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FOOD PRICE STABILITY AND WELFARE OF THE POOR

by

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FOREWORD

The Cornell Food and Nutrition Policy Program (CFNPP) was created in 1988 within the Division of Nutritional Sciences to undertake research, training, and technical assistance in food and nutrition policy with emphasis on developing countries. The Nutritional Surveillance Program (CNSP), which was formed in 1980 with support from the Agency for International Development, is part of the CFNPP.

CFNPP is funded by several donors including the Nutrition Office and the Africa Bureau of the Agency for International Development, UNICEF, the Pew Memorial Trust, the Rockefeller Foundation, the government of Indonesia, and the World Bank.

CFNPP is served by an advisory committee of faculty from the Division of Nutritional Sciences, the departments of Agricultural Economics, Rural Sociology, and Government, and the Program of International Agriculture. Several faculty members and graduate students collaborate with CFNPP on specific projects. The CFNPP professional staff includes nutritionists, economists, and anthropologists.

The Pew/Cornell Lecture Series on Food and Nutrition Policy, which was initiated this year, is sponsored by the Pew Memorial Trusts of Philadelphia and the Cornell Food and Nutrition Policy Program to generate and exchange knowledge about how government policies affect the welfare of the poor including their food security and nutritional status.

In this lecture Professor Peter Timmer discusses the pros and cons of government policies aimed at the stabilization of the prices of food staples. He argues that price stabilization is likely to result in greater investment both within and outside agriculture, enhanced economic growth and improved welfare of the poor including better nutrition. He concludes that fiscal costs of stabilization policies can be justified on grounds of economic efficiency and nutritional welfare of the poor.

November 30, 1988

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Rich countries and poor alike are increasingly urged by economists to "get prices right." These are often code words meaning that governments should stop intervening in formation of market prices. Especially in the food and agricultural sector, where markets tend to be competitive, trade liberalization is nearly always prescribed for countries suffering from structural imbalances and slow or negative growth. The generic advice to use free markets to determine food prices is one component common to most structural adjustment programs required in the past decade.

Why should governments intervene in the pricing of basic foods, and what stake do the poor have in that rationale? From the perspective of economics, only two possible reasons for an interventionist food price policy might be defended: the interventions could improve the efficiency of the economy and thereby speed economic growth; or they could improve income distribution and raise the welfare of the poor.¹ The poor have a stake in either case, but their short time horizons tend to weight their interests toward near-term improvements in income distribution even if the benefits come at the expense of the longer-term speeding of economic growth. Economics is especially designed to identify and analyze the types

¹Strictly speaking, a neoclassical economist would defend pricing interventions to redistribute real incomes only if non-price redistributions such as lump sum transfers or asset redistributions were impossible for bureaucratic or political reasons. Such is often the case, however.

of conflicts that occur when such trade-offs between good objectives are confronted, but policies that can contribute to both dimensions are superior to those aimed at only one.

This paper examines the potential to use food price policy to improve the welfare of the poor in both dimensions. Although trade-offs between efficiency and income distribution are identified and discussed, the main focus is on the unique role played by policies that stabilize food prices to contribute simultaneously to both economic efficiency and nutritional welfare of the poor. This argument is not new to the economics profession, but the analytical case for food price stability has never been put in a sufficiently dynamic and macroeconomic context for the benefits to appear large, relative to the costs of stabilization programs. Drawing on recent work on this issue, the paper reviews the analytical basis for such programs and then examines evidence from a sample of twelve countries in Asia and the Near East with respect to relationships between income growth and improvements in average caloric intake since 1960. The conclusion, that the level and stability of food prices are important factors—in addition to simple changes in average per capita incomes—in explaining such improvements, reinforces the analytical case for stabilization.

THE ANALYTICAL CASE FOR PRICE STABILIZATION²

With the early contributions of Smith, Marshall, and Pigou to the economics literature, economists have understood for nearly a century the basic analytical rationale for government interventions into market price formation. Economies of scale and monopolies, externalities in production and consumption, public goods, and imperfect information in the absence of complete contingency markets have long offered theoretical justification

²This section draws on Timmer (1989).

for interventions designed to correct such market failures. The resurgence of the free-market paradigm in the 1980s builds on a crucial lesson from postwar development experience: policies that attempted to strengthen the competitiveness of markets as a way to improve their efficiency outperformed policies that attempted to correct for market failures by suppressing market activities. This success for market-oriented policies came about primarily because government failures in market interventions were often far more serious in terms of wasted economic resources and forgone growth than were the market failures they were designed to correct.

An additional factor grew out of the theory of the second best. Many imperfections in markets, especially in rural factor and product markets, could be explained as second-best adaptations to inherent constraints on first-best arrangements because of imperfect and asymmetric information, moral hazards and high transactions costs, and a significant degree of risk aversion by the very poor in the context of incomplete credit and contingency markets. In such circumstances, government interventions into one market run a substantial risk of lowering the welfare of the poor because the connections of that market to other markets provide some degree of welfare insurance. Under the twin banners of "government failures" and models of interlinked markets in a second-best world, neo-neoclassical and social-choice theorists provided a new intellectual foundation to the free-market paradigm.³

POTENTIAL VERSUS ACTUAL BENEFITS OF GOVERNMENT INTERVENTION

The basis of the new intellectual foundation for policies favoring free markets is not theoretical, however, but inherently empirical. Given

³See especially Stiglitz (1987), Srinivasan (1985), Braverman and Guasch (1986), and Bates (1981).

the reality of widespread market failures in developing countries, modern welfare economics is very clear on the *potential* scope for government interventions to achieve a Pareto-superior position for the economy. Whether a government can improve welfare through an actual intervention in a specific case depends on two factors: whether the market failure itself is “real” within the context of the theory of the second best, and whether the government can actually improve social welfare by intervening. The latter question must be addressed in a dynamic context that explicitly includes the potential for vested interests to capture both the economic gains from the policy intervention and the policy-making process itself, thus leading to further interventions that carry the economy away from the Pareto optimum achieved by the initial, but limited, government intervention.

These analytical foundations for free-market policies can also be used to develop the empirical case for price-stabilization policies. In doing so, however, this paper rejects the emerging consensus that the welfare gains from price stabilization, although theoretically justified, are empirically not very important relative to the costs governments must incur in order to stabilize prices.⁴ Two key innovations in the analysis, one microeconomic and one macroeconomic, lead to such different empirical conclusions. The first is to consider the farmer as an investor rather than the manager of a static stock of assets and a flow of variable

⁴This is the key conclusion in Newbery and Stiglitz (1981), in Stiglitz (1987), and in Bigman, Newbery and Zilberman (1988). The latter authors, for example, in their discussion of Just’s (1988) arguments for price-stabilization policies, make the following comment: “Attempts to quantify the net (efficiency) benefits of institutional attempts to reduce risk, like commodity price stabilization or quota policies, suggest that they are usually small and often negative” (p. 461). The conclusion that there is little empirical rationale for governments to attempt to stabilize food-grain prices is so sharply at variance with actual experience that different approaches should be investigated.

inputs. The model of farmer as manager is the basis of nearly all theoretical and empirical assessments of risks from price and yield instability, but the model clearly excludes important elements in farmer decision making that are strongly influenced by these risks, especially expectations and patterns of investment in physical and human capital. Transforming the problem into one of dynamic portfolio investment decision making enormously complicates the analysis of risk, even when restricted to farm-level issues.

Tracing the macroeconomic ramifications of price instability is even more complicated because general-equilibrium analysis is needed with dynamic investment functions that are conditioned by stability-sensitive expectations.⁵ But incorporating these dynamic factors into both the micro and macro analyses offers the opportunity to examine the impact of price-stabilization policies on agricultural development and economic growth. The static, micro-based models simply do not address these issues; they are incapable of assessing the consequences for the economy of the price-stabilization policies that are widely implemented—consequences that policy makers actually worry about.

THE QUANTITATIVE SIGNIFICANCE OF PRICE STABILIZATION

The important analytical question for the evaluation of stabilization policies is not to demonstrate that pervasive market failures in developing countries lead to non-Pareto-optimal outcomes but to show that they are quantitatively significant relative to the costs governments would incur in order to alleviate them. Large costs from price instability will not be

⁵The macroeconomic dimensions of price stability are stressed in Ravi Kanbur's review of the Newbery-Stiglitz book. See Kanbur (1984). The extreme difficulty of building dynamic investment factors into general equilibrium models of agricultural pricing can be seen in de Janvry and Sadoulet (1987).

found in the static, micro-based models that follow the Newbery-Stiglitz tradition. As noted above, impact on investment behavior and on the macro economy are the obvious places to look for more significant benefits from price stabilization, as well as at consumer preferences for price stability in the presence of adjustment costs. No formal model is offered here, but the likely ingredients of a model that would capture these effects include the following: displaced investments in physical capital at the farm level, in the marketing sector, and the industrial sector; substitution of consumption and leisure for savings and work; biases in investments in human capital for the farm agent and intergenerationally in children; the transactions costs consumers face in reallocating budgets when prices change; the welfare gains from a psychic sense of food security (and voters in rich countries and poor alike place a substantial economic price on this factor); and the feedback from this sense of security to a stable political economy, which reinforces investors' willingness to undertake long-term (and hence risky) commitments.

Investment

It has long been recognized that the absence of long-term contracts, future-contingency contracts, and perfect credit markets induces a downward bias in investment in both physical and human capital.⁶ Unforeseen instability in food prices is likely to cause reduced investment in both kinds of capital at three levels of the economy. At the farm level, price instability leads to lower investments than are optimal in production for the market relative to production of subsistence crops, in productivity-enhancing soil amendments, irrigation and drainage facilities, land leveling, and new technology, as well as in commodity-specific knowledge and skills.⁷ Farmers also invest in processing and marketing equipment

⁶See Crawford (1988) and Becker (1962).

small mills, motorcycles, and trucks- that allow them to increase the value added of their sales through better quality or timeliness of delivery. Significant instability in prices make such investments riskier than is optimal for the society as a whole. The displaced investments are likely to be reflected in lower savings rates from farm income- because rural credit markets usually do not offer efficient financial intermediation.⁸ There is also likely to be some displacement of work, and hence earned income, in favor of greater leisure. Both the added consumption from displaced savings and increased leisure contribute to welfare of the farm family, of course, but the shift in allocation of time and resources because of price instability is not optimal for economic growth.

Investments by the private sector in marketing infrastructure are also dampened in the face of price instability (except, perhaps, for short-run speculative investments), and this lack of investment has a particularly negative impact on growth because of the increasing returns and public-goods aspects of development of an efficient marketing system. Such a system must connect farmers with local buying agents, thus transmitting market information and permitting exchange to take place.

⁷The concern for inefficient allocation of farm investments in the face of price uncertainty is not new. An early general analytical treatment is in Schultz (1945); the first specific application was the "forward pricing" model of Johnson (1947). Wilcox and Cochrane (1960) stress that the forward pricing approach did not ensure farmers stable prices, but rather certain prices for a single production cycle. I am indebted to Ken Robinson for reminding me of this earlier debate.

⁸Malcolm MacPherson has reminded me that rural savings rates must be "corrected" for the impact of large transitory incomes on patterns of permanent consumption. Savings rates appear to be higher where transitory incomes form a large share of total income, but these savings are for consumption smoothing, not productive long-term investments. Such savings average out to zero over a household's life cycle. The argument here is that reducing the price-induced risk of income fluctuations will increase the net savings rate for intergenerational investments.

which generates gains in efficiency from trade. It must transform agricultural commodities at the farm gate into foods at the time, place, and form desired by consumers. An efficient marketing system has to solve the problem of price discovery, at least at the local level and seasonally, even if government price policy sets a band in which such price discovery must take place.⁹ Many marketing investments are commodity-specific—rice mills and dryers, for example—but decisions about trucks, warehouses, telephones, and so on may also be based primarily on the production and trading prospects for a single important commodity such as rice or wheat. These prospects depend to a significant extent on the degree of price stability.

The Industrial Sector

The industrial sector has a stake in food price stability because of the importance of wages in expected costs. Stability of money wages through stable food prices is likely to induce investments in labor-using machinery, thus improving the efficiency of technology choice in low-wage economies. If stable food prices also contribute significantly to a stable political environment in which investors can form secure long-run expectations, the overall level of investment is also likely to be stimulated. Structuralist models that show the importance of stable food prices to the level of macroeconomic activity are also relevant in this setting, but as much for the impact of stability on investment decisions as for the stable level of employment and short-run economic activity itself.¹⁰ Contingency funds set aside to cope with unexpected price rises can instead be devoted to productive investments.

⁹See Chapter 4 of Timmer, Falcon, and Pearson (1983) for further analysis of the importance of an efficient marketing system and the role of price policy in developing one.

¹⁰See Taylor (1980) for a model of these short-run effects.

The Macro Economy

Not all macroeconomic consequences of stabilizing food prices are positive. The resource requirements of the price-stabilization program itself can destabilize foreign-exchange requirements, the credit system and money supply, and budget allocations. An important operational issue is to balance the positive macroeconomic effects against these negative ones, as well as against the operational costs of the stabilization program itself.¹¹

Consumers

The last factor to be incorporated into the analytical model that underlies the stabilization approach to agricultural pricing is the impact on consumers. The models used in the stabilization debate so far have looked rather narrowly at gains and losses in consumer surplus or, more elegantly, in compensating variations or equivalent variations.¹² The stabilization approach argues that important sources of welfare loss to consumers due to price instability are omitted by such neoclassical approaches. Two sources seem especially large and may be measurable. The first is the value consumers place on avoiding the transaction costs incurred because of the need to reallocate their budget resources each time relative prices change. Compared with rich consumers, poor consumers are likely to value this aspect more. To fulfill minimal nutritional requirements, the poor feel the pressure to substitute among food commodities much more acutely than do the rich.¹³ Accordingly, there

¹¹Little attention, either analytical or empirical, has been devoted to the joint aspects of these issues. See Pinckney (forthcoming) for the case of Kenya's grain price stabilization program and Timmer (1988b) for the Indonesian experience.

¹²See Hallam (1988) and Helms (1985).

¹³See Timmer (1981).

are important implications for income distribution of food price stability. The consequences for the poor of food price variations are not symmetrical, however, because upward movements have a more negative welfare impact than do proportional downward movements. The poor respond more flexibly to price changes, so a price rise that makes them poorer induces a larger reaction – and hence greater welfare loss due to transactions costs in decision-making – than does a price decline. This asymmetry explains, at least partially, why popular outcries over food price increases are always louder than the praise for food price declines. The pressure to readjust expenditure patterns is felt much more strongly when prices rise.

Second, fear of food shortages in urban areas evokes a universal and visceral reaction. Governments are held accountable for provisioning cities at reasonable costs, and citizens have repeatedly demonstrated their capacity to bring down governments that fail in this obligation.¹⁴ It is acute food shortages – not the average level of food prices – that induce anti-government panics, however. Food shortages are simply the mirror image of steep price rises. Price policies that successfully avoid such episodes clearly contribute substantially to levels of overall social welfare. This level of social welfare is reflected in a more stable political economy, with its attendant positive impact on investors' expectations.

It should be stressed that consumer demand for price stability cannot be expressed in markets. For precisely this reason, the popularity of price stability is usually treated by economists as a “political” issue, not as one for economic analysis. Such a narrow analytical perspective simply fails to recognize the inherent market failure underlying the transfer of consumers' desires from a non-existent economic market to the

¹⁴See Kaplan (1984) for a fascinating historical account of the relationship between urban masses and their rulers with respect to provisioning of basic foodstuffs.

political arena where the demand for a public good can be expressed and met. The resulting increase in consumer welfare is very much an economic phenomenon, comparable to the welfare generated by the consumption of "real" goods and services.

The benefits from stabilizing the prices of basic foodstuffs, or other agricultural commodities with significant macroeconomic linkages, are likely to be considerably larger than those reflected in the models that have been used so far to analyze relative costs and benefits of price-stabilization programs. While little is known empirically about the size of the dynamic and macroeconomic benefits of stability, they cannot just be ignored in the theoretical or empirical evaluation of such programs. The pervasive, indeed universal, tendency of Asian governments to stabilize their domestic rice prices in the face of unstable world market prices for rice suggests that the benefits may be very large. The rapid economic growth in many of these Asian countries suggests that the impact of efficiency losses and budgetary costs on growth cannot be too large, at least if the price-stabilization program is well designed and implemented.

When properly managed, food price stabilization programs have a clear potential to improve economic efficiency and thereby speed economic growth. There are important implications for income distribution and the welfare of the poor from the short-run success of these programs, especially in preventing sudden increases in the price of basic foods. But the long-term contribution to the poor is likely to be through the higher wages made possible by a more productive and efficient economy. Food prices also have a direct and immediate impact on income distribution because the *level* of prices is such a key factor influencing nutrient intake. Of course, many other factors affect income distribution, especially the distribution of land, the level of agricultural productivity, and the impact of these factors on real wages. These topics are intertwined. The section

below focuses on the nature of the mechanisms that make both short-run and long-run income distribution such complicated topics. It will become apparent that reaching and helping the “poorest of the poor” in a sustainable fashion requires more than good intentions and legislative mandates.

PRICE POLICY AND INCOME DISTRIBUTION

The economic literature has suggested for several decades that the solution to poverty lies in fairly equal distribution of land and a “unimodal” strategy of development that is designed to include the vast majority of the rural population in its programs.¹⁵ The argument has clear appeal. It is hard to imagine that a country in which agricultural land is owned and operated predominantly by smallholders, their labor productivity is high, and food prices are low and stable would have pressing problems of poverty and skewed distribution of income. In some important sense, this description defines away the problem, because assets are fairly distributed, incomes of farm households are adequate, and even the poor have stable access to low-cost food. Problems might remain, however. The poor have basic needs other than food, farms could be too small to support large and growing families, labor productivity might be threatened by population growth and inadequate development of new technology, and the “cheap food” policy would probably be very expensive to the budget.

All developing countries would like to be in the imaginary position just described; it would vastly simplify agricultural policy making by permitting a single-minded attention to stimulating technical change and growth in productivity. Most countries do not have this luxury (although

¹⁵The term is Bruce Johnston’s, and the strategy is most clearly articulated in Johnston and Clark (1982)

some are obviously better situated than others). They must worry simultaneously about income distribution and poverty alleviation while they try to maximize economic growth. The growth-equity trade-off has been a staple topic for analysis by development economists for decades. Policies that stimulate absorption of readily available labor require that its cost, i.e., real wages, be kept low. Stimulating savings and efficient use of capital requires high interest rates, i.e., large incomes for capitalists. Even socialist countries have come to recognize the importance of these allocative signals for rapid economic growth, despite the low wages, high profits, and skewed distribution of incomes that the signals generate.

In countries with seriously distorted economies and poor policies for development, important opportunities exist for improvement in both dimensions. But these growth-equity trade-offs remain real and difficult in the short run for many rural economies. The "food price dilemma," in particular, exists even when there are growth- and equity-enhancing changes in policy that might be made in the industrial arena. This dilemma—low food prices help poor consumers but imperil incentives to farmers and thus lower growth in agricultural output and employment—places food price policy at the core of any effort to cope simultaneously with economic growth and income distribution.¹⁶

The relevant policy question is whether a country should strive for better "initial conditions" by undertaking land reform, should concentrate on rapid improvements in labor productivity and real wages, or should attempt direct programs of poverty alleviation to improve the distribution of basic goods and services. There are trade-offs among these possibilities, if for no other reason than the government's budget has many claimants. But the trade-offs run much deeper, into the basic economic and political

¹⁶See Timmer, Falcon, and Pearson (1983), especially chapters 5 and 6, for a discussion of the food price dilemma and its relationship to other policy options in the rest of the economy.

mechanisms that dictate how a country's economy produces and distributes output. Land reform is a political exercise with surprisingly few solid economic underpinnings.¹⁷ While granting the desirability of more equal distribution of land, most policy makers will want to know if progress on improving income distribution can be made in other dimensions.

Several paths are open, with progressively longer time horizons: guarantee the access of the poor to a stable supply of food through entitlement programs; focus rural investments on projects and programs that stimulate the demand for unskilled labor and raise real wages; and provide incentives for the rural population to invest in human capital, including formal schooling, learning by doing, and a switch from quantities to quality of children. Short-run gains in food consumption via direct policy interventions are potentially very important, but sustainability is a very serious issue.¹⁸ Consistently maintaining food prices below the long-run opportunity costs in world markets is not likely to be a sustainable policy for poor countries, and even the degree of short-run stability for domestic prices in the face of unstable world prices will depend on the budgetary support a country can commit to the task of price stabilization. Over the long term, investments in human capital are

¹⁷This is a controversial statement. It stems from a review of the debate over the desirability of a land reform in the post-Marcos Philippines. Although nearly all economic analysts support some form of land reform, they do so primarily for political reasons. The recent "neo-neo-classical" literature on interlinked markets has significantly undermined the earlier Marshallian view that only owner-operators could use land efficiently. Without large efficiency gains, the economic case for land reform becomes much weaker, especially if substantial disruption occurs to established patterns of input supply and output marketing during the reform process.

¹⁸See Lal (1985), especially the discussion of basic needs on pp. 100-102, for a forceful exposition of the role of productive employment in guaranteeing the sustainability of consumption gains.

no doubt the most important factor leading to improvements in income distribution. The role of food price stability in stimulating investments in human capital in rural areas has been noted already.¹⁹

The obvious compromise between immediate, but unsustainable, improvements in income distribution using general subsidies to food prices and long-term improvements through investments in human capital is to stimulate employment and raise rural wages in the agricultural sector. The consequences of rising real wages for income distribution are fairly immediate. The critical turning point for income distribution in a country occurs when surplus labor is absorbed, real wages begin to rise, and profits stop expanding as a share of national income.²⁰ Relative income distribution, however, is not really the most important issue when trying to eliminate the worst aspects of absolute poverty, including the hunger and malnutrition that is closely associated with it. More important is the rising per capita consumption and real welfare implied by higher wages. From this perspective, rising wages are a vehicle for improvements in food intake and, most important, for sustaining those higher levels of consumption. An agricultural development strategy that succeeds over the course of a decade or longer in raising rural wages would almost certainly improve income distribution within the rural sector and significantly improve standards of nutritional well-being.²¹

¹⁹The papers by Schultz (1988) and Behrman and Deolalikar (1988) expand on the human capital dimension of the development process.

²⁰This is a general result from most dual economy models of development. Historical experience, especially in the labor surplus economies of East and Southeast Asia, strongly supports this sequential interpretation of the causal relationships between wages and income distribution.

APPROACHES TO IMPROVING FOOD CONSUMPTION²²

Income distribution is hard to measure even at a single point in time, and it is doubly hard to track over time. The distribution of food consumption, especially caloric intake, has often served as a proxy for the broader measure of income distribution. Household food consumption surveys are frequently repeated at five- or ten-year intervals with similar protocols and sample frames, so reasonable inferences can be made about distributional changes over time. On a more immediate basis, changes in average caloric intake in a country offer substantial insight into changes in income distribution over time, and such data are available on an annual basis for most countries. Comparisons across countries and over time offer a relatively quick and easy approach to the analysis of comparative patterns of income distribution, or at least one important component of it for which policy makers express concern.

The level of average caloric intake for a particular year and country is correctly criticized as a welfare indicator because the distribution of levels around the average is not discernible from the average. But when the average changes significantly over time, substantial implications for welfare change are implied. Middle- and upper-income households have very low income elasticities of demand for calories. If average caloric intake increases or decreases from year to year, most of the changes are due to altered caloric intake in poorer households. When a country

²¹Raising real wages is not the same thing as raising labor productivity, although the two are related. Certain forms of institutional or technical change can raise average labor productivity while leaving marginal productivity unchanged or even lower. In neoclassical models of wage determination, marginal labor productivity should be equal to the wage. It is also important to stress that the wage under discussion is that prevailing in rural labor markets accessible to any individual desiring to work, not a restricted wage paid, for example, to plantation employees or workers on special government projects.

²²The following section draws on Timmer (1988a).

increases its average daily per capita intake of calories from well below the recommended average to well above it, the only explanation is that low-income households are better fed. Stagnation or deterioration in this measure means a lower standard of living for the poor.

Table 1 presents the basic data to examine these trends for twelve countries in Asia and the Near East for the period from 1965 to 1985. The diversity is quite substantial. Daily calorie supplies available, the nearest available proxy for intake, ranged from a low of 1,747 kilocalories (kcal) in Pakistan in 1965 to 3,263 kcal in Egypt in 1985. Relative to recommended levels of intake, based on age structure, activity levels, and climate, Pakistan's intake in 1965 was nearly 25 percent too low, while Egypt's 1985 intake was 30 percent above average recommended levels. Despite substantial disagreement over the true welfare significance and validity of recommended nutritional levels on average, they do provide a useful benchmark that is corrected for the most important differences in population structures and nutritional needs. Any country with average caloric intake significantly below the recommended level almost inevitably has a sizable proportion of the population, usually in rural areas, that would like to consume greater quantities of food if their income levels permitted. This connection to incomes of the poor allows changes in caloric intake over time to be used as a rough proxy for changes in welfare levels of the poor even in the absence of statistics on income directly.

Only Malaysia and Turkey had levels of average caloric intake at or above such recommended levels in 1965; the unweighted average deficit was 7.5 percent. By 1985 only Pakistan, India, and Bangladesh remained below recommended levels, and the unweighted average surplus was 10 percent. On average, per capita caloric intake in the twelve countries improved by 17.5 percent, from well below to well above recommended levels--all in two decades. The improvement is especially dramatic in

Table 1. Changes in Caloric Availability in Representative Countries in Asia and the Near East, 1965-1985

Region Country	Daily Calorie Supply			Supply as Percent Above or Below Average Calorie Requirements		
	1965	1985	% change	Level ^a	1965	1985
<u>Southeast Asia</u>						
Malaysia (mal)	2249	2684	0.9	2232	-0.8	20.2
Thailand (thl)	2200	2462	0.6	2219	-0.9	11.0
Philippines (phl)	1936	2341	1.0	2266	-14.6	3.3
Indonesia (isa)	1742	2533	1.7	2164	-17.2	17.1
<u>South Asia</u>						
Pakistan (pak)	1747	2159	1.1	2320	-24.7	-7.0
Sri Lanka (sri)	2155	2385	0.5	2215	-2.7	7.7
India (ind)	2100	2189	0.2	2200	-4.7	-0.6
Bangladesh (bng)	1964	1899	-0.2	2300	-14.6	-17.4
<u>Near East</u>						
Tunisia (tun)	2296	2836	1.1	2388	-3.9	18.8
Turkey (tky)	2636	3167	0.9	2500	5.4	26.7
Egypt (egy)	2435	3263	1.5	2510	-3.0	30.0
Morocco (mor)	2182	2678	1.0	2423	-9.9	10.5

^aBased on 1983 population structure.

Sources: Data from World Bank, *World Development Report, 1987* (New York: Oxford University Press for the World Bank, 1987).

Southeast Asia and the Near East. South Asia's gains were much more modest, and Bangladesh actually slipped backward.

Explanations for the changes in caloric intake across the twelve countries are more complicated than might be expected. Figure 1 plots the average annual percentage change in per capita caloric intake (CGAIN) against growth in average per capita incomes. A rough positive relationship is apparent, but the income variable (YAVG) leaves substantial variance unexplained in a simple regression. The size of the initial gap between recommended and actual intake levels also fails to explain a significant amount of the variance on its own. The most satisfactory model combines income growth in the agricultural sector and the gap into a single multiplicative variable and includes it as a second explanatory variable along with the gain in average per capita income for the entire population. Even this regression explains only half the variance in the growth of per capita caloric intake for the twelve countries between 1965 and 1985, and less than 40 percent of the variance is explained after correcting for degrees of freedom used in the regression.

Other factors than the size of the initial caloric deficit, growth in agricultural incomes, and growth in total incomes are important for explaining why average caloric intake changed. Changes in income distribution and food prices are likely to be the key omitted variables. But that is precisely the point. As Figure 1 shows, the main outliers in the regression analysis are Indonesia and Egypt on the positive side, and Thailand on the negative. India, Bangladesh, and Sri Lanka are also uniformly below the regression line, but not by a great amount. The rapid growth in caloric intake in Indonesia is partly accounted for by the recovery in the economy after 1965, not all of which is captured in per capita income figures. But Indonesia also devoted substantial resources to a successful price-stabilization program, and this effort, plus rapidly rising

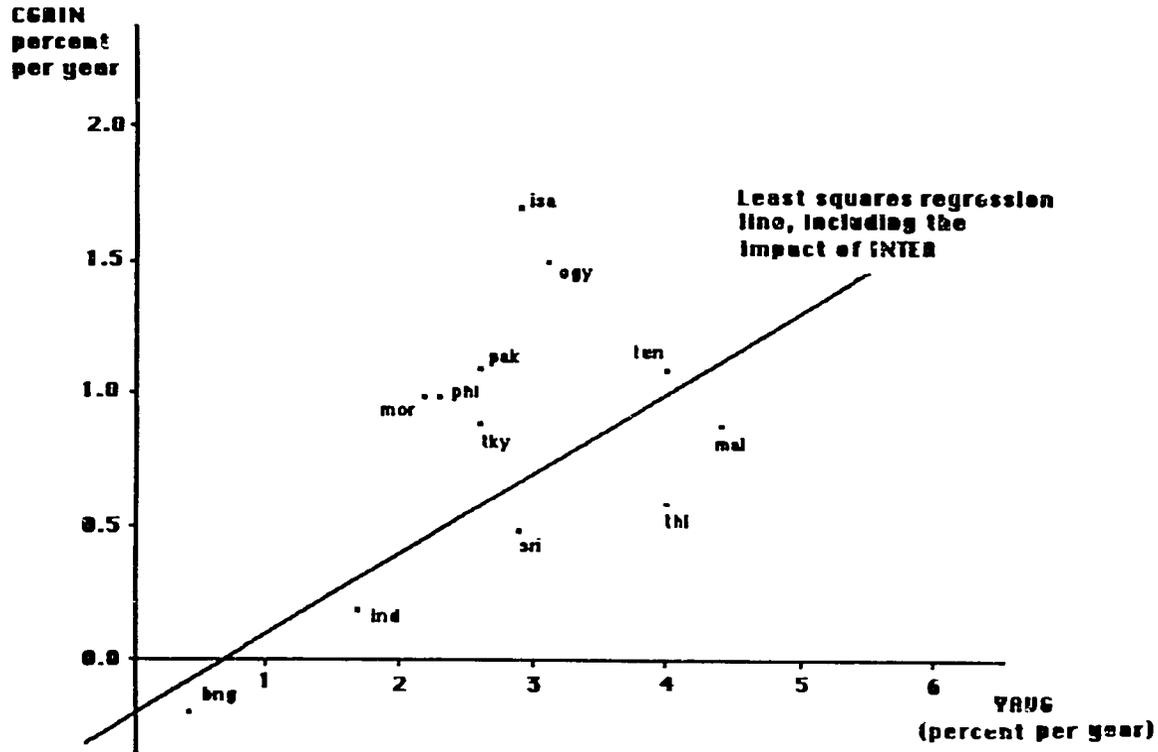


Figure 1. The Relationship Between the Increase in Per Capita Calorie Intake (CGRIN) and Average Per Capita Income (YAUG), 1965-1985

Source: Timmer (1988a).

production of rice, accounts for much of the nutritional improvement.²³ Egypt maintained large subsidies on bread, the basic staple, for most of the period and operated food ration shops throughout the country.²⁴ The positive deviations are understandable primarily within a model where the level and stability of food prices contribute in a fairly immediate and significant way to food intake of the poor.

Thailand's slow gain in caloric intake relative to its growth in per capita income can be accounted for by deteriorating income distribution between the rural and urban areas during the second half of the period. World prices for most agricultural commodities that Thailand exports were very depressed in the mid-1980s. These low prices caused agricultural incomes to grow much less rapidly than the growth in labor productivity in the agricultural sector. In equations where growth in agricultural income enters the regression independently, instead of in combination with the size of the initial gap (which is small for Thailand), Thailand's low growth in caloric intake is no longer an outlier.

The three negative deviations in South Asia, although not substantial, are important because of the regional pattern. During this period South Asia had low growth in labor productivity, low growth in per capita incomes, and a likely deterioration in rural wages. The data for caloric intake support this characterization. Sri Lanka grew fairly rapidly during the second part of the 1965-1985 period, but with noticeable worsening of what had been a remarkably even income distribution. Average caloric intake increased in Sri Lanka, but not as much as if the previous distribution of income had been maintained. More troubling perhaps, there is evidence of a deterioration in the bottom income decile

²³See Timmer (1988b).

²⁴See Alderman, von Braun, and Sakr (1982) for a discussion of Egypt's food pricing and distribution policies.

during the period of most rapid growth.²⁵

India and Bangladesh had very little growth in income or productivity, and their caloric intake was virtually stagnant. Even so, growth in caloric intake was less than would be expected on the basis of the parameters for the rest of the sample. The obvious explanation is a deterioration in rural income distribution as real wages fell. The use in India of higher food prices to induce greater production was a notable production success, but the added production did little to improve the food intake of the bottom 40 percent of the population thought to suffer caloric deficits, precisely because of the higher prices used to stimulate the increased production.²⁶ The worsening distribution of land in Bangladesh, in combination with only limited increases in demand for landless laborers, has exacerbated the situation of the poor in that country. The 1974-75 famine also seems to have permanently reduced the demand for agricultural labor after the massive migrations in search of food and jobs.²⁷

LESSONS AND CONCLUSIONS

The most powerful lessons on the relationship between food prices and income distribution are simple and familiar: the need to stimulate agricultural productivity and to foster the intersectoral links that contribute directly to agricultural development, employment, and rising real wages. When the industrial and service sectors are growing efficiently and have strong market linkages to the rural economy, an agricultural

²⁵See Sahn (1988) for further discussion of the new growth strategy in Sri Lanka after 1978 and its impact on income distribution and caloric intake by income class.

²⁶See Reutlinger and van Holst Pellekaan (1986).

²⁷See Ravallion (1987) and the discussion of Bangladesh in Ahmed (1988).

sector that grows fast enough to raise labor productivity, combined with a price-stabilization policy that assures income gains to farmers and access to food for low-income consumers, will raise rural wages and improve income distribution. There are no tricks here; only a coherent food and agricultural policy maintained for several decades can make a sustainable difference to the poor. The crucial nutritional vulnerability of the poor is to short-run downward shocks to their real income. Floods and droughts might affect their employment opportunities, as might sudden changes in domestic or export demand for labor-intensive industrial goods. The major source of nutritional vulnerability, however, is a sudden increase in the price of the basic foods purchased by the poor. For this reason, managing short-run price policy so that the real incomes of the poor are stabilized, while protecting long-run investments in the rural sector, guarantees welfare levels of the most vulnerable with the shortest time horizons. But food price policy cannot solve the problem of hunger any more than it can solve the problem of agricultural productivity. For both problems, agricultural development is needed.

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