EXPORT INSTABILITY AND ECONOMIC DEVELOPMENT

A SURVEY - PART I : THE THEORY

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CONTENTS

1. Introduction

The problem of export instability in the context of 'lesser-developed countries' (LDCs) has for a long time been a topic of serious concern for development economists and the focus of attention for policy-makers. Yet the debate has tended to be characterised by a lack of theoretical clarity, not only in terms of the ambiguity surrounding the concept of 'instability' itself, but also as a result of the tenuous linkages between the various strands of the literature. Some synthesis of these strands is well overdue, [1/] particularly in the light of the current diffusion of the theory of choice under uncertainty into many areas of economics including that of international trade. In stark contrast to the paucity of theoretical contributions to the debate is the relative proliferation of empirical studies, whose theoretical legitimacy is not always readily apparent. Moreover, one cannot but be struck by the lack of balance between the relative agnosticism of the academic debate as reflected in the text-book conventional wisdom [2/] that export instability may not <u>in general</u> be very serious for development prospects, and the continuing concern shown by LDCs (and reflected in various UNCTAD proposals) for remedial action.

This paper is the first of three surveying the field of export instability. Part 2 will consider the empirical work in this area, and Part 3 traces the evolution of policy thinking both at the national and international level. It is hoped that this survey will contribute to the reconciliation of some of the apparent contradictions in this literature.

2. The Historical Context

(i) Instability Matters [3]

Until MacBean's controversial work in 1966 (30) the predominant view among development economists was that LDCs (usually assumed synonomous with primary producers) typically exhibited greater instability in their export prices, quantities, and proceeds; that the causes were inextricably linked to structural parameters concomitant with being 'underdeveloped'; and that the consequences were serious for their development prospects. [4]

Precisely what constituted 'export instability' was not clear, and even if a common measure were adopted, at what point it became a problem would involve normative judgements. These problems were recognised in the early literature but were not seen to present any overriding difficulties. Intuitively one felt that instability did constitute a problem for LDCs and some kind of variance measure would suffice to capture its essential features.

The debate focused on the following considerations:

(a) Fluctuations in export prices, quantities, and proceeds; and their relationship to other sources of instability.

(b) Short-run deviations from trend (somehow defined); both expected changes based on past experience, and unexpected changes.

(c) Fluctuations in proceeds, recognising that independent movements in prices and quantities may offset each other and that the relevant national variable may be earnings from exports.

(d) The consequences for the economy as a whole and the achievement of a steady foreign exchange stream to achieve planning ends, rather than stabilisation of consumer purchasing power or producer income per se.

(e) Instability of total export receipts from one or a number of countries rather than of particular goods and services, although work has been done on the latter issue.

(f) The assumption that there are costs attached to 'excessive' fluctuations, i.e. those beyond the minimum necessary to achieve long-run allocative efficiency in terms of shifts of resources in response to changes in tastes, technology, and the factors of production. 5/

(g) The implication that the costs of policy intervention should not outweigh the benefits.

The belief that export instability mattered for LDCs can perhaps be seen in terms of an ad hoc synthesis of three main theoretical strands including a Keynesian cycle approach, a traditional price-theoretic approach, and a protest from a 'structuralist' growth tradition; which we will now consider more closely.

The 'Transmission Hypothesis' evolved from a Keynesian trade-cycle scenario strongly influenced by the dislocation of international trading relationships traceable to the depression of the 1930's, the two World Wars, and the Korean War. It hypothesised that instability was transmitted through the industrial countries' business cycle to the 'peripheral' economies through import demand. A crucial premise, based on a Marxist or Hansen-Keynes analysis, was that instability due to indigenous factors is lower for LDCs, so that if in fact they do experience cycles, then they must have been transmitted from developed countries (DCs). For a treatment of this mechanism, see Rhomberg (43).

An obvious vehicle for analysis of the problem emerged from traditional price theory. For example, Massell (32) provided a linear partial equilibrium model and showed how an aggregative linear instability index can be derived. The causes of export instability and its effects on revenue are handled in a simple comparative static framework depending on shifts in the curves representing domestic supply, domestic demand, and total demand; with the final outcome depending on both the size of the shifts and the magnitude of the relevant elasticities.

The essence of the problem is then clear : LDCs are particularly unstable because they specialise on primary exports [6/] which are peculiarly susceptible to shifts in supply and demand and are more price inelastic than manufactured goods. In addition they were unable to 'gain on the roundabout what they had lost on the swings', i.e. balance losses in one commodity or market with gains in another, due to their greater geographic

and commodity concentration. The potential factors influencing these shifts and elasticities (reflecting both structural and random factors) are numerous. For elaboration of these points, see MacBean (30); the U.N. (50); (51); and for an UNCTAD view (52). The most obvious ones on the demand side are technical substitution and cyclical income and inventory effects; while supply shifts are traced mainly to the vissitudes of the weather, price-cobweb cycles, and political/institutional disturbances. Low elasticities are mainly attributed to structural inertia in LDCs and stable consumption patterns in DCs. The analysis can easily be expanded to discuss speculation and varying degrees of monopoly power.

The third strand of the literature derives from the infiltration of 'structuralist' insights into trade theory associated with the so-called 'New' trade theorists. For a discussion of this development, see Meier (37); or more recently Diaz-Alejandro (18). In addition to emphasising the market instability and structural inertia characteristics of LDCs, the particular question of export instability tended to become (perhaps rather artificially) attached to more fundamental criticisms directed against the neoclassical model and invoked as simply another argument against specialisation according to comparative advantage. The implication was that it introduced another element of uncertainty into the calculations of predominantly export-dependent economies; although there was no attempt to frame these 'stylised' facts into a more rigorous theoretical framework, and in subsequent policy discussions, stabilisation proposals became tangled up with normative proposals designed to redistribute resources in favour of LDCs. 5/

The upshot of these arguments was the identification of the following costs with export instability :

On the private sector there might be storage costs; capital wastage from alternate over and under utilisation of capacity; the social costs of unstable incomes (such as starvation); frictional unemployment and haphazard income distribution. Moreover, private reactions to mitigate these effects might not be socially optimal. For example, risk-averse behaviour might discourage diversification from subsistence into risky but higher yielding cash-crops or lead to a fall in the productivity of investment. Finally there might also conceivably be a feed-back on trend export demand if instability encouraged losses in competition to stabler synthetics.

On the public sector the potential list is just as large. Even if fluctuations were foreseen there might be administrative costs for controls aimed at balance-of-payments stability, or the opportunity costs of holding extra reserves to cushion their impact. If they were unforeseen, then uncertainty about the payments situation might encourage risk-averse behaviour in planning. The costs here represent development opportunities foregone to achieve external balance in response to fluctuations. In addition, there might be discouragement of foreign investment or a rise in the cost of foreign borrowing to compensate for the increased risk. This is besides any political feed-back from inflation arising from measures to cure payments instability (for example, from import controls), or from cost-push pressures in the boom which continue into the slump.

Hence, the claim that export instability constituted a serious problem particularly for LDCs seemed clear and indubitable to its proponents, and the empirical evidence appeared to support their case (see Part 2). Yet

one cannot but feel that they 'missed the boat' in subsequent research.

Firstly, although inadequate as it stood, the Transmission Hypothesis has been unnecessarily neglected. An important exception to this is the work by Mathieson and McKinnon (34); (35); who found no evidence that the post-1945 international economy exerted a net destablising impact on LDCs. They chide Rhomberg for his contention that LDCs have been a stabilising influence on DCs (insofar as they reacted with a lag to fluctuations in the latter) since LDCs have in fact been more unstable and their share of world trade has declined. Although LDCs have been more unstable, they suggest that one should look more to the indigenous sources of instability. Moreover, they argue that the experience of the 1930's may not be applicable post-war, since cycles in industrial countries have been both milder and less in unison. This latter point, however, should be qualified insofar as the post-war period is not homogenous. Witness the recent complaint that instability has increased, particularly since 1972, due to greater unison in DCs' business cycles (53).

Very little work has been done on the cyclical behaviour of LDCs or to extend Mathieson and McKinnon's cross-section study to a time-series basis incorporating both supply and demand factors. Of particular interest is the possible contrast between the experience of a pre-war 'colonial' economy and a newly independent economy where the government itself is likely to be an important generator of instability, and there is likely to be a significant difference in the range of macro-tools available for stabilisation.

Similarly, research can benefit from disaggregation of the components of national income, particularly in view of Mathieson and McKinnon's finding that instability is much higher when these components are analysed. 7/

Clearly there is scope here for linking the literature on export instability in this cycle context to studies in economic history aimed at investigating the impact of trade in a broader context, particularly where data deficiencies preclude the application of sophisticated techniques in favour of the economic historian's judicious use of proxies. An example here is the work of Ford on Argentina (19). For a review of economic history in the trade context, see Diaz-Alejandro (18).

Secondly, despite the usefulness of the neoclassical price framework as a heuristic device, one feels that it imparted a static bias to research into what is arguably a dynamic problem. What makes this even more puzzling is that the problem, as viewed by the structuralists, was firmly rooted in a dynamic trade-growth tradition associated with such people as Chenery (13) rather than in the essentially static neoclassical framework to which it has been confined. Basically, the Chenery approach argued, on the basis of assumptions derived from growth theory, that if LDCs are characterised by external economies and a divergence between market prices and social opportunity costs, then the static pattern of allocation dictated by comparative advantage is inconsistent with a pattern of resource allocation which maximises long-run growth. Hence, even the application of cobweb models (which are more likely to capture the known dynamics of commodity markets) is unlikely to satisfy the structuralists.

Unfortunately, the structuralists have been more concerned with setting up growth models and estimating the 'gaps' than with formulating the particular problem of export instability, indicating how it might be incorporated within the dynamic allocation problem, and defining the precise link between short-run fluctuations and long-run growth. Yet it is precisely this link, and the replacement of neoclassical assumptions by propositions derived from a structuralist syndrome, which lies at the heart of the case that export instability matters for LDCs, with the emphasis on the balance-of-payments constraint on growth through the supply of foreign exchange and 'essential' capital goods imports.

Hence, the logical consequence of this early literature should have been the development of a dynamic approach to the problem of export instability, building on the short-run cyclical bias of the Transmission Hypothesis, modified where appropriate to reflect structuralist assumptions; and a clear specification of the links between short-run export instability and growth. Similarly, it would not have been incompatible to link such a model to an independent commodity market model, particularly where an LDC (such as Ghana) derives a substantial portion of its foreign exchange from a single commodity. Ironically, it was to be from the vantage point of the neoclassical pure theory of trade that the significant theoretical breakthrough occurred. More on this below.

(ii) Instability Doesn't Matter

The pre-MacBean consensus had been marred by two notable sceptics :

Caine (9); (10); (11); and Hirschman (24). They recognised that the problem existed and might require action in some cases, but not that it need necessarily be inimical to growth and welfare as seemed to be implied by the previous school of thought. On the contrary, they hypothesised that instability might be positively associated with growth insofar as investors might prefer fluctuating returns which provided incentives in the form of high stakes, (for example, Australian sheep station owners) and consumers and governments might at least make provision for fluctuations through some permanent income behaviour or forward market operations. Consequently, if private responses to fluctuations were in some sense optimal in a growth context; for example, by increasing the savings rate, then any interference with the price mechanism ran the danger of distorting this pattern of allocation. In short, instability does not in general matter enough to warrant hasty remedial action. Note that the possibility of a conflict between private reactions to offset the effects of instability and a social optimum in some sense is not explored. This point is taken up again in 3(v).

Some early empirical doubt as to the validity of the pessimistic case outlined in 1 (i) had been provided by Michaely (38); and Coppock (15); but undoubtedly the severest blow came in 1966 when MacBean (30) appeared to refute the pessimistic case on the basis of a post-war cross-section and time-series study backed up with a number of case-studies. Not only did he find scant support for its propositions, but in fact found some evidence for the Caine/Hirschman position (see part 2). In most cases there did not seem to be a close connection between fluctuations in income and fluctuations

in export proceeds, and unstable proceeds did not in general impede growth: '... probably the importance of short-term export instability to under-developed countries has been exaggerated'.

Again the contention was that export instability in general did not matter enough to merit blanket action. [8/] On the causes side, MacBean's explanation was that specialised countries specialised on relatively stable goods, and instability could be better explained by 'local' causes such as political instability. As for the consequences, instability was not fully transmitted to domestic variables because of offsetting national policies and low values for the trade multiplier - principally due to a relatively high marginal propensity to consume imported consumer goods by high income groups. Particular emphasis is therefore placed upon 'natural stabilisers' which insulated the domestic economy from the impact of export fluctuations through cuts in 'luxury' imports and the absorption of variance within expatriated profits rather than through variations in employment or taxes. [9/]

Although MacBean's work is quoted with confidence in many standard trade texts, for example, Sodersten (46), there are a number of reasons why his conclusions should be treated with caution. Firstly, as we shall argue in Part 2, his statistical basis simply does not warrant his conclusions. Secondly, there is doubt whether he really tested the structuralist model at all rather than a collection of ad hoc propositions, particularly if it is interpreted in its dynamic and uncertainty-creating dimension. This may partly be due to the poor specification of the pessimistic model as we argued above. Maizels (31), in a review of MacBean's book, comments on the fact that MacBean finds a significant relationship between export fluctuations and

fluctuations in capital goods imports, and one between fluctuations in capital goods imports and investment; yet fails to find one between export fluctuations and fixed investment. Moreover, it is unsatisfactory to ascribe the causes of instability to 'political' factors without attempting to specify them within the model (difficult though it may be), particularly as we really want to know the net effect of government policy which can both increase and decrease instability. MacBean's casual empiricism in his case-studies and on page 53 is unconvincing at this level of generality.

MacBean's own theory of how instability is transmitted was never rigorously specified or tested, but it implicitly utilised a Keynesian income-adjustment mechanism for the balance-of-payments and a 'colonial' structure for the economy based on Levin (29). His 'damped' multiplier model is constructed on the basis of very different assumptions to those envisaged by the structuralists, and although it may represent a plausible explanation of the experience of some LDCs characterised by a large expatriate sector and a government which responds passively to fluctuations in revenue from the export sector; one wonders whether it represents an adequate explanation of the post-war era when 'stop-go' policy and sporadic devaluation have themselves been significant contributers to instability. For example, Diaz-Alejandro (18) points to the well known cycle of inflation, exchange-rate overvaluation, imposition of direct controls on imports, a fall in domestic income, devaluation, partial liberalisation etc. In this sense LDCs are more akin to DCs in their cyclical behaviour. For analysis of the importance of the policy regime context, see Bhagwati et al (4). The point then, is that one cannot simply dismiss the government as an exogenous cause of instability without looking more closely at its role in amplifying and dampening instability transmitted from the foreign trade sector. Moreover, even if

we accept MacBean's model historically, it is precisely the removal of the expatriate automatic stabilizer which may be increasing payments instability, particularly if accompanied by a reduction in foreign confidence in the currency of the LDC. It may also be true that LDCs are characterised by weaker sectoral interdependence and secondary multiplier repercussions, but (as we shall argue below) what matters is how instability is transmitted, and if the export sector is large the effect may still be quite serious despite a weak multiplier.

Hence, one should perhaps interpret MacBean's pioneering work as serving to force the debate into a more empirical plane, recognising that export instability may be important but the effects more complicated than would appear at first sight and the variation between countries more significant than had been assumed. He also provided us with an alternative hypothesis as to how instability is transmitted. However, what is disappointing is the failure of subsequent research to take up the challenge presented by these alternative hypotheses, and the fundamental proposition raised in this survey is whether in fact the problem of export instability has been satisfactorily formulated or tested. It is our contention that it has not, but that recent developments in economic theory, if absorbed into the mainstream debate outlined above, can provide the basis on which to do so; although recognition of the compexity of the problem is likely to preclude any simple prescriptions. Discussion will centre around three general criticisms of the literature :

(i) The failure to clearly demarcate the particular transmission mechanism assumed, despite recognition of its apparent diversity across countries.

(ii) The failure to link a particular TM to testable structural and behavioural hypotheses grounded in economic theory - particularly the theory of behaviour under uncertainty adopted.

(iii) Overwhelming reliance on a highly aggregative cross-section and 'crude' multiplier empirical methodology, lacking the degree of sensitivity required for the problem in hand.

We will reconsider the question of export instability by firstly reviewing the nature of the TM; secondly by outlining an attempt to redefine the problem of instability more rigorously; and finally by evaluating a number of theoretical developments which have a bearing on the debate by focusing on : extensions to the market model, applications of probability theory, and insights from the theory of choice under uncertainty. A critical evaluation of the empirical literature is reserved for Part 2 of this survey, where it is argued that hasty adoption of cross-section and multiplier analysis seriously undercuts the utility of the results and does much to explain the inconclusiveness of the empirical findings. It is further suggested that there is potential for the use of more sophisticated quantitative techniques - particularly simulation and spectral analysis - for dealing with this problem.

3. Export Instability Reconsidered

(i) The Transmission Mechanism

The rationale for discussing export instability is its association with certain 'costs' which we might like to offset through policy action, but the significance of these costs depends on hypotheses as to how instability is transmitted. A source of great confusion in the literature has been the failure to clearly distinguish between alternative hypotheses and how they might be related to explicit structural and behavioural assumptions which we might like to test in a macroeconomic model. This recognition of the variety of forms which the TM can adopt and of its essentially dynamic nature may help to explain the lack of success in the empirical work to confirm any universal mechanism. This suggests, initially at least, the return to investigation of the ideosyncrasies of particular economies, and possibly the construction of a methodology to serve as a heuristic device to compare a number of such TMs in terms of 'key' parameters and functional forms. There are a number of such relationships which might be extracted from the literature, but in this section we shall consider only some of these 'key' relations by focusing on two extreme forms of TM representative of the opposing schools of thought summarised in 2 above.

Firstly, there are sectoring assumptions. Contrast a 'colonial' economy characterised by a large enclave expatriate export sector, with a structural 'two-gap' economy dependent on a peasant export sector to earn foreign exchange for a small, but rapidly growing, import-substituting sector

under the aegis of government planning.

Secondly, we might specify the extent of the primary 'leakages' in a Keynesian framework i.e. adjust total export receipts to delineate those which are income-creating in the domestic economy. MacBean, for example, in his 'damped' multiplier model, assumes these leakages (including expatriated profits, income from re-exports and trade taxes) to provide a significant automatic stabiliser.

Thirdly, one needs to consider the secondary impact on non-export transactors analogous to the trade multiplier effect, which will determine both how much non-export transactors will be affected by export fluctuations, and the impact on the balance-of-payments. The crucial question is how exporters react to variations in their incomes. Initially this will depend on the size of the income left after deducting primary leakages and taxes. One would then need to look at the employment structure/production function to gauge the ease with which the exporter can insulate himself by substitution in the factor or product mix or by price adjustment. Again, contrast the possible reactions of the peasant exporter and MacBean's foreign firms. For the former, income may fluctuate directly with the ability to shift the burden severely limited in the short-run (particularly if the product is a tree-crop with a long gestation period) and the grim possibility of starvation in the absence of credit facilities. In the latter case, however, no harmful effects are envisaged insofar as firms absorb fluctuations within repatriated profits; and there is no apparent constraint on input supply or substitution possibilities when foreign exchange earnings fall. 10/

Another crucial link in the discussion of the secondary effects is consumption behaviour. The pessimistic case traces the impact of export

income variations through the conventional multiplier process, with consumers reacting by 'Pavlovian' changes in consumption. In MacBean's model, exporters pursue a permanent income relation and absorb the variance of transitory income by lowering the propensity to consume, in order to acquire additional reserves for 'temporary' shortfalls in income. However, the income available for domestic consumption is small since the marginal propensity to import consumer goods is high. In the two-gap world, however, the possibilities for this automatic stabiliser are very limited insofar as controls on such "non-essential' imports have already reduced them to a minimum as part of a planned strategy to give priority to 'essential' capital goods imports. Moreover, even if this import stabiliser were ruled out but exporters continued to follow a permanent income hypothesis, so that we might expect an increase in the saving rate and thus potentially in investment and growth, the additional savings would be redundant if it is the foreign exchange gap which is the binding constraint. Hence, depending on the form of consumption behaviour assumed, export instability can reduce, increase or have a relatively neutral effect on growth.

Investment behaviour is also central to the debate. The pessimistic case posits a crude accelerator mechanism linking in with the fluctuations in aggregate demand caused by the simple Keynesian consumption variations depicted above. In this case, the costs represent the wastage implied by alternate over and under utilisation of capacity. But also implied by this view is adverse qualitative effects on investment on the assumption of risk-aversion: for example, an increase in the cost of borrowing to compensate for added risk, or substitution in the portfolio of short-run 'safe' investments for long-run

higher yielding, but riskier, ones. For a pessimistic view of these effects, see Nurske (40). On the other side of the coin, MacBean assumes a permanent investment hypothesis i.e. firms consider a steady rate of output to be less costly than alternate over and under utilisation of capacity and laying off skilled labour. The Caine/Hirschman hypothesis implies an asymmetric investment function i.e. greater proportional investment in the upswing than in the downswing.

Fourthly, a more subtle link can be derived, of relevance for the two-gap model, between fluctuations in exports and the behaviour of the domestic import-substituting sector. If the production function is characterised by fixed coefficients and a constraint is imposed by capital goods imports i.e. the elasticity of substitution between domestic and imported inputs is approximately zero, then a fall in export receipts could affect output directly through a shortage of foreign exchange.

Fifthly, one would need to incorporate a price sector to examine the impact of export instability on the price level. For example, the effects of high government spending in the boom which is carried over to the slump - or similar demand-pull pressures emanating from the export sector. Cost-push influences might be traced to wage rises in the boom combined with wage rigidity in the slump, or to import controls. Finally, one might like to consider the possible upward pressure on interest rates to compensate for the added risks implied by export instability.

Sixthly, there is the key role of the government, both in terms of its management of the foreign exchange market and its macro policy in general.

MacBean contends that foreign exchange reserves are 'adequate' (in his sample) in relation to their needs. The structuralists, on the other hand, argue that they are either inadequate to cope with the payments problems which result from export fluctuations or involve heavy costs. Similarly, note the contrast between the pessimistic view that the government exacerbates export instability through 'stop-go' cycles and MacBean's view that counter-active policy is marginal compared to the operation of automatic stabilisers and spending does not vary with fluctuations in revenue.

Finally, there is the balance-of-payments adjustment mechanism and the strategic role of the import function therein, which illustrates a significant difference between the structuralist and colonial models. In the latter, the brunt of the adjustment is borne by consumer goods imports automatically; in the former the foreign exchange shortage may, in the absence of compensating capital inflows, lead to forced cuts in consumption imports and even cuts in 'essential' imports if the former are already at a minimum. Insofar as these imports play a crucial role in the production function, output may be affected. There is thus a fundamental contrast between these two models based on the role of imports in the multiplier process. In the colonial model, the relationship is akin to the standard Keynesian trade multiplier effect of a change in exogenous final demand on output and employment given supply flexibility and demand as the constraint. Hence, imports are seen as a deflationary leakage. However, in the foreign exchange constrained model, the constraint is the supply of exchange and imports may be inflationary insofar as they expand output through an import multiplier mechanism. For a discussion of these two multiplier processes in the context of an input-output model, see Diamond (17).

This discussion serves only to highlight some [11] of the issues which stem from the early debate and to emphasise the importance of specifying the particular TM one has in mind within an integrated sequential framework; and how such relations might be built into a testable model. Ideally one would like to construct a general model in which one could compare these different assumptions and trace through their implications by varying the relevant coefficients, but the author's own attempt to do so within an input-output framework proved to be excessively cumbersome. The problem is that there is considerable room for variation in assumptions and difficulty in distinguishing between them empirically. This provides the ethos for criticism against the cross-section technique in Part 2.

A second implication of this discussion is that the hypotheses which stem from alternate views of the TM have only been partially formulated or tested. Although reference is made to the uncertainty said to result from export instability, this has not been related to an explicit theory of choice under uncertainty, which precluded the satisfactory testing of a significant part of the problem and deprived the empirical literature of much of its credibility. In the sections that follow, we shall consider how some of these key hypotheses - particularly those relating to consumption, investment, and reserve-demand behaviour - might be reinterpreted in the light of recent developments in economic theory, as a means of providing a more complete basis for evaluating the problem of export instability. Before testing the model, one has to be sure that the functional relationships it contains are sensitive enough to capture the complexity of the TM, which will require a closer examination of how 'key' actors in the process react to fluctuations in

variables related to their behaviour. This will require a specification of the costs associated with export instability and reference to a theory of choice under uncertainty to which we now turn.

(ii) Instability Redefined

The early debate identified instability with short-run deviations from some long-run 'norm' or trend path; but as Gelb (20) has pointed out, this already presumes that a decision has been taken as to what type of fluctuations are relevant, and hence what index we select to filter out the corresponding movements in the time-series. In fact, this calculation has not been done, and comparability between empirical results has been made infinitely worse by the ad hoc formulation of the instability indexes (see Part 2). Yet the costs we attribute to fluctuations are inextricably bound up with such factors as their frequency. Do high frequency movements really matter for allocative decisions? It is this sort of question which needs to be asked before arbitrarily plunging into a time-series whose inherent complexity is revealed by spectral analysis. The usefulness of spectral analysis for investigation of this problem is that it forces us to specify a priori what type of fluctuations are relevant to the particular transactor in the TM, and thus to ensure that we filter out only those components of the time-series which are relevant to the testing of the particular hypothesis under consideration.

Similarly, export fluctuations have been considered 'excessive' in the sense that they are somehow beyond the minimum to ensure a smooth adjustment of supply and demand over time, and hence give 'perverse' signals to decision-makers, or lead to adjustments in related variables to which costs have been

attached. Thus, the nature of these costs depends crucially on whether fluctuations are anticipated or not. Following Gelb, we can identify three general types of cost even if fluctuations are anticipated : the cost of adjustment if adjustment takes place - for example, of actual to optimum capital stock, if such adjustment is not instantaneous; the cost of idle resources at time t if heavy adjustment costs preclude complete adjustment at each t - for example, the alternate over and under utilisation of capacity; and the need to satisfy fluctuating constraints vis a vis stable long-run average ones- even if adjustment were costless - for example, the case of diminishing marginal utility of income with a variable budget constraint.

If, however, fluctuations are unforeseen, then this opens up a whole new dimension to the problem, including the possibility of risk-aversion. We will review the recent literature which might help to fill this gap below; but it is crucial to emphasise that the empirical literature, whilst paying lip-service to this aspect of the problem, has not tested it in practice. What it has confined itself to test is whether there is a relationship between fluctuations in exports and fluctuations in a variable such as investment, which corresponds to the 'Pavlovian' adjustment implied by the first of our costs, against the alternative reaction corresponding to the second. Yet, as we suggested in the previous section, this ignores the more subtle transmission mechanism effects including those relating to the productivity of investment. For example, if exporters are risk-averse and substitute production for the home market for exports, then there may appear to be no connection between export instability and investment, yet policies designed

to reduce risk-aversion might increase investment and growth. Similarly, testing the proposition that countries with high instability have low growth in a cross-section regression, runs into the problem of ceteris paribus. For example, is it really realistic to assume that investors in all the countries in the sample share the same time horizon with respect to uncertainty? Hence, it may be that the effects of export instability are not derivable without a closer examination of the export transactor's behaviour. One possibility is to look at the welfare implications of instability through the market model.

(iii) Extensions to the Market Model

In section (2), we discussed how the simple market model has been used an analytical framework for the problem of export instability, and we suggested that an extension to more dynamic commodity market models might prove more realistic. However, this framework has also been used to assess the welfare implications of price instability. The belief that growth in LDCs has been constrained by price instability, through its effects on export revenue and the foreign exchange market is still strongly held by many of the international organisations, and has been an integral part of UNCTAD's demands for international price stabilisation schemes. Among the questions posed in this framework are the following : is price stability desirable for consumers, producers, and society as a whole? Do these conclusions depend on the source of the instability? What happens if we move from a closed to an open economy? Does the form of the stabilising mechanism matter? Does relaxation of the free trade assumption affect the results?

Using this framework and the concept of economic surplus for a closed economy, Waugh (54) showed that consumers benefited from price instability if one assumed a negatively sloped stationary demand function and a positively sloped shifting supply curve. Oi (41) demonstrated this also to be the case for producers if the demand curve shifted and the supply curve remained stationary. Massell (33) synthesised these results and found that consumers and producers together prefer price stability if compensation were paid.[12/] Heuth and Schmitz (23) then extended the analysis to an open economy and demonstrated that if the shifts were due to external factors, then society in the exporting country can still prefer instability (and no compensation need be paid since the situation was Pareto-optimal), but prefer stability if a buffer stock is used and consumers compensate producers. Importers, on the other hand, still prefer instability. Bieri and Schmitz (5) relaxed the free trade assumption and showed that if the source of the instability is external, then the exporting country can still prefer instability regardless of the form of the monopoly. However, the importer prefers stability regardless of the source of the instability, but only in the case of tariffs and not in the case of a marketing board regime. Finally, Sundrum (48) focused on producer revenue and provided an alternative (and empirically more useful) criteria for discovering whether shifts in supply and demand would raise or lower average revenue; both in the case where the shifts are random and where they are known.

Although well grounded within traditional economic analysis, this approach suffers from a number of drawbacks in terms of the problem in hand. To begin with, it relies heavily on the concept of economic surplus, with its focus on the average change in gain or loss to consumers and producers. For a discussion of the usefulness of this concept, see Currie (16). Another

problem is its assumption of price as a uniformly distributed randon variable or that a buffer (with or without costs) stabilises it at its expected value. Leaving aside the empirical question as to how successful in practice the buffer is in predicting changes in market prices, and whether the costs outweigh the benefits; there is a more fundamental criticism of the stress on expected values. This approach is usually justified in terms of risk-neutrality, or that the commodity forms a sufficiently small part of total producer sales or consumer purchases, that the change in price leaves the marginal utility of money constant. This may be particularly inappropriate for producers specialising on a single cash crop. Moreover, it ignores the effect of uncertainty and its possible distortions on resource allocation. We are really interested in the variance of proceeds, since the increase in expected proceeds from price changes may lead to a reduction in utility if it increases the variance of proceeds as well.

To remedy this, and to overcome the limitations of this partial equilibrium analysis; Batra (2) has examined the implications of price instability within a general equilibrium framework, on the basis of a specified theory of choice under uncertainty. We will discuss this approach in more detail below, but Batra concludes that primary producers, in particular, could obtain significant benefits from price stabilisation in terms of increased output and expected national income, and a shift in income distribution in favour of labour and against capital.

Despite these qualifications, these models do remind us of the welfare aspects of export instability, and of the importance of the policy regime context. A fruitful development would be to link these theoretical propositions to work on the empirical performance of alternative stabilisation regimes. For example, Batra argues that, when uncertainty is introduced into the analysis, international stabilisation schemes may increase the

efficiency of resource allocation, and thus cause us to revise our opinions on the supposed distorting effects of such schemes. Also, it may help to shed light on some of the hoary issues in economic history, such as the effects of the West African Marketing Boards. For a discussion of this issue, see Birmingham et al (7). However, one might need to shift the attention away from price instability to revenue instability if this is the more unstable variable and the one relevant to allocative decisions. Of relevance then would be the recent paper by Sundrum (48), in which he derives criteria for assessing the impact of price fluctuations on the stability of producer revenue under a regime of a self-liquidating buffer. This contrasts with the traditional explanation of shifts in export proceeds related to shifts in supply and demand and the relevant values of their elasticities, referred to in section 2.

(iv) Applications of Probability Theory

An alternative approach is derived from probability analysis. Consider the model by Katrak (26) demonstrating that a policy of diversification may involve a trade-off between attempts to reduce the amplitude of fluctuations in export proceeds and the variance of fluctuations. Diversification, he argues, may reduce the former but increase the latter. Lawson et al (27) add the qualification that the share of the 'traditional' export in a 'normal' year must be greater than half. This analysis, although handled within a relatively simple model, emphasises the importance of ascertaining the magnitude and nature of the adjustment costs implied by different types of fluctuations, in order to assess the net impact of

different policies on decision-makers within a given social welfare function. For example, the need to distinguish here between expected and unexpected fluctuations; for as Katrak points out, the empirical literature deals with some average of the annual deviations, but diversification may simultaneously reduce this amplitude and increase the variance of the annual percentage deviations.

Katrak's suggestion that we ought to look at the effect of diversification policy on the variance of the percentage deviations in order to gauge its impact on the predictability of fluctuations is, however, open to qualification. For example, Lawson et al point out that even a zero value for this measure does not necessarily imply that fluctuations are predictable.[13/] There is also the question whether we should give equal weight to both positive and negative fluctuations, and the realism of assuming that policy does not influence export trend.

The issue of diversification is an important one, and the utility of this approach lies in its warning that the effects of policies designed to reduce geographic and commodity concentration, will remain ambiguous until we know more about the nature of the fluctuations which really matter for allocative decisions. If Gelb (20) is right, then it is wrong to concentrate on high frequency movements since these may be ignored in relation to the cycle; while low frequency movements present the serious problem, since they usually imply higher amplitude and necessitate long-run adjustment. Similarly, diversification might, in the long-run, reduce the variation in the total receipts of an economy by taking advantage of negative correlations between the receipts of individual exports; but, in the short-run, it might reduce the negative correlation between quantity and price for a country which can influence world price through variations in its own supply of a particular

commodity. Hence, if the diversification policy is adopted, the country may lose its influence on world price and with it the automatic stabilizer on its receipts. Moreover, this approach forces attention on the stochastic aspects of export instability and away from the rather narrow 'characteristics of commodities' approach which has dominated the empirical literature. It reminds us of the importance of specifying the link between ex ante uncertainty and ex post variance, which will depend on a theory of choice under uncertainty; to which we now turn.

(v) The Theory of Choice under Uncertainty

One of the most important developments in economic theory in recent years has been in the area of behaviour under uncertainty; and its diffusion into international trade theory provides a powerful tool for handling the problem of unexpected fluctuations in export proceeds. We will only attempt a brief outline of the actual and potential impact of this approach on the problem of export instability, focusing first on its implications for the neoclassical pure theory of trade, and then on its implications within a more disaggregated perspective.

The basic approach, which has been summarised in two parts by Rothschild and Stiglitz (44), is to specify an aggregate utility function in which the maximand is expected utility, and to incorporate attitudes to risk described by a Von-Neumann-Morgenstern utility function whose concavity implies risk-aversion. Additional assumptions about risk attitudes may then be specified, usually according to the Arrow-Pratt definitions. This relaxes the assumption of risk neutrality (or constant marginal utility of income) used in section (iii) and allows us to handle the problem of uncertain

fluctuations in proceeds and their corresponding costs, which was central to the pessimistic case, but was subsequently neglected in the empirical work. Moreover, mean-variance analysis provides us with a useful empirical vehicle; although it is commonly recognised that this approach is consistent with the expected utility approach, only if all probability distributions are multivariate normal or the utility function is quadratic. The drawbacks of this modification are well documented. See Rothschild and Stiglitz for a discussion.

A path-breaking work utilising this approach, and specifically directed at the problem of export instability, was Brainard and Cooper's (8) application of a Markowitz-Tobin portfolio theory to the standard pure model of international trade. In addition to introducing uncertainty into trade theory, they also raised the question whether there might be a divergence between the social costs of fluctuations and private costs, which might imply non-optimal private adjustment to uncertainty, and so justify policy intervention as an extension of the case for protection in the face of externalities. This provides a useful framework for the discussion of trade instability and the identification of the sort of instability relevant to particular decision-makers within the TM. It recognises the interdependence of the economy through use of an input-output system, and the need to consider private reactions within the light of government policy objectives. One useful empirical off-shoot of their work is the possibility of constructing a covariance matrix for an economy, augmented to include potential exports and import substitutes, to ascertain the possible advantages of diversification, recognising that diversification does not always guarantee a reduction in instability. Some countries that <u>appear</u> to be diversified by producing a

wide range of goods, may not in fact be very diversified, if many of these goods share the same instability characteristics.

Following in the footsteps of Brainard and Cooper, the early neglect of uncertainty in economics is well on the way to being met with a vengeance, and their general propositions have been made more elegant within the expected utility framework. Uncertainty is related to price, technology, and preferences, and trading decisions are considered both before the resolution of uncertainty (ex ante) and after (ex post); although input decisions are invariably treated as ex ante. For a comprehensive reinterpretation of the standard results of trade theory within the setting of uncertainty, see Batra (2); although this literature is still very much in a state of flux, with new results being generated at an alarming rate. The most recent innovation is the addition of financial markets and the possibility of risk-sharing. For a recent survey of these developments, see Helpman and Razin (22).

Doubtless this literature will continue to generate new results at a high level of abstraction, but this approach can also provide a guide to the formulation of more disaggregated hypotheses about behaviour under uncertainty relevant to the TM outlined in section 3 (i). This may help to frame hypotheses more explicitly, and to emphasise that the adjustment under uncertainty may be more subtle, and therefore more difficult to detect empirically, than the 'Pavlovian' reaction mechanism or crude multiplier analysis has assumed.

For example, research on the consumption function might benefit from insights being developed in the two-period expected utility framework, linking portfolio and saving behaviour under uncertainty, and comparing the

implications of different assumptions about the choices available to decision-makers in an uncertain environment. For a taste of this literature, see Sandmo (45); and Leland (28). The simple Keynesian absolute income hypothesis or the relative income hypothesis do not explicitly allow for uncertainty, but focus instead on the multiplier effects on investment decisions. Both the life-cycle and permanent income hypotheses, however, incorporate uncertainty. The latter could be tested insofar as we might expect export transactors to save more as a reserve against future shortfalls in income, compared to domestic transactors, if they suffer a higher degree of variation in their 'transitory' income component. One debate within the expected utility framework which would then be particularly relevant, concerns the apparently paradoxical situation in which uncertainty might lead to an increase in the precautionary motive for saving if it is income which is uncertain, and a reduction in saving or portfolio diversification if there is the possibility of a capital loss. This would be particularly relevant to a peasant export farmer facing an uncertain return in his main crop and variable income receipts which are not independent of his past saving decisions.[14/] How do short-run variations in export proceeds influence present value calculations? Does risk-aversion assume unrealistically myopic investment horizons? If producers maximise the present value of returns over the long-run, the error of focusing on expected return may in practice be quite small, even if we assume risk-aversion; although we may need to take account of autocorrelation and the possibility of an outcome for proceeds which is low relative to the expected value, thus raising the possibility of insolvency.

To investigate the impact of uncertainty on investment decisions, one might apply the tools being developed within the neoclassical theory of the firm under uncertainty to LDCs within the context of a two-gap model.

Analysis of the neoclassical firm under uncertainty has become a rapid growth point. For example, see Batra and Ullah (3). To see how the problem in investment is handled, see Stephens (47), who links a market valuation theory under uncertainty to the neoclassical firm's objective function in a Jorgensen setting. An alternative investment function under uncertainty is provided by Birch and Siebert (6), who extend Eisner's permanent investment hypothesis within an accelerator model. Intuitively, one might like to re-work the neoclassical model in line with the structuralist syndrome, in order to test the pessimistic case of export instability. For example, while one might expect some adjustment of the capital to labour ratio in the former model, this is ruled out in the latter when we introduce fixed production coefficients, and the effects on output and employment may be more direct. Moreover, this framework could also be used to examine the effects of uncertainty about the supply of essential capital inputs into a domestic import-substituting sector, with appropriate assumptions about the elasticity of substitution between domestic and imported inputs. For a demonstration of how one might estimate this import constraint on the production function, see Micholopolus (39).

Finally, the behaviour of the government in relation to fluctuations in its revenue from the export sector and its foreign exchange receipts (recognising that the components of foreign exchange may vary in their effects in both magnitude and timing), would benefit considerably from the infiltration of models being developed within the demand for reserves literature. These models are based on rational optimising behaviour and incorporate a stochastic inter-temporal dimension, with export instability entering as one of the arguments. An example here is the model of Iyoha (25). The relative

theoretical clarity of this literature lies in marked contrast to the ad hoc formulations of the mainstream export instability literature. It therefore provides a useful format for investigating the impact of fluctuations, whilst permitting variation in the assumptions made about macro-policy behaviour and the structural characteristics (for example, in adjustment via imports) of the particular economy under examination.

Thus, these developments in the theory of choice under uncertainty, provide a useful foundation for a more rigorous treatment of the consequences of uncertainty resulting from international trade, and the basis for derivation of testable hypotheses about the behaviour of 'key' actors within the TM. This, of course, assumes we are prepared to accept the restrictions imposed by the axioms. For more details on this aspect, see Batra (2). We can examine the pessimistic case and its implication that uncertainty resulting from unstable exports leads to risk-averse investment and planning behaviour and the reduction of the optimal capital stock below the level which would have prevailed under uncertainty; whether it leads to portfolio diversification; or whether the MacBean or Caine/Hirschman hypotheses are more applicable. This should provide a link between the short and long-run effects of export instability, which was so noticeably absent from the early debate.

4. Conclusion

This paper has confined itself to a discussion of the theoretical research on the problem of export instability, and has not sought to venture into related developments in the empirical or policy field. A number of general conclusions follow from the discussion.

(a) The early debate tended to be characterised by a lack of theoretical clarity, so that the pessimistic case of export instability emerged as a rather unsatisfactory synthesis of a cycle theory, a traditional market model, and a structuralist protest. The first was subsequently neglected, although modification might have proved useful; the second imparted an unnecessarily static bias to research; and the third remained an offshoot of a more general debate and was never satisfactorily formulated, particularly the precise link between the short and long-run consequences of unstable exports. This may partly explain the confusion in the policy literature, between measures designed to stabilise short-run prices or proceeds; and those aimed at a redistribution of resources to LDCs through manipulation of trend values.

(b) Scepticism of the pessimistic case led to the healthy formulation of alternative hypotheses about the transmission of fluctuations from the export to the domestic sector - notably MacBean's damped multiplier thesis, and an optimistic interpretation by Caine and Hirschman. This served to force the debate into a more empirical

mould, and a priori, export instability could both increase and reduce growth. However, MacBean's findings exerted an unwarranted impact on the theoretical literature, and satisfactory testing of these alternative hypotheses was hindred by lack of a clear demarcation between them.

(c) The essentially static posture of the literature is fundamentally in conflict with the idea of the TM as a dynamic process; and with the stylised facts of history, which reflect the multifarious ways in which fluctuations emanating from the export sector have been transmitted to the domestic economy. A consistent theme running through this survey, is the need to switch the focus of analysis back to a dynamic case-study basis, and to test the consequences of export instability within a clearly defined set of assumptions about the particular structural features [15/] of the economy in mind. A reappraisal of the problem in terms of an explicit TM within a fully defined macroeconomic context, provides both the basis for the construction of testable models, and a format for the critical evaluation of the 'key' parameters at issue. We have indicated how these assumptions might be related to contrasting views of the TM, and of the importance of utilising an explicit theory of choice under uncertainty when framing hypotheses about behaviour in response to unexpected fluctuations.

(d) A reconsideration of the problem of export instability, will require a clearer specification of the costs of adjustment in a time-series perspective, and of the type of fluctuations relevant to decisions.

Recent developments in the theoretical literature, if absorbed into the standard debate on export instability, can provide a powerful means of investigating this problem. The application of probability theory reminds us of the stochastic nature of the problem; developments in the market model isolate its welfare implications and emphasise the importance of the policy regime context; while insights from the theory of choice under uncertainty permit, for the first time, explicit definition of the problem of risk-aversion, and closer examination of the behaviour of 'key' transactors in the TM. Thus far, this theory has not been extended to handle the specific problems of LDCs, where structuralist assumptions might be more appropriate than neoclassical ones. This literature is still relatively new, and one hopes that we will shortly be witnessing the sort of synthesis between the elegance of neoclassical theory and the 'realism' of structuralist assumptions in the area of export instability, that is apparent in the more general field of international trade and development with respect to the developing economies.[16/]

FOOTNOTES

1/ There has, to my knowledge, been no comprehensive survey of this literature since MacBean's work in 1966 (30).

2/ For example, Sodersten (46); and Thirwall (49).

3/ For an early treatment of the problem, see Coppock (15); and more recently, Helleiner (21). MacBean also discusses this school under what he terms the 'prima facie case'.

4/ For example, Cairncross (12): 'The prices of primary products are notoriously volatile, and the damaging effects of this volativity on the economies of the exporting countries are beyond question'. Similar views were to be found in most development texts, for example, Meier (36).

5/ Part of the problem which has plagued subsequent policy discussions, is that the justification for measures to reduce instability were not clearly distinguished from those designed to ensure: 'the equitable and just relationship between primary commodity prices and manufactured or capital goods prices'.

6/ DCs may export more in total, but they form a much higher proportion of total exports in LDCs.

7/ Principally due to measurement error in aggregate demand.

8/ Or to quote MacBean: '...before attempting to prescribe a cure, one should in general be sure: (a) that the patient is really sick, (b) that the causes are understood, (c) that the prescribed cure is not going to be worse than the disease'.

9/ Despite some offsetting international policies, MacBean concludes that government stabilisation measures have been marginal compared to 'automatic stabilisers'.

10/ An intermediate case might be a plantation export sector, where some wage-adjustment might be expected, but a fairly long-term employment policy adopted.

11/ One might also extend the analysis to consider the effects of export instability on income distribution and its feedback on growth, in line with the work of Chenery et al (14); or on trend export demand, raised in the cocoa context, by Owen (42). An ambitious task would be to link together a number of countries in the spirit of 'Project Link' (1) ; (55).

12/ i.e. if fluctuations are due to shifts in demand (supply), then producers (consumers) are paid compensation.

13/ If changes in revenue take a fixed value in half of the years I to N, and a negative same value in the remaining years.

14/ An immediate empirical application here, would be to discover what aspects of uncertainty influenced the decisions of Ghanaian cocoa farmers in the 1950's and 60's. Most models have focused simply on mean price as the appropriate market signal; but we want to know the income-elasticity of supply, insofar as a marketing board stabilised price, but simultaneously destablised income. Given appropriate assumptions about diversification possibilities, capital markets etc., we would want to know how farmers viewed the trade-off between the reduction in price variance but lower mean price, and increased income instability.

15/ The author is currently engaged on the construction of a macro-simulation model for Ghana, to examine the consequences of export instability.

16/ This is the conclusion reached by Diaz-Alejandro in his survey article on international trade and economic development (18).

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