

Food price policy

The rationale for government intervention

C. Peter Timmer

Policy-makers in the most successful developing countries have not accepted either of the two major schools of thought on food price policy. The neo-classical school favours free trade to maximize efficiency of resource allocation. The structuralist school favours interventions to satisfy goals for income distribution. Especially in the rapidly growing, rice-based economies of Asia, policy-makers have been more concerned about stability of domestic prices than their level relative to world prices. This concern, traditionally dismissed by economists as purely political, is justified on economic grounds because of improved macro-economic and dynamic efficiency from stable food prices. The paper identifies both the benefits from food price stability and the costs of achieving it.

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¹This school of price policy is usually associated most closely with T.W. Schultz and his colleagues and students from the University of Chicago. For a review, see Theodore W. Schultz, ed, *Distortions of Agricultural Incentives*, Indiana University Press, Bloomington, IN, 1978.

²For an introduction to the border price paradigm, see C. Peter Timmer, *Getting Prices Right: The Scope and Limits of Agricultural Price Policy*, Cornell University Press, Ithaca, NY, 1986, Chapter 2; for the most influential statement of the role of border prices in social cost-benefit analysis, see Ian M.D. Little and J.A. Mirrlees,

continued on page 18

A three-way debate is under way on the appropriate role of price policy in agricultural development strategies. The free market school argues that all agricultural prices should reflect their opportunity costs at the border, no matter what the international market processes are that determine the prices, and no matter what the price levels happen to be. The result of such a pricing strategy is supposed to be optimal efficiency of resource allocation, as well as minimal rent-seeking activity with its associated losses in X-efficiency.¹ The border price paradigm that serves as the intellectual foundation for this approach has broad analytical support among neo-classical economists. Border prices are the basis of modern techniques of project appraisal and of the 'new' welfare economics.²

The structuralist school argues that the entire border price paradigm for domestic price determination is misdirected, at least for a select list of commodities, such as basic foodstuffs, that have important roles in the macro economy and welfare of consumers. Supply and demand elasticities are quite small for these commodities, so the triangles of allocative losses from not equating domestic prices with border prices are trivial. The border prices themselves are heavily influenced by gross distortions in agricultural policies in the developed world, are highly unstable, and thus carry minimal information on how resources should be allocated in the long run. Accordingly, prices should be set to favour income distribution objectives in conjunction with macroeconomic stability.³

The agricultural pricing debate is just one of several that have been conducted between these two schools of thought in development economics since the 1950s.⁴ The free market approach has clearly won the ear of most large donor agencies in the 1980s, although the structuralist paradigm remains influential in Latin America. Other developing countries, even the most successful ones in East and Southeast Asia, have openly rejected the free market approach for primary foodstuffs, especially rice and wheat, in favour of interventions to stabilize and support agricultural prices. At the same time, the structuralist approach has also been rejected because the allocative and

continued from page 17

Manual of Industrial Project Analysis in Developing Countries. Vol 2: Social Cost-Benefit Analysis, OECD, Paris, 1969; and for applications of the new welfare economics to important pricing issues in developing countries, see David M.G. Newbery and Nicholas Stern, eds, *The Theory of Taxation in Developing Countries*, Oxford University Press, London, 1987.

³See Lance Taylor, *Macro Models for Developing Countries*, McGraw-Hill, New York, 1980; Paul Streeten, *What Price Food? Agricultural Price Policies in Developing Countries*, Macmillan, London, 1987; Alain de Janvry, 'Social structure and biased technical change in Argentine agriculture', in Hans Binswanger and Vernon W. Ruttan, eds, *Induced Innovation*, Johns Hopkins University Press, Baltimore, MD, 1978; Michael Lipton, *Why Poor People Stay Poor: A Study of Urban Bias in World Development*, Temple-Smith, London, 1977; and Mohan Rao, 'Getting agricultural prices right', *Food Policy*, this issue.

⁴An excellent review of this debate from a neo-classical perspective is to be found in Ian M.D. Little, *Economic Development: Theory, Policy, and International Relations*, Basic Books, New York, 1982; the structuralist approach is best presented in Lance Taylor and Persido Arida, 'Long-run income distribution and growth', in Hollis Chenery and T.N. Srinivasan, eds, *Handbook of Development Economics*, Vol 1, North-Holland, Amsterdam, 1988.

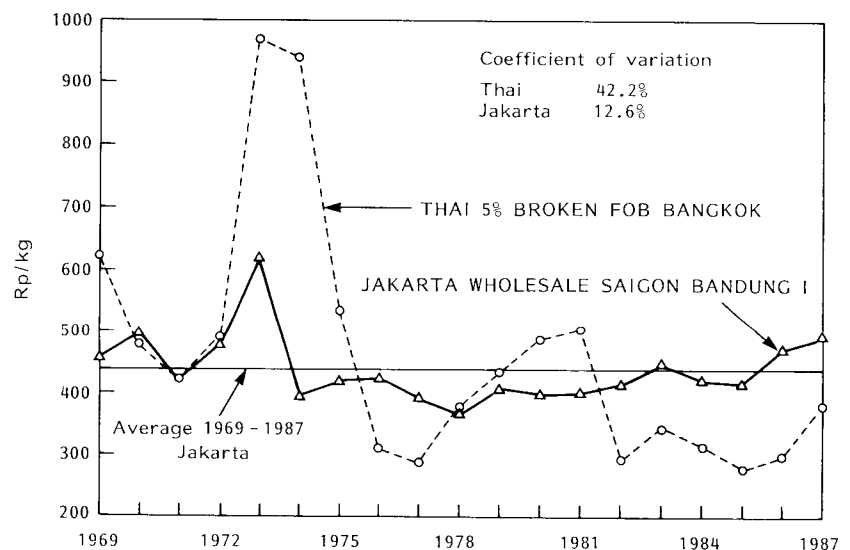
budgetary costs of wide deviations from border prices (including those deviations due to overvalued domestic currencies) have turned out to be substantial. The result has been a *mélange* of *ad hoc* pricing interventions intended to satisfy the needs of farmers for price incentives, the needs of consumers for low-cost foods, the constraints imposed by budget-minded finance ministers, and the powerful sociopolitical desire for price stability as the proximate indicator of a society's degree of food security. Figure 1 shows one example of the outcome of such a pricing strategy. Indonesia has sharply reduced the instability of domestic rice prices relative to that in the world market but has not deviated significantly from the long-run trend in world prices.

The analytical underpinnings for this pragmatic approach to agricultural pricing so dominant in Asia are just beginning to coalesce into a third school of thought, tentatively labelled here the 'stabilization' school. The main contention of this school is that by following short-run price movements in international markets an economy incurs significant efficiency losses, but the economy incurs equally significant efficiency losses by *not* following longer-run trends in international opportunity costs (whatever the market processes that determine them). Optimal *efficiency* thus calls for some degree of market intervention to stabilize short-run prices, but there must be sufficient flexibility to allow domestic prices to reflect international price *trends*. Rent-seeking behaviour is constrained, if not eliminated, by using competitive market agents to carry out most marketing activities, but within government-established price bands.

While rejecting the call of free market advocates for no pricing interventions, the stabilization school also rejects the structuralist desires to use agricultural prices primarily as an instrument for redistributing incomes. Further, by encouraging the development of a competitive price marketing sector over time, the role of government price interventions can decline as the role of price stability for the basic foodstuff becomes progressively less important to the economy during the course of economic development. Structuralist or socialist-inspired stabilization policies that actively seek to displace the private marketing sector have great difficulties when the opportunity (or budgetary need) comes for such a transition.

Figure 1. Comparison of domestic and international rice prices in Indonesia, 1969-87 (at 1987 constant prices).

Sources: Frank Ellis, Integrated Planning Unit, Food Logistic Agency (BULOG), Jakarta, Indonesia, 1988.



Neither the underlying analytical foundations nor workable operational procedures have been satisfactorily developed for domestic price-stabilization schemes to be designed, implemented and evaluated with any degree of coherence.⁵ The fact that nearly all countries in Asia attempt to implement such schemes suggests that the rewards to progress on both fronts – analytical and operational – will be very substantial. This paper lays out the basic logic of the analytical approaches in order to focus the discussion of operational issues on pricing strategies that are consistent with the theoretical rationale for their design and implementation.⁶

The analytical case for price stabilization

With the early contributions of Smith, Marshall and Pigou to the economics literature, economists have understood for nearly a century the basic analytical rationale for government interventions into market price formation. Economies of scale and monopolies, externalities in production and consumption, public goods, and imperfect information in the absence of complete contingency markets have long offered theoretical justification for interventions designed to correct such market failures. The resurgence of the free market paradigm builds on a crucial lesson from post-war development experience; policies that attempted to strengthen the competitiveness of markets as a way to improve their efficiency outperformed policies that attempted to correct for market failures by suppressing market activities. This success for market-oriented policies came about primarily because government failures in market interventions were often far more serious in terms of wasted economic resources and forgone growth than were the market failures they were designed to correct.

An additional factor grew out of the theory of the second best. Many imperfections in markets, especially in rural factor and product markets, could be explained as second-best adaptations to inherent constraints on best arrangements because of imperfect and asymmetric information, moral hazards and high transaction costs, and a significant degree of risk aversion by the very poor in the context of incomplete credit and contingency markets. In such circumstances government interventions into one market run a substantial risk of lowering the welfare of the poor because of its connections with other markets that provide some degree of welfare insurance. Under the twin banners of 'government failures' and models of interlinked markets in a second-best world, neo-classical and social-choice theorists provided a new intellectual foundation to the free market paradigm.⁷

Potential versus actual benefits of government intervention

The basis of this foundation is not theoretical, however, but inherently empirical. Given the reality of widespread market failures in developing countries, modern welfare economics is very clear on the *potential* scope for government interventions to achieve a Pareto-superior position for the economy. Whether a government can improve welfare through an actual intervention in a specific case depends on two factors: whether the market failure itself is 'real' within the context of the theory of the second best, and whether the government can actually improve social welfare by intervening. The latter question must be addressed in a dynamic context that explicitly includes the potential for vested interests

⁵As a simple example of the problems faced, there is no 'best' technique for estimating trends in prices; see Robert J. Schwartz, 'Optimal trends for forecasting prices: an empirical assessment of three grains', PhD dissertation, Economic Department and Harvard Business School, Harvard University, Cambridge, MA, 1987.

⁶For further treatment of the theoretical rationale for price stabilization, see David M.G. Newbery and Joseph E. Stiglitz, *The Theory of Commodity Price Stabilization: A Study in the Economics of Risk*, Clarendon Press, Oxford, 1981; Carlisle Ford Runge and Robert J. Myers, 'Shifting foundations of agricultural policy analysis: welfare economics when risk markets are incomplete', *American Journal of Agricultural Economics*, Vol 67, No 5, 1985, pp 1010–1016; Joseph E. Stiglitz, 'Some theoretical aspects of agricultural policies', *The World Bank Research Observer*, January 1987, pp 43–60; Richard Just, 'Making economic welfare analysis useful in the policy process: implications of the public choice literature', *American Journal of Agricultural Economics*, Vol 70, No 2, 1988, pp 448–453; Sanjay Pradhan, 'Market failures and government failures: Industrial restructuring and pricing policy analysis for the Indian fertilizer sector', PhD dissertation, Economics Department and Harvard Business School, Harvard University, Cambridge, MA, 1988; and Robert Myers, 'The value of ideal contingency markets in agriculture', *American Journal of Agricultural Economics*, Vol 70, No 2, 1988, pp 255–267.

⁷See especially Stiglitz, *op cit*, Ref 6; T.N. Srinivasan, 'Neoclassical political economy, the state and economic development', *Asian Development Review*, Vol 3, No 2, 1985, pp 38–58; Avishay Braverman and Luis Guasch, 'Rural credit markets and institutions in developing countries: lessons for policy analysis from practice and modern theory', *World Development*, Vol 14, No 10/11, 1986, pp 1253–1267; and Robert H. Bates, *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*, University of California Press, Berkeley, CA, 1981.

to capture both the economic gains from the policy intervention and the policy-making process itself, thus leading to further interventions that carry the economy away from the Pareto optimum achieved by the initial, but limited, government intervention.

The stabilization school builds on these analytical foundations to develop the empirical case for price-stabilization policies. In doing so, however, it rejects the emerging consensus that the welfare gains from price stabilization, although theoretically justified, are empirically not very important relative to the costs governments must incur in order to stabilize prices.⁸ Two key innovations in the analysis, one microeconomic and one macroeconomic, lead to such different empirical conclusions. The first is to consider the farmer as an investor rather than the manager of a static stock of assets and a flow of variable inputs. The model of farmer as manager is the basis of nearly all theoretical and empirical assessments of risks from price and yield instability, but it clearly excludes important elements in farmer decision making that are strongly influenced by these risks, especially expectations and patterns of investment in physical and human capital. Transforming the problem into one of dynamic portfolio investment decision making enormously complicates the analysis of risk, even when restricted to farm-level issues.

Tracing the macroeconomic ramifications of price instability is even more complicated because general-equilibrium analysis is needed with dynamic investment functions that are conditioned by stability-sensitive expectations.⁹ But incorporating these dynamic factors into both the micro and macro analyses offers the opportunity to examine the impact of price-stabilization policies on agricultural development and economic growth. The static, micro-based models simply do not address these issues; they are incapable of assessing the consequences for the economy of the price-stabilization policies that are widely implemented – consequences that policy makers actually worry about.

Pradhan, in his analysis of fertilizer-pricing strategies in India, reaches similar conclusions after a careful review of the analytical literature on price stabilization:

The efficiency and policy implications of the perfectly competitive market with a complete set of markets need to be qualified (and qualified strongly in some cases) because their assumptions are not realistic. Perhaps most significant in this context are the assumptions about perfect insurance and capital markets, particularly in the context of economic environments characterized by uncertainty and price fluctuations. Unfortunately, the theoretical and empirical literature reviewed here shows that either the models are too simplified (eg, the debate following the Oi–Waugh contributions), or they fail to capture some of the essential problems of price instability in uncertain environments . . . In an attempt to incorporate these, five such adverse welfare consequences (the contingency fund effect, the adjustment cost effect, the forecasting error effect, the psychic cost effect, and the ‘fear of bankruptcy’ syndrome stemming from continued adjustment and disequilibria in the face of uncertain price fluctuations) are hypothesized and introduced . . . some of the important effects can be embodied in a general notion of transactions costs as an increasing function of price instability and uncertainty. Indeed, once these microeconomic and macroeconomic factors are realistically (and even quantitatively) considered, it becomes clear that imperfections in risk and capital markets combined with substantial price fluctuations for a commodity like fertilizers in a country like India have significant adverse externalities and non-Pareto-maintaining welfare consequences.¹⁰

⁸This is the key conclusion in Newbery and Stiglitz, *op cit*, Ref 6, Stiglitz, *op cit*, Ref 6, and David Bigman, David M.G. Newbery and David Zilberman, ‘New approaches in agricultural policy research: discussion’, *American Journal of Agricultural Economics*, Vol 70, No 2, 1988, pp 460–461. The last-mentioned authors, for example, in their discussion of Just’s arguments for price-stabilization policies, make the following comment: ‘Attempts to quantify the net (efficiency) benefits of institutional attempts to reduce risk, like commodity price stabilization or quota policies, suggest that they are usually small and often negative’ (p 461). The conclusion that there is little empirical rationale for governments to attempt to stabilize foodgrain prices is so sharply at variance with actual experience that different approaches should be investigated.

⁹The macroeconomic dimensions of price stability are stressed in Ravi Kanbur’s review of the Newbery and Stiglitz book: see S.M. Ravi Kanbur, ‘How to analyse commodity price stabilization? A review article’, *Oxford Economic Papers*, Vol 36, 1984, pp 336–358. The extreme difficulty of building dynamic investment factors into general-equilibrium models of agricultural pricing can be seen in Alain de Janvry and Elisabeth Sadoulet, ‘Agricultural price policy in general equilibrium models: results and comparisons’, *American Journal of Agricultural Economics*, Vol 69, No 2, 1987, pp 230–246.

¹⁰Pradhan, *op cit*, Ref 6, pp 31–32.

Incomplete stock markets and insurance markets for Indian investors in fertilizer factories means that instability in fertilizer prices and uncertainty lead to sub-optimal levels of investment in domestic factories, thus causing a larger-than-optimal exposure to the world market in which India has a 'large-country' effect on prices. The macroeconomic consequences of the adjustments required to cope with this added exposure are quantitatively significant, primarily for two reasons: the foreign exchange requirements are a large fraction of normal imports, and fluctuating prices of fertilizer lead to fluctuating supplies of food, which further destabilize the macro economy.

The logic of extending Pradhan's analysis of fertilizer pricing to food pricing is straightforward. No farmers anywhere in the world have stock markets in which they can choose a portfolio of farm assets that can match their personal risk preferences. They are mostly stuck with the farms they have. Nor can yield or price risks be hedged in existing markets at reasonable costs. Asymmetric information and adverse selection make crop insurance a very expensive option, one that is frequently non-existent. Futures markets have very short time horizons; they are adequate perhaps for the short-run allocation of inputs but not for longer-run investment decisions where price uncertainty is a major impediment.¹¹ Even in developed countries, few farmers use futures markets to offset their price risks. Stiglitz speculates that transaction costs may be too high, farmers may feel an informational disadvantage relative to large traders, and they may fear manipulation.¹²

The quantitative significance of price stabilization

The important analytical question for the stabilization school is not to demonstrate that the pervasive market failures in developing countries lead to non-Pareto-optimal outcomes, but that they are quantitatively significant relative to the costs governments would incur in order to alleviate them. Large costs from price instability will not be found in the static, micro-based models that follow the Newbery–Stiglitz tradition. As noted above, impact on investment behaviour and on the macro economy are the obvious places to look for more significant benefits from price stabilization, as well as at consumer preferences for price stability in the presence of adjustment costs. No formal model is offered here, but the likely ingredients of a model that would capture these effects include the following: displaced investments in physical capital at the farm level, the marketing sector and the industrial sector; substitution of consumption and leisure for savings and work; biases in investments in human capital for the farm agent and intergenerationally in children; the transaction costs consumers face in reallocating budgets when prices change; the welfare gains from a psychic sense of food security (and voters in rich countries and poor alike place a substantial economic price on this factor); and the feedback from this sense of security to a stable political economy, which reinforces investors' willingness to undertake long-term (and hence risky) commitments.

Investment. It has long been recognized that the absence of long-term contracts, future-contingency contracts and perfect credit markets induces a downward bias in investment in both physical and human capital.¹³ Unforeseen instability in food prices is likely to cause reduced investment in both kinds of capital at three levels of the economy. At the farm level, price instability leads to lower investments than are

¹¹For a model that demonstrates the downward bias to investment in such circumstances, see Vincent P. Crawford, 'Long-term relationships governed by short-term contracts', *American Economic Review*, Vol 78, No 3, 1988, pp 485–499.

¹²Stiglitz, *op cit*, Ref 6.

¹³See Crawford, *op cit*, Ref 11, and Gary Becker, 'Investments in human capital: a theoretical analysis', *Journal of Political Economy*, Vol 70, No 5, 1962, Supplement, pp 9–49.

optimal in production for the market relative to production of subsistence crops, in productivity-enhancing soil amendments, irrigation and drainage facilities, land levelling, and new technology, as well as in commodity-specific knowledge and skills. Farmers also invest in processing and marketing equipment – small mills, motorcycles and trucks – that allow them to increase the value added of their sales through better quality or timeliness of delivery. Sharp instability in prices makes such investments riskier than is optimal for the society as a whole. The displaced investments are likely to be reflected in lower savings rates from farm incomes because rural credit markets usually do not offer efficient financial intermediation. There is also likely to be some displacement of work, and hence earned income, in favour of greater leisure. Both the added consumption from displaced savings and increased leisure contribute to the welfare of the farm family, of course, but the shift in allocation of time and resources because of price instability is not optimal for economic growth.

Investments by the private sector in marketing infrastructure are also dampened in the face of price instability (except, perhaps, for short-run speculative investments), and this lack of investment has a particularly negative impact on growth because of the increasing returns and public-goods aspects of development of an efficient marketing system. Such a system must connect farmers with local buying agents, thus transmitting market information and permitting exchange to take place, which generates gains in efficiency from trade. It must transform agricultural commodities at the farm gate into foods at the time, place and form desired by consumers. An efficient marketing system has to solve the problem of price discovery, at least at the local level and seasonally, even if government price policy sets a band in which such price discovery must take place.¹⁴ Many marketing investments are commodity-specific – rice mills and driers, for example – but decisions about trucks, warehouses, telephones and so on may also be based primarily on the production and trading prospects for a single important commodity such as rice or wheat. These prospects depend to a significant extent on the degree of price stability.

The industrial sector. The industrial sector has a stake in food price stability because of the importance of wages in expected costs. Stability of money wages through stable food prices is likely to induce investments in labour-using machinery, thus improving the efficiency of technology choice in low-wage economies. If stable food prices also contribute significantly to a stable political environment in which investors can form secure long-run expectations, the overall level of investment is also likely to be stimulated. Structuralist models that show the importance of stable food prices to the level of macroeconomic activity are also relevant in this setting, but as much for the impact of stability on investment decisions as for the stable level of employment and short-run economic activity itself.¹⁵ Contingency funds set aside to cope with unexpected price rises can instead be devoted to productive investments.

The macro economy. Not all macroeconomic consequences of stabilizing food prices are positive. The resource requirements of the price-stabilization programme itself can destabilize foreign-exchange requirements, the credit system and money supply, and budget

¹⁴For further analysis of the importance of an efficient marketing system and the role of price policy in developing one, see C. Peter Timmer, Walter P. Falcon and Scott R. Pearson, *Food Policy Analysis*, Johns Hopkins University Press, Baltimore, MD, for the World Bank, 1983.

¹⁵See Taylor, *op cit*, Ref 3, for a model of these short-run effects.

allocations, a topic discussed in more detail below. An important operational issue is to balance the positive macroeconomic effects against these negative ones, as well as against the operational costs of the stabilization programme itself.¹⁶

Consumers. The last factor to be incorporated into the analytical model that underlies the stabilization approach to agricultural pricing is the impact on consumers. The models used in the stabilization debate so far have looked rather narrowly at gains and losses in consumer surplus or, more elegantly, in compensating variations or equivalent variations.¹⁷ The stabilization approach argues that important sources of welfare loss to consumers due to price instability are omitted by such neo-classical approaches. Two sources seem especially large and may be measurable. The first is the value consumers place on avoiding the transaction costs incurred because of the need to reallocate their budget resources each time relative prices change. Compared with rich consumers, poor consumers are likely to value this aspect more. To fulfil minimal nutritional requirements, the poor feel the pressure to substitute among food commodities much more acutely than do the rich.¹⁸ Accordingly, there are important implications for income distribution of food price stability.

Second, fear of food shortages in urban areas evokes a universal and visceral reaction. Governments are held accountable for provisioning cities at reasonable costs, and citizens have repeatedly demonstrated their capacity to bring down governments that fail in this obligation.¹⁹ It is acute food shortages – not the average level of food prices – that induce anti-government panics, however. Food shortages are simply the mirror image of sharp price rises. Price policies that successfully avoid such episodes clearly contribute substantially to levels of overall social welfare. This level of social welfare is reflected in a more stable political economy, with its attendant positive impact on investors' expectations.

The benefits from stabilizing the prices of basic foodstuffs, or other agricultural commodities with significant macroeconomic linkages, are likely to be considerably larger than those reflected in the models that have been used so far to analyse relative costs and benefits of price-stabilization programmes. While little is known empirically about the size of the dynamic and macroeconomic benefits of stability, they cannot be ignored in the theoretical or empirical evaluation of such programmes. The pervasive, indeed universal, tendency of Asian governments to stabilize their domestic rice prices relative to unstable world market prices for rice suggests that the benefits may be very large. The rapid economic growth in many of these Asian countries suggests that the impact of efficiency losses and budgetary costs on growth cannot be too large, at least if the price-stabilization programme is well designed and implemented. A few countries have successfully managed the complex tasks of intervening in agricultural price formation without incurring unacceptably large budgetary costs or sacrificing long-run efficient resource allocation, and several lessons emerge from their experience.

Operational issues in analysing price-stabilization policies

All countries in Asia intervene in their rice markets. The primary analytical methodology used by economists to understand the impact of

¹⁶These issues have received considerable analytical attention in the case of Kenya's grain price stabilization programme: see Thomas C. Pinckney, *Operational Management Rules for Stabilizing Grain Prices*, IFPRI Research Report, International Food Policy Research Institute, Washington, DC, forthcoming.

¹⁷See Arne Hallam, 'Evaluating individuals' welfare gains: Is theory a cookbook for empirical analysis?', *American Journal of Agricultural Economics*, Vol 70, No 2, 1988, pp 442–447; and L. Jay Helms, 'Expected consumer's surplus and the welfare effects of price stabilization', *International Economic Review*, Vol 26, 1985, pp 603–617.

¹⁸See C. Peter Timmer, 'Is there "curvature" in the Slutsky Matrix?', *Review of Economics and Statistics*, Vol 62, No 3, 1981, pp 395–402.

¹⁹For a fascinating historical account of the relationship between urban masses and their rulers with respect to provisioning of basic foodstuffs, see Steven Laurence Kaplan, *Provisioning Paris: Merchants and Millers in the Grain and Flour Trade during the Eighteenth Century*, Cornell University Press, Ithaca, NY, 1984.

intervention, the border price paradigm, says they should not. This must be one of the widest gaps between theory and reality in all of economics. To close the gap it is essential to recognize that it exists because of failures at both ends. The analytical methodology has serious problems in purely theoretical terms. Relaxing the assumptions that make the framework simple and elegant, and therefore useful as a conceptual device, comes at a high cost in practical applicability. If analysts insist on realistic assumptions to reflect the pervasive market failures, non-equilibrium outcomes and lack of information in the economies of developing countries, their methodologies are made progressively more complex, situation-specific and dependent on the very knowledge that is lacking. On the other hand, most governments do intervene too much, at significant cost to the budget and the efficiency of the economy.

If better analysis is to contribute to improved policies, both the objectives for and problems with market interventions must be recognized.²⁰ In rice-based Asian economies, rice price policy can affect economic growth, income distribution and political stability – three important factors in any policy-maker's objective function. Economic growth is affected by the level and stability of price incentives to farmers, which stimulate growth in output and rural incomes. Low and stable consumer prices keep real wages low, thus stimulating investment, industrial output and exports. With purchases of rice still a large share of household budgets in many Asian countries and rice production the single most important farm activity, the impact of rice prices on real incomes by sector and income class is enormous. Most countries have no other policy instrument with a fraction of the potential of rice prices to alter the society's income distribution. Because of the economic significance of rice, maintaining reasonable stability in rice prices contributes directly to political stability. Nothing is more unsettling politically than rapid shifts in real income and wealth among large sectors of the population. Governments can eliminate at least one important cause of such instability by stabilizing rice prices.

There are, however, significant costs to the price policies used to reach these three objectives. The most visible, and therefore the most important to government policy-makers, is the cost to the budget of defending stable prices and of maintaining domestic price levels above or below prices in world markets. But there are important hidden costs as well. The budgetary costs are not painful just because taxes must be collected to pay for them if fiscal policy is to remain in balance. Expenditures for subsidies to producers or consumers have alternative opportunities in investments or other programmes that might offer higher pay-offs. Static efficiency losses due to misallocation of resources are seldom large when compared with income transfers or GDP, but if distortions are sufficiently large and persist long enough to be built into investment patterns, the losses become truly significant.

Lastly, continuous market interventions and price controls have an impact on the development of a private marketing sector. Investments in physical and human capacity in this sector are not forthcoming if margins are squeezed, policy implementation is erratic or the middleman is held responsible for policy failures. The loss is the absence of competitive traders in search of marketing opportunities for new commodities or greater volumes. Farmers need this dynamic search process; it provides them with information about what to produce and how profitable it will be. Government traders seldom reach farmers at

²⁰This discussion draws on C. Peter Timmer, 'Analyzing rice market interventions in Asia: principles, issues, themes, and lessons', in Asian Development Bank, *Evaluating Rice Market Intervention Policies: Some Asian Examples*, ADB, Manila, 1988.

all, much less with this type of information. Growth and diversification in agriculture are stimulated by transmitting information about changing demand patterns to farmers willing to experiment. Only a competitive, dynamic private trading sector has demonstrated much capacity to establish this link.

The issue is how government interventions into the level and stability of prices in domestic rice markets can be designed to stimulate the development of a competitive private marketing sector rather than retard it. The factors that stimulate the private sector are often subtle and hard to measure. Generating positive expectations about potential role and rate of return on investment is obviously essential, but there is little academic knowledge about the ingredients in such expectations, and few policy analysts have personal knowledge of what makes private traders tick. We do know that positive expectations are fragile; they take a long time to build and can be destroyed overnight with one foolish intervention. Trading is risky enough without having to figure out what the government will do. Perhaps the best that price policy analysts can do to encourage an efficient private sector is to create a stable policy environment, set price margins wide enough for significant participation by the private sector, and eliminate legal and bureaucratic barriers to entry by private traders. Simple as these tasks seem, they often conflict directly with the short-run or long-run interests of policy-makers in food price stabilization and of food logistics agencies in implementing it.

Costs of price stabilization

Governments enact programmes to stabilize commodity prices because free market prices do not provide a satisfactory degree of price stability. These programmes are subject to two basic principles: they are activities of the public sector that require the expenditure of public resources; and price stabilization is inherently destabilizing to some other part of the economy, usually the budget or credit system.

Stabilizing grain prices has two distinct but related components: seasonal price stabilization between post-harvest lows and pre-harvest highs; and year-to-year stability relative to world prices. The high costs of seasonal price stabilization often catch policy-makers by surprise. Squeezing the price margin to less than the lows and highs that would be dictated by the full costs of storage incurred by the private sector, including the profit and risk premium, is an expensive undertaking. One simple model shows that costs to the government budget rise with the *square* of the 'squeeze' on the full price margin – that is, the proportion of the full seasonal price rise that the government attempts to prevent by implementing a narrow band between permitted low and high prices.²¹ The costs in this generic 'floor and ceiling' price model do not include the overhead costs of maintaining an effective food logistics agency, nor the probability that storage costs for the public agency are likely to be substantially higher than those in the private sector.

Stabilizing domestic prices in relation to world prices is most easily accomplished through a national buffer stock operated in conjunction with trade policy. Coordination is achieved by placing monopoly control over imports and exports in the hands of the same agency that manages the logistical operations involved in running the buffer stock. In principle, this role for the agency permits international trade to be the balance wheel that maintains a stable equilibrium between domestic

²¹See Timmer, *op cit*, Ref 2, pp 63–66.

demand and supplies available to the market from domestic production and net trade (and stock changes). Such direct quantitative controls often conflict with GATT rules or desires of trading partners, but they are standard in rice trade in Asia. Of the major countries in Asia, only Thailand does not restrict international trade in rice to a state-controlled monopoly, and even Thailand has often used extensive intervention into its export trade to stabilize (and lower) domestic rice prices.

Unlike seasonal price stabilization, which always costs the government money, monopoly of international trade can sometimes yield revenue for the budget or the state trading company. The key is the level of the domestic price relative to the international price and the direction of trade. Economic forces limit the options, however, and push the results towards subsidies rather than revenues. Countries that keep their prices below border prices tend to discourage production at efficient levels and hence end up importing the needed supplies, at a cost to the budget, to keep domestic prices low (again, the exception is Thailand). In reverse fashion, countries that maintain prices to farmers well above border prices frequently produce surpluses that must be stored or exported at a loss. Consequently, schemes for both seasonal and annual price stabilization require public resources to be effective.

Financing price stabilization

Two distinct forms of financial resources must be committed on behalf of the public food logistics agency. Assuming the agency is implementing a floor and ceiling price policy through a combination of domestic procurement, market injections from short-run buffer stocks, and international trade, it needs a line of credit to purchase domestic grain during the harvest and to store it until needed for market injection, as well as a continuing budget allocation to cover operational losses incurred because of the squeeze on the price margin. The subsidy required to cover losses on international trading (or profits) depends on prices in world markets relative to domestic prices, and this relationship can change dramatically from year to year. South Korea nearly always profits when it imports rice from world markets; Indonesia did so in 1983, but its imports required subsidies in 1980 and 1981. In 1985 and 1986 Indonesia had to subsidize rice exports.

With proper financial controls and accounting procedures, central banks and ministers of finance should expect their food logistics agencies to repay, with full interest, the credit used for domestic procurement and seasonal stockholding when the stocks are sold in the market. Continuing losses incurred on behalf of policy-dictated objectives for price stabilization should be visible in the routine budget. Such an open financing mechanism for food-price stabilization has the twin advantage of clearly identifying the regular subsidies incurred by society to stabilize its staple food prices and highlighting the fact that the instability is transferred to the outstanding debts owed by the food logistics agency. When crops are good and purchases are high, credit needs rise sharply. This credit is not repaid until the stocks are needed to contain domestic price rises. Repayment can take quite a while if the private sector (including farmers) also holds stocks from the good harvest and provides supplies to domestic markets for longer than normal. The added interest costs on the 'excessive' public stocks must then be added to the agency's routine subsidy, or the stocks must be exported (probably at a loss). The main point, however, is that demand

for credit becomes unstable as grain prices become stable. Since the outstanding credit held by a food logistics agency is often a substantial share of total credits outstanding from the formal banking system – 20–30% is common – the macroeconomic consequences of this financial instability can be quite dramatic (especially if the country is operating under strict credit ceilings imposed by an IMF standby agreement, as in Bangladesh in the early 1980s).

The transmittal of instability in credit and budget requirements to the rest of the economy can impose significant adjustment costs, no matter whether the food logistics agency is increasing or decreasing its use of credit and budgetary resources. When needs rise, interest rates rise or government loans are rationed, budgets of other agencies are cut, investment projects are delayed or the deficit is financed by increasing the money supply, with attendant potential for inflation (although the large grain crop that generated the requirements for additional credit has a negative impact on inflation). When loans are unexpectedly repaid as stocks are drawn down, money and purchasing power are withdrawn from the economy, with potential recessionary impact.

Changes in the real scarcity of food require that adjustments be made somewhere in the economy. The important questions for the analysis of stabilization schemes for food prices are which adjustments do the least damage to the growth prospects for the economy and to the desired distribution of income. These questions require a general-equilibrium analysis with dynamic investment functions linked to the impact on expectations of instability in food prices, in credit markets and in budgetary behaviour of the government. No realistic computable general-equilibrium models are capable of addressing such issues in quantitative terms, and analysis of policies to stabilize food prices remains partial and highly intuitive even under the best of circumstances.

The operational significance of the two basic principles discussed in this paper – grain price stabilization both costs public resources and destabilizes either the government budget or the credit market – is quite profound. Failure to face them directly is the most common reason for failure of stabilization programmes. Planning of stabilization activities can be based on expected values under normal circumstances, and budgets can be drawn up under these assumptions. But actual operations must be conducted as reality unfolds and reality is likely to hold surprises with respect to the size of the harvest, level of consumer demand, expectations of the private sector and its participation in storage and transportation, world market prices (in dollars) and the country's exchange rate. For the logistics agency to cope with these surprises, it must be able to arrange for substantial credit lines at very short notice, often no more than a week or two. Many government agencies have difficulty allocating resources so quickly unless they understand in advance the need and can trust the logistics agency to spend the money, with adequate financial controls, for the intended purposes. It is no wonder that so few countries have been able to carry out this task successfully over a long period of time.