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Private Decisions and Public Policy: The Price Dilemma in Food Systems of Developing Countries

by

C. Peter Timmer

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Department of Agricultural Economics
Michigan State University
East Lansing, Michigan 48824

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OF DEVELOPING COUNTRIES**

by

C. Peter Timmer

John D. Black Professor of Agriculture and Business
Harvard Business School

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I. INTRODUCTION

The world food crisis in the early 1970s yielded two sharply divergent schools of thought on economic development. One school was concerned by the significantly higher food prices, the apparent scarcity of energy resources, and the declining rates of growth in agricultural productivity. In such an environment, the best that could be done for the world's poor was to eliminate the worst manifestations of their poverty by reorienting national development strategies toward direct provision of basic needs. An early populist expression of this viewpoint by Lappé and Collins, Food First: Beyond the Myth of Scarcity, had widespread impact on political activists and Congressional attitudes about appropriate forms of development assistance. For the development profession itself, a wing of the World Bank was instrumental in developing the basic needs perspective, and perhaps it was most eloquently presented by Streeten, et al., in their book, First Things First: Meeting Basic Human Needs in Developing Countries.

The second school of thought was much more concerned with the widespread and persistent tendency of developing countries to undervalue their rural sectors and to depress food prices. For this school, the high prices for grain in world markets in 1973-74 provided a restructuring of incentives to producers that was long overdue, with an expectation that a positive response in output would be the result. The timely expression of this view was the volume edited by Nobel Prize winner T.W. Schultz, Distortions of Agricultural Incentives. This work quite explicitly rejected the notion that the 1970s represented a "turning point in history" (Brown, 1974) and insisted that longer-term trends in agricultural productivity and household decision making in response to changed economic signals remained intact.

The focus on food policy emerged in the late 1970s as a conscious effort to bridge these two schools of thought. The Basic Needs school understood the consequences for food consumption of the new economic environment but failed to provide a policy framework that would lead to sustainable growth in economic productivity in the long

run. Its concerns for policy were short run--the time span in which welfare problems are most pressing. In contrast, the Production Incentives school either missed or ignored the effects higher levels of producer prices, especially for the society's basic foodstuff, would have on food consumption. This school focussed attention on policies to promote long-run growth in efficiency and productivity through technological change and trade. But precisely because of its preoccupation with the long run, it missed most of the policy debate over how to help the poor in the short run in the face of scarcer supplies of food and energy.

The dilemma--particularly with regard to agricultural price policy--surfaced because both schools were right, and their divergent ideas needed to be reconciled.¹ The Timmer, Falcon, and Pearson book, Food Policy Analysis, evolved over a five-year period to address directly the "food price dilemma" that reflects the conflict between the short-run and long-run interests of the poor. In the short-run, the poor's primary concern is for low food prices to maintain their access to food. In the long run, their interests are served by incentives that raise economic productivity and generate jobs. Consequently, the dilemma stems from the opposite effects price incentives have on food consumption and production. The debate over food price policy is thus seen as the core analytical problem to address. When viewed broadly, as it is here, this debate extends from micro-level problems of farm production and household access to food to the problems of markets, technological choice, and the decision-making environment at the micro-macro level and ultimately to issues of fiscal and monetary policy, macro prices, and international trade. In this sense, food policy is the tail that wags the dog of economic development.

The first part of this paper presents a methodological "history of thought" that traces the evolution of the food policy perspective--the analytical approach that places both agricultural production and food consumption issues in a macroeconomic context. In the initial stages, the analysis sought empirical verification of the separate effects food prices have on producers and consumers, the source of the food price dilemma. The micro decision-making models of the household and firm that dealt with these effects were well within the purview of neoclassical economists, and only the empirical parameters of changed behavior in the face of changed prices were at issue. When

¹Early statements of this dilemma can be seen, appropriately enough, in reviews of Food First and Distortions of Agricultural Incentives. The reviewer criticized the first volume for neglecting the incentives issues, and the latter for ignoring the short-run welfare effects of higher food prices. See Timmer (1978c, 1979).

governments intervene to change prices, however, standard economic models were on thin ice; changes in prices affect not only households and firms but also government budgets, international trade, investment patterns, and a host of other dynamic and macro-level outcomes for which economists had no accepted models of behavior or performance. In particular, the economics profession has carried on a long-standing debate over the tension between market allocation processes and government interventions to improve income distribution. Food price policy is at the core of this controversy, but in this debate economists' models provide only limited insight into effective social policy. The first part concludes with a review of the role of markets and the tension over government intervention.

The second part of the paper examines the two-way relationship between government policy, especially with respect to food prices, and the macro economy. These macro connections bedevil economists' partial equilibrium models that purport to identify the welfare consequences of food price interventions. But the food sector, because of its macro connections, is squarely in the center of a country's economic development effort. Consequently, an empirical understanding of the government's role in the food system is needed if food policy initiatives are to bridge the micro-level food price dilemma and use macro prices to create an investment environment favorable to equitable economic growth. The results reported here, especially the effects of macro price policy on the share of agriculture in total economic activity--"structural change" to economists--draw heavily on empirical work carried out since 1980. Where the results are in, the story is easy to tell, and the reporting is brief. Where the critical questions remain unanswered or ambiguous, however, the conclusion is more tentative and the story somewhat more complicated.

The paper concludes on a note that is even more speculative. The stakes of the various actors in the food system will be quite apparent as the elements of a successful food policy unfold. But there are broader stakes as well. This paper argues that a country's food policy provides an "early warning signal" about the society's political and economic health. Because the food system is so sensitive to the economic environment and because food security is very much a barometer of political unrest, a sophisticated assessment of a country's food policies provides early insight into its evolving climate for investment by domestic and multinational firms. As more governments and investors understand this, a powerful consortium of interests could be assembled with a stake in promoting food policies that accomplish both the goals of the Basic Needs school in the short run and the productivity gains in the long run sought by the Producer Incentives school. Since the analytical, managerial, and financial resources to accomplish both

tasks will have to come from external support as well as domestic sources, such a consortium of interests should be welcome indeed.

II. THE EVOLUTION OF FOOD POLICY: FROM MICRO TO MACRO

Price policy as a potent instrument of macroeconomic policy has seen a renaissance since the doldrums of the 1960s when presumed fixed factor proportions in production (Eckaus, 1955) and the "structuralist" view of consumption (Weiskoff, 1971) led economists to build elaborate multi-sector planning models that did not contain any relative price variables. A strong undercurrent of practicing economists argued throughout this period that "getting prices right" was a necessary but not sufficient ingredient in building a base for sustained economic growth (Falcon and Papanek, 1971). Or, as Timmer (1973) concluded after analyzing the reasons for the spread of labor-intensive rice mills on Java, "'getting prices right' is not the end of economic development, but 'getting prices wrong' frequently is." The necessity for time series data for production, consumption, and prices over a long period of time, however, usually forestalled any meaningful statistical demonstration of the price impact. Even the believers seldom were concerned about the distributional impact of price variations on producers and consumers, much less their effects on the nutritional status of the poor.

It is no coincidence that the renewed significance of price policy corresponds to a rise in the perceived importance of food and agriculture in the development process and of adequate amounts of food as a basic human right. The food and agricultural sector has long been the proving ground for statistical tests of price responsiveness because data over a relatively long time were available on market prices for food and export crops and for area planted and crop yields in some well-administered colonies. Krishna (1967), for example, reports estimates of farmer response to price for several important cereals in India-Pakistan for periods beginning in 1914.

Similarly, much of the early literature on statistical estimation of demand functions deals with agricultural commodities because the separation in the timing of supply and demand functions resolved the identification problem in practice before it was resolved theoretically. Further, agricultural markets tend to be more competitive than many markets for industrial products, and thus they more nearly satisfy the competitive model of classical economics. The flexibility of the classical model, and hence its "natural" tendency to find a full-employment equilibrium, depended on elastic price responses from producers, consumers, and wage earners. It was the failure of these responses in advanced Western economies in the 1930s that displaced the classical model and planted the roots of the structuralist model that dominated economic planning for two decades after World War II.

The food scare of the early 1970s, when wheat prices in international markets rose from \$60 to \$220 per ton in just eighteen months and prices for rice and soybeans had even larger relative movements, jolted economists for two entirely different reasons. First, and most important to Western economists, the agricultural sector, which had historically been dwindling in size, suddenly rose up and struck a potent blow to the entire international macroeconomic order--an event which preceded the shock dealt by OPEC's hike in oil prices. The food and agricultural sectors in the United States and many other countries significantly influenced the level of macroeconomic activity. Macro economists knew little about managing an economy beset by sectoral shortages rather than general slack. Microeconomics and commodity modeling suddenly became important to macroeconomics.

Second, the episode forced development economists to ask the question: who was reducing their food consumption in the face of drastically higher prices and worldwide shortfalls in food production? The answer was all too obvious. The thousands, perhaps millions, of urban and rural poor who starved in 1973 and 1974 in Africa, Asia, and Latin America were ample testimony that economic principle can be accurate, if dismal. But planners who attempted to assess the severity of the damage and predict where the problem might be worst so that food distributions could avert famine were hampered by an appalling lack of knowledge about what poor people eat and how their food consumption patterns change when incomes and prices change.

A. The Food System and Micro Decision Making

By the mid-1970s, a school of practicing development economists began to see in many countries empirical confirmation of the important role of prices in agricultural development. The induced innovation hypothesis of Hayami and Ruttan (1972) provided empirical and theoretical foundations for regarding price as a major factor in allocating resources in agriculture in the long run. Timmer and Falcon's work on the political economy of rice in Asia (1975a, 1975b) highlighted several important roles for rice prices: (1) as an influence on the area devoted to rice cultivation, where alternative crops could be grown; (2) a determinant of rice yields in the short run and long run; and (3) a measure of consumer welfare and political stability. The first role has been abundantly confirmed. The second has received additional confirmation in work by Peterson (1979) and others, work which emphasizes the difference between individual crop response--mostly area shifts--and aggregate agricultural output response--mostly due to yield effects. The influence of rice prices on consumer welfare and political stability, despite some tantalizing evidence, remains largely unexplored.

If higher food prices do in fact call forth abundant food supplies, what will happen to food consumption? While the Production Incentives school tended to focus on the "supply creates its own demand" aspect of gains in food production on small subsistence-oriented farms, the Basic Needs school was concerned about the impact of higher food prices on the urban poor and rural landless, even if greater food supplies were physically available in the markets.

The economists' traditional approach to answering the question--the elasticity of the food demand curve--was not adequate to the task. Market demand curves estimated from aggregate time series data, the only estimates available at the time, did not reveal who was adjusting their consumption when food prices change, or by how much. Tracing the relationships between food price policy and nutritional status required the estimation of consumption parameters that were disaggregated by income class. Efforts at such estimation have been stimulated by economic planners trying to devise more effective policies to guarantee basic needs and improve food consumption among the urban and rural poor. Analytical work in this area was hampered, however, by two factors: serious problems with data that restricted the potential for direct estimation of disaggregated demand elasticities; and the highly restrictive nature of economists' models of systems of demand equations used in place of direct estimation. For example, the desire to use a computable aggregate model which ensured macroeconomic consistency forced the micro-relationships that determine nutritional status to be specified in extremely simplified and restrictive forms. Although macro consistency is extremely important and the food sector's role in macroeconomic activity is large but poorly understood, such an approach usually misses much that is important to policy planners trying to assess the effects of price changes on nutritional welfare.

For example, an important nutritional question in Pakistan is the amount of wheat and rice eaten by the poor. In terms of economic analysis, the important issue is the quality of that wheat and rice and the elasticity of substitution, by income class, for grain of different quality as prices change. In Indonesia the important question is the varying quantities and proportions of rice, maize, cassava, and wheat flour in the diets of peoples from various income strata and substitutability of one for another as prices and incomes change (Timmer, 1980; Alderman and Timmer; Monteverde).

These questions are not illuminated by the standard systems-of-equations approach used by economists to address much more aggregated issues.² Most of the work on disaggregation has used direct estimation techniques on very large household food expenditure surveys, drawing on econometric specifications and interpretations originally used by Timmer in Indonesia.³ Subsequent analysis has been carried out primarily by people connected directly or indirectly with the food policy paradigm.⁴ The consumption components of food policy analysis (as opposed to the production component) is designed primarily to examine those government policies whose major emphasis is broader than narrowly-focused nutrition interventions, that is, those policies for which partial equilibrium models are seriously restrictive. Direct and indirect changes in prices and incomes provide the driving force for affecting food consumption from three general types of policies: food supply (production and imports), food pricing and marketing, and general economic development policies. Impact of a government policy is traced through either price effects, exogenous income effects, or endogenous income effects. A possible food supply policy whereby a shift in food supply curves affects various income strata of urban households has been examined in one geographic context by Pinstrip-Anderson, et al. (1976). This is the simplest policy effect to trace because a single chain of causation links food supply policy, price effects, and food consumption of urban households. Even so, as Figure 1A shows, the methodology requires a full own- and cross-price elasticity matrix by income strata to translate changes in the food price into changes in food consumption, by income strata, and a full set of market equations to translate neutral shifts in supply into changes in price.

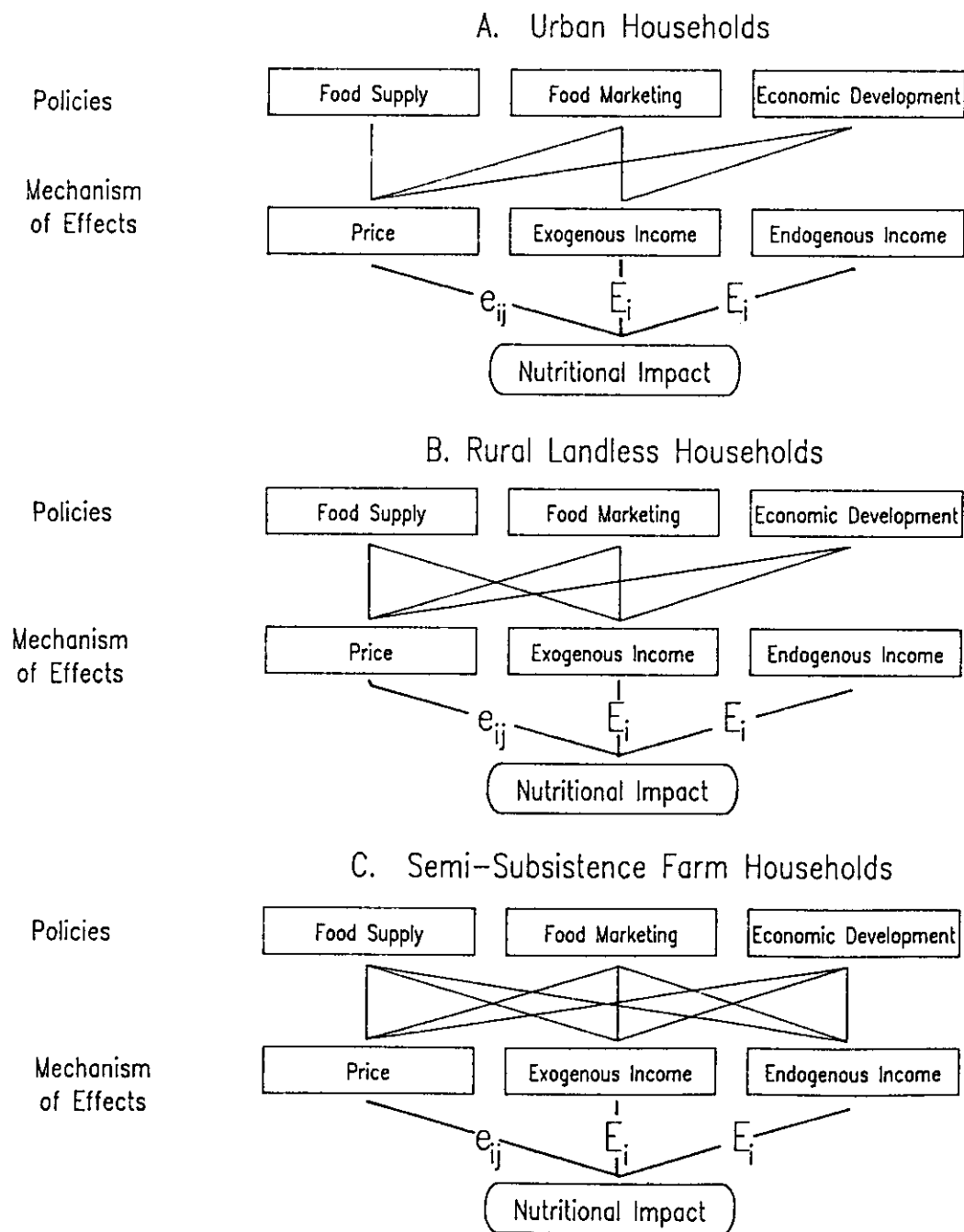
As Figures 1B and 1C show, extending the analysis to broader policies that affect food marketing or economic development or to other vulnerable groups--the landless

²It should be noted that Pitt has recently made some progress in disaggregating a food consumption system for Bangladesh.

³Two papers sponsored in 1978 by the Jakarta office of the Ford Foundation and the Food Policy Discussion Group organized by BAPPENAS, the Indonesian National Planning Agency, produced the initial statement of the consumption model and the first directly estimated food price elasticities disaggregated by income class. See Timmer (1978a, 1978b).

⁴For a list, see the bibliographic references to chapter 2 of Food Policy Analysis. An initial synthesis of these empirical studies as appropriately titled "Is There 'Curvature' in the Slutsky Matrix?" because the Slutsky equation that decomposes price elasticities into substitution and income components provided the starting point for both systems models and direct estimation techniques. See Timmer (1981).

Figure 1. Impact of Government Policies on Household Nutrition



Note: e_{ij} is the Slutsky matrix of own and cross price elasticities, and E_i is the vector of income elasticities.

rural poor or subsistence farmers--adds an entirely new dimension. Exogenous income effects via changed employment patterns and opportunities and endogenous income effects for farmers because of changes in output or price must be added to the price effects. Income elasticities that are income strata specific will be needed to translate the changes in income into altered food consumption. Much more difficult to construct are the corresponding functional relationships that translate the shift in policy into changes in income, by income strata. For the exogenous income effects, it is necessary to specify any changes, by income class, in employment or wages, or both, caused by the policies under analysis. This type of analysis is difficult in itself, but the endogenous income effects are doubly difficult to specify because they depend on output and price components. Both of these, but especially the output component, are likely to vary systematically by income strata.

More importantly, the translation of policy change into effects on prices and incomes must necessarily be done in the specific political, social, and economic context of the change itself. For instance, any changes in price resulting from a shift in supply will depend on a country's import or export status, the state of the marketing sector, and the institutional mechanisms of price formation. Similarly, the income effects of a change in marketing will depend on the extent of open or disguised unemployment, choice of technique in processing and distribution, and mechanisms of wage formation. It is impossible to generalize about these effects on the basis of current empirical studies, and no models are sufficiently disaggregated or empirically based to provide much insight.⁵

⁵Substantial mechanical and methodological progress has been made in the past decade in the construction of computable general equilibrium models, especially under the leadership of Hollis Chenery and Sherman Robinson while they were at the World Bank. These models are very complicated and yet remain highly restrictive in their ability to capture the subtle dynamic effects of price policy changes on income distribution and the structure of the economy. For one of the most illuminating examples of the potential of these models, see Jaime de Melo and Sherman Robinson, "Trade Adjustment Policies and Income Distribution in Three Archetype Developing Economies."

B. From Micro Decision Making to Macro Policy

Once attention has been directed at price effects at levels beyond just the consumer or producer, economic models of choice that underlie the specification of empirical investigations become unclear. Economic analysis is concerned with the efficient allocation of scarce resources among competing demands, and the decision-making criteria are based on optimizing behavior by the economic agents being analyzed. Much of economic theory until the 1930s involved analyzing the implications of optimizing behavior on the part of producers (firms) and consumers (households) and determining the nature of the equilibrium produced by their interchange in markets for factors and goods.

There is more to economic life, however, than the optimizing behavior of the primary economic agents in the system. An economy is also more than the simple sum of its parts. The Great Depression forced economists to realize that important fluctuations in aggregate economic activity could not be predicted or explained simply on the basis of optimizing behavior on the part of the basic units (micro) of the economy.

The Keynesian analysis tried an entirely new approach. Rather than build painstakingly from individual decision-making units to larger aggregates and ultimately to market behavior for commodities and factors, Keynes started with national aggregates as the variables of interest. The relationships among the important aggregate (macro) economic variables--national income, savings, investment, employment, wages, and total consumer spending--were posited or investigated directly, and little effort was made to link this macroeconomic behavior to relationships predicted from optimizing behavior on the part of the microeconomic decision makers. By the late 1950s, two separate fields of analysis, microeconomics and macroeconomics, evolved with two separate decision-making models: private optimizing agents in firms and households; and policy makers in charge of fiscal and monetary policy.

This compartmentalization of economics into microeconomics and macroeconomics is quite recent, with the earlier term "political economy" encompassing both. Ragnar Frisch first used the term "macroanalysis" in 1933 to refer to the analysis of such monetary aggregates as GNP, national income, and savings. In less than fifty years these aggregate variables have come to have a descriptive and analytical life (and profession) of their own, despite Schumpeter's insistence that they were not "accurate or reliable" variables for analysis.

The Keynesian revolution in intellectual thought was complete by the late 1940s, but a sense of unease persisted over the schizophrenia required of economists trained in

classical analytical economic methodology who practiced the new macroeconomics. Samuelson's neoclassical synthesis resolved the issue at one level by showing the renewed relevance of microeconomic methodology if macroeconomic policy were "successful." A full employment economy then reverted to the "rules" of microeconomics. Successful macroeconomic policy thus provides the setting for the relevance of microeconomics--a revolutionary perspective. As Crotty notes, it was Marx who first asked, "What is the macro foundation of microeconomics?"

The difficulty is that macroeconomic policy has never quite been able to be successful enough. The problems of unemployment, inflation, and the relationship between the two (the Phillips curve) have so plagued macroeconomic analysts and policy makers that microeconomic issues failed to receive the attention of economic analysts oriented to policy issues. In economics, until very recently policy analysis meant macroeconomic analysis. The development of "post-Keynesian economics" has been in response primarily to the inability of macroeconomic analysis to deal with micro issues. But concern over the lack of analytical links between microeconomics and macroeconomics has existed ever since the terms themselves were invented.

Building bridges between microeconomics and macroeconomics is difficult because economics as an analytical science requires decision makers to analyze. Given a decision maker's objectives, constraints, and some (usually optimizing) rule of behavior, formal or informal mathematics or graphs provide the appropriate solution--the decision to be made. The only decision makers economists have analyzed with any success are those at a micro level--the firms and households producing and consuming goods and services--and the national policy maker who is constrained in maximizing employment, and hence presumably social welfare, only by the capacity of the nation's capital stock. The links between the micro and macro domains are relatively unexplored because economists have seen few decision makers there with decision rules susceptible to formal analysis.

Important actors exist in the area where micro and macro realms converge. Indeed, following Leibenstein's plea that "A Branch of Economics is Missing: Micro-Micro Theory," it is possible to specify a continuum of decision makers in the economic system whose behavior needs to be understood within an economic framework even if that behavior cannot be reduced to simple mathematical optimization models. Leibenstein's interest in a micro-micro theory grew out of his work on X-efficiency theory and a concern for how individuals within firms (the unit of analysis in microeconomics) interact to produce the observed behavior and performance of that firm. When extended to individuals within households, micro-micro analysis provides the basis also for the "new household economics" founded by Gary Becker and T. W.

Schultz.⁶ The connection between food and nutrition decision making at the household level and investments in human capital has been stressed by Schuh (1981).

At the other extreme, macroeconomics does not have an analytical methodology to deal with some global problems that have recently become important: the distribution among nations of the benefits of economic growth; the structure and stability of the international financial system; transfer of technology; foreign aid; and the growing interdependence of economies through trade in important commodities. At this level, a macro-macro focus would include the primary actors in the global economy: international organizations such as the World Bank and the I.M.F.; countries as sovereign entities able to pursue development strategies and to make bilateral or multilateral economic arrangements; and multinational corporations, which increasingly take a global view of their operations.

Figure 2 classifies this continuum of economic decision making into five categories: micro-micro, micro, micro-macro, macro, and macro-macro. For each level of analytical focus or decision-making locale, the figure identifies the primary actors responsible for making decisions, the locus of their activities and their scope for action, the basic issues they must cope with, and the main instruments at their disposal.

The continuum becomes apparent when it is recognized that decision makers at one level tend to become the actors in the next level. Much like layers of an onion, macro-macro actors in the global economy are seen to be active at a more micro level dictated by the national macro economy. Activities of large corporations and unions in turn depend on more local conditions in markets and industries. These in turn are strongly conditioned by the micro behavior of firms and households, which is ultimately affected by the interaction of individuals at the micro-micro level.

The scheme in Figure 2 is rough and by no means complete. It does highlight, however, the neglect of analytical attention to three of these areas. Micro-micro issues have been treated as behavioral and analyzed mostly by psychologists and sociologists. Their ultimate interest is the individual rather than the individual's behavior in relation to economist's units of observation, the firm and household. Schelling's recent work that

⁶The Becker-Schultz approach to household economics presumes the existence of a jointly maximized utility function that somehow overcomes Arrow's impossibility theorem about the existence of such a function. Models of bargaining among household participants would seem to be much more realistic in a wide variety of circumstances, but several important results of consumer theory break down when household decision making is determined by bargaining outcomes. For a particularly fascinating example affecting rice production and food consumption in Africa, see Jones (1983).

Figure 2. The Continuum of Decision Making in Economics

Analytical Perspective	Actors	Locus of Activity	Major Issues of Concern	Primary Instruments or Modes of Activity
Micro-Micro	Individuals	Firms Households Bureaucracies	Internal behavior as it affects activities of firms, etc.	Personal "effort" derived from individual utility function
Micro	Firms Households	Local markets, industries; or self-sufficient farm/households	Decisions with respect to input/output levels, allocation of income among commodities and services, including savings, and labor supply	Optimizing behavior with respect to production technology. Collective utility function and behavior with respect to incomes and prices
Micro-Macro	Large corporations Large unions Public enterprises	National markets and industries/ commodities/ "problems"	Prices for products, advertising and sales, research and development, product mix, work rules, wages, benefits, productivity, profits and performance	Investment strategies, sacrificing vs. aggressiveness, lobbying, advertising, dialogue vs. confrontation, industry "accommodation," political action committees, court orders, regulations vs. incentives
Macro	Government policy makers	National economy and international trade with that economy	Unemployment, inflation, income growth, balance of payments	Monetary policy and interest rates, fiscal policy, wage/price controls or guidelines, foreign exchange rates and tariff policy
Macro-Macro	International organizations, Nation states, Multinational corporations	Global economy	Market access, gains from economic growth, and terms of trade, international monetary system, foreign aid, international security, transfer of technology	Bilateral and multilateral negotiations, cartels and trade embargoes, investment strategies, network creation

links micro behavior of the individual with macro performance is the first major attempt by an economist to reconcile these issues.

The analysis of the second area, behavior at the micro-macro level, has been reserved primarily for business schools and, more recently, schools of public policy. Again the focus has not been on how these actors--the large corporations, unions, cooperatives, public enterprises, and regulatory agencies--relate to the outcome below at the micro level and the policies above at the macro level. Rather the analysis has been either descriptive or "strategic"--designing internal mechanisms for coping with what is viewed as a largely exogenous environment at both ends of the spectrum. Consequently, the questions involving the links between these levels, which are mediated by the micro-macro actors, have remained unanswered.

Despite the increasing awareness of global interdependence, economics has neglected many of the problems of decision makers in a third area, the macro-macro, because the profession was methodologically preoccupied with either microeconomic or macroeconomic issues. Only the renaissance of political economy and the emergence of articulate analysts studying third world dependency have brought these global issues to renewed analytical attention.⁷ Understanding this range of decision making can broaden the scope for effective public intervention to resolve social issues at all levels of the continuum. Economists learned in the 1930s that microeconomic instruments did not solve macroeconomic problems. Only instruments designed specifically for the nature of the problem were effective. Similarly, the scarcity of food and energy resources as a microeconomic problem cannot be alleviated by macroeconomic instruments even though the problems may have macroeconomic affects. The underlying micro-behavioral regularities that gave macroeconomic analysis its legitimacy have shifted, and only new understanding of this area will resolve the problems. Samuelson indicates that "... macro models do not tell us how to handle such a microeconomic restriction..." (p. 77). Eckstein argues that the major macroeconomic issues for the future will be planning to alleviate supply bottlenecks, planning that will be made extremely difficult because the

... policy machinery is obsolete... Perhaps the biggest challenge to economic policy over the next five years is to develop the principles, the analytical techniques, the information base, the policy formation machinery, and the instruments that will be needed to solve these problems. Since our reliance must continue to be primarily on the productive activities of private enterprises, and since the United States has

⁷For a provocative assessment of the state of analysis of these issues, see Lance Taylor, "Back to Basics: Theory for the Rhetoric in the North-South Round."

no healthy tradition of business-government collaboration in peacetime, the design of such machinery will be very difficult. (Eckstein, p. 81)

The policy machinery is obsolete primarily because of the micro-macro aspects of the problems being confronted. The locus of these issues listed in Figure 2 includes national markets for industries, commodities, and a range of social problems. Among those activities that have strong public welfare aspects are the railroad, automobile, electrical generating industries; the energy, food, and steel markets; and the problems of environment, urban decay, and industrial productivity. Decision makers in this area remain largely outside the public domain and yet are poorly understood by economists because they are not located in small firms or consuming households.

The growing dominance of these problems has pressed economists to reassess the kinds of issues they analyze and the models used to address them. Interest is growing in what Muench and Wallace call the "structure of exchange"--the analytical question for policy economics of "what markets exist and how they function" (p. 337). Since markets provide much of the arena for these microeconomic and macroeconomic issues, many economists oriented to macro policy are becoming understandably interested in what Solow called the "tension between market allocation and public intervention."

Marketeers keep thinking about the doughnut of allocative efficiency and informational economy and dirigistes are impressed with the size of the hole containing externalities, imperfections, and distributional issues. (Solow, p. 13)

As traditional macro policy instruments failed to deal effectively with inflation, unemployment, and shortages of food and energy, the inevitable tendency of macro policy makers was to resort to "macro regulation." Without the regulators adequately understanding the micro details of the industry and commodity, however, it was apparent that massive regulatory intervention causes at least as many problems as it solves.

Scitovsky notes that it is mostly government that

... overrules market prices and suppresses competitive price adjustments. Farm price supports, airline regulation, and the dead-ending of trucks are examples of government interference in favor of business; but there is much of it also for the sake of greater equity. Indeed, to intervene in the interests of distributive justice has become an important preoccupation of government under advanced capitalism. To mitigate the inequities of capitalism while preserving its efficiency is the great liberal compromise--but does it work? Since we cannot divorce the signalling function of prices from their distributive function, every modification of market-determined distribution is likely to weaken or falsify market signalling and thereby to weaken the economy's automatic tendency to adjust. (Scitovsky, p. 5)

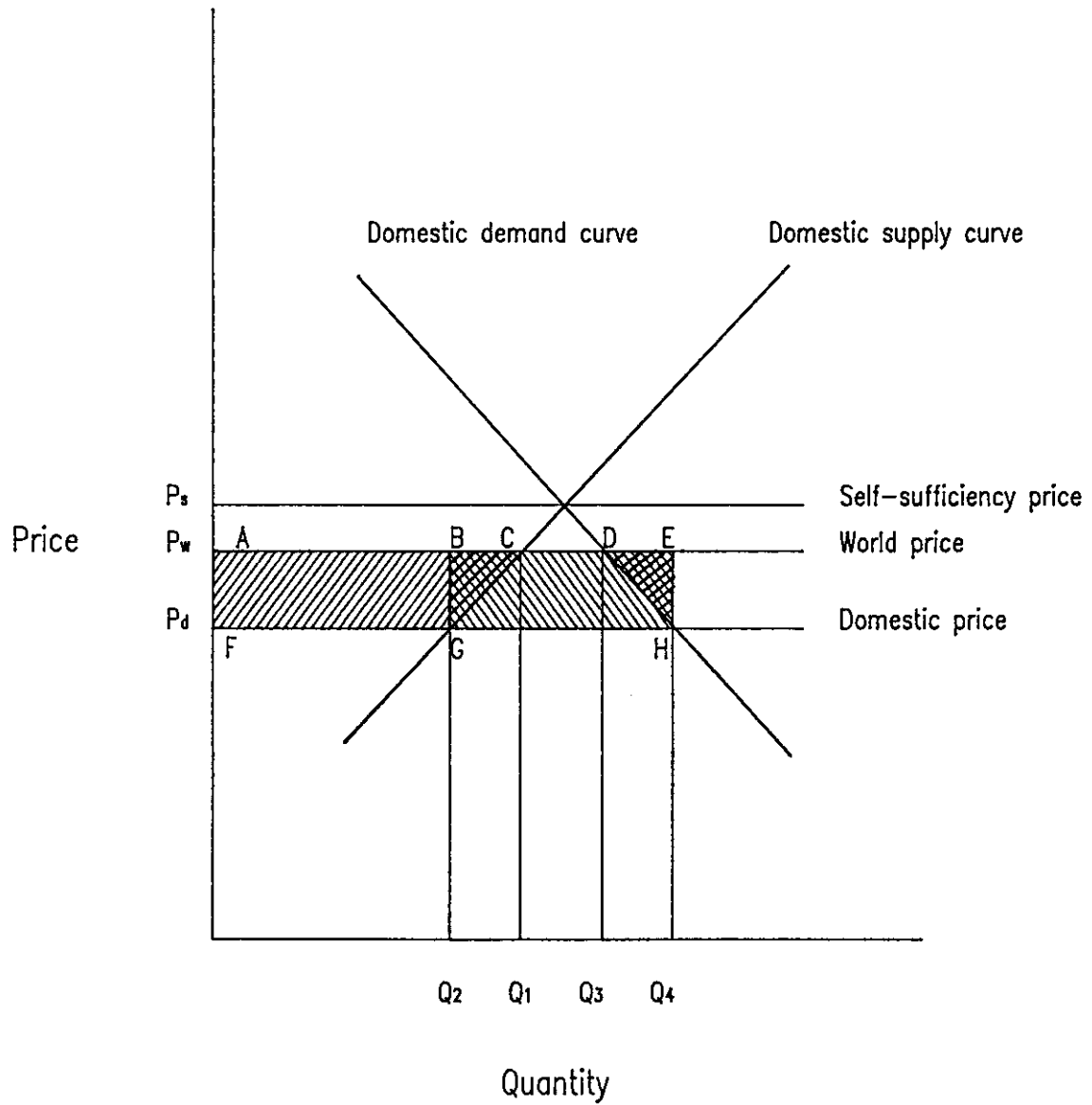
C. Getting Prices Right

Scitovsky's strong reminder that prices play both allocative and income distributional roles is particularly relevant for food prices in developing countries. If food price policy interventions affected only the distribution of incomes between producers and consumers, the policy debate would be largely political. Economists might be involved in analyzing the incidence of the taxes needed to finance the budget subsidy devoted to food. Their attention would be drawn to the effect of additional food imports on the foreign exchange rate, and hence on the price structure for the rest of the economy, but economists would have relatively little to contribute to the debate over price policy. Indeed, the income transfer effects and the politics of budget allocations have dominated the formation of food price policy in developed and developing countries alike, despite the presence of another major component of price policy impact that only economists can identify and quantify. This is the loss of economic welfare to both producers and consumers that is caused by distortions in the allocation of resources from their most efficient use in production and consumption. These losses can be identified only within the framework of efficient resource allocation that underlies the entire neoclassical market paradigm. A simple example analyzing the impact of a subsidy on rice imports is shown in Figure 3, where triangle BCG is the production efficiency loss and DEH is the consumption efficiency loss.

Economists view such efficiency losses, especially on the production side, with genuine concern. At least in the simple static model of partial equilibrium effects, all the price policy's consequences for income distribution that are desired on political grounds can be achieved with subsidiary tax and direct income transfer programs, without incurring the efficiency losses. Unfortunately, such taxes and direct transfers are difficult to implement for political and administrative reasons; unlike the implicit income transfers effected by price policies, they must be made explicit and channeled to individuals through a government bureaucracy.

Economists have a further concern over the effects allocative efficiency losses have on investment and structural change in the economy. Harberger taught the profession many years ago that the triangle of allocative losses is small relative to the rectangles of income transfers, as shown in Figure 3. On the production side, Leibenstein showed that the triangle might also be small relative to technical or X-efficiency losses caused by a failure to achieve the maximum output from a given set of inputs. Consequently, an early hypothesis was that rapid growth and technical efficiency achieved by constructing state-of-the-art industrial plants as turn-key operations could

Figure 3. Effects of a Subsidy Policy on a Consumer Import, Rice



easily overcome the "small" losses from misallocated resources caused by prices distorted to achieve income distribution goals. The historical record seems to show, however, that rapid growth and efficiency prices go together--that severe price distortions impede the growth process as well as static resource allocations.

Similarly, consumer efficiency losses are also likely to have dynamic allocative effects on an economy. The evolving patterns of demand over time provide the main driving force for investment and structural change. Subsidizing important commodities, especially an imported basic foodstuff, can drastically skew development patterns and retard growth in employment and aggregate economic output. At the same time, however, the additional consumption of the basic foodstuff made possible by the subsidized price might have important consequences for nutrition (and consequently human capital), effects which complicate the welfare analysis of price policy. These consequences must be dealt with directly by disaggregating price analysis by income class.

It is easy to see why economists are so concerned to "get prices right." Price distortions, as measured by deviations of domestic market prices from international market prices, cause inevitable losses in economic welfare because of dead-weight efficiency losses. Within the fairly narrow assumptions of the neoclassical model, these losses arise whether prices are raised or lowered and whether the commodity is imported, exported, or switched from one to the other because of the response of producers and consumers to price changes. The only situation where efficiency losses do not occur is when response elasticities are zero (the "triangles" thus disappear). In such a world, prices do not matter at all for resource allocation, and they are important only as a key element in income distribution.

When the commodity in question is the basic food grain for the society, the income distribution effects of price policies can be extraordinarily powerful. Indeed, the government may have no other policy instrument capable of putting real purchasing power in the hands of consumers, especially urban consumers, that has nearly the impact of a price subsidy on food imports.⁸ It is perhaps no wonder that many government

⁸In Figure 3, the government is able to transfer to consumers real income equivalent to the area ADHF, while incurring a budget subsidy cost equal to the subsidy per unit times the volume of imports, or BEHG. The difference is paid as an implicit tax by producers. If imports are a small share of total consumption, the leveraging effect of an import subsidy on total income transfer can be very substantial. If imports are 5 percent of consumption, for example, farmers will provide about 95 percent of the income transfer without any taxes ever having been formally levied.

officials choose to believe that supply and demand elasticities for such a commodity are nearly zero, for if it were true, there would be only political (and mostly positive) consequences to food price subsidies, with no economic distortions and serious reductions in growth opportunities.

One response to the tradeoff between the allocative and income distributional effects of price policies is to have the state make the allocative decisions directly. Rather than using markets to provide the context for analyzing the efficacy and efficiency of government price policy interventions, the paradigm of central planning might be used. Quantitative targets and allocations then become the decision variables, with prices set to reflect social values and needs.

The planning paradigm has considerable theoretical and emotional appeal. In principle, it allows society to make important allocative decisions on the basis of human needs rather than according to scarcity values of prices determined by the purchasing power of a highly unequal world market. Simply because the demand of American and European consumers for steak makes grain expensive is no reason why Mozambique should also make grain expensive for its own poor consumers. The quantities of grain needed to fulfill a society's goals can be part of the state plan and can be produced directly or imported. In this way, social priorities, including the elimination of hunger, can be met well before an economy has grown sufficiently wealthy for all consumers to be adequately nourished without government interventions on their behalf.⁹ The planning paradigm, which owes as much to Fabian Socialist thought as to Marxist-Leninist theory, is used as a basis for economic organization for a majority of the world's population. The extent of control over planning varies widely, however, from the fairly rigid quantitative targets for nearly all sectors and enterprises in the Soviet Union to the indicative, but not prescriptive, central planning done by such nominally socialist countries as India or Indonesia.

Within this vast heterogeneity of centrally-planned economies is an emerging uniformity of result. As Hartford's work shows, central planning with quantitative controls places a heavy burden on the performance of the food system. But at the same time, food remains the most basic of human needs. Out of the tension between the failure of planning to generate a modern, efficient food system and the urgent desire to

⁹The necessity for a food stamp program in the United States, however, suggests that market-oriented economies may never become rich enough for all consumers to be able to afford adequate diets from their own earned incomes. Even rich countries have hungry people if there are no food interventions.

see that all people are adequately fed has come a great deal of experimentation in socialist countries with respect to the organization of food systems. This has come at the same time that market-oriented economies have sought efficient interventions to improve the access of their poor people to food.¹⁰ No single solution to this food price dilemma is likely to emerge as the answer for all societies, but the underlying importance of markets as a key to all the solutions is being recognized.

D. The Role of Markets

Markets can perform three functions. They can provide the physical and institutional setting for the transformation of agricultural commodities in time, place, and form. These technical marketing activities must be carried out in all food systems, for they involve storing the commodity from harvest to time of consumption, transporting it from farm to city, and processing it into forms desired by consumers. Not all food systems carry out these activities cheaply and efficiently, but they all perform them.¹¹ The second potential role of markets is to provide mechanisms and institutions to transfer ownership (or at least physical possession) of commodities. Shops, stalls, village marketplaces, or supermarkets provide consumers access to food if they have money. The farmer's field or house, a roadside lay-by where a truck can stop, or wholesale markets near a warehouse or mill offer farmers the opportunity to sell. Only totally subsistence farmers do not need markets to play this role. Everyone else must trade something of value, frequently their labor time, for the opportunity to receive food and other goods and services.

¹⁰For a fascinating description and analysis of the experiments with "production responsibility systems" in China, see Kathleen Hartford, "Once More With Feeling: A New Stage in Chinese Agricultural Policy." In some locations the communes have been dismantled, and production decision making has been returned to individuals, households, or very small groups of households. Markets have been reestablished in rural areas to provide both incentives for greater production and signals to planners about surpluses and scarcities.

For a series of reports on government efforts to introduce food interventions in market-oriented systems, see several of the IFPRI Research Reports (Washington, D.C.: International Food Policy Research Institute).

¹¹Much of the marketing chapter (IV) of Food Policy Analysis is devoted to techniques for measuring the costs and efficiency of these marketing activities.

The third potential function of markets is price discovery. When physical transfer of ownership takes place, a bargain has been struck. The buyer parts with the cash equivalent of the price, and the seller parts with the commodity. All societies see some of this sort of exchange--buyers and sellers agreeing on a price for a commodity or service--but in many societies, such exchange is either illegal or restricted to minor commodities. Basic foods are nearly always important in such societies, and attempts are made to enforce centrally-directed terms for the exchange--the price for the commodity. The buyers and sellers are not free to alter these terms, and no matter whether supplies are scarce or in surplus, the price of exchange (and sometimes the quantity as well) is set by the state.

The appeal of such a policy if it is carried out reasonably effectively is twofold. First, stability in prices of basic foods is assured, and this is enormously popular with urban residents who must purchase all their food from modest wage income. Price stability at the farm level is also popular, for with it farmers do not have to develop complicated strategies for dealing with risks from both markets and weather; they can devote their talents to the day-to-day tasks of ensuring the best crops possible given the changing physical environment for farming.

The real issue, of course, is stability at what price. Consumers want low and stable prices, while farmers want high and stable prices. The second advantage of the central government's control over crop marketing and price formation is the potential to set the two prices separately. The subsidies needed to pay the marketing costs incurred between the farm and consumer can come straight from the treasury as a reflection of social priorities.

This approach to price policy is obviously incompatible with the use of markets for price discovery through the interaction of many buyers and sellers. In these circumstances, markets are playing the first two of their potential roles, but price discovery as a market function is truncated by the planning guidelines. This can happen not only in socialist countries but also in market-oriented countries that are trying to enforce specific price levels for particular commodities. Price policy interventions that rely on quantitative controls thus inevitably dampen, and sometimes destroy, the role of markets in price discovery.¹²

¹²It is still possible for a domestic food price policy to buffer domestic decision makers from day-to-day and month-to-month movements in international commodity prices, while allowing domestic markets to operate efficiently in allocating products across time, space, and form.

Markets can play both an engineering and an economic function. The first two roles--the storage, transportation, and processing function and the transfer of ownership--can be thought of as engineering functions. Technical efficiency in their design and operation is crucial to low-cost performance. In planned economies, no economic analysis at all may go into investments in these dimensions of food and agricultural marketing. Whatever equipment and system the engineers designate as efficient are put into the plan. Actual investments are then made according to priorities in the planning agency.¹³

The economic function performed by markets occurs when the costs of transportation, storage, and processing are reflected in the willingness of sellers actually to transfer the commodity to buyers and when the total cost of the purchase influences the consumer's decision of whether or not to buy. Price formation itself is thus taking place in markets as a simultaneous concomitant of the costs to society of producing and consuming the commodity.

This price discovery is important because of the information contained in the prices. When prices are formed in reasonably competitive markets, the scarcity of the commodity as measured by the marginal costs of production (or supply) is matched by the willingness of consumers to substitute this commodity for something else in their expenditure bundle. Prices are signals. When they are high, the commodity is scarce. Producers are stimulated to expand output, and consumers are encouraged to restrict purchases. When prices are low, they signal producers that only minimal effort should be expended in production, and they induce consumers to expand their use of these cheap goods and services. Both high prices and low prices are important; they provide signals to decision makers to adjust their behavior to reflect a disequilibrium between long-run supply and demand.

The full importance of markets to the food system now begins to become apparent. Food production is inherently unstable, and even demand is often hard to foresee, especially demand in export markets. More than perhaps any other major part of the economy, a country's food system tends to be moving from one disequilibrium

¹³For an example of an engineering approach to planning marketing investments at the national level, see C. Peter Timmer, "The Choice of Technique in Indonesia," in C. Peter Timmer et al., Choice of Technique in Developing Countries: Some Cautionary Tales. For the engineering approach at the firm level, see Louis T. Wells, "Economic Man and Engineering Man: Choice of Technology in a Low-Wage Country," in the same volume.

setting to another. What adjustment mechanisms are available to cope with this continuing disequilibrium and all the risks and costs associated with it?

Market systems have literally millions of decision makers on both the supply and demand sides of the disequilibrium responding through individual adjustments and incentives to bring the system back into balance. None of these adjustments is easy. Low prices can force small farmers to sell their land. High prices can force poor consumers to restrict their food intake. Although these adjustments are potentially painful, they are more or less automatic in market economies.

Centrally-planned or bureaucratically-controlled food systems have no such automatic adjustments. Indeed, the planners themselves may not even know about the disequilibrium because all price information flows only in one direction, from the planning office down. It is not until long lines or signs of urban discontent break through the bureaucratic consciousness that information about scarcities and surpluses arrives at the planning office so that planners can make at least marketing, as opposed to production, reallocations (and frequently not even these). The dynamic adjustment of food systems to new costs and opportunities is hobbled when they are hidden from the decision makers who must ultimately make the adjustments.

One of the great paradoxes of modern economic systems is apparent here. The agricultural and food sector is one of the most "public" in terms of policy and program needs, but at the same time it is one of the most "private" in terms of day-to-day decision making in production, marketing, and consumption. The paradox is explained by the role of markets and the myriad of decisions that are coordinated by those markets. It is the well-known instances of market failure--when markets do not provide adequate supplies of public goods or where markets do not perform efficiently--that gives agriculture its public dimensions: the need for government policy to ensure competitive standards, along with investment in agricultural research, roads and marketing infrastructure, irrigation, communication, grades and standards, and even price stability, which may not be provided by competitive private markets to an extent that is socially adequate. The government's policies and public investments determine the efficiency and dynamism of a country's agriculture more so than in almost any other sector. But at the same time, millions of individual households make the day-to-day decisions that actually generate the efficiency and dynamism.

Significant tension exists over the widespread failure of markets in the food systems of rich and poor countries to guarantee all citizens access to food and the desirability, even necessity, for societies to use markets as the vehicle both to reach individual producers and consumers efficiently and to generate an evolving flow of

information about costs and returns in the sector. Two fundamental approaches have been used to resolve this tension. One has been to displace markets from these functions and rely on planning allocations or direct parastatal controls instead. As the approach that uses quantitative controls has become progressively less efficient in a highly dynamic world where opportunities and potential losses are a function of information flows, new planning experiments have been tried. These have taken several forms: the Hungarian orientation to agricultural exports led by decentralized coops and firms reacting to market signals, the Chinese experiment with production responsibility systems and rural markets, and an expanded role in several Latin American and African countries for private traders in legal markets as competition for government marketing parastatals.

The alternative approach has been to use government interventions to strengthen the efficiency of markets within a policy framework of investments in public goods and a commitment to solving the problem of hunger through targeted consumer subsidies that reach the poor without seriously distorting the signals generated in the markets. Investments in a marketing system can lower marketing costs directly, thus easing the food price dilemma of providing low prices to consumers but sufficiently high prices to producers, and these investments can also increase the efficiency and competitiveness of the marketing system by lowering barriers to entry. Efficient markets, however, do not solve the problem of hunger in the short run any more than providing food rations at cheap prices solves the problem of building a productive rural base to solve the problem of hunger in the long run. A bridge between these two problems is essential if both are to be solved. Price policy connects the short run to the long run by pointing decision makers in the right direction.

It should be clear that the market approach does not call for eliminating government price interventions in food markets. Rather, it is a matter of determining the mix of government interventions that can best serve the society's needs in the short run and its goals in the long run. Policies that get this mix right will require disaggregated analysis with finesse in design and implementation. Policy is more than just getting the prices right, although this is certainly an important piece. It must also provide appropriate institutions and mechanisms for institutional change as the structure of the economy matures. Markets are an important and perhaps critical institution in which these changes can take place quickly and efficiently. Where this occurs, the capacity to do technically complex and intuitively rich policy analysis will be a valuable resource. It will be the only way to provide policy makers with the sophisticated understanding of food systems needed to send appropriate signals in a dynamic world.

III. FOOD POLICY AND ECONOMIC GROWTH

The Keynesian Revolution in economic thought on the role of government in stabilizing the macro economy, along with the analysis from Pigou to Lerner on welfare problems created by specific types of market failures, legitimized the "great liberal compromise," to use Scitovsky's phrase. This compromise seeks to retain "enough" of the efficiency of market allocation to avoid total state control, and yet use government policy interventions to promote social justice. The issue is particularly clear in the food sector, where purely market forces nearly always result in skewed asset and income distribution, throwing up both poverty and hunger in the midst of wealth and plenty. Social pressures are strong to intervene in the domestic economy to counter this aberrant (many say obscene) outcome of "normal" economic forces. Price policy designed to make basic foodstuffs cheap has been the major vehicle governments in poor countries have found effective in accomplishing this task.

But the effectiveness has turned out to be illusory and short run for many countries. Even within a context of sophisticated government understanding of the role of markets in generating information and physically connecting producers and consumers, government policy must cope with a much broader set of interactions and issues than just the impact of food prices on the poor. The food price dilemma is one of these issues, but there are others. Most macroeconomic policies, as opposed to sectoral projects and programs, affect the entire economy, including the food system. Also, as Schuh (1977) argued for the U.S. economy, the performance of the food sector can have significant macroeconomic repercussions. Government policies designed to provide the poor with improved access to food while providing farmers with adequate production incentives might solve the food price dilemma in the narrow sense, but be so distorting to the rest of the economy that the solution is not sustainable. Similarly, growth policies for the industrial sector that ignore the agricultural and food sector can also be ultimately self-defeating. The task for government policy, especially that policy aimed at solutions to poverty and hunger in the long run, is to place the food sector in its macroeconomic context and find an appropriate balance of policies that lead to self-sustained growth.¹⁴

¹⁴The relationship between agricultural and overall economic growth has been a major topic of development thought for many years. The most influential early article was W. Arthur Lewis's "Economic Development with Unlimited Supplies of Labor," which appeared in 1954. Lewis is often accused of "ignoring" agriculture in his growth model, which treats the traditional sector as the source of both labor and food surpluses for the

A. The Food System and the Macro Economy

It is important to understand the two-way street between the food sector and the macro economy. For some countries the food economy and the macro economy are more or less the same thing. They are still sufficiently poor that most GDP is generated from rural-based production. When processing and marketing activities are added to the purely agricultural base, the point is simply made stronger. Good crops, at stable prices, mean years of good incomes. Crop failures plunge the entire economy into depression.

Few economies remain so heavily dependent on agriculture, although the entire food and agricultural sector--the agribusiness sector--seldom declines below 20 percent of total economic activity even in rich countries. Yet for countries with 20 to 30 percent of GDP stemming directly from agriculture, and another 10 to 20 percent from input processing and marketing activities, the income, demand, investment, and employment links between rural and urban sectors remain quite strong. Multipliers of employment from changes in rural incomes can be substantial, provided that consumer prices do not favor imported goods over ones that are produced domestically. Demand for fruits, vegetables, and livestock products is quite elastic with respect to both rural and urban incomes, and these products can be very labor intensive if produced appropriately from domestic resources. Similarly, the demand for light industrial goods--pots and pans, bricks, tiles, clothing, dishes, glass, bicycles, and furniture--can provide the basis for domestic industries that are very employment intensive.¹⁵

Price policy provides one of the key policy levers for generating the rural incomes that create this kind of demand. In contrast, some government policies effectively drain incomes out of rural areas by explicit or implicit taxes on basic agricultural commodities

rapidly growing industrial sector. A close reading of Lewis, however, reveals his understanding of the need for a dynamic agricultural sector, rather than a static one, in the development process. Johnston and Mellor elaborated on this theme in 1961, beginning a stream of increasingly persuasive and influential analyses of the role of agriculture in development. Johnston and Mellor have recently stressed the importance of two-way growth linkages between the rural and urban sectors, Mellor in The New Economics of Growth, and Johnston (with industrial economist Peter Kilby) in Agriculture and Structural Transformation: Economic Strategies in Late-Developing Countries. The book edited by Eicher and Staatz, Agricultural Development in the Third World, especially the introductory essay, provides a current review of these issues.

¹⁵These connections are modeled at a macro level in C. Rangarajan, "Agricultural Growth and Industrial Performance in India."

and subsidies for consumers. Such price policies raise the disposable incomes of consumers, especially middle- and upper-income urban consumers (unless the subsidies are targeted directly to the poor). These consumers tend to have different expenditure patterns from those of their rural cousins. Urban consumers buy more imported goods and products of the urban industrial sector, which tends to be more capital intensive than rural industry, especially if heavily protected. Again, these secondary effects on employment and income distribution that are generated outside the agricultural sector are not easy to quantify, but they may be important nonetheless. Only investigation in specific circumstances can say.¹⁶

Taylor has constructed several simple macro models that capture some of the Keynesian consequences of food price changes. These models are more applicable in an economy with a substantial industrial sector operating behind tariff barriers that permit it to be high cost, and hence uncompetitive in export markets. The fairly rigid quantitative demand for food and its large share in the average consumer's budget means that food price changes lead to substantial real allocations of budget expenditures to food (when prices increase) or away from food (when prices drop). As a consequence, the shift in consumer spending on industrial goods can have a major impact on total demand and utilization of industrial capacity, thus affecting industrial employment. Many developing countries do not have industrial sectors of sufficient size for this to be an issue, but the newly industrialized countries of Latin America and perhaps India and Egypt fit the description.¹⁷

¹⁶Examples of methodologies that might be used to capture some of these effects are presented in Raj Krishna, "Measurement of the Direct and Indirect Employment Effects of Agricultural Growth with Technical Change," John Mellor, "Food Price Policy and Income Distribution in Low-Income Countries," and Peter B. R. Hazell and Ailsa Roell, "Rural Growth Linkages: Household Expenditure Patterns in Malaysia and Nigeria."

¹⁷Trade orientation is an important element of Taylor's models. Import-substituting countries operating behind protective tariff barriers tend not be able to find additional export markets if domestic demand falls when food prices rise. Countries using export-led growth as the engine of development, such as Taiwan and South Korea, are less susceptible to such shifts in domestic demand. They pay a heavy price, however, by being dependent on the vicissitudes of external demand for their industrial products. As the world recession in 1982-83 has demonstrated, this demand does not ride a one-way "up" escalator. The best presentation of Taylor's models is Lance Taylor, Macro Models for Developing Countries, especially Chapter V that contains the model called "price policy and the food people consume."

Many of the dynamic ramifications of agricultural price policy occur as ripples throughout the macro economy, affecting not only rural and urban employment, the structure of wages, and demand for industrial goods but also investment decisions. The overall level of investment in an economy is a key variable in even the simplest macro models. The potential of price policy to change the level of investment, primarily because it changes income distribution between producers and consumers and between urban and rural areas, is thus an important macro concern. The composition of the investment is not necessarily a macro issue, but it does strongly affect the dynamic impact of price policy on income distribution, long-run growth, and the structure of the economy.

At any given point in time, savings rates tend to be higher in households with higher incomes because low-income consumers must spend most of their resources on current needs. Upper-income households save more in the form of financial assets and make much larger investments in their family's human capital in the form of expenditures on education and health care. A price policy that transfers income to poor consumers at the expense of upper-income consumers can be expected to lower the aggregate savings rate for the society, and vice versa. Although a low volume of savings used very efficiently in investments can allow a country to outperform in growth terms another country with a high savings rate but very low efficiency of investment, it remains obviously true that a high savings rate and high investment efficiency lead to the best performance of all. Current empirical literature on the effects positive real interest rates have on both volume of savings and efficiency of investment suggests the two are correlated. Consequently, a food price policy that avoids subsidizing consumption either explicitly or through an overvalued exchange rate may reinforce macro policies that pursue "efficiency" levels of interest rates and foreign exchange rates.¹⁸

An agricultural price policy that provides additional financial incentives to producers has an impact on sectoral investment that is also likely to reinforce the macro effects. Farm households have higher savings rates than those of households where income is earned entirely from wage labor, mostly because of the opportunities producers have to make productive investments directly in the farm enterprise. These investments might be very short term--fertilizer, pesticides, or seeds, for example--but they can also

¹⁸For further elaboration of these issues, see the macro chapter (V) of Food Policy Analysis, as well as C. Peter Timmer, "The Financial Aspects of Macro Food Policy" (1983b). The chapters on monetary and fiscal policies in Economics of Development place these issues in their broader development context (see Gillis, et al.).

have significant longer-term effects. Careful development and maintenance of irrigation works, land-leveling, long-run enhancement of soil fertility, and investment in higher-value tree crops or livestock operations all affect productivity in the long run. They are also quite responsive to the price environment facing farm households. One of the major tragedies attending a sustained bias against farm-level price incentives is the loss of this source of potential growth in agricultural productivity.

One last influence of agricultural prices on investment must be noted. Even without accepting the entire induced innovation hypothesis of Hayami and Ruttan, it is clear that government investments in agricultural research, infrastructure, and other supporting services for rural areas are very much a function of the perceived scarcity of food. Prices are one loud and clear signal about the degree of this scarcity. Domestic investment decisions that are based on social benefit-cost analysis need not incorporate actual market prices into the analysis. Since government is doing the investment, social prices, rather than private prices, can be used to value benefits and costs.

There is clearly a tension, however, between an investment decision based on one social value for an agricultural or food commodity and a domestic price policy that places a different social value on it. The different time frames of implementation--importing food to achieve price stability in the short run as opposed to investments in agriculture for productivity growth in the long run--mean that full consistency is not essential. But the analytical and managerial complications of actually using different short-run and long-run planning prices are serious indeed. Perhaps equally important, private investment decisions, particularly at the farm level, are made on the basis of expected private prices, not the planning prices used in social benefit-cost analysis. Forgoing this potential source of growth must be included as one of the potential costs of a price policy that provides general food subsidies to all consumers.

One response of policy analysts to the complexity and pervasiveness of effects of agricultural and food price policy is to retreat to a market-induced, neoclassical answer. As long as factor and product markets are allocating resources reasonably effectively, government policy makers need not worry about all the indirect, roundabout, and dynamic effects of price policy. There are three substantial problems with this approach. First, it presumes that domestic price policy will mirror international opportunity costs. Secondly, it presumes that domestic product and factor markets function well enough to satisfy the neoclassical conditions for efficient resource allocation. This may not hold, especially for rural labor markets in heavily populated poor countries where the "market" wage leaves substantial numbers of underemployed and unemployed workers. Lastly, it presumes that the short-run consequences of the

market solution for income distribution, including the nutritional effects, are acceptable to the government.

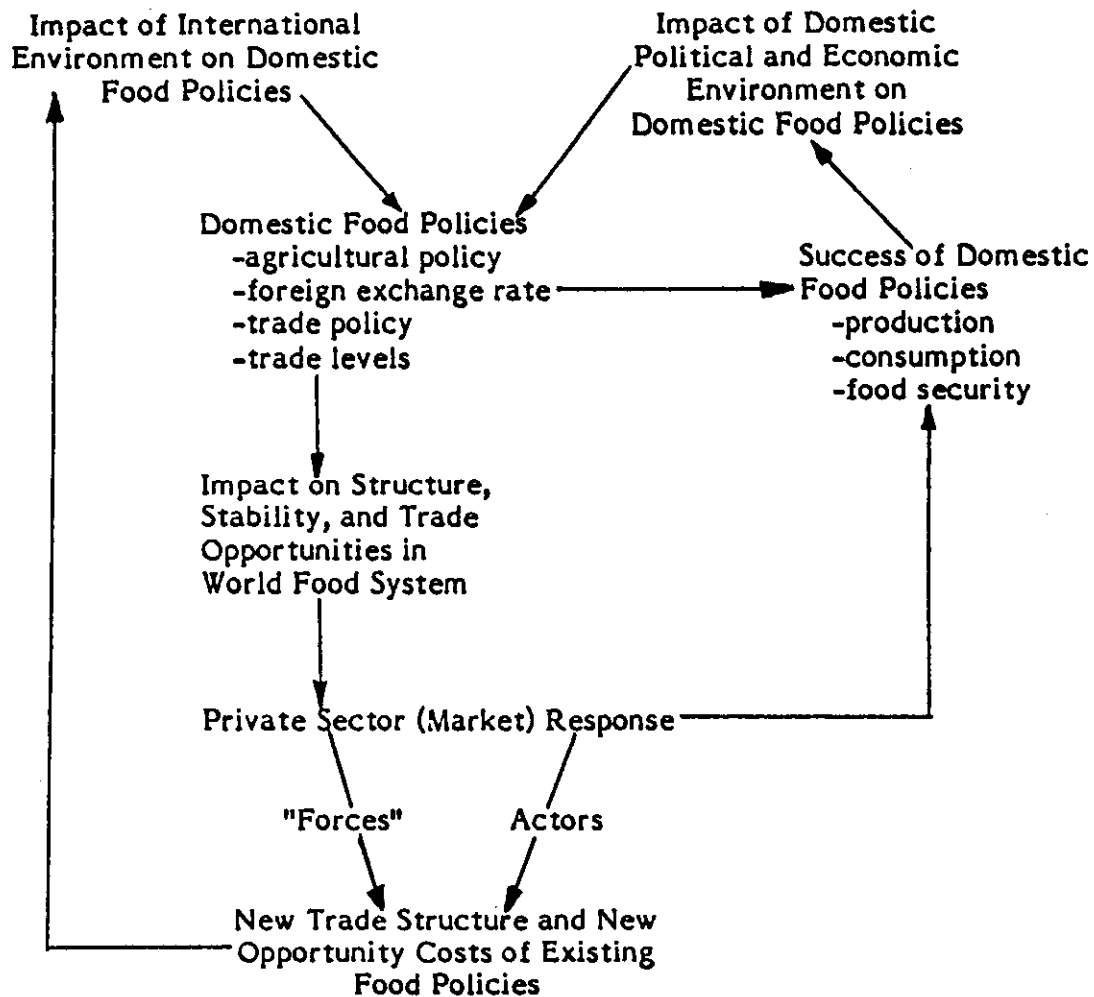
All governments intervene in the formation of their domestic food and agricultural prices. While the free market solution provides a powerful paradigm for understanding how these interventions work, its normative judgements are not sufficiently robust, or realistic, to provide satisfactory answers for making policy. Its power lies not in providing an optimal answer but in identifying alternative costs and benefits to different interventions. The search for the full range of effects of price policy interventions, no matter how far-ranging or complicated, is thus legitimate and important. Policy analysis will always be a process that is at least as intuitive as it is quantitative.¹⁹ To treat it exclusively as one or the other is to miss both the strength of the underlying economic models of resource allocation for illuminating important social choices and the necessity for society, rather than analysis, to make those choices.

B. The Domestic Food System and the International Economy

In no area is the necessity for society to make basic policy choices more evident than in defining the relationship between a country's domestic food system and international commodity markets. Virtually all countries use international markets as one means of implementing domestic food policies, and the long-run opportunity costs of imports and exports has been held up as a standard against which to judge the efficiency of policy interventions. The world markets that generate these signals are not static, however, and both broad economic forces and participants in the markets directly shape the response of the world food system to the policy environments set forth by governments. As Figure 4 shows, these responses generate a new market environment which feeds back to domestic policy formation and the costs of implementation. The issue is how domestic food policy responds to the international environment when it simultaneously changes that environment as well. The key to this issue lies in understanding the formation of a country's foreign exchange rate and its effect on the food system.

¹⁹The point is made in an especially compelling way in the introductory chapter to Bruce F. Johnston and William C. Clark, Redesigning Rural Development: A Strategic Perspective.

Figure 4. Connections Between Domestic Food Policy and the World Food System



The foreign exchange rate is perhaps the most important macro price to any economy that is actively trading in international markets. It moves the competitiveness of producers of tradable commodities up or down, while it also alters their relative competitiveness because of differences in cost structures, especially in use of tradable inputs whose costs are linked to foreign exchange rates. Most developing countries maintain official foreign exchange rates that are overvalued to a significant degree because of high import barriers (either direct controls or tariffs), direct allocation of foreign exchange for "priority" uses, and a strong tendency for domestic inflation rates to be higher than those of their industrialized trading partners. In the absence of controls and trade barriers, a market equilibrium would place a higher price on foreign exchange, thus making imports more expensive in terms of domestic resources while making exports more competitive.

In principle there is no reason why overvaluation should cause a bias against agricultural profitability, but empirically, agricultural commodities tend to be more highly tradable than (protected) industrial goods and services. Most agricultural commodities--grains, beverage crops, fibers--are traded internationally, and those that are not--many root crops, fruits, vegetables, and livestock products--are close substitutes for the traded commodities in either consumption or production. Consequently, their price behavior closely mirrors that of the commodities that are directly traded, and for practical purposes, the entire food and agricultural sector of a country might as well be thought of as producing and consuming tradable goods.

If this is the case, the widespread presence of overvalued exchange rates places an equally widespread burden on agricultural producers--to the benefit of consumers of food and other agricultural commodities (including industry that uses agricultural raw materials). Recent analysis of the effect of changed energy prices on agriculture has modeled this role of exchange rates on the rural-urban terms of trade.²⁰ These terms of trade are an important factor influencing short-run profitability of agriculture and rural-urban income distribution.

²⁰See C. Peter Timmer, "Energy and Structural Change in the Asia-Pacific Region: The Agricultural Sector" (1982) and "Macro Prices and Structural Change" (1984). These papers use changed oil prices for importers and exporters as an "exogenous" shock that has major implications for the macro economy, especially for real foreign exchange rates. A simple model was constructed to trace the ripples of these macro shocks through the total economy and the agricultural sector. The empirical estimation of the model confirmed the strong impact of both oil prices and foreign exchange rates on the rural-urban terms of trade and on the agricultural sector's productivity performance relative to the rest of the economy.

For the Asia-Pacific countries in the sample, a 10 percent devaluation of the exchange rate tended to raise the rural-urban terms of trade by about 1 percent (other trade policy and macro prices held constant). This is quite a powerful effect on the entire agricultural sector in the short run, and individual producers of commodities who use few purchased inputs can have their profitability influenced even more directly if the price at the farm gate is linked to the export price.

In the longer run, dynamic consequences for the sector are likely to be even more substantial and will extend to the nonagricultural parts of the economy as well. A model designed for testing causality, originally devised by Sims, was applied to the same data set used to model prices and structural change to identify these broader effects. A long-standing question in development economics has been whether rapid growth in agriculture causes rapid growth in the nonagricultural sector, or vice versa, or whether the two sectors' growth rates are jointly determined by each other or by exogenous forces. The causality tests for these countries suggest joint determination of agricultural and nonagricultural GDP by mutual market connections and by common outside influences. These are likely to include both endogenously determined macro policies and exogenous conditions such as food and oil price shocks. Whatever the ultimate causes, the empirical evidence shows that the agricultural and nonagricultural sectors of these countries are intimately intertwined, with the international trade sector providing a significant link. Policy for one, especially trade and exchange rate policy, inevitably means repercussions for the other.

C. Macro Food Policy

If the food system has strong and systematic effects on the macro economy, the converse is also true. The impact of the macro economy on the food system can be so powerful that when the macro sector is sending contrary signals, it frequently dooms all efforts of policy makers within the agricultural sector to make any headway in "getting agriculture moving" (to use Arthur Mosher's phrase). A distorted set of macro policies--which typically includes rapid inflation, an overvalued exchange rate, subsidized interest rates for preferred creditors, minimum wages for an urban working class elite, and depressed rural incentives--makes rapid growth in agricultural output extremely difficult, and it serves simultaneously to skew the distribution of earned income. Short-run interests of poor people are often protected to some extent by such policies through the availability of cheap food, usually made possible with subsidized imports.

The options available to food policy makers in such a context are extremely limited: more investment in irrigation, a better agricultural research and extension program, perhaps a subsidy on fertilizer and modern seeds. These will contribute to agricultural growth, but in the constraining environment of a distorted set of macro policies, such programs will not provide the basis for long-run dynamic growth of rural output and incomes, which is the essential base for a food policy that simultaneously increases food production while reducing hunger.

This macro perspective places the food system squarely in the context of economic growth and efforts to alleviate poverty. These efforts involve strategies for the modernization of the agricultural sector, for it is there that much poverty is found. The policies that create this rural dynamism, however, do not all emanate from agricultural planning offices. Most of the decision-making environment required to stimulate efficient resource allocation, labor productivity, and more jobs is created by macroeconomic policy.

At the same time, policy makers understand that the incentives needed to generate much of this rural dynamism can seriously affect the food consumption of poor people. Government policies that use a macro approach to poverty alleviation need to be complemented by a disaggregated micro perspective on decision making by the poor, both as consumers and producers. Poor consumers have different diets from those of more comfortable individuals in a society, their income sources are usually much less secure, and they are more sensitive to changes in food prices. Similarly, very small farmers often do not control adequate resources in the form of land, water, or credit to participate fully in the potential of new agricultural technology. Reaching the poor in the short run is always difficult because of their weak links to the food system and the rest of the economy. The task is to find interventions in the micro environment that can protect their welfare while the macro forces strengthen their links to the economy in the long run.

One role of food policy is to build a bridge between these micro and macro tasks. Understanding the role of trade and markets provides the supports for that bridge, but closing the gap between short-run and long-run effects of macro policy relies on the effective use of both food price policy and carefully targeted food subsidies. Many countries start from an environment for food price policy that uses food imports and budget subsidies for across-the-board consumer protection, while a host of production-oriented government projects attempt to increase food output. Such a price policy/project orientation is backwards. Price policy is likely to be more effective as part of the incentive package that induces greater food production from millions of small

farmers, while targeted food subsidies protect the very poor until they find jobs and higher incomes that result from the new policy environment.

Since much of the environment for rural decision making is dictated by macro policy, rapid rural growth over long periods of time can occur only when this macro environment encourages the efficient allocation of resources. Short bursts of growth are possible from any of the other elements in farm decision making--a new seed technology, subsidized fertilizer, or a more effective extension service. But for the long haul, rural growth will falter in the absence of an overall economic climate that encourages, and ultimately forces, the allocation of land, labor, and capital into their most productive uses. Efficiency losses are compounded by macro policy that distorts the allocation of economic factors away from their most productive uses. The distortions usually found--overvalued exchange rates, subsidized interest rates, depressed agricultural incentives, and low food prices--are motivated by short-run concerns over economic growth and the distribution of the output. Using these macro prices (in their broadest sense) to solve short-run distributional problems rather than to allocate resources for long-run growth will eventually lead the entire economy into stagnation and decline. Economic growth, including growth in rural areas, is ultimately inhibited by such a set of macro signals. At the same time, the short-run distributional and welfare concerns remain and, indeed, are exacerbated if attempts are made to bring the macro prices and macro policy into alignment with the underlying scarcity value of resources.

Determining the impact of a macro reform on important food policy objectives is a crucial analytical task. Such reforms come eventually because serious macro distortions bring enormous pressures for macro policies more consistent with real scarcity values in the economy. Either external creditors--the I.M.F., World Bank, bilateral donor agencies, or the multinational commercial banks--bring these pressures to bear and force the painful adjustment when a crisis is reached, or else a country's macro policy makers stay ahead of the situation and design new policies that avert a crisis.

Even without specific concern for the food system, such a macro reform is likely to improve the rural-urban terms of trade directly by raising the food price to its international opportunity cost. More broadly, the devaluation that brings foreign exchange rates into equilibrium usually will pump new purchasing power into rural areas, with positive effects on rural employment and improved income distribution. Eventually, scarcity values for labor and capital will induce a new efficiency in resource use.

For the reforms to be effective, many price increases will be needed, and overall budget subsidies must be cut. The real incomes of many workers and civil servants will be sharply reduced, and the urban political base of a government can be seriously

threatened in the wake of the painful adjustments needed. From a food policy perspective, those adjustments hinge critically on the likely reductions in food consumption by poor households caused by the higher food prices that almost inevitably accompany a macro reform. Food policy attempts to find a set of food consumption interventions that will prevent the worst manifestations of such a squeeze on the poor, while still stimulating the production response that is the main long-run goal of the reform.

A crucial role for food policy analysis in the macro debate can now be seen. To enable a macro reform to be politically feasible before an economy has crumbled so far that reform becomes a financial necessity, the analysis can pinpoint short-run interventions that are both sound in fiscal terms and effective in reaching the poor. Such designs are possible only within an integrated food policy framework that specifically links the production, marketing, consumption, and macro sectors. By designing short-run targeted food consumption subsidies to help poor people across the bridge to long-run dynamic economic growth, it is easier for macro policy makers to implement the needed reforms in the first place. The political inertia so often observed in the face of macro economies run amok is entirely understandable. An analytically sound food policy can break this inertia by offering macro policy makers a new potential for action.

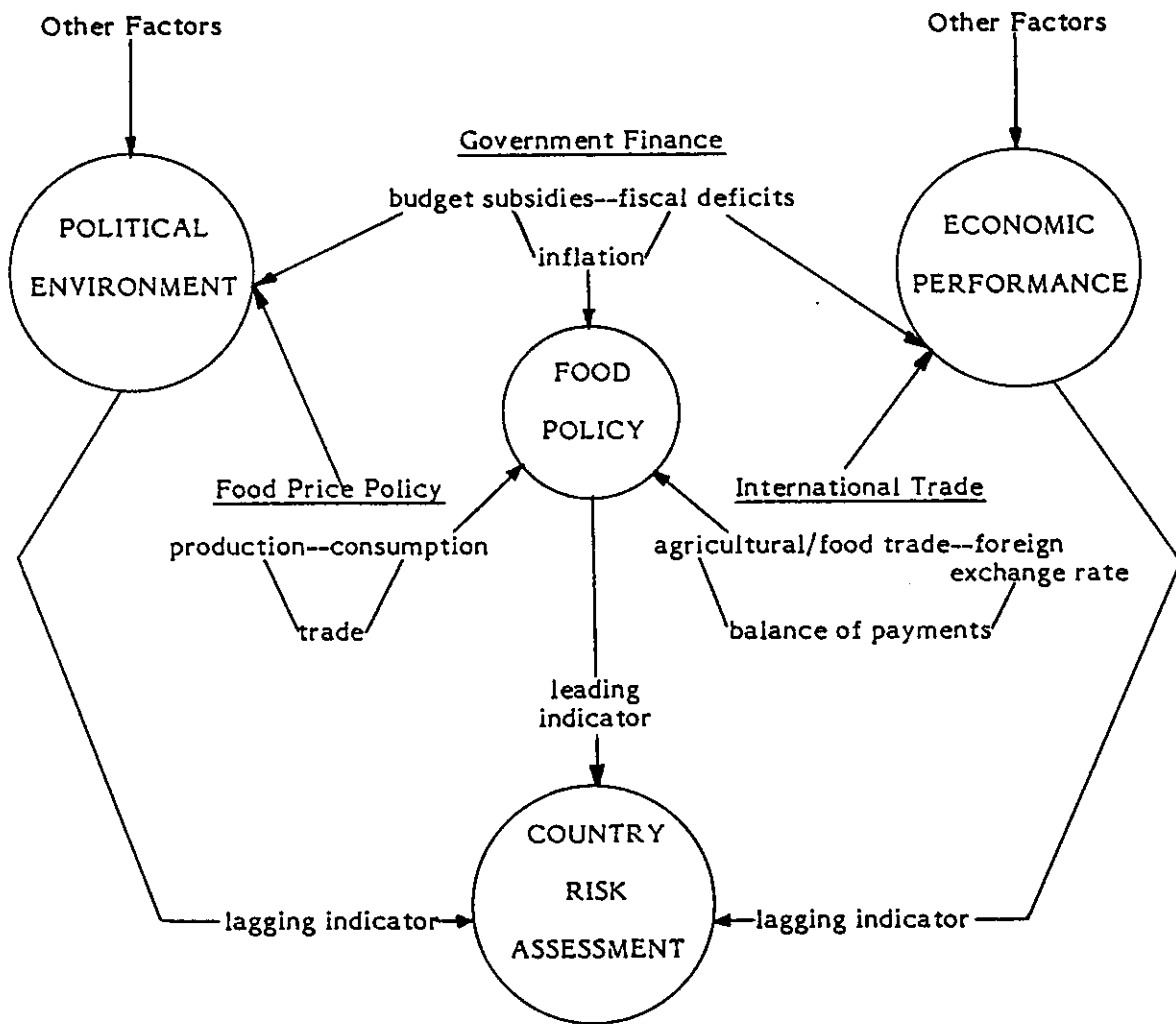
IV. FOOD POLICY AS AN INDICATOR OF "COUNTRY RISK"

The potential for an effective food policy to allow government policy makers to pursue growth-oriented macro policies suggests where to look for early warning signals about the future health of the country's political economy. These signals are generated by the design and implementation of a country's food policy, and they are revealed in answers to the following sorts of questions. How is the country solving the food price dilemma? Are prices to farmers high enough to "get agriculture moving," and are targeted food subsidies available to the poor? Or is the country persisting in a "cheap food" policy, even if it must bankrupt the treasury to pay for expensive food imports? Is the government maintaining an overvalued exchange rate, thereby depressing rural incentives? Are domestic agricultural prices in line with international ones? Do other macro prices--interest rates and wage rates--reflect market scarcities, or do government controls keep interest rates low for preferred borrowers and wages high for an urban industrial elite, thus skewing the choice of technology away from labor-intensive enterprises and their rapid generation of employment? Is the government hostage to its own price policies, immobilized by the vested interests created by the policies themselves? Does this make the economy vulnerable to sudden shifts in external conditions, as the government is locked into inappropriate and counterproductive policies?

Answering these questions--for which Food Policy Analysis provides the tools--reveals early and clearly the potential dangers in a country's political economy to domestic and foreign investors. The food system is highly sensitive to the macro policy that ultimately affects the rest of the economy. Investment climate and "country risk" depend both on the vitality of a country's economy--its growth in real income per capita for example--and the perceived stability of the government and its economic policy. Consequently, purely economic measures of a country's performance are not as likely to provide the breadth of coverage or the richness of insights as a political economy approach which consciously integrates the feedback effects among political forces, policy making, and economic performance.

Figure 5 illustrates how the components that are central to a country's food policy--food price policy, government finances (especially the role of the subsidies), and the international trading sector (especially the foreign exchange rate)--can be linked to measures of economic performance, to indicators of the political environment, and ultimately to an assessment of country risk to investors. Food policy is shown at the intersection of the three components.

Figure 5. Analyzing Country Risk



Government finance is a key factor in food policy because of the extensive use of subsidies to affect agricultural profitability and consumer welfare. When the subsidies serve productivity goals and remove economic distortions, as with the fertilizer subsidy in Indonesia (Timmer, 1983a), economic performance is enhanced. Targeted food subsidies can protect the welfare of the poor. But economy-wide subsidies on a country's basic food grain can cause severe pressures on government fiscal resources, frequently causing governments to resort to low farm prices or special exchange rates for grain imports. Fiscal pressures thus affect agricultural price policy and the international trade sector, but they also tend to spill over into monetary policy and rapid growth of money supplies, leading to inflation. This too alters the real value of a fixed foreign exchange rate and the rural-urban terms of trade in the face of fixed agricultural price policies. It is clear that government financial policy, especially with respect to food-related subsidies, has important ramifications through the food sector for both price policy and international trade.

The second component, food price policy, can be implemented only with some combination of budgetary or international trade instruments. Food price policy is at the core of the food policy debate and is the main indicator of how a country is resolving its basic food price dilemma. Where a country's food price policy fits in its overall development strategy, and relative to other countries that are potential competitors for investors' interest, signals fairly clearly whether the country is favoring producers or consumers. Some countries, such as Mexico under SAM and China under Deng, use subsidies to favor both, but with all the potential consequences just outlined for finance, the macro economy, and trade.²¹ On the other hand, favorable producer incentives when coupled to highly targeted consumer subsidies indicate a sophisticated government policy that is grappling with the food price dilemma in a concerned but fiscally more sustainable manner. Such a country is likely to have a favorable long-run political environment because of government efforts to ameliorate the worst manifestations of poverty in the short run and its commitment to economic growth, with the prospect of reduced poverty in the long run.

A useful indicator of the effectiveness of a country's food price policy might well be a comparison of the growth rates in agricultural output with the rate of decline in nutrient deficits (or number of individuals with energy deficits). If the two are moving

²¹SAM is the acronym for Sistema Alimentaria Mexicano, or Mexican Food System, initiated by President Lopez Portillo in 1979.

more or less in tandem, the food price dilemma is being resolved in a balanced, sustainable fashion. If the nutrient deficits are declining but agricultural output is not rising, the government gets high marks (and probably political support) for its welfare concerns, but the productivity base will eventually be eroded, as Sri Lanka and China observed in the 1970s. On the other hand, rapid gains in output without commensurate nutritional gains bespeak a deteriorating income distribution with potential political fallout. India, Brazil, and Indonesia (until 1978) seemed to follow variants of this path.

The third component of food policy, international trade, serves as a balance wheel for the financial aspects and the consequences of food price policy. International trade in basic foods is very much a policy instrument for most developing countries, not simply the result of comparative advantage as expressed in world grain markets. To be sure, Figure 4 showed that domestic policy and international markets are not exogenous to each other, especially over the intermediate to long run when participants in the world food system itself respond to the new pressures and opportunities created by a country's use of trade as a food policy instrument. Such trade is not costless, however. For a country to import grain, it requires foreign exchange, and to earn it, a country needs at least one export sector that is competitive in international markets. The more broadly based the capacity to earn foreign exchange (or to compete efficiently with imports), the more effectively do links across sectors energize the growth process for all sectors.

The empirical evidence discussed earlier shows that the food and agricultural sector is particularly sensitive to international trade signals and opportunities, especially to the foreign exchange rate. An analyst who understands how a country's set of policies and restrictions on currency and trade affects its foreign exchange rate, and thereby the performance of the entire food system, has an acute feel for the part of the economy most vulnerable to international shocks. While it may take several years for pressures on the food system to show up in measures of economic performance, the vulnerability itself is clearly reflected in the structure of exchange rate formation and subsequent influence on the food system. For this reason, Figure 5 shows changes in the international trade sector affecting economic performance, but this performance serves only as a lagging indicator of country risk.

By the time economic performance has sagged, it is much too late to be learning about the risks inherent in a country's economic policies. By the same token, the day before rioters bring down the government is too late for indications of political risk to be surfacing. The political consequences of a government's financial decisions and changes in food prices are obvious enough when the cabinet falls, and so these consequences of the political environment in Figure 5 also turn out to be lagging indicators of country risk.

What is needed are leading indicators, and food policy analysis can play a role in identifying them. Burgeoning consumer food subsidies can show a government is concerned about poverty or politics, or both. But if the subsidies are untargeted, they can also signal future stress on the budget and the need to divert resources away from productive investments, to print money to cover the deficits, or to increase basic food prices sharply. All of these actions will ultimately affect the investment climate of the country, but a focus on food policy identifies their potential impact well before the negative repercussions are actually felt.

On the international trade side, the critical indicator is not the current account balance, the overall balance of payments, or foreign exchange reserves, but rather the foreign exchange rate and the policy mechanisms for setting and defending it. Countries that see the foreign exchange rate as a test of national virility or as a strictly political instrument to protect domestic importers are unlikely to be flexible enough to react to changed circumstances, either domestically or internationally. This rigidity in policy making renders the country particularly vulnerable to oil price shocks, changed terms of trade, or differential inflation rates with trading partners. Broadly based international trade is a powerful engine of growth for an economy, with the rural sector in particular caught up in its momentum. Because of the food system's response to the exchange rate and the necessity to adjust the exchange rate to changed circumstances, an overvalued exchange rate thus provides another early warning to potential troubles ahead.

A country's vulnerability to exogenous (or endogenous) shocks is the ultimate test of its potential risk. If everything stays smoothly on trend, simple trend analysis provides adequate information about likely investment climates. But risk is concerned with possible deviations from trends. Since all countries inevitably have occasional unpleasant surprises that shatter the trends, two questions become important. First, how resilient is the economic and political system to such shocks? Understanding the dynamics of the food system helps answer this question. Analysis of a country's food policy is an especially sensitive approach to identifying areas of strength and weakness in an economy. Second, how flexible and sophisticated are the country's political and economic leaders? Food prices and food security are crucial to a country's political health. A focus on its food policy reveals how well policy makers manage food price policy and comprehend the implications for foreign trade. How the government reacts to the foreign exchange rate's effect on the food system and uses the political economic mechanisms to set the exchange rate yields clear evidence of the policy makers' flexibility and awareness of the implications of their actions.

Analysis of a country's food policy integrates these apparently diverse perspectives and creates from them a sensitive barometer of the health of a country's political economy. To be fair, some countries have poorly managed food policies and have had vibrant economies anyway. But these "outliers" tend to be rich--Japan, Kuwait, or Saudi Arabia, for example. Some, such as Brazil, Mexico, Venezuela, or Nigeria, have lived on borrowed funds while becoming progressively more vulnerable to outside factors. Others have such rich agricultural resources, as do Kenya and Thailand, that they can be mined for long periods before exploitation shows sharply diminishing returns. For most countries a look at food policy is highly revealing of broader economic and political forces at work, and even for the exceptions noted above, analysis of a country's food policies in their larger macro context would have provided early signals of major turbulence ahead.

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