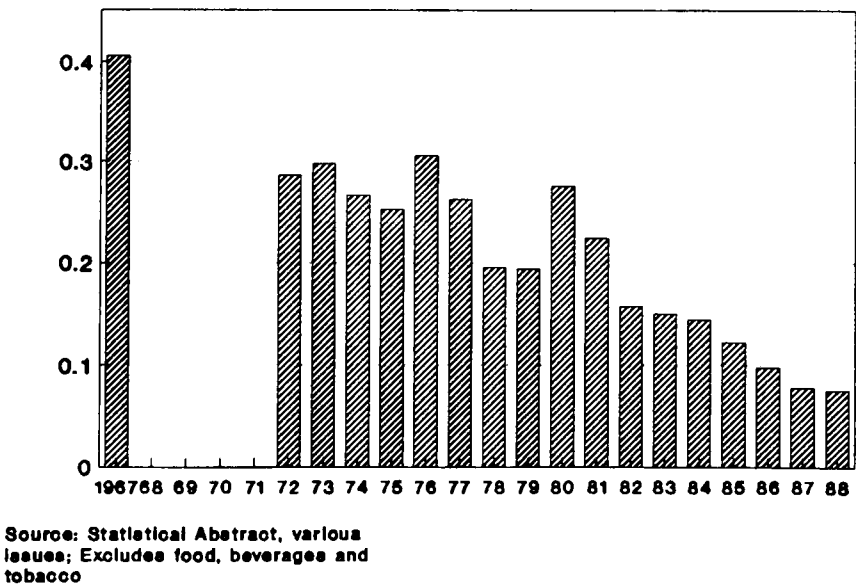
6.4.2 Other Data Which Could Reveal Biases

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, although not fully, 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, various issues). Hence there has been no incentive to increase underreporting of sales due to changes in the corporate tax rate, except perhaps in 1974.

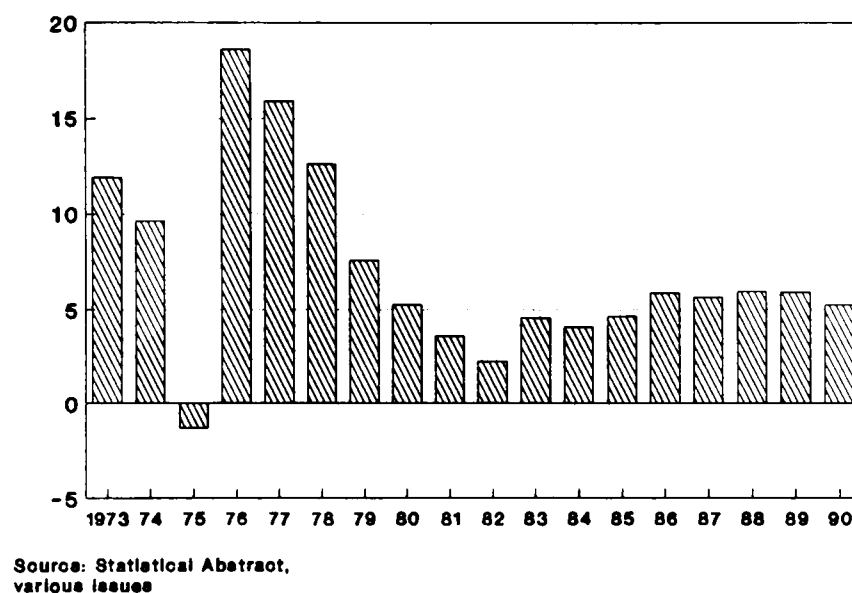
Underreporting of exports may also produce flawed domestic producer price deflators. As depicted in Figure 6.5, the share of exports in manufacturing output has fallen considerably since 1967. Hence, assuming that the incentive for underreporting exports has remained constant, there is no reason to believe 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 be correlated with the black market rate premium so that a peak was likely to have occurred after the attempted coup d'etat in 1982.

FIG 6.5 SHARE OF EXPORTS IN
MANUFACTURING OUTPUT, 1967 & 1972-88



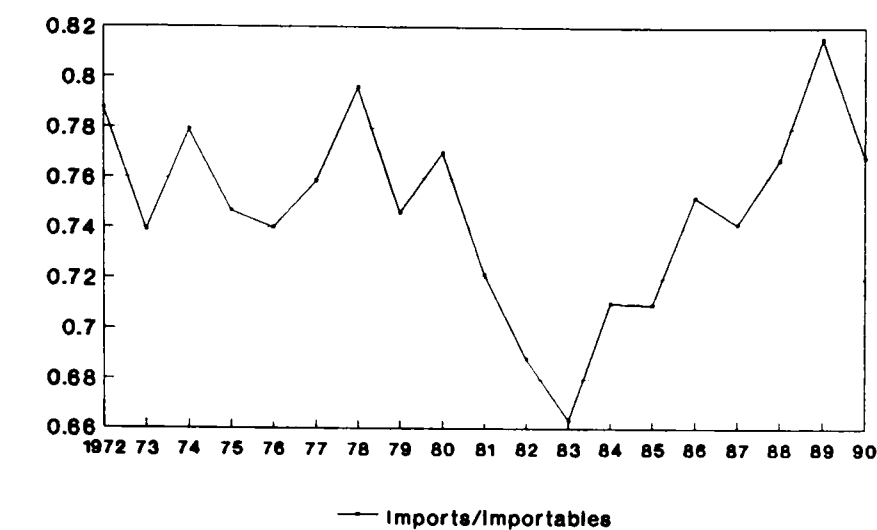
In order to test our second hypothesis of falling prices as more firms enter and output expands, let us look at the annual growth rate of manufacturing output (calculated from the quantity index). As can be seen from Figure 6.6, the growth rate was very high in the 1970s, with the exception of 1975. 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 6.1).

FIG 6.6. MANUFACTURING QUANTITY INDEX
GROWTH (%) IN 1973-90



According to the theory of a constant foreign exchange constraint captured by Figure 6.2, 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 can therefore 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 6.7.

FIG 6.7. MARKET SHARE OF IMPORTS
1972-90

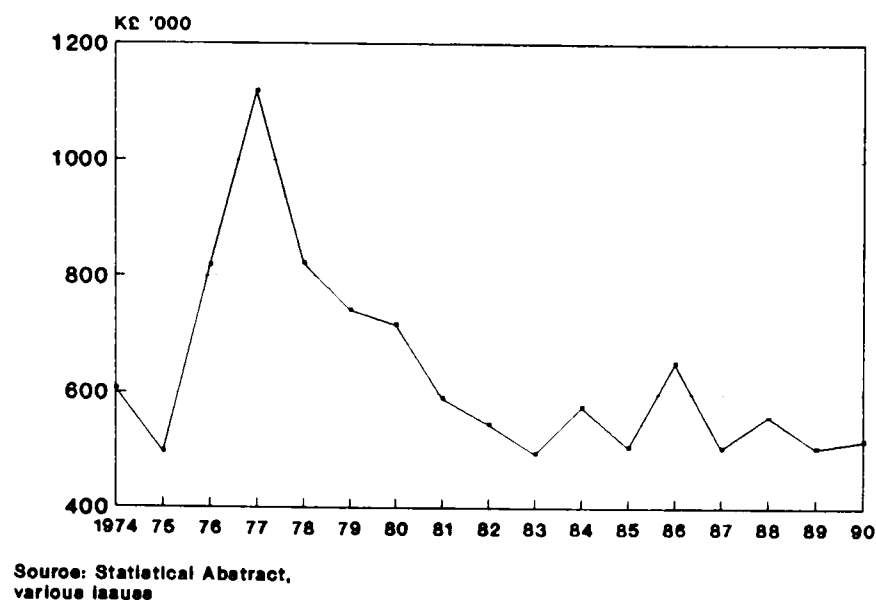


Source: Statistical Abstract,
various issues

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 6.8 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.

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

FIG 6.8. EXPORT EARNINGS DEFLATED BY
IMPORT PRICE INDEX, 1982 PRICES



At least two of the peaks in the market share of imports reflect speculative inventory accumulation. As will be shown in Chapter VII, 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.

6.4.3 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 implausible, 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):

$$(6.12) \quad w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log(x/P)$$

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 price index defined by

$$(6.13) \quad \log P = \alpha_0 + \sum_k \alpha_k \log p_k + \frac{1}{2} \sum_k \sum_l \gamma_{kl} \log p_k \log p_l$$

In many practical situations $\log P$ will be approximately proportional to any appropriately defined price index, for example, $\log P = \sum_k w_k \log p_k$. The index P can be calculated directly before estimation so that (6.12) 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 $\sum_k \alpha_k = 1$, $\sum_k \beta_k = 0$, and $\sum_k \gamma_{kj} = 0$. 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 (6.12) 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:

$$(6.14) \quad e_x = 1 + \beta_i/w_i; \quad e_{ii} = \gamma_{ii}/w_i - \beta_i - 1; \quad e_{ij} = \gamma_{ij}/w_i - \beta_i w_j/w_i$$

$$e_{ii}^* = \gamma_{ii}/w_i + w_i - 1; \quad e_{ij}^* = \gamma_{ij}/w_i + w_j$$

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,⁶⁷ 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,⁶⁸ which implies that tradables are consumed by the private sector, except for investment. This is a plausible assumption for Kenya.

⁶⁷Low income index of consumer prices (Nairobi), except for two categories: (i) clothing and footwear, and (ii) furniture, furnishing, house equipment and household operation.

⁶⁸Includes 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.

The first step is to estimate price index P and insert it into equation (6.12). 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 (6.12) 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 6.4.

Table 6.4. The Nearly Ideal Demand System for Kenya, Importables.

Equation (6.12): Modelling $w(i)$ by OLS; Sample 1973 to 1990					
Variable	Coefficient	Std.Error	t-value	HCSE	PartR ²
Constant	-2.5134	0.73862	-3.403	0.56780	0.4527
LogPm	0.36796	0.087655	4.198	0.087210	0.5573
LogPn	-0.69523	0.11822	-5.881	0.10534	0.7119
Logx-LogP	0.77128	0.18584	4.150	0.14064	0.5516
R ² = 0.829569 F(3, 14) = 22.715 [0.0000] $\bar{O}$ = 0.0234911 DW = 1.98					
Information Criteria: SC = -7.11128					
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					
$e_x = 3.39$ $e_{ii} = -0.632$ $e_{in} = -3.77$					
$e_{ii}^* = 0.462$ $e_{ij}^* = -0.0182$					

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).⁶⁹ 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.⁷⁰

⁶⁹Adam (1991) estimates a demand system of five assets for Kenya. Some of his price elasticities also have a high absolute value.

⁷⁰Using the Kenyan import price index as an alternative price for importables, its coefficient w.r.t. the budget share is not statistically significant.

6.4.4 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:

$$(6.15) \quad p_i q_i = p_i \gamma_i + \beta_i (x - p_n \gamma_n)$$

$$(6.16) \quad p_n q_n = p_n \gamma_n + \beta_n (x - p_i \gamma_i)$$

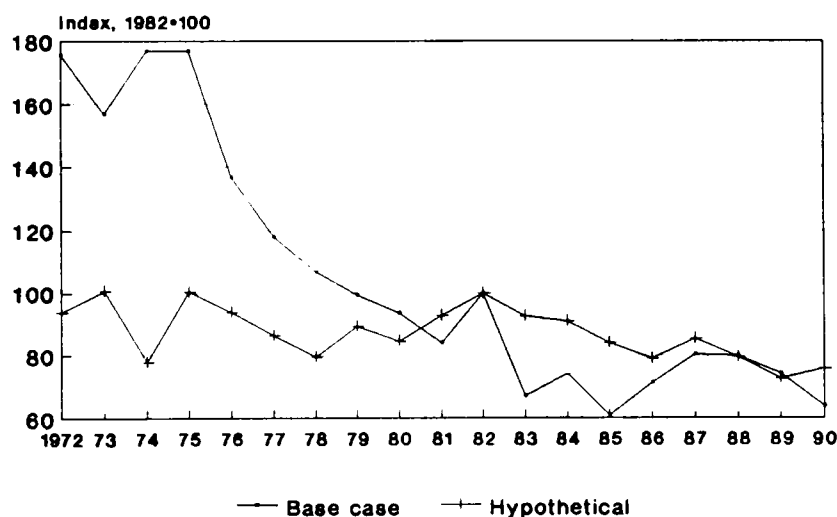
where x denotes the total expenditure, p_i is the price of importables, p_n the price of nontradables, q_i and q_n are the quantities of importables and nontradables, respectively, and β is the marginal propensity to consume so that $\Sigma \beta_k = 1$ ($k = i, n$). Parameters γ_k ($k = i, n$) are usually interpreted as subsistence quantities for which there is no substitution. The residual, $(x - \Sigma p_k \gamma_k)$, is allocated between the goods in fixed proportions β_k (Deaton and Muellbauer 1980). 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} ($k, l = i, n$):

$$(6.17) \quad e_k = \beta_k/w_k; \quad e_{kk} = \gamma_k(1 - \beta_k)/q_k - 1; \quad e_{kl} = -\beta_k p_l \gamma_l / p_k q_k$$

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 (6.15)–(6.16) by assuming plausible values for elasticities, and that the subsistence quantity for importables is zero ($\gamma_i = 0$). Figure 6.9 depicts the base case 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 have assumed that $\gamma_i = 0$. The hypothetical implicit tariff index is not very sensitive to the choice of e_i .

FIG 6.9. HYPOTHETICAL
IMPLICIT TARIFF INDEX 1972-90



Source: Statistical Abstract,
various issues

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 of trade policy in 1979 is picked up by

the alternative 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 alternative implicit tariff index, obtained by using plausible elasticities to derive the domestic deflator (instead of using the domestic ex factory price series) looks 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 6.2.2). Unlike the index of import compression (the IIIR), our hypothetical index indicates a slightly higher level of protection in the 1970s than in the 1980s.⁷¹ Further, it shows that trade policy was more liberal during the latter half of 1980s than in the first half.⁷² This is again in contrast with the IIIR. The hypothetical index also seems to contradict the snapshots of the actual level of protection in Kenya, assuming that the index reading for 1968 is at the level of the early–1970s.

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

⁷¹The average reading of the hypothetical implicit tariff index is 90.2 for the 1970s, while that for the 1980s is 86.1 (1982=100).

⁷²The average index reading for 1980–84 is 92.1, while that for 1985–89 is 80.1 (1982=100).

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.

6.5 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.⁷³ 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 6.1). 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 overinvoicing are likely to be positively correlated with the black market premium. If the premium is higher than the prevailing tariff rate, it is

⁷³Figure 6.1 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 (SITC 2) and animal and vegetable oils and fats (SITC 4) do not have an equivalent in domestic manufacturing and are therefore left out. Beverages and Tobacco (SITC 1) and mineral fuels (SITC 3) are also left out from the weighted import price index.

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 than 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.

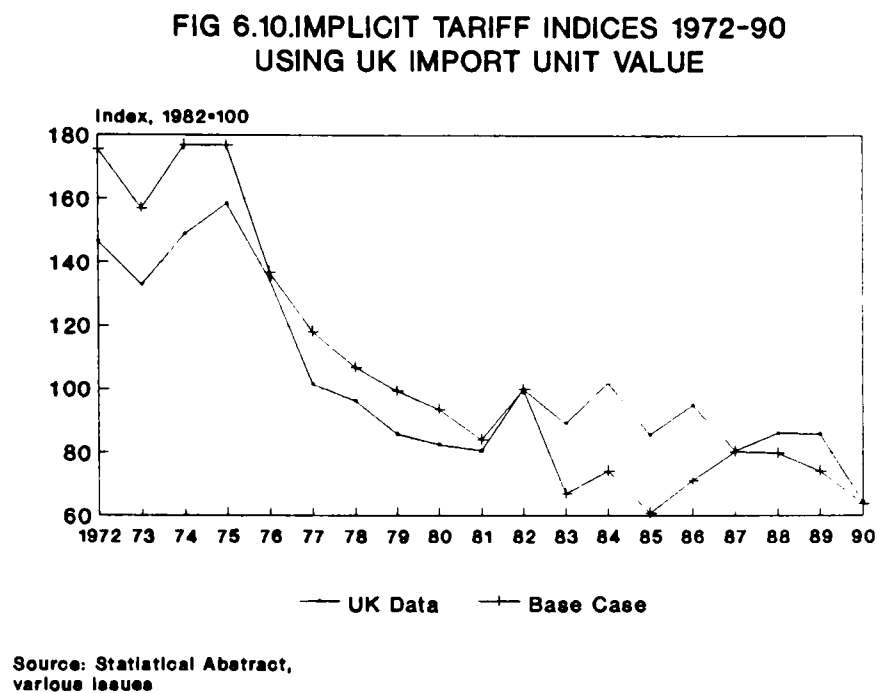
There may be other reasons than overinvoicing for the relatively high import prices recorded in African trade statistics, such as high concentration of import supply on

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. Analyzing 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.⁷⁴ 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.

⁷⁴Only the former French colonies were studied in detail.

Finally, let us construct an alternative implicit tariff using the average UK import unit value (United Kingdom, Central Statistical Office). It is depicted in Figure 6.10 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.

6.6 Conclusions

Our choice for a 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 for years 1968, 1985 and 1988. These two measures show 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 by much, 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 more below its notional demand (estimated from an import demand function assuming plausible price and income elasticities) 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 main 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 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. Although one has to be cautious when using the NRPs as they are very sensitive to the choice of samples as well as price series, this contradiction casts some doubt as regards the derivation of the hypothetical index.

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. 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.

ANNEX 6.1

This annex will describe how the base case implicit tariff index for Kenya, depicted in Figure 6.1, 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 left out from the index.

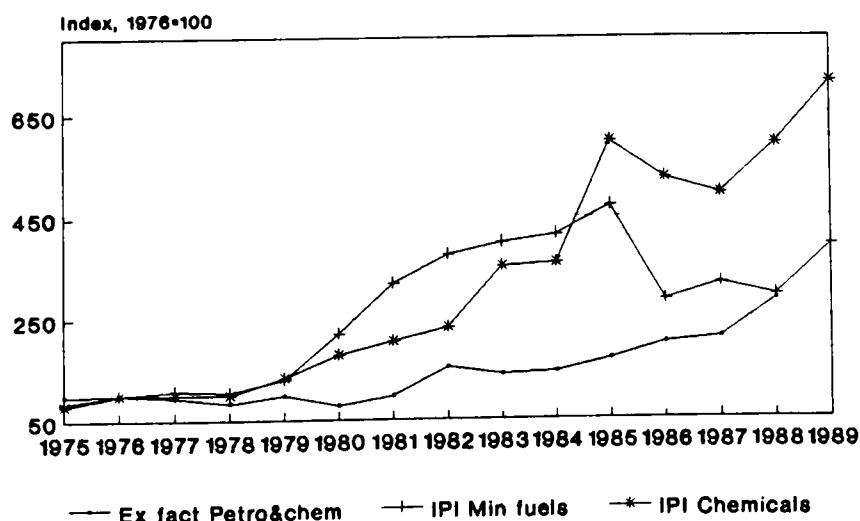
The annual quantity index for (non-food, –beverages and –tobacco) manufactured production $q_{(T-F-BT)}$ can be derived by using the following formula:

$$(A6.1) \quad q_{(T-F-BT)} = [Q(T)q_T - Q(F)q_F - Q(BT)q_{BT}]/Q(T-F-BT)$$

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 A6.1.1). 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 A6.1.1 for the sake of comparison.

FIG A6.1.1. IMPORT AND EX FACTORY PRICE INDEX FOR PETROLEUM & CHEMICALS 1975-89



Sources: Statistical Abstract, various issues; IPI Import Price Index

As can be seen from Figure A6.1.1., 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. 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).

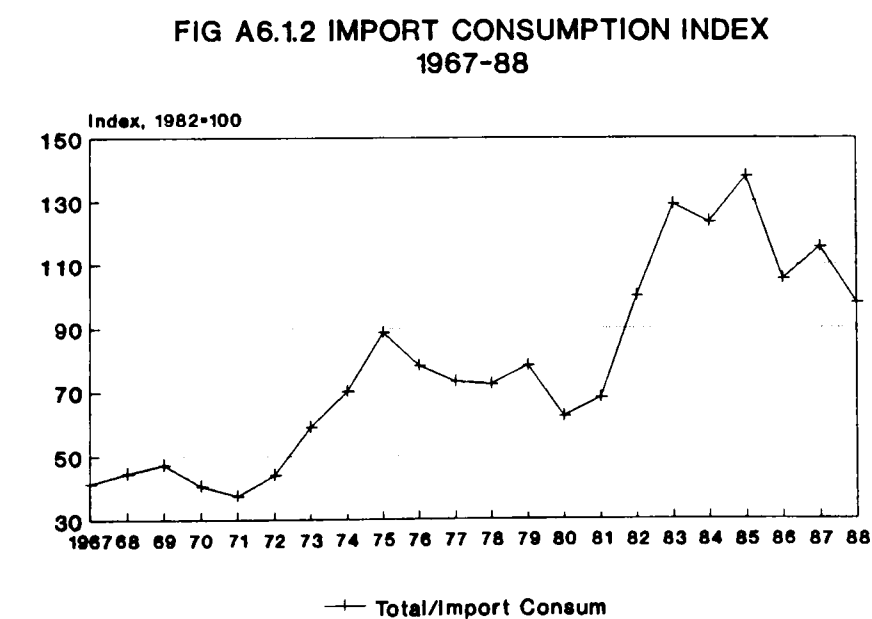
ANNEX 6.2

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.

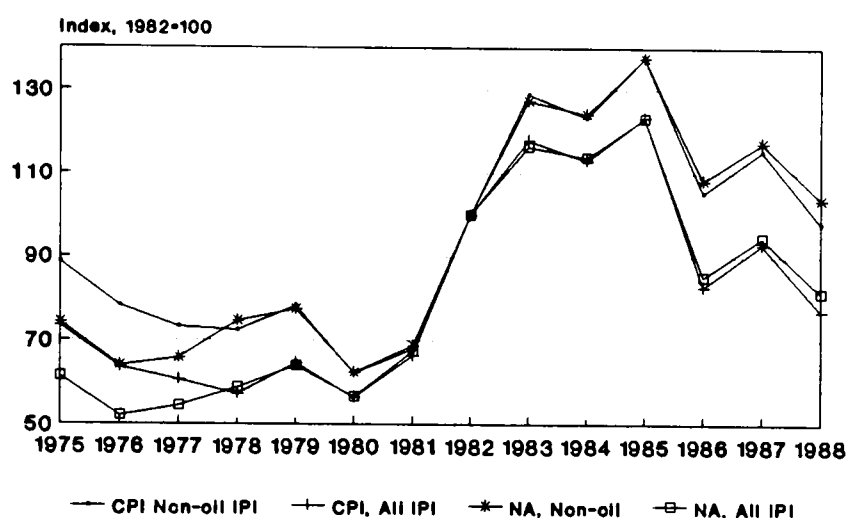
The import consumption index for Kenya is depicted in Figure A6.1.2. Unlike the implicit tariff index (Figure 6.1), it indicates a considerable tightening of import controls over time. Particularly in 1982–83, there is a large jump in the index. The current value of total private consumption is obtained 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.



Source: Statistical Abstract,
various issues

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 A6.1.3 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.

FIG A6.1.3 IMPORT CONSUMPTION INDICES
1975-88



Source: Statistical Abstract,
various issues

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 in 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.

VII AN EMPIRICAL ASSESSMENT OF WELFARE COSTS OF SPECULATION DURING KENYAN TRADE REFORMS

This chapter empirically tests the theory of economic behaviour in the absence of credibility as presented in Part One. In particular, we will examine private speculative responses to trade reforms which are perceived to lack credibility. As was shown in Chapter II, there are two sufficient conditions for incredibility: (i) time-inconsistency and (ii) macro incompatibility of the reform. As suggested by Engel and Kletzer (1987) and Froot (1988), both these conditions are likely to be probabilistic rather than on-off situations. In the former case, private agents are not certain about the true intentions of the liberalizing government and attach a subjective probability to default of the reform. In the latter case the possibility of external shocks may undermine the permanence of liberalization. In the absence of sufficient political will to devalue, the only way the government can respond to a deterioration in the terms of trade is to reverse the reform. This possibility affects expectations of private agents concerning the future price of importables and their intertemporal behaviour.

Chapter III identified the following sources of welfare costs created by a lack of credibility: (i) non-optimal intertemporal substitution in consumption, (ii) accumulation of inventories of durable imports, (iii) insufficient relocation of factors of production in response to the reform, and (iv) deferral of investment. Our empirical analysis of the welfare costs of incredibility will concentrate on items (ii) and (iv). In other words, we will attempt to quantify the speculative accumulation of imports by private agents (including the entire range of choices available), and the extent to which investment in manufacturing was deferred in Kenya.

In African economies the effect of non-tariff restrictions on the price of importables is often unknown and varies from sector to sector. It may be that the liberalizing government does not even know whether a given reform will turn out to be strong or weak. By the same token, it is much more difficult to establish empirically whether an episode was carried out gradually or abruptly. This is made even more difficult when the reform suffers from incredibility and collapses before the time dimension can be observed properly. Nevertheless, we will make an attempt to determine whether the Kenyan reforms under study were gradual, big bangs, or overshooting.

As argued in Chapter VI, one method of identifying liberalization episodes is to examine when actual policy changes, such as shifts in import licensing practices, tariffs, or export incentives, were initiated and when they were stopped or reversed. When introductions and reversals of policy changes are frequent, this approach alone is not sufficient to determine whether or not a given trade regime has become more liberal. Changes in trade policy instruments do not necessarily surface at the aggregate level as they may be in opposing directions, influenced by other policies, and/or variations in economic conditions. A quantitative index of trade policy is therefore required to establish the net effect of changes in policy instruments, for example, on relative prices.

How can we diagnose the less than perfectly credible episodes from a narrative of changes in trade policy instruments? In principal, a candidate for such an episode should pass a three-faceted test. The first part of this test is to examine whether or not we can identify it as an episode by using a quantitative measure of trade policy. Second, we have to ascertain that at least one of the sufficient conditions for incredibility is being met, i.e. the reform is perceived to be either macro incompatible or time-inconsistent by the public. As pointed out earlier, the two conditions are not likely to be either on or off but the perceived probability of

reversal lies somewhere between zero and one. The third test is to make sure that sufficiently little else was simultaneously going on in the macroeconomic front so that we can attribute the event in question to trade policy.

The previous chapter made it clear that finding reliable quantitative criteria of trade policy is not an easy task. Although we were able to remedy the problem to an extent by deriving a hypothetical index with imposed elasticities, our initial candidate for such a criterion, the implicit tariff index, turned out to be less successful mainly because of data problems in the domestic deflator. Yet, an objective criterion is needed if we wish to study the investment response to liberalization, or the effects of trade policy on exports over time, or across countries. For such studies we do have to know what type of orientation the country's trade policy had during the period in question. However, when we want to assess the social cost of incredible trade reforms, the information requirement is likely to be less than when investigating other types of private responses. This is because we are actually assessing the relatively immediate effects of changes in policy instruments on private behaviour, regardless of whether they will ever surface at the aggregate level. In other words, we are looking at how the private sector reacted at the government's attempt to influence relative prices, i.e. trade policy, regardless of how successful it was in this attempt. Moreover, an annual quantitative index of trade policy could even be misleading in some cases as an episode may begin and end within a year, averaging out in the index, but still inducing speculative action and a social cost.

For our empirical analysis of the credibility problem and speculation in Kenya during 1975–1991, it is therefore justified to define liberalization episodes based solely on the narrative of changes in trade policy instruments (Section 6.2.2) rather than, for instance, on a hypothetical implicit tariff index (Figure 6.9). The episodes

that we will study below are: (i) endogenous import liberalization during the coffee boom in 1976–78, (ii) exogenous import liberalization in 1980, (iii) systematic licensing introduced in 1982,⁷⁵ and (iv) relaxation of import controls and subsequent emphasis on export promotion, effective since 1989.⁷⁶ Recall that the nature of the third episode is ambiguous *ex ante*. Although access to imports of intermediate and capital goods was improved, it was carried out at the expense of imports of consumer goods so that this reform may have to be classified as tightening of import controls rather than liberalization.

The speed of liberalization is a less relevant consideration for the first reform as its extent was dependent on the windfall alone under the endogenous trade policy rule. The 1980 liberalization can be labelled as a big bang as the removal of non-tariff restrictions was fast and extensive, although there were also gradual elements to it, such as a preannounced timetable for shifting import items to less restrictive categories. The speed of the 1982 reform is somewhat ambiguous as, on the one hand, various schedules were reformed one by one, i.e. gradually, but, on the other hand, once the revision of a schedule was completed, it was put into use at once. The last episode had a much more gradual approach to import liberalization than the 1980 reform. Cautiousness did not, however, make it credible to the public, but authorities seem to have been more effective in prevention of private speculation.

Before attempting to quantify the welfare cost caused by speculative private action in Kenya in response to trade liberalization episodes, we will assess their credibility by examining data on external reserves. As was pointed out in the Introduction,

⁷⁵This definition of episodes differs from N'geno (1991).

⁷⁶The 1973 reform is left out as the data prior to 1973 are not comparable.

there are only few empirical studies on the effects of trade liberalization in African economies. Hardly any of these studies concentrate on the credibility problem.⁷⁷ This chapter will therefore be devoted to analyzing the extent to which speculation, induced by a lack of credibility, makes African trade reforms fragile, often resulting in their abandonment.

Derived from the theoretical analysis in Part One, three hypotheses will be tested. First, we will examine how uncertainty concerning the permanence of a more liberal trade policy affects inventories of imports held by private agents. The null is that stocks of imported consumer durables and storable intermediate goods go up shortly before private agents anticipate that the reform will be reversed. This is because the expected gain from holding stocks goes up when it is anticipated that the reform can not be sustained and that the future price of importables will increase. In practice, stockpiling can take various forms, such as holding excess import and foreign exchange licenses, placing imports in bonded warehouses, or storing actual imports which have been declared through the Customs. According to our second hypothesis uncertainty about the future policy makes investors wait and accumulate inventories of importables — in the absence of access to foreign savings — rather than invest in physical plant (or domestic financial assets). Policy-makers expect that the new liberal trade regime (or a promise of it) will induce investment in the export sector instead of importables. The shift might not, however, take place due

⁷⁷Gelbard (1990) is an empirical study on trade liberalization in Argentina. He argues that an episode that was aborted in 1982 had a persistent effect on industrial output due to (i) a large devaluation required after a period of expansion in the nontradable sector, real appreciation and capital flight, and (ii) persistence of import competition from inventories of durable imports which were accumulated during the period of low import restrictions. The study does not, however, substantiate the latter point with data. Another study from Latin America is Hausmann (1991) who examines permanent negative oil shocks in Venezuela in the 1980s. A lack of fiscal adjustment makes the private sector suspicious about the solvency of the government. To hedge against the eventual public default in 1982 private agents accumulated inventories of importables and converted domestic financial assets into foreign currency. By contrast, in 1986 both the current and capital account were restricted (import controls and a multiple exchange rate) so that such hoarding could not take place.

to waiting and temporary preference for more liquid assets until uncertainty has been resolved. Finally, potential links between the two hypotheses will be investigated. Accumulation of stocks can be expected to create an increase in the demand for credit, whereas waiting in investment is likely to cause an increase in the supply of loanable funds.⁷⁸

The rest of the chapter is organized as follows. Section 7.1 will assess the credibility of the four liberalization episodes, identified from the narrative of changes in trade policy. Section 7.2 will present a taxonomy of the range of choices available to the private sector to hedge against an anticipated reversal of the reform, including relevant data in order to test the above three hypotheses. Section 7.3 will discuss how private agents can finance speculative inventory accumulation, while Section 7.4 contains a detailed analysis of private responses to each of the four liberalization episodes. Finally, a summary can be found in Section 7.5.

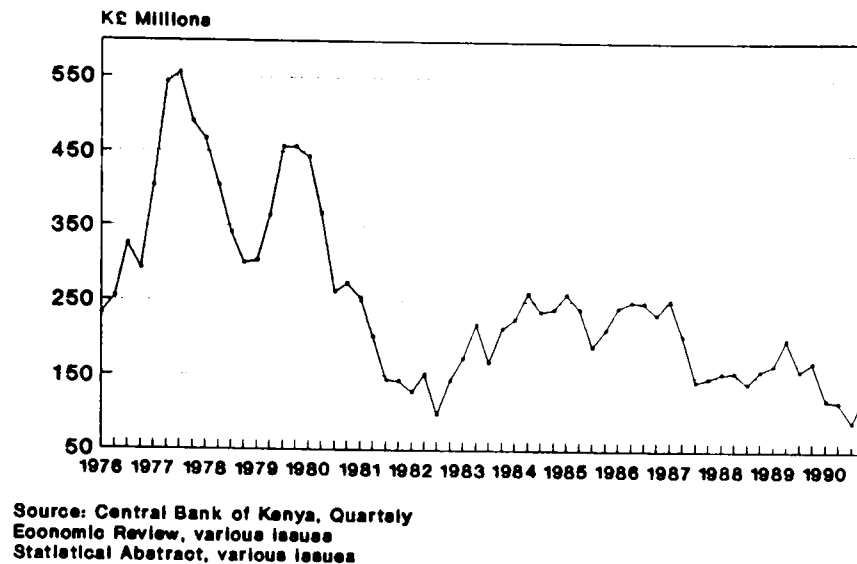
7.1 Credibility of Kenyan Reforms

The external reserve position is an important indicator of sustainability of trade reforms both to the private sector and to the government. Figure 7.1 depicts quarterly data on external reserves at the Central Bank of Kenya in 1976–1990, deflated by the import price index (1982/IV=100). As the latter is based on the cif prices of imports in Kenyan shillings, it captures changes both in the world price of imports and those in the exchange rate. We can see that in 1978 external reserves fell sharply, indicating that the coffee boom was coming to an end, and that the private sector correctly anticipated reversal of liberalization and took advantage of

⁷⁸In the absence of waiting, an alternative assumption would be that the demand for funds to finance inventories of imports drives the interest rate up, causing investment to fall.

the last opportunities of an easier access to licenses. Tightening of import controls in 1979 considerably improved the reserve position.

FIG 7.1. EXTERNAL RESERVES 1976-1990
AT 1982 PRICES
DEFLATOR IMPORT PRICE INDEX (82IV=100)



Another steep fall occurred almost immediately following the 1980 exogenous liberalization which, in the absence of any exchange rate adjustment, was incompatible and hence incredible. Reserves fell by almost KP (Kenyan pounds) 100 million per quarter during the second and third quarter of 1980. At that rate of decline, and without a reversal of the reform, reserves would have been completely ran down during the next six months. It can be said that the objective probability of collapse of this reform was very close to one, and that the subjective probability perceived by private agents was very close to the objective one. A reform of this scale (implemented without devaluation) would have required a large improvement in the terms of trade in order to be sustainable. In addition, the presence of external aid made it difficult for private agents to be certain about the intentions of the government as it was new and lacked reputation. It is therefore plausible that the 1980 reform was also perceived as time-inconsistent so that both sufficient conditions for incredibility may have been present. A time-consistency problem

implies a subjective probability somewhere between zero and one, although we cannot say anything more accurate about it.

A two-month halt (October–November 1980) in the issuance of licenses stopped the decline in reserves only temporarily, and they continued to fall in 1981–82, although not quite as dramatically as in 1980. It is possible that the latter fall reflects the fact that import schedules were reformed gradually so that import–competing and consumer goods were the last schedule to be revised. Hence, there was a short period when access to inputs was freer but licensing of import–competing and consumer goods was not yet tightened. By 1983, however, the schedules were established and succeeded in stabilizing the reserve position reasonably well, although they remained at a low level.

There was another fall in reserves in 1987 after the mini coffee boom of 1986. Despite import liberalization, the level of reserves was sustained quite well in 1989 thanks to large inflows of policy–based lending. In 1990 reserves fell again, reaching an all–time low (at least since 1976) during the third quarter. This reflects the fact that import liberalization was perceived to be macro incompatible as aid flows contracted, compensating devaluation was delayed, and introduction of a sales tax was also slow relative to the speed of relaxation of import controls. In 1990 reserves were equivalent only to six weeks' imports. This led to a reversal, and the reform was subsequently reoriented towards export incentives rather than import liberalization.

Summarizing, the coffee boom liberalization in 1976–78 and the exogenous trade policy experiment in 1980 were clearly not fully credible to the public. The former reform was a direct consequence of the endogenous trade policy rule as was its reversal when the windfall was over. The second reform was carried out as a big

bang despite the adverse terms of trade that prevailed at the time but was not accompanied by compensating devaluation. Reserves fell dramatically soon after the reform was initiated at an unprecedented rate. Support from the international financial institutions did not suffice to restore compatibility, and hence, credibility of the reform. The two subsequent reforms, revision of import schedules in 1982, and the one which effectively began in 1989, had a much more cautious approach to relaxation of import restrictions than the 1980 one. Revised import schedules, which liberalized imported inputs but simultaneously became stricter on import-competing and consumer goods, seem to have suffered from an initial lack of credibility which was soon regained. Moreover, there were two exchange rate adjustments in 1981, and one in 1982 to support the reform. Again, the latest import liberalization was not macro compatible which resulted in its abandonment in late 1990 when the external aid injection was over, and devaluation and introduction of a sales tax were carried out too slowly relative to removing import controls.

7.2 Choices Available for Private Speculation

Theoretical models focus either on consumer or producer/investor behaviour in the face of uncertainty concerning the permanence of trade liberalization. Consumers who anticipate that the reform will be short-lived because of its macro incompatibility, time-inconsistency, or for some other reasons, increase purchases of importables to substitute consumption intertemporally, or to accumulate stocks of durable goods for future consumption. As was shown in Chapters II and III, this is socially costly. In African economies intertemporal optimization by consumers is constrained by the availability of credit so that in order to accumulate stocks they have to forego current consumption of other goods.

Production side models address both the inertia of shifting existing physical capital to the export sector, and the preference for deferring investment when the permanence of reform is uncertain. For consumers it does not matter whether compatibility is subsequently restored by reimposing the previous trade restrictions, or by devaluation. In the meantime they have an incentive to hoard temporarily cheap importables. For investors instead the future policy choice is an important consideration as it will determine the return to their investment. Return of import restrictions favours import–substitution, while devaluation increases the relative prices of exportables. In Sub–Saharan Africa firms do not usually have (legal) access to foreign exchange as a way of deferring investment but they can instead accumulate stocks of importables as foreign exchange availability for imports typically improves during trade liberalization. In addition, domestic industries tend to have priority over importers of consumer goods in foreign exchange allocation.

In practice the range of choices for speculative action is much wider than that of stylized theoretical models. Apart from stockpiling of imported durables, both consumer goods and intermediates, private agents may also hold excess import and foreign exchange licenses, or use bonded warehouses for their inventories. In this section we will explore the gains and costs of these choices as well as the risks involved. In each case relevant time series data will be presented in a graphic form. Private response to each of the four reforms identified in the previous section will be analyzed in detail in Section 7.4.

Despite its private profitability, speculative behaviour has a social cost. Excess licensing as such does not necessarily incur a welfare cost as the license is just a promise to deliver foreign exchange. The actual cost arises when licenses are used to accumulate stocks of imports. The only direct costs of excess licensing are due to a balance of payments crisis and to crisis management. Stocks of imports, either in

bond or declared through the Customs, yield a zero social return but tie up scarce foreign exchange, or investment funds. In Africa, their opportunity cost can be very high indeed. Hoarding may also endanger the entire process of improving resource allocation by liberalization.

Table 7.1 depicts the range of choices for speculative action as a function of expected exchange rate and trade policies. Assuming that a lack of credibility is due to inconsistent macroeconomic policy, private agents anticipate a reversal of current liberalization. Compatibility would require either devaluation, return to tighter import licensing, tariff increases, or a combination of these measures. Table 7.1 lists examples of action rational agents would take in each instance. It is important to note, however, that these are not necessarily the only rational choices as there is at least a third dimension to the table, i.e. the cost of finance committed to a given means of speculation.

Table 7.1. Range of Choices for Private Speculation as Function
of Expected Exchange Rate and Trade Policies.

EXPECTED EXCHANGE RATE POLICY	EXPECTED TRADE POLICY	
	QRs returned Same tariffs	Tariff Increases
Devaluation	Declared imports	Declared imports
	Bond decumulation ⁷⁹	Bond decumulation
No Devaluation	Forex licenses	Bond decumulation
	Bond accumulation	

⁷⁹Expected devaluation alone, i.e. without any change in QRs or tariffs, could produce a similar speculative outcome.

In anticipation of devaluation and tariff increases, private agents are more likely to accumulate actual imports, and decumulate excess licenses and stocks in bonded warehouses. When no devaluation, or changes in tariffs are expected, excess licenses are the most cost-effective means of hoarding, to be followed by accumulation of imports in bond.

7.2.1 Stockpiling of Foreign Exchange Licenses

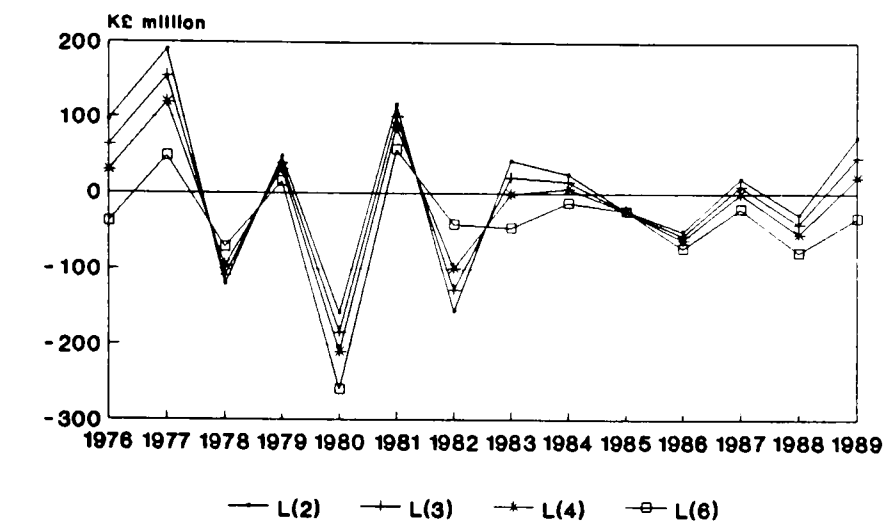
One way of assessing the magnitude of excess licensing is to compare annual foreign exchange allocations to actual private imports. In order to obtain a foreign exchange license, importers must hold a valid import license. Actual imports are derived by deducting re-exports and government imports (which do not require a license) from direct imports.⁸⁰ As the level of imports varies from year to year, and as there is a time lag between allocation of foreign exchange and payment for imports, a genuine deviation between annual allocations and actual imports can therefore be expected. In order to determine the magnitude of excess licensing, we have to derive first hypothetical imports based on annual foreign exchange allocations and the average time lag. The residual between the hypothetical and actual imports, i.e. the speculative component, can then be calculated.

Unfortunately, no systematic information is available concerning the average lag between allocation of foreign exchange and payment for imports. Interviews with Kenyan importers indicate, however, that it is likely to be between three and four months. Therefore, Figure 7.2 (a) depicts the residual derived for these two lags. For the sake of comparison it also includes the two- and six-month lags. The residual is deflated by the import price index (1982=100) to account for changes in

⁸⁰Direct imports include goods placed in bonded warehouses.

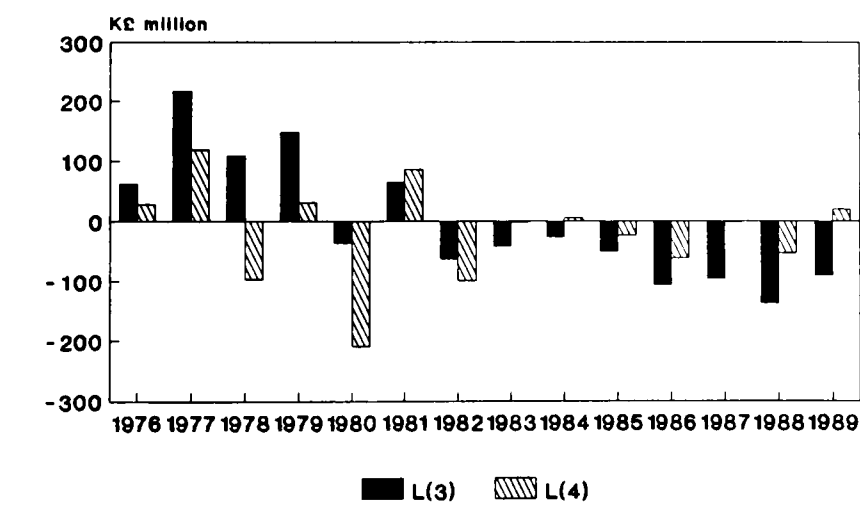
import prices and the exchange rate. Figure 7.2 (b) depicts the stock of licenses for 1976–89.

FIG 7.2(a). FOREIGN EXCHANGE ALLOCATION
VERSUS ACTUAL IMPORTS AT 1982 PRICES



Source: Central Bank of Kenya;
Statistical Abstract, various issues

FIG 7.2(b). STOCK OF EXCESS FOREIGN
EXCHANGE LICENSES AT 1982 PRICES



Source: Central Bank of Kenya;
Statistical Abstract, various issues;
Initial stock zero by assumption.

One can think of at least two different reasons why importers acquire excess licenses. First, multiple applications are submitted when controls are tight to make

sure that at least one license will be approved. Such a practice can easily produce considerable excess allocation of foreign exchange over import requirements. Second, licenses may be stockpiled instead of imported goods during a more liberal trade regime to be used either shortly before the reform is expected to be reversed, or when QRs have been tightened again. Until recently, stockpiling of licenses used to be a cheap way of hedging against tighter import controls. In order to curtail multiple applications a computerized information system and a charge of two percent of the amount of the invoice were introduced during the latest trade reform. Furthermore, import licenses and foreign exchange allocations could no longer be applied for more than three or six months in advance initially. Thereafter they could be extended by another three months.

As a choice of speculative action stockpiling of licenses is associated with considerable risks, particularly devaluation and an increase in tariffs between the time of obtaining the license and using it for acquiring the foreign exchange for the payment of imports. In other words, excess licenses are the most cost-effective means of hedging against the return of import controls when the exchange rate and tariff policies can be expected to remain constant. To determine the dominant motive amongst Kenyan importers to acquire excess licenses, one has to compare the four liberalization episodes to the excess allocations of foreign exchange. A more detailed analysis is left for Section 7.4 where speculative private behaviour during each liberalization episode will be assessed separately. One obvious conclusion is, however, that the variability between allocations and actual imports was extensive in the 1970s and early-1980s but it has been reduced considerably since 1983. If we assume that three months is the most likely lag, we can see from Figure 7.2 (b) that importers constantly held an excess stock of foreign exchange licenses in 1976–81, except for year 1980. Since 1982 the stock of licenses appears to be negative. In other words, importers increasingly used other sources of foreign exchange than the Central Bank to pay for their imports.

7.2.2 Bonded Warehouses

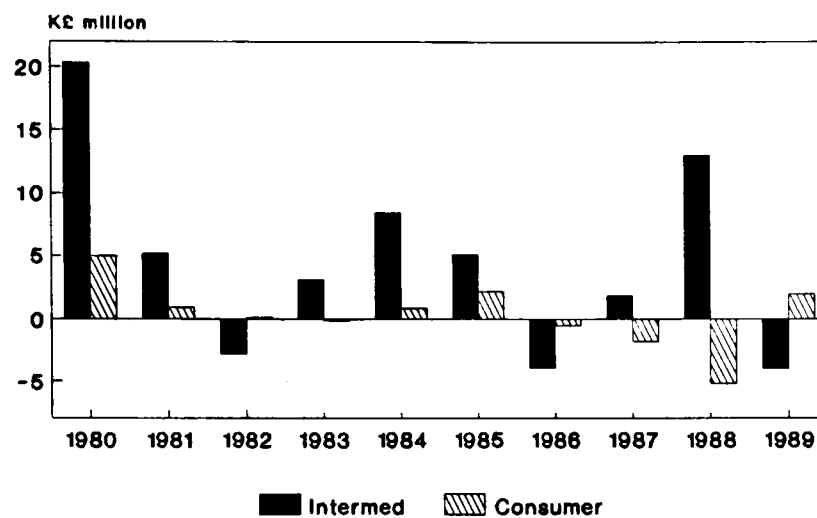
Another option available for private speculation is to place imported goods in bonded warehouses instead of declaring them through the Customs. This is probably the best data set to capture speculative responses to trade reforms suffering from a credibility problem as they are inventories of imports waiting to be declared through Customs for home use. In order to verify whether or not firms accumulated stocks of bonded importables in response to trade reforms we will examine the unpublished record of entries to and removals from the warehouses collected by the Department of Customs and Excise. Data on the level of bonded stocks at a given time are not available.

Data on bonded imports are not generally available. Raw data on individual entries into and removals from bonded warehouses were therefore extracted from the mainframe computer at the Government Computer Services in their original form as recorded by the Customs. Only years 1980–89 could be obtained, while years 1983 and 1989 include data for six months only. The raw data was then processed by using SPSS software in order to obtain monthly totals for durable and semi-durable consumer goods and durable intermediate imports.

There are currently 118 common bonded warehouses in operation in Kenya. They are either private or run by the government. Until recently, importers were able to store their imports in these warehouses for at least two years before declaring them through the Customs. To reduce speculation the length of time imported goods can be kept in bond has been limited to a maximum of one year. Figure 7.3 (a) depicts the annual change (removals and re-exports deducted from entries) in the total

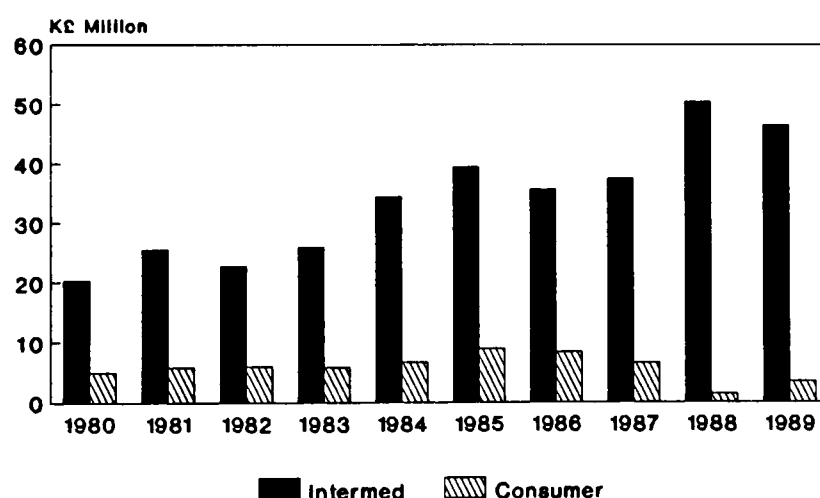
value of durable consumer imports⁸¹ and imported non-food, non-oil intermediate goods⁸² held in the bonded warehouses. Data are available from 1980 to mid-1989, with the exception of the first half of 1983. Figure 7.3 (b) shows the stock of bonded imports, i.e. the bonded stock, except for data on the initial level of stock, which is not available, and assumed to be zero.⁸³

FIG 7.3(a). ANNUAL CHANGE IN BONDED WAREHOUSES AT 1982 PRICES



Source: Department of Customs and Excise
1983 and 1989 show half-year data.

FIG 7.3(b). STOCK OF BONDED IMPORTS AT 1982 PRICES



Source: Department of Customs and Excise
1983 & 1989 include only half-year data
Initial stock assumed to be zero.

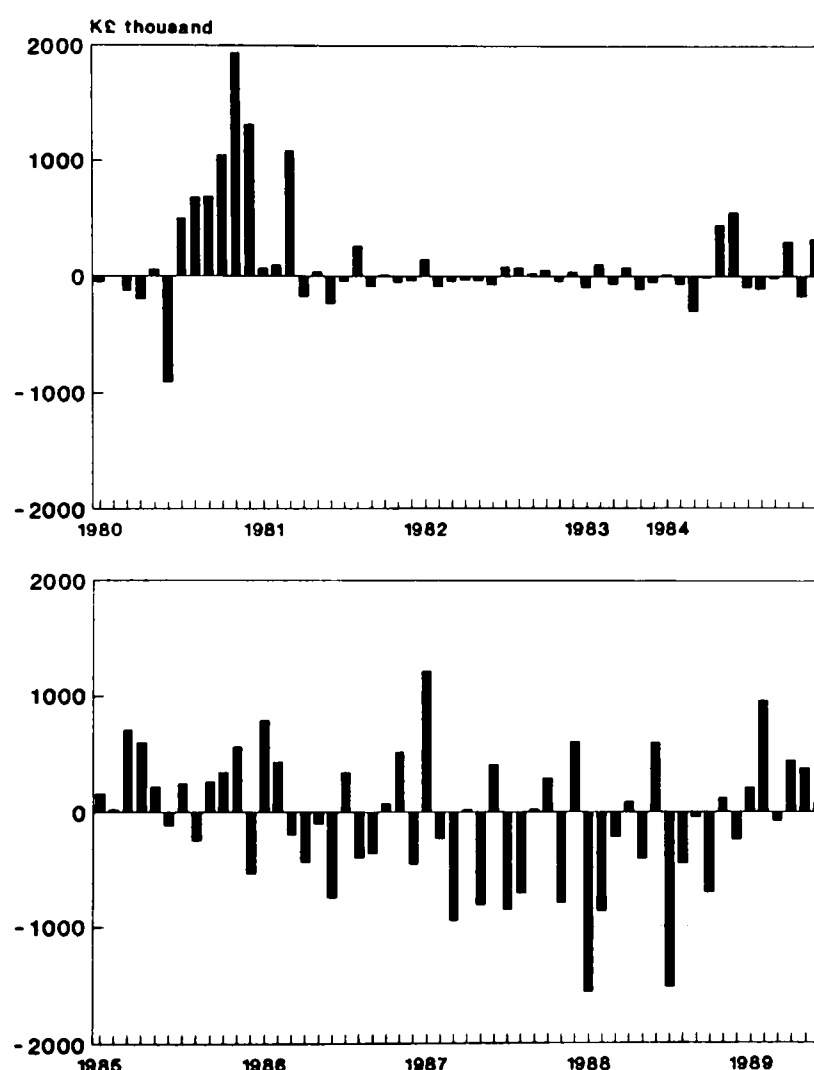
⁸¹Consumer durables include passenger motor cars (51), other non-industrial transport equipment (522), consumer durables (61) and consumer semi-durables (62) as defined by the Broad Economic Categories, BEC (United Nations 1989).

⁸²Includes primary industrial supplies (21), processed industrial supplies (22), parts and accessories of capital goods (42) and transport equipment (53) as defined by the Broad Economic Categories, BEC (United Nations 1989).

⁸³Hence years 1983 and 1989 include the net change in bond for six months only.

The two series are deflated by the appropriate decomposed import prices indices.⁸⁴ During the period for which data are available there has been an increase in the level of bonded stock of intermediate goods, whereas the net effect on that of consumer goods has remained more or less unchanged, except for a fall in 1988–89. The peak year of stock accumulation in bond was 1980 for both intermediate and consumer durables. Another substantial peak for intermediate goods occurred in 1988, while the bonded stock of consumer goods was heavily decumulated. Figures 7.4 and 7.5 depict monthly changes in the bonded stocks of imported consumer durables and intermediate goods from 1980 to mid-1989, again with the exception of the first half of 1983. A more detailed discussion of the changes in bond and lack of credibility in trade reforms can be found in the next section.

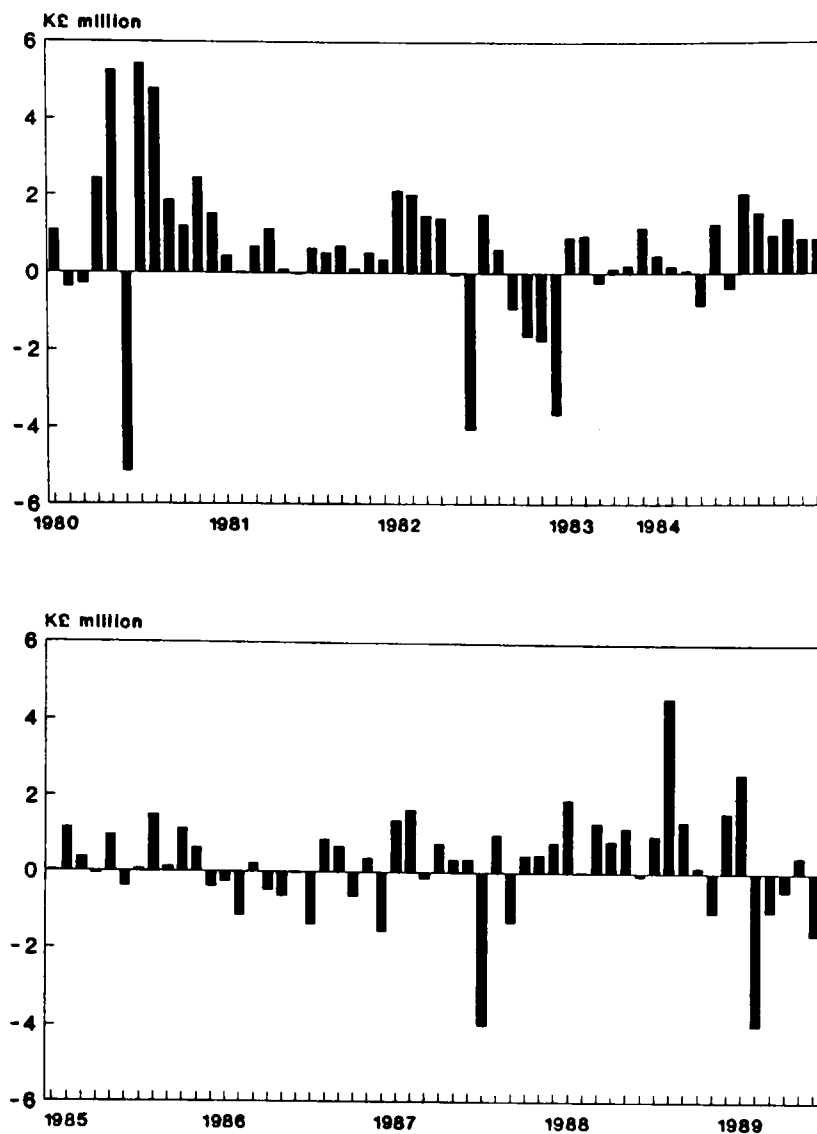
FIG 7.4. NET CHANGE IN BONDED CONSUMER DURABLES AT 1982 PRICES



Source: Department of Customs and Excise
1983 and 1989 show half-year data.

⁸⁴As to consumer goods, passenger motor cars (51), other non-industrial transport equipment (522) and consumer durables (61) are deflated by the import index for machinery and transport equipment. Consumer semi-durables (62) are deflated by the import index for miscellaneous manufactures. Intermediate imports are deflated as follows: Primary industrial supplies (21) by the import price index for crude materials, inedible; Processed industrial supplies (22) by the weighted average of the import price index for animal and vegetable oils and fats, chemicals and manufactured goods; and Parts and accessories for capital goods (42) and transport equipment (53) by the import price index for machinery and transport equipment.

FIG 7.5. NET CHANGE IN BONDED
INTERMEDIATE GOODS AT 1982 PRICES



Source: Department of Customs and Excise
1983 and 1989 show half-year data

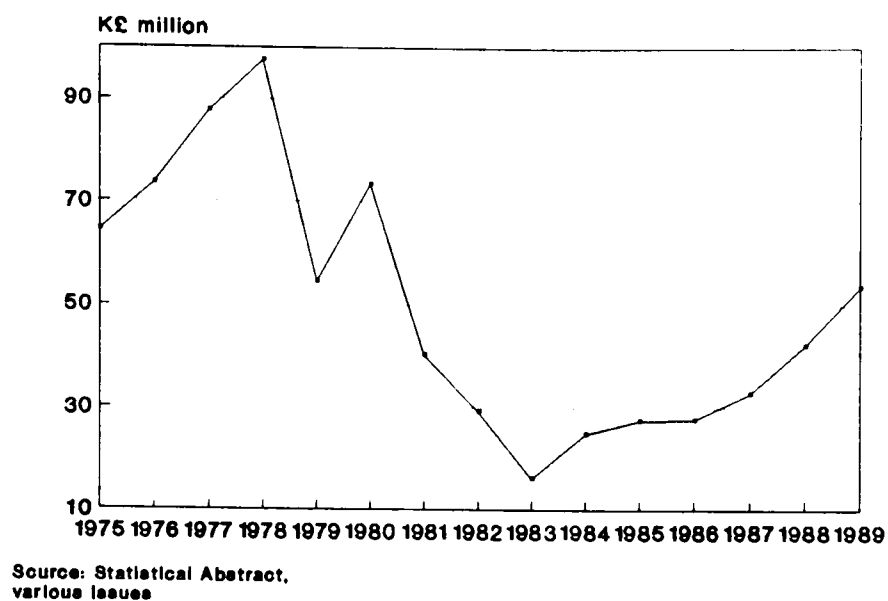
As in the case of licenses, fees charged for the use of bonded warehouses have gone up during the latest trade reform. Before that they used to be fairly cheap to operate. As a means of taking advantage of temporarily relaxed import controls, bonded warehouses carry a risk of tariff increase and devaluation. This is because tariffs charged when declaring goods through the Customs are based on the current value of the Kenya shilling as well as on the current tariff rate. The exchange rate risk is obviously of a smaller magnitude as the imports themselves must have been paid for before placing them in bond. In addition, warehousing in bond involves the cost of capital tied up in the stocks.

7.2.3 Excess Importation of Durable Goods

In addition to excess licenses and bonded imports, private agents can accumulate actual imports in order to take advantage of temporarily lower prices. Actual imports for home use are those declared through the Customs either upon arrival in Kenya, or from bonded warehouses. In other words, imports entered in bond are not included in home consumption but removals from bond are. From the importer's point of view, actual imports involve the highest cost of holding speculative inventories: in addition to the storage costs, goods and tariffs have to be paid for before stocking. But at the same time the risks of adverse changes in tariffs or in the exchange rate are eliminated. As to consumer goods, importing firms are usually able to shift part of the cost (as well as part of the gain) to consumers who have an incentive to accumulate stocks of temporarily cheaper durable imports, or substitute consumption intertemporally.

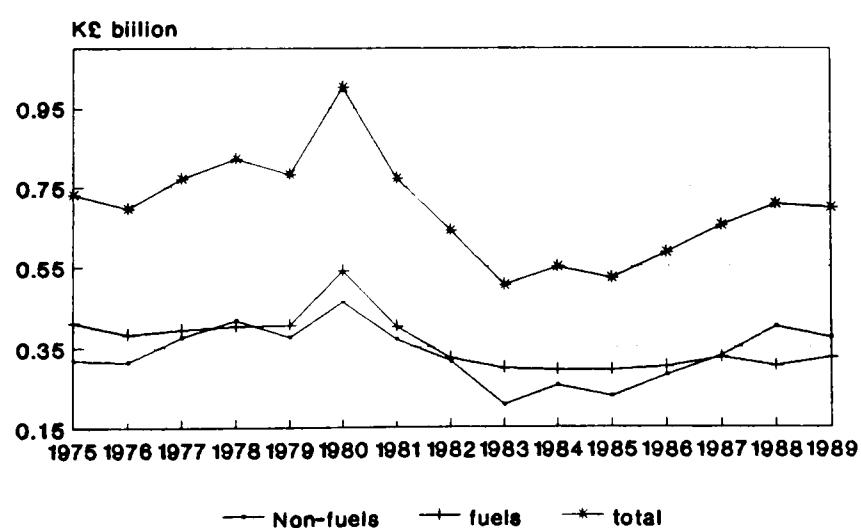
Unfortunately, import data is available only on the annual basis so that we cannot determine, for example, whether there was a peak in imports shortly after October 1980 (allowing some time for shipment) when foreign reserves fell considerably and the reform came to a virtual halt and was subsequently abandoned. It is only possible to assess whether or not annual imports were significantly higher during 1980 compared to other years before and after the reform. Figure 7.6 depicts imports of consumer durables for home use at constant price in 1975–89. The highest peaks were indeed in 1978 and 1980, whereas the lowest level of consumer imports occurred in 1983.

FIG 7.6. IMPORTS OF CONSUMER DURABLES AT 1982 PRICES



Incredible import liberalization can create an incentive for firms to accumulate stocks of importables as an alternative asset if their expected future yield is higher than that of physical plant or available financial assets. Figure 7.7 depicts the total value of non-food intermediate goods as well their non-fuel and fuel components at 1982 prices imported for home consumption. By far the highest peak occurred in 1980, reflecting the credibility problem of the exogenous liberalization episode. The low levels of 1983–85 may well be explained both by decumulation of previously acquired stocks and a recession.

FIG 7.7. IMPORTS OF NON-FOOD INTERMEDIATE GOODS AT 1982 PRICES



Source: Statistical Abstract, various issues

Finally, by looking at the changes in stocks held by firms we can determine whether or not additional imports really were for speculative purposes instead of current consumption. Data on inventories can be obtained from the Kenya Business Expectations Enquiry (BEE) maintained since 1973 by the Central Bureau of Statistics. From the viewpoint of inventories the two most important sectors are manufacturing and commerce (retail) which hold 90 percent of the total reported stocks. The stocks reported by the BEE include "finished goods, work-in-progress, materials, fuels, components, spare parts etc."

A priori, stocks are likely to go up both in manufacturing and commerce during a trade reform which is not credible to the private sector. Consumers demand more for cheaper imported goods and less for domestic products (since consumer credit is not available), causing a fall in sales and an increase in stocks of the manufacturing sector. This can be reinforced by increased imports of intermediate goods, spares and alike due to their temporarily improved availability. In the commercial sector, they are also likely to go up as businessmen fill up their stocks with imports in anticipation of tightening of the controls at a later date and a higher future price.

Manufacturers do not hold stocks entirely as an alternative asset to physical plant or financial assets but also for other reasons, such as production smoothing or avoidance of stock-outs (see Annex 7.1 for a brief review of theories regarding inventories). In order to extract the import component, which may be subject to speculation, it is useful to divide the total stocks into work-in-progress and finished goods, on one hand, and materials, fuels, components, spares etc. on the other. It turns out that materials dominate the total manufacturing stocks, being on average three times the value of finished goods and work-in-progress. From the viewpoint of accumulating inventories of imports, the stocks of materials are obviously more interesting, bearing in mind the high import dependence of the Kenyan manufacturing sector.

Figure 7.8 depicts the value of materials, fuels, components, spare parts etc. held by manufacturing firms in 1978–90 at constant prices. Stocks are deflated by the manufacturing input deflator (derived from the value of non–labour inputs and the quantity index for manufacturing). There are two pronounced peaks which occurred during the first quarter of 1981 and the last quarter of 1982. Stocks were at their lowest level at the end of 1986. More systematic licensing since 1982 seems to have made it possible for the manufacturing sector to reduce the level of materials stocks in the 1980s.

FIG 7.8. STOCKS OF MANUFACTURING
INPUTS AT 1982 PRICES

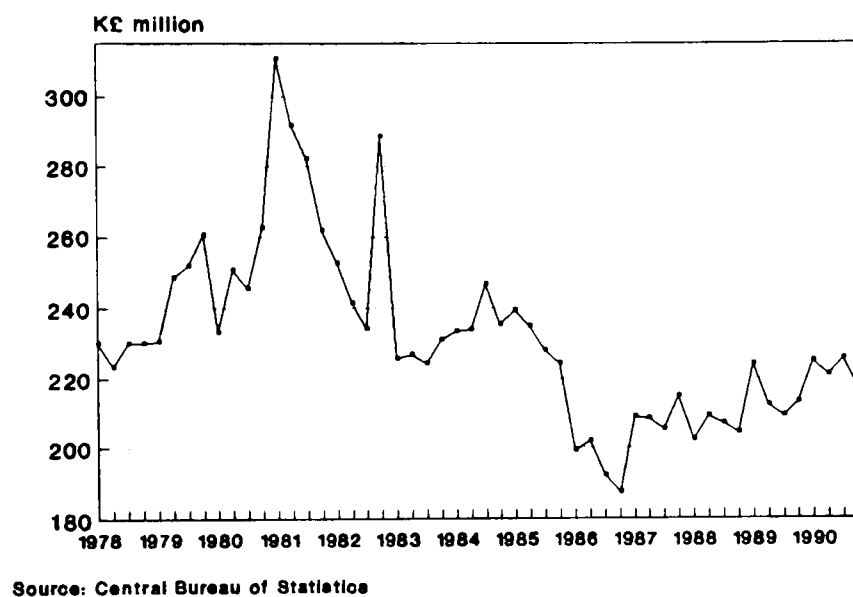
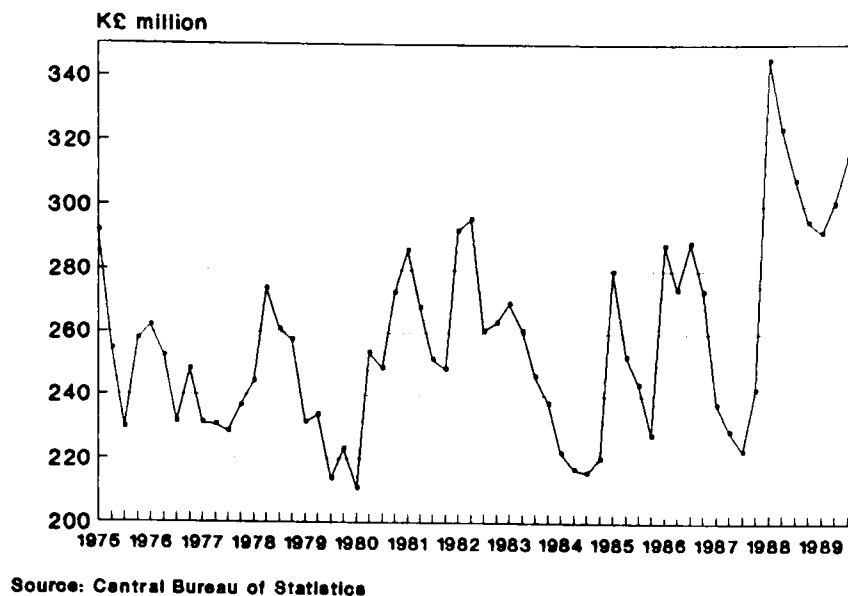


Figure 7.9 depicts quarterly data on the total commercial stocks in 1975–90 at constant prices. As most of the stored goods, both imported and domestic, are for household consumption as industries import and stock their input requirements themselves, the series are deflated by the tradable components (the weighted average of clothing, footwear and furniture, furnishings, household equipment and household operation) of the consumer price index (CPI) for the low–income group (Nairobi).

FIG 7.9. COMMERCE, VALUE OF TOTAL STOCKS AT 1982 PRICES



The trend in commercial stocks is positive but variations around the trend are highly volatile. Accumulation of inventories are followed by decumulation over and over again. As can be expected, the positive trend seems to coincide with the tightening of import restrictions on consumer goods since 1982. A more restricted access to import licenses calls for larger stocks in order to avoid stock-outs. The largest single accumulation took place during the first quarter of 1988.

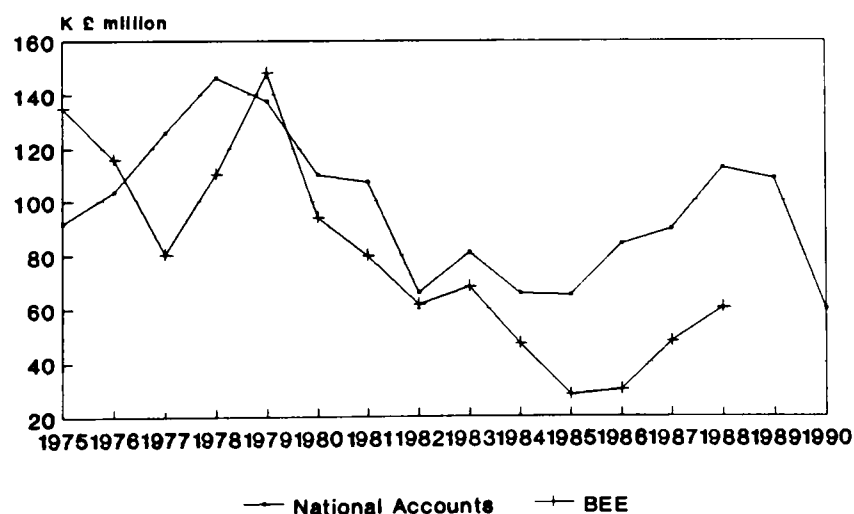
7.3 Financing of Speculative Inventory Accumulation

In principle, there are two possibilities of how a firm (consumer) can finance speculative stocks: (i) diverting investment funds (savings) for inventory accumulation, or (ii) increasing borrowing (foregoing other consumption). The first option of finance refers to our hypothesis of waiting (instead of investing in physical plant), while the second option confers with the hypothesis of increased liquidity in the economy. If the importer cannot obtain the required foreign exchange from the

Central Bank, he can resort to the parallel market.⁸⁵

In order to determine whether investment in physical plant was deferred due to uncertainty concerning the future trade policy, we will study the gross fixed capital formation in the manufacturing sector (Figure 7.10). There are two sources that are based on different methods of data collection. The Business Expectations Enquiry (BEE) collects information on annual investment in fixed assets at factor cost during the last quarter of each year. In the National Accounts estimates of capital formation of the private sector are undertaken, by and large, on a commodity flow basis. Statistics from the end-use analysis of imports and on buildings completed are the main sources of information, supplemented by data collected in agricultural and industrial surveys. The public sector data are obtained directly from their accounting records. The manufacturing gross fixed capital formation deflator, derived from the National Accounts, is used to transform both series into constant prices. Note that the BEE seems systematically to give lower levels of investment than the National Accounts.

FIG 7.10. MANUFACTURING, CAPITAL FORMATION AT 1982 PRICES



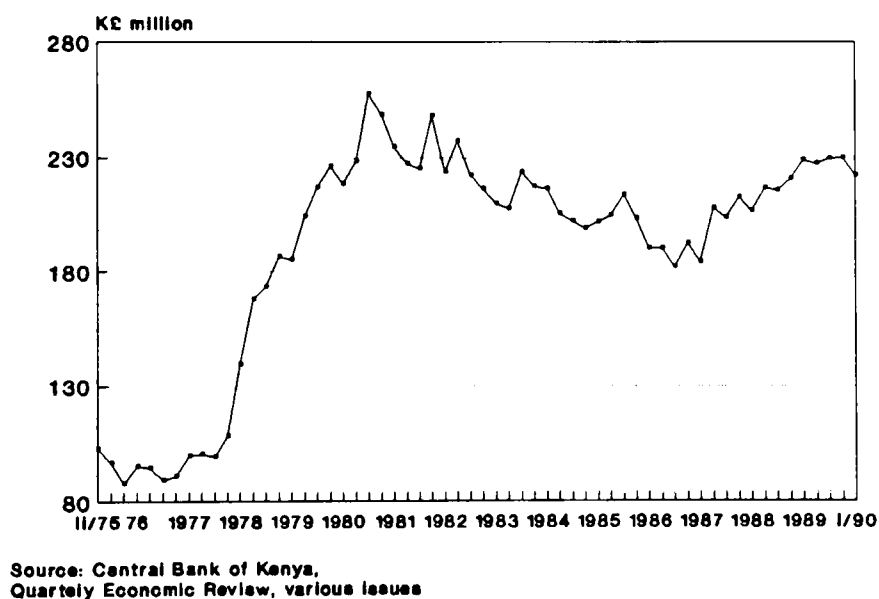
Source: Central Bureau of Statistics;
Statistical Abstract, various issues

⁸⁵An inter-bank market for foreign exchange became fully operative in 1993 when the Central Bank of Kenya ceased to provide foreign exchange for commercial imports.

The BEE data shows that a surge in demand due to coffee boom – in the absence of sufficient relaxation of import controls – encouraged investment in import–substituting manufacturing in 1978–79. Thereafter, it fell sharply in 1980–82, while the single largest fall occurred in 1980. There was a modest recovery in 1983, only to be followed by another slump in 1984–86. During the three subsequent years investment went up but, as the National Accounts data indicate, there was steep decline again in 1990.

The Central Bank of Kenya publishes monthly information on commercial bank and non–bank financial institution (NBFI) lending. Figure 7.11 depicts lending to the manufacturing sector at constant prices in from the second quarter of 1975 to the first quarter of 1990. The series is deflated by the manufacturing input deflator.

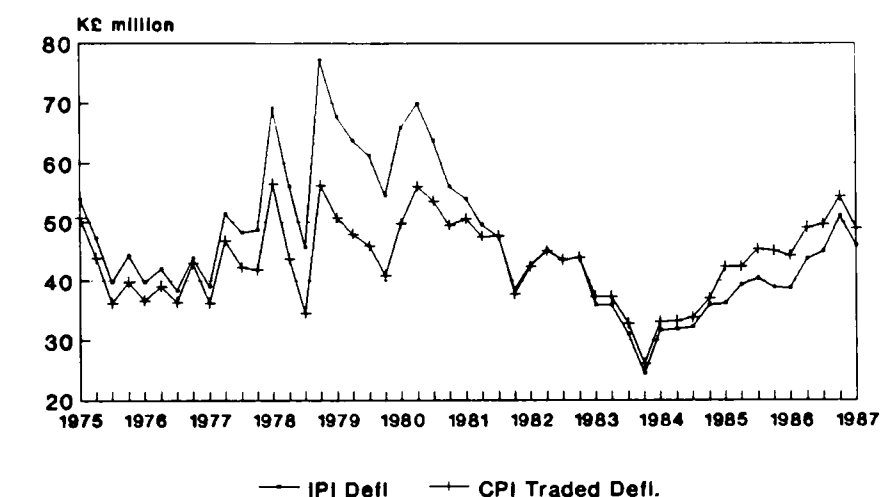
FIG 7.11. LENDING TO MANUFACTURING
AT 1982 PRICES



There was a phenomenal expansion of lending to manufacturing towards the end and after the coffee boom. The highest point was, however, reached during the last quarter of 1980, reflecting the abortive trade reform. Thereafter the trend was

declining but picked up again since 1987. Figure 7.12 depicts lending to import trade in 1975–1987.⁸⁶ Lending is deflated by the import price index for all imports, and by a decomposed index consisting of traded goods in the CPI. The negative trend after the three obvious peaks in 1978–80 is likely to be due to either tightening of controls of consumer imports since 1982, or a recession, or both. Subsequently, the negative trend reverses slightly which, at least since 1986, could be interpreted as a reflection of economic recovery.

FIG 7.12. COMMERCIAL BANK & NBFI LENDING
TO IMPORT TRADE, 1982/IV PRICES

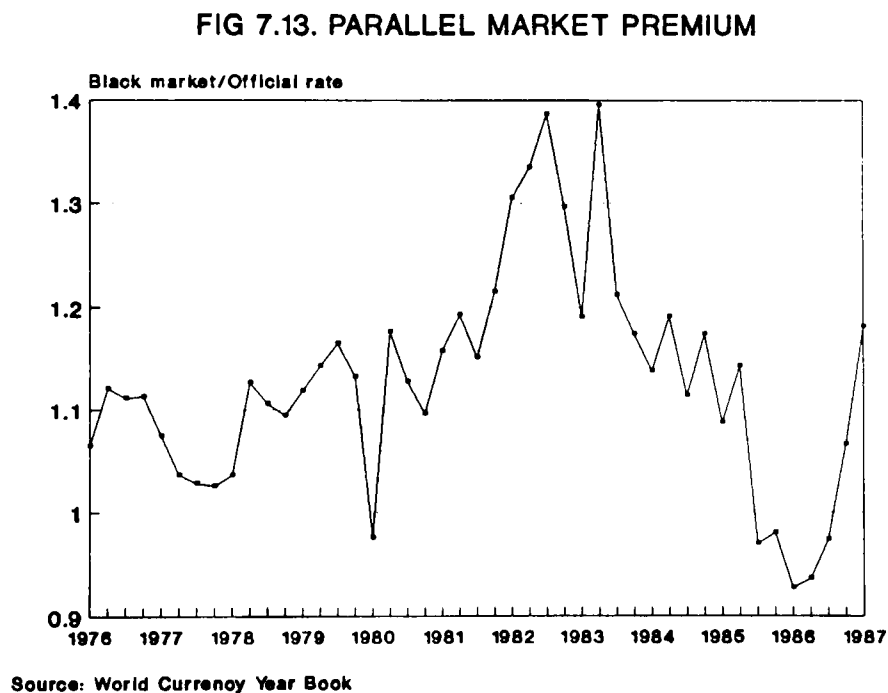


Source: Central Bank of Kenya, Quarterly
Economic Review, various issues;
Statistical Abstracts, various issues

The total commercial bank and NBFI lending at constant prices (deflated by the GDP deflator) has a strong and fairly smooth positive trend throughout the period under study. The fact that most of the above peaks in lending to manufacturing and import trade are associated with a simultaneous increase in the total lending supports our hypothesis of increased liquidity in the economy when trade policy is in flux.

⁸⁶Classification of credit to the private sector was changed so that series for import trade is available only upto the first quarter of 1987.

Finally, it is plausible to assume that, in addition to capital flight, the parallel market premium over the official foreign exchange rate measures the severity of trade restrictions. Illegally acquired foreign currency is used to finance either legal⁸⁷ or illegal imports. When import controls are relaxed, and it is credible to private agents, one can expect the parallel market premium to fall but if the reform lacks credibility the premium is likely to rise. Figure 7.13 depicts the premium in 1976–1987. The highest levels of premia coincide with the attempted coup d'état in 1982. Some years indicate a negative premium which is likely to reflect a data collection problem rather than trading below the official exchange rate. Note that the parallel market premium can be also used as an indicator of trade policy, provided illegal imports can be assumed to be a dominant factor in determining the premium. We will come back to this point in Section 7.4.



⁸⁷As discussed earlier, private agents have been entitled to apply for import licenses under the no foreign exchange (NFE) system. Until recently, applicants had to declare their source of currency, although these regulations were not always effectively enforced.

7.4 Private Response to Trade Liberalization in Kenya

This section will be devoted to a detailed analysis of private speculation during each of the four liberalization episodes identified earlier. We will also make an effort to quantify the social costs created by private action in response to a lack of credibility.

7.4.1 Coffee Boom Liberalization in 1976–78

During the coffee windfall in 1976–78 Kenyan import regime was relaxed, particularly in 1978, as foreign exchange earnings soared but tightened again in 1979 when the boom was over. This was a typical response to a positive shock under the endogenous trade policy rule. As Bevan *et al.* (1990b) show, private agents recognized the temporary nature of the boom (revealed by increased saving of the transient income), and were therefore likely to be able to anticipate a reversal of trade liberalization at the end of the boom.

Did private agents in Kenya engage in speculation in anticipation of a higher future import price? Let us first look at excess foreign exchange allocation (Figure 7.2a,b). In 1976–77 excess licensing in the range of 120–220 million Kenyan pounds (KP) at 1982 prices took place, assuming that the average lag between the allocation of foreign exchange and actual imports entering Kenya is 3 or 4 months. It was a rational way to hedge against a reversal of the reform, as the exchange rate policy was maintained constant, and no major tariff reforms were under way. Holding a foreign exchange license was equivalent to holding an option to buy foreign

exchange in case it would begin to look like that the liberal period was coming to an end.

To get an idea of the magnitude of excess licensing, we may compare it to manufacturing investment which was approximately KP 200–230 at 1982 prices during 1976–77. In other words, excess licensing was at least half of the size of total manufacturing investment, and possibly almost as high as investment. In 1978, when it became obvious that the boom was soon to be over, imports were roughly KP 100 million in excess of allocations by the Central Bank, assuming a lag of 3 or 4 months. Excess licenses in stock allowed firms to increase imports quickly, without a lengthy application process, or even refusal of a license as export earnings began to dwindle. Note that it is the actual excess imports that create the welfare cost, and that there will be no such cost as long as excess licenses are not used.

As indicated in Table 7.1, accumulation of durable imports in bonded warehouses would have been another rational choice of speculative action in 1978. Unfortunately, data on bonded warehouses prior to 1980 could not be obtained from the Government Computer Services data base so that we do not know whether there was an increase in bonded imports towards the end of the boom as one would expect.

Although actual imports of consumer durables (i.e. imports declared through the Customs) were not necessarily the optimal choice of hoarding from the importer's viewpoint, they nevertheless increased considerably throughout the coffee boom, reaching their by far highest peak in 1978 (Figure 7.6). This may be explained by increased consumer demand for durables as a form of saving the transient income, or by the fact that consumers, unlike firms, are not able to take advantage of any other means of hoarding than the actual purchase of imports. The 1978 peak compared to

1976–77 is a clear indication that consumers (and traders) correctly anticipated the imminent reversal of liberalization and took advantage of temporarily cheaper imports. (Imports of consumer durables were KP 10 million higher in 1978 than a year before, and KP 43 million higher than in 1979.) The jump in the actual imports of consumer durables is also reflected in commercial stocks (Figure 7.9). The stocks held by commerce peaked during the second quarter of 1978, roughly KP 30 million up from the previous quarter, and were gradually decumulated thereafter.

Similarly, intermediate imports increased in 1977–78 (Figure 7.7) but the 1978 peak was much less pronounced in relative terms than that of consumer durables. This is perfectly rational as users of intermediate inputs, who are also their importers, had access to more cost-effective means of hoarding, particularly bonded warehouses. In absolute terms, however, intermediate imports were KP 50 million higher in 1978 than during the previous and subsequent year. The peak observed in intermediate imports in 1978 was not translated into manufacturing stocks of materials (Figure 7.8), which hints to increased demand and confirms our assumption that firms preferred other means of hedging to accumulation of declared imports. An increase was, however, recorded in manufacturing stocks of materials during the last three quarters of 1979. Import controls had been tightened by then, that increase is likely to be a reflection of falling incomes.

Recall that KP 100 million worth of excess foreign exchange allocations (at 1982 prices) were used up in 1978. Assuming that they were all used for inventory accumulation the increase in bonded imports should have been around KP 20 million, provided our estimate of KP 30 million of excess imports of consumer durables and KP 50 million of intermediate goods (declared through the Customs) is correct. The peak in intermediate imports may have been non-speculative instead, as it does not appear in the stocks of materials of the manufacturing sector. In that

case the increase in bond should have been KP 70 million. In the light of available data on subsequent accumulation of bonded stocks this estimate seems to be too high. Therefore we have reason to believe that the value of speculative inventory accumulation by firms is likely to have been less than KP 100 million.

Let us now examine how speculation was financed. As can be seen from Figure 7.10, there seems to have been no waiting in investment during the coffee boom. Quite the contrary, investment in import–substitution grew substantially. Private agents were confident that protection would not be removed, despite a temporary relaxation of import controls, and continued to invest in import–substituting industries.

Lending to manufacturing soared in 1978 and continued to grow fast also in 1979 and 1980 (Figure 7.11). As stock accumulation was shown to have been minimal in manufacturing, the bulk of this increase must reflect other financial needs than inventories. Further, as investment is financed mainly from retained earnings (Mayer 1990), the jump is likely to indicate increased finance of working capital as manufacturing output was expanding substantially. Figure 7.12 reveals that there were two peaks in private lending to import trade: the first during the first quarter of 1978 (an increase of KP 15–20 million), and the second during the last quarter of 1978 (an increase of KP 20–30 million). They seem to coincide with the end–of–coffee–boom hoarding of imports as consumers and traders anticipated that endogenous liberalization was coming to an end. Finally, there was a small peak in the parallel market premium in 1978, indicating that it was used as an alternative source of foreign exchange for imports (Figure 7.13).

7.4.2 Exogenous Liberalization in 1980

Unlike in the 1970s, the 1980 reform was not an endogenous policy response to a favourable external shock (as there was no such shock in the Kenyan economy then) but an exogenous change in trade policy, with the objective to bring about structural changes in the economy. Liberalization was part of conditionality attached to stabilization and structural adjustment loans from the IMF and the World Bank, making it a candidate for a time-consistency problem. In addition, in the absence of compensating exchange rate adjustment, the other necessary condition for credibility, macro compatibility, was not being met. As was shown in Figure 7.1, external reserves began to fall sharply almost immediately after the reform was initiated. This led to a foreign exchange crisis in September 1980, to be followed by a nearly complete halt in foreign exchange allocations, and a reversal of many reform measures introduced earlier in the year.

In 1980 imports exceeded the foreign exchange allocations by approximately KP 180–210 million (Figure 7.2a). For the most plausible lags of three and four months, the stock of foreign exchange licenses was negative by KP 40–210 million (Figure 7.2 b), which indicates that other sources of foreign exchange were also used. The range of the stock of licenses is wide, emphasizing the importance of the chosen lag. Manufacturing investment was roughly KP 100 million during that year (Figure 7.10).

As can be seen from Figure 7.3, inventories in bonded warehouses experienced the highest increase in 1980 than in any other year. The net increase in bond was KP 20 million worth of intermediate goods, and KP 5 million worth of consumer durables. Monthly data (Figures 7.4 and 7.5) show that accumulation occurred soon after the reform was reversed. In November alone bonded consumer durables went up by KP

2 million. Note also that both categories show a steep decumulation peak in June, which may reflect anticipated changes in tariffs which were to be announced in the Budget Speech during that month.

From the viewpoint of testing our first hypothesis of accumulation of actual imports, a potential bias associated with the available data on imports is that the entire observable increase is usually not attributable to speculation alone. As imports of consumer goods, for example, have been suppressed by quantitative restrictions, there will be a substitution effect away from domestic goods and in favour of importables when they become available. Clear peaks in the data are, however, likely to indicate accumulation of inventories in anticipation of a higher future price. Bevan *et al.* (1990b) argue that the surge in imports during the coffee boom liberalization was due to private agents' willingness to save the transient income (consumer durables are seen as a form of saving) as well as an indication of suppressed import demand. In 1980 there was no increase in transient income and at least part of the suppressed demand had been taken care of during the coffee boom liberalization. Hence, we have all reason to believe that any surge in durable imports following the reform in the 1980s can be, to a large extent, attributed to speculation.

As it appears from Figure 7.6, the 1980 exogenous liberalization, when shrinking foreign exchange earnings would have called for tighter licensing under the endogenous trade policy rule, created in a peak of approximately KP 20 million in the imports of consumer durables during that year. Consumers and traders correctly perceived macro incompatibility of the reform. Somewhat unexpectedly there is a much steeper increase in durable intermediate imports in 1980 than during the coffee boom liberalization (Figure 7.7). As foreign exchange earnings were falling in 1980, importers of intermediate goods made use of what was perceived as a

temporary relaxation of licensing. Compared to the year before and after the reform, the jump in intermediate goods was around KP 200 million, i.e. 10 times the jump observed in consumer durables.

Our inference is confirmed by the fact that one of the two steepest increases in manufacturing stocks occurred during the first quarter of 1981. Allowing for some lead time between the submission of a license application to the Ministry of Commerce and the arrival of goods in Kenya, this increase, roughly KP 65 million compared to the level of stocks 6 months earlier, clearly coincides with the 1980 reform. Similarly, commercial stocks increased by KP 40 million during the first quarter of 1981 relative to the level of stocks 6 months earlier.

Investment in manufacturing experienced the steepest single fall in 1980, i.e. close to KP 55 million relative to the previous year. Although it is not possible to say how much of this fall in gross fixed capital formation was due to waiting, it does lend some support to our hypothesis of deferral of investment during incredible reforms. Similarly, credit to both import trade and manufacturing peaked during the second and third quarter of 1980, respectively, indicating that both options of financing stock accumulation were being used. The magnitudes involved were a peak of credit of KP 15 million to import trade, and KP 40 million to manufacturing compared to 6 months earlier. The parallel market premium (Figure 7.13) fell sharply during the first quarter of 1980, following relaxation of the import deposit scheme, but shot up again during the next quarter, indicating a lack of confidence in the permanence of the reform, and an increased demand for foreign exchange by importers.

Summarizing, the 1980 import liberalization was macro incompatible from the start as no compensating policies, such devaluation, were implemented. Private agents correctly anticipated the reversal of the reform and took advantage of what was

perceived to be a temporary relaxation of import and foreign exchange controls. The lack of credibility is demonstrated by a sharp fall in reserves. The consequences are evident in each and every data set presented above in order to account for the entire range of choices for speculative action, i.e. excess licenses, bonded imports and durable imports declared through Customs. Both sources of finance, investment funds and bank borrowing, were also heavily used to pay for excess imports. Investment in manufacturing experienced its steepest single fall, while credit to manufacturing and commerce peaked.

The increase in bonded imports and the two estimates for excess imports of durable goods yield a total of KP 245 million. This is two and half times the total capital formation in manufacturing in 1980, and 9.1 percent of GDP (at constant factor prices). Assuming a rate of return of 10 percent in an alternative use, and that imports are held in stock for a year, the welfare cost created by speculative inventories is 0.91 percent of GDP. Although the cost is somewhat higher than that derived from the simple consumption model without consumer credit (Chapter III) and using plausible parameter values, it seems in general to be in line with the theory.

Finally, we have to ask whether the estimated excess imports can be traced in the stocks reported by firms. From Figures 7.8 and 7.9 we can see that commercial stocks increased by more than the estimated value of excess imports of consumer durables, whereas only a third of the peak in intermediates seems to have ended up in manufacturing stocks. As these two sectors account for 90 percent of the reported inventories, we have to conclude that the welfare cost may be smaller than estimated on the basis of peaks in bonded warehouses and declared imports. Alternatively, the Business Expectations Enquiry may have a data problem in its reporting of stocks. The latter view is supported by the fact that the increase in incomes and hence in non-speculative demand was modest in 1980.

7.4.3 Introduction of Systematic Licensing in 1982

As it became obvious that relaxation of the existing import controls without compensating devaluation was not going to be sustainable, Kenyan policy-makers decided to undertake a comprehensive reform of import schedules instead. Previously a large number of imported items was not included in any of the schedules, making it very difficult for the licensing authorities to keep the amount of imports in control when quotas were relaxed. One of the objectives of reforming the schedules was to make them comprehensive. The other was to give input and capital imports for the domestic industries a preferential access to foreign exchange, while import-competing and consumer goods became more restricted than before. Relaxation of licensing was, to an extent, compensated by tariff increases. As indicated by a fall in external reserves (Figure 7.1), the reform seems to have suffered from a lack of credibility initially, as it was implemented gradually so that the schedule for import-competing and consumer goods were the last one to be revised. After the schedules were fully established, and supporting devaluations carried out in 1981 and 1982, credibility of the reform was restored.

As can be seen from Figures 7.2(a) and 7.2(b), annual deviations between foreign exchange allocations and actual imports were reduced substantially after 1982. The exchange rate and tariff policies were no longer constant so that excess licensing became riskier. Imports in bonded warehouses were also decumulated in 1982. As in the case of excess licensing, devaluations and tariff increases made them less attractive from the importer's point of view. After a fall in 1983, tariffs remained relatively constant as did the exchange rate (except for small adjustments). As can be expected, bonded imports increased since 1983. Consumer and intermediate imports for home use do not indicate any speculative accumulation in response to the new import schedules as both fell in 1982. However, the stocks of inputs held by

the manufacturing sector increased by almost KP 55 million during the last quarter of 1982, to be followed by an even sharper decumulation during the next quarter. Despite the fall in actual imports, this hints to a brief speculative episode. The value of commercial stocks also rose temporarily by almost KP 50 million during the first and second quarter of 1982.

After 1982 the level and volatility of material stocks in manufacturing was reduced, reflecting the more systematic nature of licensing and preference given to imported inputs. On the one hand, manufacturers were assured that foreign exchange for the required inputs will be made available for them at the expense of consumers. On the other, the authorities responsible for issuing licenses were now more in control and could prevent speculative peaks effectively. Investment fell in 1982, increased modestly in 1983, and fell again in 1984–85 (Figure 7.10). It is quite difficult to say whether any of the decline in investment was due to waiting induced by uncertain trade policies, as there was a simultaneous recession in the economy. Lending to manufacturing (Figure 7.11) remained at quite a high level in 1982, whereas credit to import trade (Figure 7.12) fell compared to 1978–80.

A simultaneous economic downturn makes it difficult to assess the magnitude of speculative cost of the 1982 reform as stocks are likely to have increased also due to reduced demand. Nevertheless, both manufacturing and commercial stocks experienced sharp but short-lived peaks. Even if the entire KP 100 million of excess importation over approved licenses (Figure 7.2 a) would have been used for speculation, the social cost remains much smaller than during the two previous episodes as the stocks were decumulated very quickly.

7.4.4 A Shift to Export Promotion in the Late-1980s

As depicted in Figure 7.1, external reserves declined in 1990 in the absence of a substantial aid inflow which had improved the external position during 1989. During the third quarter of 1990, reserves fell to their lowest point since 1976, indicating that import liberalization under way was suffering from a lack of credibility. Figure 7.2(a) shows that the value of imports exceeded that of licenses issued in 1988 approximately by KP 40–50 million (for the lags of 3 and 4 months), while in 1989 licenses were again stockpiled.

The value of intermediate imports in bonded warehouses increased by KP 13 million in 1988. The tariff reform, which was under way, may have encouraged importers to place their imports in bond in anticipation of lower rates. The opposite development took place in the case of consumer durables for which higher tariffs were expected as temporary surcharges were to be imposed to compensate for the planned removal of QRs. Bonded stocks of consumer goods were decumulated by KP 5 million in 1988. Traders stockpiled actual imports instead of bonded goods. As can be seen from Figure 7.9, there was a large peak, worth more than KP 100 million, in commercial stocks during the first quarter of 1988. It is somewhat unclear what can have prompted this huge increase in commercial stock. Compared to the total of durable consumer imports, for example, the peak alone is double their value, hinting to a possible problem in the data on stocks. Although there was a small peak in the first quarter of 1989, manufacturing stocks increased only modestly in 1989–90.

Investment plummeted in 1990. According to the National Accounts data, the fall was in the range of KP 50 million compared to the previous year. This fall was almost equivalent to the fall in 1980, and support the hypothesis of waiting during uncertainty about trade policy. However, it is again difficult to say much about the

magnitude of deferral. Lending to manufacturing increased during 1989 (data is not available beyond the first quarter of 1990), but not by much. Data on lending to import trade is not available after the first quarter of 1987 so that we do not know whether the huge increase in stocks in 1988 was accompanied by credit expansion to import trade.

Despite a more cautious approach to import liberalization during the latest episode, there were three indications of speculation in the data. First, stocks of bonded intermediate imports had a substantial increase, while consumer goods in bond were decumulated. As argued earlier, this must have been a reaction to expected changes in tariffs. Second, commercial stocks soared in 1988, to be followed by a smaller peak at the end of 1989. The former hike was close to KP 100 million alone, while only KP 5 million came from declaring imports from bond. As the stocks remain at a high level for some time, implying a high social cost (provided, of course, that there was a genuine increase instead of a data problem). Third, investment in manufacturing fell sharply (close to KP 50 million), supporting the view that investment in physical plant is deferred during uncertainty about the future trade policy.

7.5 Summary

Trade policy in Kenya has been used both for protection of domestic industries and for macroeconomic adjustment. Since the early-1970s, availability of foreign exchange has determined the tightness and extent of imports controls at any given time, while industrial policy considerations have determined the incidence of restrictions. The endogenous trade policy rule has been revealed to private agents. Policy-makers in Kenya realized fairly early that the inevitable result of managing

balance of payments by adjusting import controls is inefficient industries and high consumer prices. Nevertheless, liberalization of imports has been less successful, despite the fact that it has been attempted several times since the early-1970s.

The coffee boom liberalization was never meant to be anything else but temporary. In the 1980s trade liberalization was imposed on Kenya as a condition for external financial assistance and, as a consequence, less willingly implemented by the government. Moreover, aid packages have often failed to coordinate trade policy measures with exchange rate management, resulting in macro incompatibility of the reform, a situation which the Kenyan private sector has been able to observe correctly. The most obvious case in point is the 1980 exogenous liberalization which was not prompted by improved foreign exchange earnings but by an attempt to make the export sector more profitable relative to import-substitution by relaxing non-tariff restrictions. As the two necessary conditions for credibility were not being met, particularly as there was no compensating devaluation, the reform was not perceived sustainable. For the same reason, the subjective probability was likely to be equal to the objective probability of default. The lack of credibility is confirmed by respective declines in external reserves.

Thereafter, import policy became more selective, i.e. an easier access to imported inputs which was carried out at the expense of consumer and import-competing goods. However, it became increasingly clear over time that import-substitution was able to offer less and less growth potential. Therefore, the most recent episode (from 1989 up to the present) has emphasized direct incentives to the export sector rather than import liberalization. A stricter administrative grip has been able to limit speculation compared to the episodes in 1976-78 and 1980.

Although one has to be cautious when using the above data for quantification of the social cost, it seems clear that despite its short duration the 1980 reform was the most costly attempt to reduce protection of domestic industries in Kenya. A lack of credibility of the 1980 reform induced a substantial and fast speculative private response which led to a reversal of the reform during the same year. External aid or simultaneous stabilization attempts could not prevent this from happening. All means of hoarding, i.e. excess licenses, bonded warehouses and accumulation of actual imports, were used. Bank borrowing increased, while investment fell, indicating that both means of financing speculation were in use. We estimated that the welfare cost of inventory accumulation was at most KP 245 million in 1980 (and at least KP 130 million), which is equivalent to 0.91 percent of GDP, assuming a return of 10 percent in alternative use. As indicated by the hypothetical implicit tariff index (Figure 6.9) the overall trade policy became tighter after the 1980 episode. This can be considered as an additional, or indirect welfare cost due to reduced efficiency.

The data analysis confirms our first hypothesis that private agents were able correctly to detect episodes which were not sustainable, particularly the ones in 1976–78 and 1980, inducing accumulation of stocks of importables before the reform was reversed. This is most obvious from the data for bonded warehouses which had their all time peak in 1980. Bonded imports are the most suitable data set to test our first hypothesis as they, by definition, are stocks of imports waiting to be declared through the Customs. The duration of hoarding was very brief in 1982. In the late–1980s private speculative response was more limited, and cannot be observed across the data as in the case of the 1980 reform.

Inventories were accumulated with the help of excess licenses which were used up when it became imminent that the reform cannot be sustained. Volatility in licensing was pronounced in the 1970s and early–1980s but has been reduced since

then. As expected, bonded warehouses were heavily used as stocks when tariffs and the exchange rate remained unchanged, particularly in 1980. Year 1988 provides a good example of tariff policy being reflected in bonded imports: consumer goods were decumulated as their tariffs were increased, whereas intermediate imports were accumulated in anticipation of lower future tariffs.

Imports of consumer durables declared through the Customs peaked in 1978 and 1980, while intermediate imports had their peak in 1980. Their speculative nature is confirmed by the respective peaks in manufacturing materials stocks (although smaller) as well as in stocks held by commerce. Both stocks peaked also at the end of 1982, reflecting the initial incredibility of reforming the schedules. In 1988 speculative intermediate imports were stocked in bonded warehouses rather than in manufacturing firms, while bonded consumer good were decumulated but commercial stocks experienced a huge expansion.

Investment in manufacturing experienced its steepest single fall in 1980. Although it is not possible to say how much of this decline in gross fixed capital formation was due to waiting, it does lend support to our second hypothesis of deferral of investment during incredible reforms. This was a very different outcome compared to the coffee boom liberalization which coincided with an investment boom. Private agents were confident that protection will prevail after the windfall was over. The 1982 episode is less clear as deferral of investment, if any, is concealed by a fall in investment due to a recession. Investment plummeted in 1990. This fall was almost equivalent to that experienced in 1980, and supports the hypothesis of waiting during uncertainty concerning the future trade policy. However, it is very difficult to say much about the magnitude of deferral.

Finally, the data confirm the third hypothesis of increased liquidity in the economy as incredible trade reforms seem to be accompanied by peaks in credit expansion to manufacturing and commerce, particularly in 1980. These peaks seem not to have crowded out other sectors as the total lending was increased simultaneously.

In 1980 the private response undoubtedly forced the government to abandon the reform. Other studies, such as Michaely (1991), show that past failures lead to a higher subjective probability of reversal perceived by the private sector. Therefore, the cost of the next attempt is likely to increase, even if it could be maintained. The World Bank advice for the economies suffering from past failures is to reform with a big bang in order to achieve a more efficient resource allocation. On the basis of this study on Kenyan episodes, we have to conclude that a big bang, or an overshoot, when the necessary and sufficient conditions for credibility are not being met, involves a risk of adverse private response which may lead to high additional welfare costs and a swift policy reversal.

ANNEX 7.1: STANDARD THEORIES OF INVENTORY HOLDING

Production smoothing during fluctuations in demand is the most commonly assumed reason for firms to hold inventories, suggesting that the variance of production is smaller than that of sales. Empirically, however, both at the aggregate level and for the most sectors in the economy, production seems to be more variable than sales (Blanchard and Fischer, 1989). Therefore, another motive suggested for holding inventories is avoidance of stock-outs under uncertainty, i.e. when production decisions have to be taken before demand is known. Some empirical studies have also included the interest rate as a third variable to explain the size of inventories.

Let us examine a model that captures the first two elements, production smoothing and stock-outs (Blanchard and Fischer 1989). A risk-neutral representative firm carries inventories both to meet expected sales and to reduce production costs. It takes the stochastic process of sales as given and thus minimizes the present discounted value of quadratic costs given by:

$$(A7.1) \quad E \left[\sum_{i=0}^{\infty} (1+\theta)^{-i} \{ (a/2)(Y_{t+i} - u_{t+i})^2 + (b/2)(Y_{t+i} + I_{t+i-1} - I_{t+i}^*)^2 \} \mid t \right]$$

$$I_t^* = E[S_t \mid t] + k$$

$$I_t = I_{t-1} + Y_t - S_t$$

$$\Omega_t = \{S_{t-1}, S_{t-2}, \dots, u_t, u_{t-1}\}$$

where Y_t and S_t denote production and sales at time t , I_t denotes inventories at the beginning of time t , θ is the discount rate, and Ω_t is the information set. Unlike in the case of speculative demand for inventories, the price level is assumed to be constant so that expected price changes do not enter as a determinant of inventories. The first term in equation (A7.1) reflects the increasing marginal cost of production so that it pays to smooth production across periods. The marginal cost is affected by a production shock u . A favourable production shock makes the firm to increase production and build up inventories for later sales. The second term reflects the cost of having a larger stock than the target level I_t^* , which is equal to expected demand plus a constant k .

Solution to equation (A7.1) yields the expression for expected end-of-period inventories:

$$(A7.2) \quad E[I_t | t] = \alpha + \lambda I_{t-1} - \lambda E[S_t - u_t | t] + (1 - \lambda) \sum_0^{\infty} [\lambda(1 + \theta)^{-1}]^i E[S_{t+i} - u_{t+i} | t]$$

where α is a constant and $\lambda < 1$. Since the firm does not know S_t , it cannot control I_t exactly which depends on the expected sequence of sales. If λ is set equal to zero, which is the same as the marginal cost is constant, then planned inventories are also constant and there is no production smoothing effect. The desire to avoid stock-outs can be shown to lead to larger variance in production than sales. An unexpected increase in sales, however, is negatively correlated with the size of inventories. When $\lambda \neq 0$, then the firm takes into account the initial level of inventories and also compares current to expected future sales, as can be seen from equation (A7.2).

The analysis can be extended to the general equilibrium framework so that consumption smoothing and taste shocks – in addition to production shocks – can be introduced. The extended model generates interesting results (Blanchard and Fischer 1989). A positive taste shock initially increases consumption and decreases inventories as consumers are willing to substitute intertemporally. Since production is predetermined, consumption increase is met by inventory decumulation. Over time inventories are replenished and production remains higher but consumption lower. Serially uncorrelated taste shocks lead to positive serial correlation in output and negative serial correlation in consumption. A favourable production shock instead initially increases production and inventories. Consumption also increases but less so that inventories go up. Serially uncorrelated production shocks lead to negative serial correlation in output and positive serial correlation in consumption.

Summarizing, productivity shocks in an equilibrium model appear to be able to explain the basic features of the joint movements of GNP and its components, i.e. recessions are usually accompanied by inventory disinvestment. Taste shocks instead lead to large fluctuations in consumption relative to output and do not generate the pro-cyclical movement in inventories and GNP that is observed in the aggregate data.

Let us examine how Kenyan inventory data complies with the standard theories discussed above. Adam (1991) tests the production smoothing/stock-out model, using the Kenya Business Expectations Enquiry data collected at firm level. The following hypotheses are derived from the model:

- (1) The variance of production is smaller than that of sales;
- (2) The covariance of sales and changes in inventories is negative;
- (3) The model can be represented by a partial adjustment analogue so that the level of production at time t is determined by expected sales, unexpected sales, the level of stocks during the previous period, interest rate and by the rate of inflation.

Each of the above hypotheses is rejected when tested with Kenyan data. First, for all one digit ISIC divisions the variance of production is greater than the variance of sales. Second, in 6 out of 8 divisions the correlation between sales and inventory accumulation turns out to be positive. Third, the partial adjustment model appears to be dominated by the expected and unexpected sales, whereas increases in inflation and in the nominal interest rate have a negative impact on the optimal inventory holding. The model also yields an implausibly slow rate of inventory adjustment.

Adam (1991) also tests the so-called target-threshold model of inventory holding. The model assumes a constant marginal cost of acquiring stocks but a fixed cost when the replenishment is actually carried out. Given the cost of stock-out and the distribution of sales, each firm derives its optimal range of stock, $[S, s]$. When the lower bound s is reached, the firm acquires a stock of $(S-s)$, i.e. replenishes it to its maximum. The test usually derived from this model is that the change in the stocks ΔN should be a stochastic, stationary process within the $[S, s]$ range. Thus, the de-trended mean value of ΔN should be zero and there should be no correlation between sales and the change in inventories. Kenyan data confirms both of these

hypotheses. Finally, the inventory—sales ratio is examined. For all sectors as a whole, and for the construction sector in particular, the trend in the inventory—sales ratio has been declining. Further, there appears to be a large variance around the trend, particularly across the business cycle.

It is worth pointing out that the stocks reported by the Business Expectations Enquiry include both finished goods and materials. As a matter of fact in manufacturing, which is the largest single stock—holder, the stocks of materials are around three times those of finished goods, on average. As Kenyan manufacturing sector is highly dependent on imported inputs,⁸⁸ we argue that access to imports in addition to avoidance of stock—outs and production smoothing is likely to be an important determinant of stock holding in manufacturing.

⁸⁸According to the World Bank (1987), the average import content in Kenyan manufacturing is close to 50 percent. Direct and indirect import content of recurrent inputs varies from 93 percent (plastics and pharmaceuticals) to 11 percent (paper and wood products).

VIII SUMMARY AND CONCLUSIONS

This thesis studies the causes and consequences of the credibility problem in trade liberalization. The analysis is both theoretical and empirical, with a special reference to African economies. The thesis has three objectives which arise from the shortcomings of previous research on trade reforms in developing countries. First, as empirical research has not always been firmly grounded in theory, a considerable part of the thesis is devoted to developing a theory of economic behaviour in the absence credibility and the speed of liberalization (Part One). Second, empirical studies have been non-quantitative. This is why an effort is made to identify liberalization episodes by using a quantitative, or objective measure of trade policy (Part Two). Third, the effects of the credibility problem of government policies in general have not been empirically quantified. Therefore, an empirical study is carried out on Kenyan trade reforms, which have suffered from a lack of credibility with the private sector, in order to quantify the social cost created by the credibility problem.

A taxonomic review of theoretical models which analyze various aspects of the credibility problem in trade liberalization is presented first. On the one hand, the review is structured around the two necessary conditions for credibility, i.e. time-consistency and macroeconomic compatibility. On the other hand, the types of welfare costs are used as a taxonomic device in order to classify the models. More specifically, we distinguish between consumption and production costs which either undesirable action or non-action by private agents can bring about. In consumption, if imports are perceived to be temporarily cheaper, welfare costs arise

from sub-optimal intertemporal substitution or from deviations in purchases relative to consumption, i.e. accumulation of stocks of durable goods. In production, social costs can result either from sub-optimal relocation of resources in anticipation that protectionism may return after a liberal period, or from waiting in investment until uncertainty has been resolved. Without access to foreign savings firms may accumulate inventories of imported goods as a means of deferring investment in physical plant. By undesirable action we mean, for example, accumulation of inventories of durable imports, or foreign savings, while non-action refers to a failure to reallocate resources in anticipation of the reimposition of pre-liberalization tariffs.

A lack of credibility may either be certain or uncertain to private agents. In the former case, the reform is perceived to be temporary (i.e. to fail for sure), while in the latter case its failure is considered possible, with a given probability attached to this possibility. If the public has rational expectations, they perceive the objective probability of collapse, whereas without rational expectations they will have to rely on a subjective probability. Regardless of its degree of uncertainty (including its absence), incredibility creates a social cost.

Time-inconsistency may arise for several reasons. First, if the government is of a redistributive type, and factor mobility is costly, it is not able to credibly commit itself to the optimal policy of free trade. The public knows that the government will subsequently have an incentive to impose a tariff and distribute the receipts to its favoured group. Second, time-inconsistency may result from conflicting goals of the public and the government, for example, regarding public spending. The private sector knows that the government will try to raise its revenue by unexpected inflation, once it has built up its real cash balances. As the increased revenue is used for its self-concerned spending, the government cannot commit itself to free trade.

The presence of conflicting goals is equivalent to a distortion which interacts with another distortion, i.e. trade restrictions. If one distortion remains, it may not be optimal to remove the other. Third, there may be uncertainty whether the government is a true liberalizer or a redistributive one. In other words, uncertainty prevails over whether or not the time-consistency problem arises. This approach makes the lack of credibility a probabilistic concept. Finally, the government can be endogenized as a political process where a majority, for example, determines whether the reform will be undertaken at all. In this case, time-inconsistency may result in a reform that never takes off due to uncertainty about winners and losers.

The other broad category giving rise to the credibility problem is incompatibility of trade liberalization with macroeconomic policies, such as fiscal, monetary and exchange rate policy. Again, private agents may observe incompatibility with certainty due to misguided government policies, or incompatibility may be probabilistic due to uncertainty created by the possibility that adverse terms-of-trade shocks will occur in the future.

Many African economies use import controls to manage their balance of payments. By definition, this endogenous trade policy rule implies that liberalization is temporary, unless the positive shock, which initially prompted the reform, turns out to be permanent rather than temporary. If private agents have rational expectations concerning the type of the shock, they are also able correctly to anticipate the fate of the reform. As a corollary, if there is no change in the terms of trade when a trade reform is undertaken, compatibility has to be brought about by a simultaneous devaluation, or by a reduction in the money supply. Temporary foreign aid, for example, allows the government to buy back domestic currency with foreign currency, provided aid will not increase public spending.

Unlike the necessary conditions, the sufficient conditions for credibility are much more difficult to identify, or to predict. Even if the two necessary conditions are being met, there is a continuum of other reasons that may create a credibility problem, such as the number of years to the next election, or an expected shift in the balance of political power.

Three simple models are developed to account for the social cost of incredibility. First, a consumption model, which assumes no access to credit and uses a set of plausible values of parameters, shows that inventory accumulation creates a cost of around 0.5 percent of the total attainable utility. (A sensitivity analysis could be carried out to obtain a plausible range of consumption costs around that figure, although the results would not be essentially different.) Further, consumption costs are an increasing function of the subjective probability of collapse (or the objective probability if private agents have rational expectations) with a jump. The rate of increase, however, is not the same throughout the interval from zero to unity. While the cost of sub-optimal intertemporal substitution is monotonically increasing in the subjective probability, the speculative holding of stocks is likely to be nil at low probabilities. When the probability reaches a critical level there is a jump in the social cost when stocks are purchased, given the levels of tariffs and interest rate. Hence, below the critical level there are no costs related to inventories but there is sub-optimal intertemporal substitution and above it the cost of holding stocks increases monotonically.

Second, a production model focuses on non-optimal relocation of factors of production in response to uncertainty about future trade policy. Varying the probability of default from zero to 0.5 (when uncertainty is at its highest) yields a range of social cost from zero up to 4.7 percent in terms of lost output. When the subjective probability increases, the anticipated return to capital in the export

sector relative to the formerly protected sector becomes less attractive. The incentive to relocate resources diminishes, increasing the welfare cost monotonically in the probability up to another critical value at which no reallocation of factors takes place and the welfare cost reaches its maximum level.

Third, the social cost of deferral of investment obviously depends on the rate of return and the level of planned investment. At low probabilities, and given the level of tariffs, the social cost would be zero since private investors will act according to the policy-maker's intentions and invest in exportables. A third critical value of the subjective probability is identified at which the cost jumps up since all investment is deferred by accumulating stocks which yield a zero social return. To conclude, the total social cost of incredibility is a non-monotonic curve with kinks.

This thesis further analyzes the speed of liberalization both under full credibility and in its absence. The general result is that instantaneous liberalization is preferable when there is no credibility problem, including the case where adjustment is costly. Employment, income distribution and distortions in factor markets may, however, may justify a deviation from the general rule, i.e. gradualism is superior to abruptness. When the assumption of perfect credibility is relaxed, results change dramatically. The question we explore is whether or not a lack of credibility makes a gradual reform more desirable than an instantaneous removal of implicit or explicit tariffs. Unfortunately, there is no unambiguous answer as a given speed of reform affects consumption and production decisions differently. Containing consumption costs would typically call for a small and slow reform to reduce the incentive to accumulate stocks, while, from the production point of view, strong and fast liberalization is better as it promotes relocation of factors, or prevents deferral of investment. Incredibility may also call for a third choice of the speed of liberalization, i.e. initial overshooting of the reform in order to signal more effectively the government's commitment to freer trade.

It is important for the liberalizing government to assess the possible consequences of incredibility in advance. If adverse effects are likely to endanger the entire reform, the government has either to find measures to enhance the credibility of its policies, counter the expected speculative action by using some other policy instruments, adopt a gradual approach, or postpone the implementation of the reform until the social cost of incredibility can be expected to be smaller. An extensive World Bank study on trade liberalization in developing countries strongly advocates large reforms (Michael *et al.* 1991). However, the study does not give much consideration to the credibility problem which may be an essential issue for sustaining the reform. Both gradualism and abruptness can suffer from a lack of credibility but it is the latter that carries a higher risk of speculative response which may force the government to abandon the entire reform.

Which of the three speeds of liberalization has the highest benefit net of welfare cost under less than perfect credibility? In order to be able to answer that question one should, in addition to the analysis of welfare costs of incredibility, (i) assess the welfare loss of gradualism or overshooting in terms of efficiency, and (ii) be able to express consumption cost (loss of utility) and production costs (loss of output) in the same units. Even if this information is not available, it is possible to say something about the choice of the speed. If speculative accumulation of stocks can be held in check it will be optimal to go for a big bang, or even an overshoot if the private sector would be convinced only by such a signal. If large-scale hoarding can be expected, the conclusion is different. Assume that the welfare cost of inaction (non-reallocation of factors and non-investment) was higher under gradualism than that of speculative action (stock accumulation) under an abrupt reform, which would call for a big bang reform. However, the latter cost may occur sooner than the respective benefits on the production side are being felt, exhausting the reserves, and forcing the government to abandon the reform. Similarly, if the capital stock in

place is sector-specific, the adverse consequences of abrupt but incredible liberalization may dominate.

There are also other arguments for a slow speed of liberalization under incredibility. First, if private agents anticipate that tariffs will subsequently be reimposed and they take a positive future tariff into account in their intertemporal consumption decisions, then it is optimal to have a positive present tariff, in order to avoid an intertemporal distortion in the price level. The causality may run both ways since the structure of expectations can be a function of the speed of liberalization as well. A large reform, for example, may increase the perceived probability of collapse, which a small one would not do. As a counter argument we can say that an implemented policy (i.e. strong and fast reform) is more likely to be maintained by the government than just a promise (of gradually implemented liberalization).

Second, exchange rate management is relevant to the choice of the speed of reform. There is at least one argument in favour of gradualism when devaluation cannot be used (for example, for political reasons) to compensate removal of non-tariff restrictions, and another argument for a slow speed when devaluation can be used. If a compensating devaluation is not possible, an abrupt relaxation of quantitative import restrictions becomes incompatible. It reduces the domestic price of importables and thereby the demand for money more than a gradual reform. An excess supply of money leads to a balance of payments deficit unless the money supply is reduced, or the demand for money is maintained by depreciation. In the absence of devaluation, a gradual reform may prolong the depletion time of reserves but cannot prevent it from happening eventually. When a slow depreciation is politically feasible but a quantum devaluation is not, then gradualism is superior to abrupt liberalization as the only sustainable way to reform.

To avoid some of the negative effects of uncertainty, gradualism may also be superior to instantaneous liberalization, when devaluation is not ruled out as a policy instrument. It may well be the case that the private sector is first and foremost skeptical about the government's ability to forecast what the appropriate amount of devaluation would be to sustain a big bang. In Africa where trade liberalization typically involves removal of quotas and other quantitative or administrative restrictions, the corresponding implicit tariff levels may be unknown and far from being uniform. Supported by external aid to compensate losers and vulnerable groups for negative effects, a relatively large initial devaluation is undertaken at the same time when a gradual trade reform is initiated. Gradual reductions in protection will enable the government to reach a new equilibrium without the uncertainty that depreciation turns out to be too small relative to the reduction in the implicit tariff. Gradualism results in a temporary balance of payments surplus and guarantees that the reform cannot become incompatible.

Third, if external reserves were large enough, they could sustain a large reform, despite speculative accumulation of inventories, and allow time for the production response to take place. However, a large reform does not necessarily solve the time-consistency problem and guarantee a favourable investment response. It may be perfectly rational from the part of private agents to expect increased taxation of the export sector — once the productive capacity is in place — as the government replaces import tariffs by export taxes as its source of revenue. A big bang liberalization may well result in a drop in investment due to waiting and anticipation of increased future export tax. If investment would suffer under both speeds, gradualism would be preferred because of the smaller adverse effects of speculative accumulation of stocks.

For empirical work on trade liberalization it is essential to define a quantitative indicator of trade policy in order to determine unambiguously what constitutes a

liberalization episode. In this paper the average implicit tariff index was chosen as a candidate for such an indicator for Kenya. The average implicit tariff index, which was calculated indirectly as the ratio of the domestic ex factory price 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, respectively) available for years 1968, 1985 and 1988. These two measures show 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 less but there is no indication that it would have fallen.

Second, a measure of import compression also indicates that the actual demand for import has been more below its notional demand (estimated from an import demand function assuming plausible price and income elasticities) 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. This measure is by no means a perfect indicator, either, particularly because it uses the real exchange rate instead of direct observation of prices, and GDP instead of expenditure statistics. Third, even if the narrative of changes in Kenyan 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. 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 in the implicit tariff, we subject both the domestic deflator and the import price index to a number of tests. It seems likely that the main source of bias is the domestic ex factory price for manufacturing. This

was clearly in evidence in the elasticities obtained from estimation of a Nearly Ideal Demand System for Kenya. As there was no clear indication of undervaluation of manufacturing sales or exports, it 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 occasional 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 derive a hypothetical domestic deflator from a Linear Expenditure System. The trend in the resulting 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 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 import compression index 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. Although one has to be cautious when using the NRPs as they are very sensitive to the choice of samples as well as price series, this contradiction casts some doubt regarding the hypothetical index.

We argue that the Kenyan 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 overinvoicing, however. Similarly, multinationals may be able to overinvoice through transfer pricing, or as a means to evade taxes. Another source of bias is the Customs valuation of imports which may differ from their actual value. Unfortunately, there is no information about the size of this deviation in Kenya. 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. Only during 1983–86 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 1982, for example, might have created an incentive to over-invoice for those importers who are exempted from pre-shipment inspection.

Finding reliable quantitative criteria of trade policy is a very difficult task indeed. Although we were able to remedy the problem by defining a hypothetical index, our initial candidate for such a criterion, the implicit tariff index, turned out to be less successful mainly because of data problems in the domestic deflator. Yet, such a criterion is needed if we wish to study the investment response to liberalization, or effects of trade policy on exports over time, or across countries. However, when we want to assess the social cost of incredible trade reforms, the information requirement is likely to be less than when investigating other types of private responses. This is because we are actually assessing relatively immediate effects of changes in policy instruments on private behaviour, regardless of whether they will ever surface at the aggregate level. In other words, we are looking at how the

private sector reacted at the government's attempt to influence relative prices, i.e. trade policy, regardless of how successful it was in this attempt.

We can therefore define four episodes for Kenya on the basis of a narrative of policy changes: (i) endogenous coffee boom liberalization in 1976–78, (ii) exogenous but macro incompatible import liberalization in 1980, (iii) systematization of import schedules since 1982, and (iv) relaxation of import controls and subsequent emphasis on export promotion, effective since 1989. These episodes are confirmed by the hypothetical index as well, except for the 1982 reform which is depicted as tightening rather than liberalization. In addition, the hypothetical index also shows that the mini coffee boom in 1986 created a temporary relaxation. Steep falls in external reserves confirm that the first two episodes suffered from a lack of credibility. A temporary fall in reserves was also observed during the third episode. The fourth episode suffered also from incredibility (at least in 1989–90), indicated by a fall in reserves, which brought import liberalization to a halt and shifted the emphasis of the reform towards export incentives.

Although one has to be cautious when using the data on stocks for quantification of the social cost, it seems clear that despite its short duration the 1980 reform was the most costly attempt to reduce protection of domestic industries in Kenya. A lack of credibility of the 1980 reform induced a substantial and fast speculative private response which led to a reversal of the reform during the same year. External aid or simultaneous stabilization attempts could not prevent this from happening. All means of hoarding, i.e. excess licenses, bonded warehouses and accumulation of actual imports, were used. Bank borrowing increased, while investment fell, indicating that both means of financing speculation were in use. We estimate that the welfare cost of inventory accumulation was at most 245 million Kenyan pounds in 1980 (and at least KP 130 million), which is equivalent to 0.91 percent of GDP,

assuming a return of 10 percent in alternative use. As indicated by the hypothetical implicit tariff index, the overall trade policy became tighter after the 1980 episode. This can be considered as an additional, or indirect welfare cost due to reduced efficiency.

The data analysis confirms our first hypothesis that private agents were able correctly to detect episodes which were not sustainable, particularly the ones in 1976–78 and 1980, inducing a sharp fall in external reserves and accumulation of stocks of importables shortly before the reform was reversed. Bonded imports are the most suitable data set to test our first hypothesis as they are, by definition, imports waiting to be declared through the Customs. The duration of hoarding was very brief in 1982. In the late–1980s private speculative response was more limited, and cannot be observed across the data as in the case of the 1982 reform.

Inventories were accumulated with the help of excess licenses which were used shortly before reversal of the reform. As expected, bonded warehouses were heavily used as stocks when tariffs and exchange rate remained unchanged, particularly in 1980. Year 1988 provides another good example of tariff policy being reflected in bonded imports: consumer goods were decumulated as their tariffs were in increase, whereas intermediate imports were accumulated in anticipation of lower future tariffs.

Imports of consumer durables declared through the Customs peaked in 1978 and 1980, and those of intermediate goods in 1980. Their speculative nature is confirmed by the respective peaks in manufacturing materials stocks (although smaller) as well as in stocks held by commerce. The both stocks peaked also at the end of 1982, reflecting the initial incredibility of reforming the schedules. In 1988 any speculative intermediate imports were stocked in bonded warehouses rather than in

manufacturing firms, while bonded consumer goods were decumulated but commercial stocks experienced a huge expansion.

Investment in the manufacturing sector experienced its steepest single fall in 1980. Although it is not possible to say how much of this decline in gross fixed capital formation was due to waiting, it does lend support to our second hypothesis of deferral of investment during incredible reforms. This was a very different outcome compared to the coffee boom liberalization which coincided with an investment boom. Private agents were confident that protection will prevail after the windfall was over. In 1982 deferral of investment, if any, is concealed by a fall in investment due to a recession. Investment plummeted in 1990. This fall was almost equivalent to that experienced in 1980, and supports the hypothesis of waiting during uncertainty concerning the future trade policy. However, it is again very difficult to say much about the magnitude of deferral.

Finally, the data confirm the third hypothesis of increased liquidity in the economy as incredible trade reforms seem to be accompanied by peaks in credit expansion to manufacturing and commerce, particularly in 1980. These peaks seem not to have crowded out other sectors as the total lending was increased simultaneously.

How can the adverse effects of the credibility problem be mitigated? First, a standard suggestion is that the government can build up its reputation. Building a reputation is a much more natural strategy than those which are permanently on the agenda, such as monetary policy, or taxation. Trade liberalization is less frequent, and therefore it is more difficult for the government to build a good reputation. Particularly, if the private response forces the government to abandon a reform, as happened in Kenya in 1980 and, to a lesser extent, in 1990, it only gains a bad reputation. Once the reform has taken off, it is very much the private response

that dictates its fate. Therefore, a government willing to build a good reputation has to design the reform so that it will not be a source of a lack of credibility. Macro incompatibility is the most obvious thing such a government should avoid.

Second, capital controls should not be removed until the trade liberalization programme is fully consolidated. As the capital account is usually restricted in African economies and yet speculative accumulation of imports occurs, the government has to look for other measures, such as quotas on durable imports. The latter should, however, be weighed against the rent-seeking costs that quotas may generate. Another instrument could be domestic credit restrictions. Depending on the propensity to store intermediate goods relative to consumer goods, credit policy can be targeted either to the manufacturing sector, import trade, or both. In addition, regulations and charges applied to importation can be modified to counter private speculation.

Finally, many developing countries are outside the world system of reciprocity in trade liberalization. Reforms are unilateral and undertaken under the pressure of donor conditionality. When a foreign transfer, which usually accompanies the reform, dries up and the reform becomes unsustainable, it is often given up. Policy oscillation ensues. Developed countries have quite successfully refrained from solving payments problems by import restrictions because of the fear of retaliation, whereas low-income countries have been able to impose restrictions without such fears. Their more close integration into the world trading system could make trade reforms more permanent and credible.

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