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THE POLITICAL ECONOMY OF RICE IN ASIA: LESSONS AND IMPLICATIONS

It is a measure of the complexity, diversity, and subtlety of Asian rice policy formulation and implementation that this final paper is not a summary of what has come before, but rather an attempt to reframe some of the original hypotheses that motivated the study in the first place. To be sure, some points are relatively settled, especially about producer response to price changes. In other areas the original hypotheses can be considerably narrowed. But for a number of important policy areas the effect of throwing more light on the situation has been to reveal much more clearly our lack of understanding. A healthy scepticism over whether research can always provide answers on policy matters has thus been generated. Our research has revealed deep-seated value judgments at the heart of many important policy debates. These views are not to be taken lightly or casually explained by the degree to which rice influences the cost of living in capital cities.

What then is there to offer for two and a half years of work? Without, hopefully, losing sight of the broader lessons that introduce this essay, the answer to the question can be framed into three major areas. No doubt the most important results are from the studies of fertilizer use, rice yields, and the rice price to fertilizer price ratio. It was clear from the very beginning of the project that exciting results lay in this area, and subsequent research, most notably by Cristina Crisostomo David (*1*), has fully borne out the promise. However, this whole area is the most traditionally neoclassical in nature of the entire project. Such results should almost have been expected from a group of economists, and the project promised more.

Documentation of the physical response of rice to fertilizer use and of the formal response of fertilizer use relative to price provided the rationale for concentrating major attention on policy formation with respect to rice and fertilizer prices. The first working paper (*15*) of the project showed clearly the political nature of those prices, for not a single country in our sample permitted rice to cross its borders freely. The enormous range in rice prices absolutely and relative to fertilizer prices was obviously governmentally determined.

The lessons in this area fall rather neatly into two broad categories: (1) short-run policy formation in a relatively static context; and (2) longer-run evolution of policy in the dynamic context of economic and political development. The objectives, constraints, and policies framework is essential here for lessons to be

drawn from a heterogeneous sample of rice-oriented societies. The distinction between short-run and long-run policy formation is most easily presented in the context of perceived constraints although some evolution of objectives also seems to occur concomitant with the degree of economic development. As noted in the introduction to this collection of essays, however, the distinction between objectives and constraints is not always clear in political economics. Perhaps the broadest lesson learned in the entire project is that a policy maker's objective is frequently not to break a "constraint." This lesson was especially distressing when hope remained that the linear programming framework of the policy-making process might actually be implemented, if even roughly. That hope has vanished.

The three areas on which this essay will concentrate are, then, the following: (1) the physical and price responses of fertilizer in the Asian rice economy with their implications for policy making; (2) the nature of short-run policy making when constraints are interpreted very narrowly and objectives are held quite firmly; and (3) the nature of policy making as it evolves in the longer run when investments to break constraints have paid off and when a society has evolved politically and economically to such a degree that societal objectives themselves have changed.

FERTILIZER: THE LESSONS FOR POLICY[1]

Two early project papers (*15*, *16*) set the direction of research in this area and provided some surprising evidence of the long- and short-run role of fertilizer in determining rice yields and of the role of relative price in determining fertilizer applications. These results depended on a small sample of national data and were justifiably criticized on the degree of aggregation and lack of environmental variables apart from separate intercept terms in the analysis of covariance functions. Both problems were resolved with an innovative model developed by David that used three different types of fertilizer-rice-yield data. She examined data for rice production, area harvested, and fertilizer consumption for 11 countries for the years 1950 to 1972. A simple Cobb-Douglas production function of the form $R = A_i H^a F^b$, where

R = rice production,
H = area harvested,
F = fertilizer nutrients applied, and
A_i, a, b = estimated parameters,

showed the following results:

$$R = 1.09\, H^{0.859}\, F^{0.143} \qquad (R^2 = 0.946) \qquad (1)$$
$$R = A_i\, H^{1.444}\, F^{0.078} \qquad (R^2 = 0.991) \qquad (2)$$

Both equations (1) and (2) are macro functions because they are estimated from national aggregate data. Equation (1) can be interpreted as a long-run function, however, and equation (2) as a short-run function. The difference is that a single function is estimated in equation (1) for all 11 countries in the sample. The assumption is that in the long run all countries can invest in water control

[1] The material in this section draws heavily on an earlier paper by the author, "Food and Fertilizer Policy in LDC's" (*12*).

projects, suitable plant varieties, and cultivation practices that would enable the countries with below average yields to achieve the yields reached by the above average countries. In this long-run environment the response elasticity of rice production to higher fertilizer applications is 0.143. That is, a 10 percent increase in fertilizer nutrient application would increase rice production by 1.43 percent with the area harvested held constant.

Equation (2) permits each country to have its own intercept term, shown as A_i, where i refers to a specific country. The production elasticities are still constrained to be the same for all countries, but the starting point, the yield with near zero chemical fertilizer, is unique to each country. The fertilizer response relates to each country's specific environment, and thus the estimated parameter can be interpreted as a short-run response. Equation (2) shows that this short-run response is about one-half the long-run response, a result nearly identical to the earlier project findings although the absolute magnitudes reported by David are significantly lower, reflecting the longer time period in the sample before fertilizer responsive varieties were widely available. In short, yield response to fertilizer in the long run after environmental, varietal, and cultivation changes are also forthcoming is about twice as large as the response in the short run.

Importantly, similar results hold for cross-national micro data. David was able to estimate the same production function model shown in equations (1) and (2) for a set of Asian farm level data from 33 villages in six countries for the wet season of 1971–72. The results are shown in equations (3) and (4).

$$R = 1.2\,H^{0.813}\,F^{0.124} \qquad (R^2 = 0.754) \qquad (3)$$

$$R = A_i\,H^{0.837}\,F^{0.095} \qquad (R^2 = 0.862) \qquad (4)$$

Once again, equations (3) and (4) show the expected decrease in fertilizer response, from 0.124 to 0.095, from long run to short run. The decrease is not so dramatic because the sample refers specifically to the wet season crop only, the villages were selected on the basis of good water control, and modern varieties were extensively used except in Thailand. The potential differences in environment, varieties, and cultivation practices are not so wide as in the national data, and hence the short-run and long-run fertilizer responses are not so different.

David's work has achieved an important understanding about the differences between short-run and long-run fertilizer responses. Since a developing nation's rice policy must balance short-run needs against longer-run goals, this understanding is a critical ingredient in the discussions of policy formation.

An even more critical ingredient is a functional knowledge of the factors that determine the level of fertilizer use by farmers. Although nothing is likely to persuade farmers to use fertilizer if it is unprofitable, incentive prices open several possibilities for extending fertilizer use (*10*). Guaranteed prices to reduce risk, credit availability to permit fertilizer purchases before the grain harvest, and aggressive extension and educational efforts may all have a high payoff once minimum profitability is insured. Higher grain prices relative to fertilizer prices can also be very effective in furthering fertilizer use, both in combination with some of the above efforts, or as substitutes for them.

In the second stage of her analysis, David measured the separate impact of price and environmental variables on the demand for fertilizer. To do so, she used the country or village specific intercepts and fertilizer response elasticities

estimated in the production functions as semicontinuous variables along with relative fertilizer prices in a log-linear demand function. Despite the obviousness of this approach—profit maximization applied to the Cobb-Douglas production function yields a normative demand function containing precisely these terms—David appears to be the first to use it successfully.

Her results are important both for the actual magnitudes and their statistical significance and for their amazing uniformity between macro and micro functions. The full results will appear in the next issue of this journal, but a brief summary is essential for the argument here.

The simplest possible fertilizer demand function with no attempt to hold environment or varieties constant in the analysis results in a price elasticity of about −0.9 for both the macro and micro data. The similarity of the two estimates lends strong support to their use as reasonable longer-run magnitudes when environment and varietal use are free to change. However, the lack of a Griliches-type distributed lag dynamic model may mean that these values are underestimates of the long-run elasticity when farmer knowledge and delays in adjustment are considered. Perhaps a reasonable assumption is that the long-run fertilizer price elasticity is about unity.

As increasing attention is paid to environmental differences, and then to varietal differences, the estimated price elasticity drops significantly. In the macro function, where environmental and varietal differences among countries are quite substantial, the elasticity drops to −0.5 when production function intercepts and output elasticities are entered and to −0.3 when differences in use of modern varieties are considered. The short-run response elasticity of Asian farmers to fertilizer price changes is about −0.5 with environment held constant and about −0.3 when neither environment nor varieties can change.

The micro demand function parallels the micro production function and shows less dramatic changes in price elasticity between short run and long run. Since the village environments do not differ widely, the coefficient attached to the output elasticity is smaller than in the macro sample. The ultimate result is a fairly high confidence in a short-run price elasticity at the micro level of about −0.6.

On the basis of her analysis, the depth of which has only been hinted at here, David judges that roughly one-third of the explained variation in fertilizer use is accounted for by price differences and the remaining two-thirds by the environmental and varietal factors. The determinants and flexibility of these environmental variables are not explained, however, nor are the costs of changing them. Investing in such change is a major area of rice policy, especially if direct price incentives to greater fertilizer use are unacceptable. Despite the great importance and significance of David's work, it still leaves unresolved the costs of altering major constraints on raising Asian rice yields. Fortunately, a large research project at the International Rice Research Institute is beginning to make progress in this critical area.

A long-run functional relationship between the equilibrium price of food grain and the price of fertilizer (and other inputs) is the heart of the political dilemma in rice and fertilizer price policy formation (*10, 11*). With David's long-run fertilizer response elasticity of 0.14 and a consumption response elasticity of

−0.2, about half of any change in fertilizer price ultimately shows up in rice prices. This relationship explains the popularity of programs to teach farmers to use better cultivation practices and more fertilizer. The immediate tradeoff between producer and consumer interests can either be softened by the expanded productivity or at least buried in the budget of the Ministry of Agriculture. But the efficacy of such programs critically depends on the price environment in which they operate.

To plan and carry out extension programs successfully, the construction of small feeder roads, secondary and tertiary irrigation canals, drainage ditches, and farmland leveling and terracing requires a judicious blend of local initiative and resource generation with national policies of support for local agricultural development. Such national policies imply both the provision of skills and material not available or producible locally and the maintenance of agricultural incentives sufficient to provoke the local initiative. These incentives bring the discussion full circle and lead to the formation of short-run and long-run policy within the objectives and constraints framework.

SHORT-RUN POLICY MAKING: THE STATIC LESSONS

The dilemma of short-run policy is best conceptualized in terms of the tradeoff between producer and consumer interests. As every country paper in this and the previous issue points out, raising rice yields is a universal objective in Asian countries. The fertilizer-rice relationships documented by David are strong evidence that the national rice to fertilizer price ratio is a straight giveaway to how policy makers weight producer and consumer interests in the short run. For example, the low prices discussed by Mangahas for the Philippines (*6*), by Siamwalla for Thailand (*9*), and by Timmer for Indonesia (*14*), reflect the dominance of urban consumer interests in those societies.

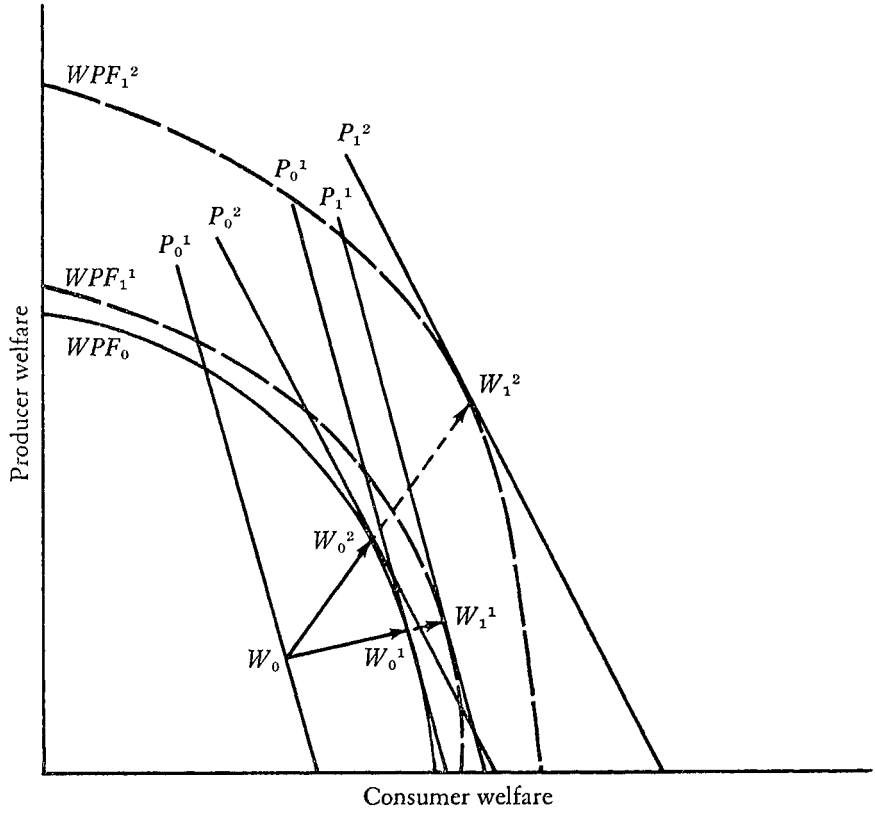
Short-run choices have long-run consequences which were argued a decade ago by Raj Krishna (*5*):

> It is true that input price subsidization avoids an immediate increase in food and raw material prices, but this will not prevent a long-run steep increase in their prices if input subsidization does not succeed in stepping up agricultural output at the same rate as price guarantees would. In other words, input subsidization may seem cheaper than product price support in the short run, but product price support may prove cheaper for the city in the long run....
>
> Thus if a support program does accelerate output growth it turns out to be a very profitable investment for the food consumers of a society.

Policy makers live forever in the short run. Even if they perceive the long-run possibilities, they must react to short-run realities. But some short-run policies have more favorable long-run implications, and the secret of success is to search these out. Indonesia in the late 1960s provides a good example.

Within the context of the tradeoff between producer and consumer welfare as the basic policy issue, three major questions arise. They are illustrated in Chart 1. After a period of hyperinflation and negative social and private investment, Indonesia found itself in the interior of its welfare possibilities frontier, or at W_0

CHART 1.—TRADEOFFS BETWEEN PRODUCER AND CONSUMER WELFARE ACCORDING TO VARIOUS PRICE STRATEGIES



within WPF_0. Any of the opportunities on WPF_0 were open to the Indonesian policy makers without altering the major agricultural production constraints but merely by stopping the hyperinflation so that markets could function again. Given the relative price relationship in existence, P_0, market integration would lead from W_0 to W_0^1, which can be termed the short-run consumer strategy.

The short-run producer strategy involved altering the relative prices in favor of producers (raising the rice to fertilizer price ratio as an incentive to farmers) so that market integration led from W_0 to W_0^2, thus sacrificing some potential consumer welfare, relative to W_0^1, in favor of considerable producer welfare gains. The political dilemma is not so difficult in this situation where serious inefficiencies permit major welfare gains for both producers and consumers via movement toward the welfare possibility frontier. The loss in consumer welfare is only an opportunity cost, not an actual loss, and this no doubt contributed significantly to the ability of the Indonesian government to change relative prices in favor of producers.

In the short run, then, Indonesia was able to make two separate policy changes. The first was a set of stabilization and market integration policies that permitted the society to reach its welfare possibility frontier, a frontier determined by the

nature of the constraints on agricultural productivity. The second policy change involved a conscious decision to alter relative prices in favor of rice farmers. Almost certainly it would have been more difficult to manage the second policy change if the first were not being implemented simultaneously because of the "more for everyone" nature of the combination.

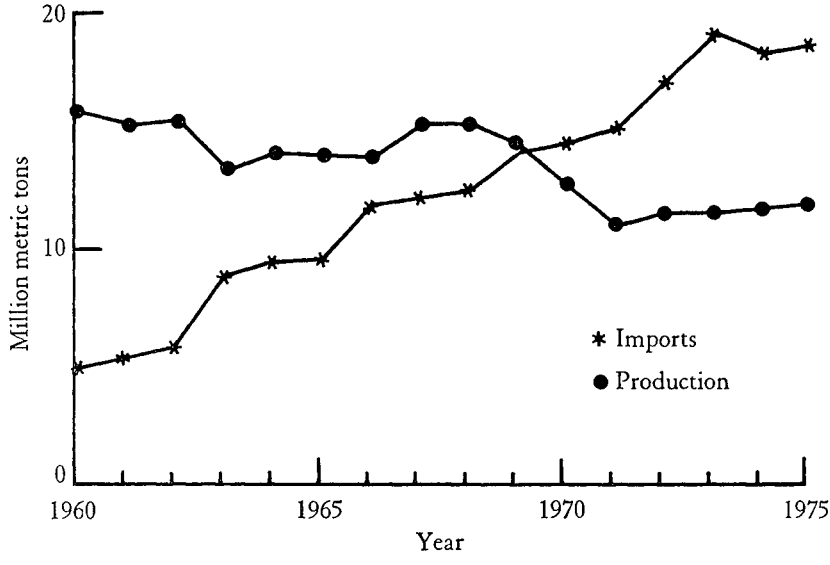
This example has obvious lessons for long-run strategies because changing relative shares of a growing pie is easier than changing relative shares where the losers visibly compensate the winners. It is important to understand that short-run policies have the sorts of longer-run implications raised by Krishna. These implications are shown directly in Chart 1, where two alternative future welfare possibility frontiers are indicated, depending on which price policy is implemented. The frontier shown as WPF_1^1 (price strategy 1 and time period 1) shows society's options if it chooses in the short run to emphasize consumer interests through maintenance of price strategy 1. That is, P_1^1 is parallel to P_0^1 and indicates continuation of the consumer-oriented price policy. If continued efficiency in markets and policy implementation allows the society to operate on the frontier and not in the interior, social welfare grows from W_0^1 in time zero to W_1^1 in time one. Growth in consumer welfare is measurably larger than growth in producer welfare.

The alternative path involves the shift from price strategy 1 to price strategy 2, which means higher rice prices (relative to fertilizer prices and relative to other consumer goods). These higher rice prices have the effect of stimulating investment in the countryside because farmers find such investment more profitable than before. In addition, the government finds that investments that ultimately raise rice production are more profitable because the price society places on rice is higher. This increases the benefits in a benefit-cost appraisal. The net impact is to shift society's welfare possibility frontier outward much more rapidly than under the consumer-oriented price regime, from WPF_0 to WPF_1^2. Again presuming efficiency, social welfare is able to expand from W_0^2 to W_1^2, and in the long run both producers and consumers are better off than at W_1^1. The long-run impact of rice price policy in Taiwan discussed by Chen, Hsu and Mao (*2*) seems roughly to fit this pattern.

It is nice to draw pictures that show painful short-run policies with happy long-run endings. The Brothers Grimm did the same thing. The questions remain. How does a society know when it is in the interior of its welfare possibilities frontier? Just how much must prices favor producers to call forth WPF_1^2 instead of WPF_1^1? Surely it is possible to go too far. What happens then? Hayami's discussion of Japanese rice policy (*4*) suggests one possible outcome.

The country essays make it obvious that not all countries have pursued the incentive price strategy, or where they have, they have hedged their bets. When producer and consumer welfare must be traded off directly and visibly, many Asian governments have sought substitutes, quite literally. Despite the fact that no single commodity is as important to its society as rice is in most Asian countries, an overwhelming lesson from the project is that rice substitutes are an important and popular policy alternative to doing anything at all with rice. Very surprisingly, this is true for both producers and consumers. Even in Thailand, the rice bowl of Asia, maize is an important commodity for policy makers because

CHART 2.—JAPAN: PRODUCTION AND IMPORTS OF ALL GRAINS, 1960–75*



* Chart from Lester R. Brown, "The World Food Prospect," *Science*, Vol. 190, December 12, 1975.

of its export potential in Japan. In periods of rice scarcity, maize makes a contribution to Thai diets. Maize is also highly important as a policy alternative in the Philippines and Indonesia. Perhaps the most obvious use of substitutes was seen in South Korea. The Moon article (*8*) showed how policy makers consciously manipulated the urban and rural prices of rice and barley to achieve their objectives.

Imported wheat is now important to urban consumers in nearly all Asian countries, and the substitution of non-rice cereals for rice offers an especially easy way to reach "rice self-sufficiency." Japan's vaunted success in rice production, spurred by the most favorable farm prices in the world, looks less compelling when viewed relative to its grain imports, as in Chart 2.

The lessons for short-run policy making can be succinctly put as follows: some short-run policies are dead ends and others have promising growth patterns. If the promising ones seem sealed off by obvious producer-consumer tradeoffs, then a search for substitutes will be made. The substitutes must be used to placate short-run consumer interests while the rice price incentive policy has time to make its longer-run impact. The danger is that consumers will then be wedded to the substitute and the long-run productivity of the rice sector will be unnecessary and unappreciated. But these problems of high productivity are more welcome than the problems of scarcity. All countries should be so lucky.

LONG-RUN POLICY MAKING: THE DYNAMIC LESSONS

The universal push to raise yields is understandable because both consumers and producers can benefit in the long run. Within a given price context, gradually increasing yields supply the extra rice needed to meet increased demand

from growing population and income. So long as the price context is profitable, the higher yields also produce higher farm incomes. But a positively sloped supply curve and a negatively sloped demand curve ensure that only one equilibrium price context exists for a country (in the absence of external trade, or with the volume of external trade held constant). No guarantee exists that this equilibrium price context is adequate to maintain producer incentives or to keep consumers quiescent. Trade is obviously the critical variable in resolving potential inconsistencies, and it was this trade that early project papers attempted to explain. The lesson was a mirror image of traditional theory; rather than trade flows explaining prices, the prices explained trade flows. Goldman examined this phenomenon for Malaysia (*3*) and documented the interrelationships between price and trade policy. The Malaysian example is particularly revealing because of the open recognition and use of the trade-price interrelationships to fund and implement overall rice policy. The specific conclusion, that self-sufficiency depends on the price, had been made in a more general context in (*15*) and (*16*). Chart 3, reproduced from (*16*), illustrates the point convincingly even before allowing for consumption responses to price changes.

The search for explanations of cross-national price variations extends well beyond the short run. Although some countries consciously used relative price variations as short-run mechanisms to produce a minimal incentive environment —the Philippines, Indonesia, Thailand, and Malaysia used such strategies on occasion—the price variations never ranged far from their own historical levels. A major lesson from the project is that such short-run intranational price variation is miniscule relative to the variations observed from country to country over the longer run. Explaining these longer-run variations relative to observed short-run variations is the task at hand.

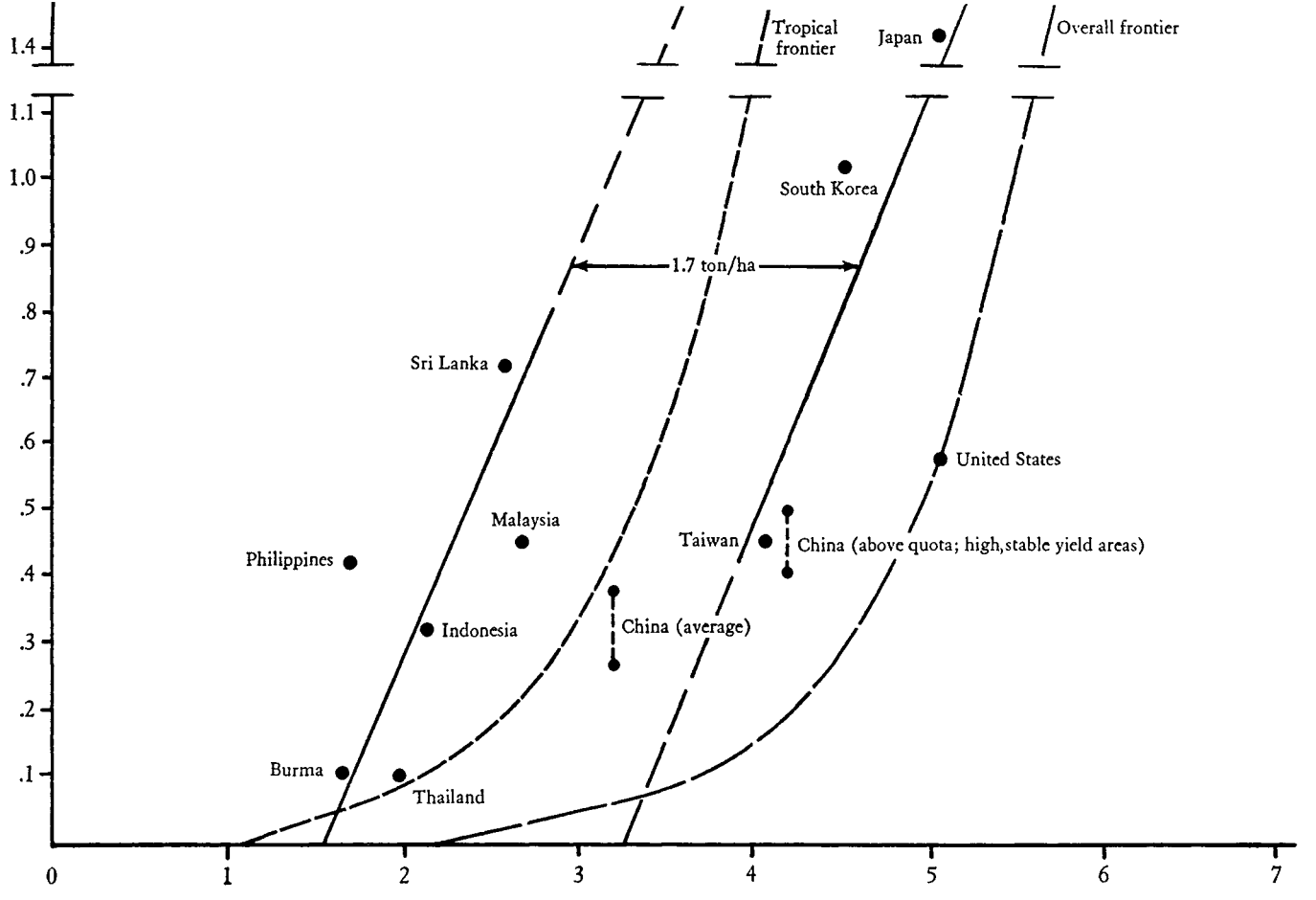
The evidence is presented in Chart 4 in an especially dramatic way. The vertical axis plots the paddy rice price to fertilizer price ratio, the variable that has played center stage throughout this entire project. The horizontal axis plots the paddy rice yields per hectare. Chart 4 can be used to demonstrate the two separate ways in which higher rice prices can induce higher yields: (1) via the direct price-yield function itself; and (2) indirectly through inducements to approach the "efficiency boundary" of the price-yield relationship.

Given a long-run physical production function, such as shown in equation (1), pure profit maximization in a riskless and perfectly knowledgeable world places an upper limit on fertilizer applications and hence on yields, for any given rice to fertilizer price ratio. The Mears article on rice policy in the United States (*7*) provides evidence that the United States can be accepted as a practical upper limit on the degree to which risk can be minimized and knowledge about fertilizer effectiveness maximized because of effective price support policies and sophisticated rice farmers. The shaded area on the right side of Chart 4 therefore is inaccessible to any country. It serves as an efficiency boundary toward which a country might strive, within its given price environment. This boundary was constructed by using the long-run production response elasticity of rice to fertilizer of 0.143 from equation (1). Short-run envelopes are closer to each country's actual observation and are more steep. But the issue now is long-run potential.

CHART 3.—NET TRADE IN RICE AS A FUNCTION OF PRICE, BY COUNTRIES, ASSUMING ZERO CONSUMPTION RESPONSE*

* Chart from C. P. Timmer and W. P. Falcon, "The Impact of Rice Trade in Asia," in G. Tolley (ed.), *Trade, Agriculture, and Development* (Cambridge, 1975).

CHART 4.—RELATIONSHIP BETWEEN RICE YIELDS AND THE RICE PRICE TO FERTILIZER PRICE RATIO IN SELECTED COUNTRIES, APPROXIMATELY 1970



Geographers, plant scientists, agronomists, and our own production function analysis argue that tropical rice-growing areas do not have as high a yield potential per harvested rice crop as temperate areas, although the possibility of double- and triple-cropping raises the potential annual yield well above temperate potential. The relationships in Chart 4 follow FAO convention and refer to yields per harvested hectare. If the average difference of 1.7 tons per harvested hectare between the potential of the more temperate areas of Japan, South Korea, China, and Taiwan (although Taiwan is at least partly tropical), and the tropical countries of Burma, Thailand, Indonesia, the Philippines, Malaysia, and Sri Lanka is subtracted from the long-run efficiency frontier, the narrow dotted line labeled "Tropical frontier" results. This, perhaps, is a more accurate reflection of the possibilities facing the tropical countries with respect to raising their rice yields.

Chart 4 demonstrates that substantial differences seem to exist in how close countries come to the yield frontiers, for their chosen price context. There is no apparent relationship between the long-run price environment and distance from the frontier when allowance is made for the lower tropical yield potential. Without this allowance, the countries paying their farmers relatively higher prices are significantly closer to the overall frontier than those countries paying their farmers lower prices. But since the cut is also temperate-tropical, the implications for policy are weak.

Perhaps the most interesting feature of Chart 4 is the apparent yield potential still to be realized within many countries given their present price context. The Philippines and Sri Lanka have gains of as much as a ton per hectare within grasp if programs can be brought to bear that encourage fertilizer use at present prices. These programs entail risk reduction and raising farmer awareness of the yield potential with fertilizer use. Equally as important would be credit and marketing programs that ensure that the fertilizer is available at the prices shown on paper. The national price context shown in Chart 4 is irrelevant if it is available only within 50 kilometers of the capital city.

Malaysia and Indonesia probably have potential yield gains of about one-half ton per hectare at the relative prices shown in Chart 4, and both countries have shown some gains in the past five years, discounting the drought in 1972. The most immediate lesson, however, is for Burma and Thailand. Yields in these two countries are not likely to rise measurably in the price context shown. On the other hand, that price context was for 1970, when world rice prices were at very low levels and internal fertilizer prices were at high levels relative to world quotations. With export rice prices substantially above the levels of 1970 and fertilizer still available at the previous protected levels (although there is much less profit than before), Thai and Burmese farmers should be facing relatively more attractive incentives to use fertilizer.

The lessons for the more temperate areas are somewhat more uniform. The United States and Japan are rich societies and have been able to guarantee that farmers could use fertilizer with full assurance that prices would be maintained. This extremely low degree of price risk and long experience with fertilizer no doubt explain why Japan is close to the frontier.[2]

[2] The United States is on the frontier by assumption.

Relative to these two rich societies, South Korea, Taiwan, and China seem to have a significant yield potential within their existing price environments. Like some other countries intent on agricultural development, China uses price incentives as part of its effort to raise grain yields (*13*). The Chinese high, stable yield areas have the potential to sell grain above basic state quotas and thus to receive bonus prices from the state. These regions compare very favorably with the rice-producing regions of Taiwan with respect to reaching the yield potential at their existing prices. Yield gains of only a half a ton per hectare, or about 15 percent, seem to be possible. Doubling their relative prices from about 0.4 to about 0.8 would double the potential gain, but, obviously, not the potential yield.

On average, South Korea and China appear about equally far from their potentials within the chosen price environments. This may seem surprising because rice yields in South Korea are 40 percent higher than average yields for China, but the relative prices in South Korea are nearly three times higher than those in China. South Korea's higher prices do not seem to have induced movement toward the frontier in addition to movement up the yield-price relationship. Perhaps the high price environment in South Korea has not existed long enough for local investments to have a significant impact on productivity. This longer-run role of price should show up as yields of about five tons per hectare in South Korea before the end of the decade if it is a causative factor and not merely coincidental.

It is awkward to ask the reader to "wait and see" as the final lesson of two years of research. And yet, prediction is the ultimate test for any model. The model and hypotheses drawn from it predict that relatively higher prices should draw yields up along two separable vectors—up the direct price-yield function and to the right along the efficiency function. But the model and results developed so far also reveal large gaps in the total range of arguments in both functions. Can Chinese village cadre substitute for higher prices in the efficiency function? Is knowledge of fertilizer gained only through time, or can money substitute in the form of higher prices or government extension workers? Must risk to farmers be nearly eliminated for a society to approach the fertilizer efficiency frontier? We do not know.

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APPENDIX

PARTICIPANTS IN THE POLITICAL ECONOMY OF RICE PROJECTS AND THEIR COUNTRIES OF RESIDENCE AND STUDY

Achmad Birowo, Indonesia
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Hsin-yiu Chen, Taiwan
Dennis L. Chinn, United States and Japan
William Collier, United States and Indonesia
Cristina C. David, Philippines
Walter P. Falcon, United States
Yuavares Gaesuvan, Thailand
Richard H. Goldman, United States and Malaysia
Yujiro Hayami, Japan
Robert W. Herdt, United States and Philippines
Wen-fu Hsu, Taiwan
Masao Kikuchi, Japan
David E. Kunkel, United States and Philippines
Teresa Anden Lacsina, Philippines
Aida Librero, Philippines
Makali, Indonesia
Mahar Mangahas, Philippines
Yu-kang Mao, Taiwan
S.M. Fuard Marikar, Sri Lanka
Sahathavan Meyanathan, Malaysia
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Narongchai Akrasanee, Thailand
Gerald C. Nelson, United States
Gordon O. Nelson, United States
Scott R. Pearson, United States
Jittima Pookkachatikul, Thailand
Ammar Siamwalla, Thailand
Soentoro, Indonesia
Sri-On Somboonsup, Thailand
Mokhtar B. Tamin, Malaysia
C. Peter Timmer, United States and Indonesia
Sopin Tongpan, Thailand
Shy Tsai, Philippines
Peter G. Warr, United States and Indonesia
Atchana Wattananukit, Thailand
Delane E. Welsch, Thailand
Thomas Wickham, United States and Philippines
Gunawan Wiradi, Indonesia
Carson Kung-hsien Wu, Taiwan
Byong Seo Yoo, Korea