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# CONSIDERATIONS IN DESIGNING STABILIZATION SCHEMES

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Stabilization schemes have, in the current national and international debates, come to mean almost exclusively price stabilization schemes. We shall largely share this preoccupation in our paper, but it is worth taking a few paragraphs to consider the rationale of this focus.

Economic theory, while somewhat ambiguous on the topic, is far from supportive of the need for price stabilization schemes. Axiomatic treatments of the theory of well behaved and decentralized economies under uncertainty (e.g., Arrow, Debreu, Hanock) lead to the conclusion that Pareto-optimal equilibria can be reached without any need of government intervention. A key feature of these analyses is to define commodities by possible states of nature as well as by their physical characteristics, so that Pareto-optimal equilibria are defined for the economy for each state of nature. Uncertainty is then only undesirable if the economy fails to make automatic adjustment from one equilibrium to another, a possibility which can only arise through market failures in either the demand for contingent claims or the supply of real insurance contracts, or because of imperfect information. Thus uncertainty is only undesirable if accompanied by market failure, and the obvious remedy is to correct these market failures rather than to remove the uncertainty itself. Samuelson in a rather different approach, argues that an economy in a Pareto equilibrium devoid of

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uncertainty cannot attain greater welfare simply through the introduction of uncertainty (unless, of course, the majority of individuals are perverse risk lovers). The conclusion in this case is that stabilization must always be desirable, and that the first-best policy is to remove the source of uncertainty. Since price instability is usually the result of more fundamental sources of uncertainty, such as production risks, then price stabilization is unlikely to be a first-best policy,

In overlooking these results from high theory, government and international bodies are clearly responding more to what might be called the pragmatic-policy approach. Proponents of this view argue that in the real world, uncertainty causes markets to fail almost everywhere. UNCTAD in various documents argues, for example, that uncertainty disrupts the orderly behavior of economic agents in a competitive economy, introducing difficulties and errors in investment and production decisions, stimulating inflation and business cycles, and increasing the risk of bankruptcies and debt default. Arguments for developing countries are also furthered by their usual specialization in a few primary commodities for which export prices are uncertain. Uncertainty then also has a direct and highly disruptive effect on export earnings and hence on economic stability and growth, and in conjunction with low foreign currency reserves, conspires to reduce a country's ability to borrow abroad and to increase its risk of international debt default.

The policy-pragmatic approach concludes that stabilization is always a <u>good thing</u> and the relevant question is what to stabilize and how. Price stabilization is a viable policy, not because it is necessarily (if ever) a first-best policy, but rather because it is one of the few forms of market intervention available to a government or international agency. However, alternative stabilization policies are often available depending on the policy goals;

for example, international compensatory finance schemes, buffer funds or producers' income insurance schemes, so that the current preoccupation with price stabilization must have yet a further underlying rationale. One rationale is suggested by the existing literature on applied welfare economics, which, while increasingly indeterminate, does tend to show that producers as a group are, on average, the main beneficiaries of price stabilization (see Turnovsky for a recent review). Possibly, those concerned with the development of predominantly agricultural economies are hopeful of capturing these welfare gains from the international markets.

However, policy makers should not be too easily seduced by the apparent gains and feasibility of price stabilization schemes. There remain important questions about the distribution of gains and losses from stabilization schemes which have yet to be resolved. These concern not only the trade-offs between consuming and producing interests, both within and between countries (a favorite topic of economic analysts) but even of the distribution of the gains and losses within these groups themselves. Lipton, for example, has argued that price stabilization of major food commodities will tend to stabilize rural wages and real incomes for poor rural families dependent, or partly dependent, on wage earnings; but, given the usual sorts of magnitudes for demand elasticities, it will tend to destabilize the revenue of farmers with a marketed surplus. He concludes that price stabilization may have desirable intra-rural income distributional effects in countries with a high proportion of subsistence farmers, but have less desirable effects in countries with more advanced agricultural sectors.

When production variability is the source of price uncertainty, the consequence of stabilizing prices for revenue stability depends crucially on the price elasticity of demand; revenues are also stabilized when the absolute

value of the demand elasticity is 0.5 or less, but are de-stabilized otherwise (Tomek, p.77).* Policy makers in countries producing commodities for export in more elastic markets than this might well want to consider the inherent trade-offs between price stabilization and the instability of producers' incomes and national export earnings. If the latter are of primary interest, then simple price stabilization may well be an inappropriate goal.

While there are clearly many unresolved considerations in determining the appropriateness of price stabilization measures, we turn now to a discussion of considerations to be taken into account in the design of such schemes. We shall focus on commodities that can be stored, and assume price stabilization is to be achieved through a buffer stock agency (BSA). Our discussion will undoubtedly be incomplete in touching on all the key considerations, and we plead guilty to emphasizing those considerations of most interest to us, as well as those which we consider to have been neglected in the past.

A highly pertinent question in the design of any price stabilization scheme is the price, or range of prices, at which market prices are to be stabilized. There are two tricky issues here. In the first place, longer run market efficiency will only be sustained in a decentralized economy if prices are still allowed to retain their role in providing signals to producers and consumers in allocating their resources. While a prime purpose of a stabilization scheme is to remove unnecessary noise in the price signal, the BSA must still set, and indeed adjust, its prices to reflect structural changes in the economy. Given the many sources of price uncertainty in the real world (production risks, business cycles, demand fluctuations, etc.) and frequent

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* Tomek reports his results in terms of the price flexibility coefficient F. Our interpretation assumes that 1/F is the demand elasticity, which is only strictly true in the absence of cross-price elasticities.

structural changes in technology and demands, the BSA is faced with an analytical problem which is likely to be beyond the ken of even the most able econometrician! A second issue concerns the size of the stocks the BSA can carry. The costs of storage and money being what they are means that any BSA will face a real non-zero probability of running out of stocks in some years. For a given storage capacity, this possibility increases as the desired range of price variability is narrowed through BSA operations, so that the choice of a price band cannot be made independently of the allocated resources of the BSA.

But the problem of price-setting does not end there. Any institution which has a major price-setting role will rapidly find itself confronted by pressures from special interest groups. When demand for the commodity in question is inelastic, producers will undoubtedly see the value in coercing the BSA to raise its average selling price, even at the expense of accumulating surplus stocks. At the international level, producing countries may see the establishment of world buffer stock schemes as a forum for improving their average terms of trade. For example, the UNCTAD proposal for an Integrated Commodities Program claims, as one of its stated objectives (p.3), the "Establishment and maintenance of commodity prices at levels which, in real terms, are equitable to consumers and remunerative to producers, taking full account of the rate of world inflation, the need to provide incentives for adequate investment in commodity production, the depletion of non-renewable resources and the need to keep the prices of natural commodities competitive with those of their synthetic substitutes." While such objectives may well be justified,*

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* Prebisch and Emmanuel have demonstrated that developing countries are disadvantaged in competitive international trade - the so-called "unequal exchange" theory. This view is also popular with Marxists, though their rationale is based on the labor theory of value (Mandel).

it is clear that the establishment of BSAs requires a serious resolution of their political and economic roles and responsibilities, and especially of the interests they are to serve.

Yet a further consideration in determining the desired price level has been raised by Hazell and Scandizzo. They argue that if producers facing risky production allocate resources on the basis of anticipated prices and yields which are formed independently of each other, then competitive markets can be inefficient. Social welfare can then be improved by establishing a BSA which has sole purchasing power with producers, and which pays producers a lower price than the one it sells at to consumers. The optimal size of the price wedge can be determined as a function of the elasticity of demand and the coefficient of variation of yields.

Although it has generally been ignored in both theoretical and empirical work, another key consideration in designing BSAs is that producers will modify their supply behavior in response to the stability induced by a BSA. The usual reasoning here is that producers are averse to risk and that, if a price is stabilized, they will tend to produce more of the formerly risky commodity. Indeed, such risk-averse behavior has seemingly been captured in empirical models of risk-responsive supply of agricultural commodities - most notably by Just. Moreover, our own work employing his methodology has confirmed such risk-responsive supply behavior in enterprises as diverse as grain and vegetable production in northern Mexico and jute production in South Asia. Such effects appear pronounced and statistically significant. Thus they are also bound to be economically significant in the design of a BSA, since any producers' gains induced by stability may soon be competed away through their own responsiveness to the new environment.

Proponents of BSAs often seem to assume away the existence of private stockholdings in commodity markets. Yet these may be quite substantial, and prior to the introduction of a government BSA, may play an important role in bringing some stability to market prices. It is clearly important to know how private stockholders will respond to a government BSA. If, as is likely, they reduce their stocks, then the BSA will require additional capacity to offset the destabilizing effects of reduced private stocks. Of course, if private stockholders previously acted in a speculative and destabilizing way, then the introduction of a BSA may be accompanied by a bonus gain in stabilization as speculative behavior is reduced.

A final consideration we wish to discuss is that of risk pooling. Two potential sources of risk pooling exist: across commodities and across regions or countries. The essential principle here is that the size and cost of a BSA can be reduced without any loss in its price stabilization role by exploiting risk pooling opportunities. The gains are obvious in the case of geographic risk pooling. If producers of the same commodity in different regions or countries face less than perfectly correlated (+1) production risks, then offsetting output fluctuations will lower the necessary size of the stocks required to achieve a given level of price stability. Geographic risk pooling provides a good argument for establishing BSAs at the multinational level.

Risk pooling over commodities can serve a similar role if they are close demand substitutes, and if their yield risks are not perfectly correlated (+1). Commodities which are not good demand substitutes offer little advantage to a BSA, but they can be a good basis for risk pooling in buffer fund schemes, such as proposed by UNCTAD.

References

Arrow, K.J. Essays in the Theory of Risk-Bearing. Amsterdam: North-Holland, 1970.

Debreu, G. Theory of Value. New York; John Wiley & Sons, 1959.

Emmanuel, A. L'Echange Inegal. Paris: Maspero, 1969.

Hazell, P.B.R. and P.L. Scandizzo. "Market Intervention Policies when Production is Risky." American Journal of Agricultural Economics, 57(1975), pp. 641-649.

Hanoch, G. Desirability of Price Stabilization or Destabilization. Harvard Institute of Economic Research, Discussion Paper No. 351, March 1974.

Just, R.E. Econometric Analysis of Production Decisions with Government Intervention: The Case of California Field Crops, Giannini Foundation Monograph No. 33, Berkeley, California, June 1976.

Lipton, M. "Farm Price Stabilization in Underdeveloped Agriculture: Some Effects on Income Stability and Income Distribution." Unfashionable Economics: Essays in Honour of Lord Balogh, ed. P. Streeten, Weindenfeld, 1970.

Mandel, E. Marxist Economic Theory. Vol. I, London, The Merlin Press, 1968.

Prebisch, R. "Commercial Policy in Underdeveloped Countries." American Economic Review, 44(1959): pp.251-73.

Samuelson, P.A. "The Consumer Does Benefit from Feasible Price Stability." Quarterly Journal of Economics, 86(1972): pp. 476-93.

Tomek, W.G. Stability for Primary Products: Means to What Ends? Occasional Paper No. 28, USAID Prices Research Project, Cornell University, September, 1969.

Turnovsky, S.J. "The Distribution of Welfare Gains from Price Stabilization: A Survey of Some Theoretical Issues." Paper presented at Ford Foundation Conference on Stabilizing World Commodity Markets, Airlie, Virginia, March 1972.

UNCTAD An Integrated Programme for Commodities: Report by the Secretary-General of UNCTAD, (mimeographed), TD/B/C.1/193, October 28, 1975.