

Ph.D. Dissertations

✓ Dante B. Canlas, *Marital Fertility and Working Wives in the Philippines: An Economic Analysis*, School of Economics, University of the Philippines, 1978.

The standard economic framework used to assess the effects of income and education on fertility and wife's work participation was critically examined in this study. In the process, some hypotheses were brought forth designed to supplement those obtained from the theory based on a standard utility-maximizing hypothesis of the household. The main argument for doing this was that the researcher found it more comfortable to deal with a theory of choice which recognized the multiplicity of wants to having children and conceded the limitation of substitution between hours spent in leisure (or nonmarket activities) and market work in a less developed economy.

The fertility hypothesis and the model of work participation stressed the nonlinear effects of income and education on the number of children ever born and the wife's likelihood to work.

The major findings showed the presence of income and education thresholds such that below the thresholds, the effect of an increase in income and education on fertility was positive. Above the thresholds, the effect was negative with the wife's education carrying the negative and significant effect. Concerning the wife's work participation, the results appeared supportive of a switchpoint for the wife's education such that the effect of an increase in her years of schooling was negative at low levels and positive at higher levels.

The paper concluded that the findings of the model studied could help explain the seemingly vague relationship between fertility and female employment observed in less developed countries.

✓ Alfian Lains, *Regional Concentration in Expansion of Rice Production in Indonesia*, School of Economics, University of the Philippines, 1978.

Using the estimated output supply response of rice farmers, this study tried to determine the regions in Indonesia where rice production could be readily expanded. The geometric lag model was applied to 1966-1976 data, in estimating the provincial supply response. The supply response functions of total paddy, wetland paddy and dryland paddy were also estimated.

Findings showed that area elasticity with respect to relative price of paddy to price of competing crop was zero for all provinces for total paddy; some provinces had zero and negative elasticities for wetland and dryland paddy. Area elasticity with respect to irrigation was positive as expected, for most provinces, and greater for Java than those of the outer-

islands. Findings on area elasticity of wetland and dryland paddy must be interpreted cautiously however due to inefficient estimators of coefficients of their area functions.

Efficient estimators of coefficient of the yield function gave a positive response of yield on irrigation and relative price of paddy to fertilizer price. The price elasticity of yield was small whether for total paddy or wetland paddy. The positive yield elasticity with respect to irrigation was smaller in Java than in several provinces of the outer-islands and was greatest in Bali.

Using the direct method of estimation, the output elasticity with respect to relative price of paddy to price of competing crop was negative. Moreover, the output irrigation elasticities derived from the direct method were greater than those based on the indirect method for total paddy. The reverse was true for wetland paddy. These differences were partly due to inefficient estimators of coefficients of area functions (except for total paddy) and output response function with relative price of paddy to price of fertilizer as one of the explanatory variables (only for total paddy), as well as the output function of dryland paddy.

Policy implications were based on the output elasticities derived from the direct method of estimation. However, only the output response function with relative price of paddy to price of competing crop as one of independent variables, was considered. Findings showed that the price variable could not be used as an instrumental variable to increase rice production, as a way of handling the food problem in Indonesia. Instead, the government irrigation policy would be important in achieving rice self-sufficiency.

Using a hypothetical model on increase of irrigated rice field, the study suggested that future expansion in rice production through improvement of irrigation facilities be concentrated in Java due to its higher output elasticity with respect to irrigation, as compared to other parts in Indonesia, and its high potential increase in rice output in absolute terms. This policy would be reasonable, not only from the viewpoint of domestic resource cost but also for generating employment for rural labor in Java. Finally, it was suggested that the BIMAS program (which was basically a coordination of extension and credit to encourage farmers to use a recommended package of technology) be concentrated in North Sumatra, West Java, Central Java and South Sulawesi.

✓ Amanda N. Te, *An Economic Analysis of Reserve Stock Program for Rice in the Philippines*, School of Economics, University of the Philippines, 1978.

This study analyzed the economic costs and benefits of using a reserve stock to stabilize inter-year rice price fluctuations in the Philippines for the period 1978 to 1982. Four basic simulation models were considered: (a) a free market without trade, (b) a free market with trade, (c) a reserve stock without trade, and (d) a reserve stock with trade.

Production and demand relationships incorporated in the simulation models were estimated using historical national data. Random variations which were introduced only into the production function were generated from a probability distribution obtained from historical analysis of output deviations from normal production. The four models were also simulated for the years 1962-76 and 1978-92, but assuming a growth rate higher than that indicated from the production function derived from historical analysis.

Simulations of 1962-76 showed that if the main objective of the government was to maintain price stability at the lowest cost, the previous government policy of importing when the need arose and not carrying any reserve stock was the right policy. A reserve stock operation would have meant added expense without any significant increase in price stability.

The analysis of past rice consumption trends pointed to population growth as the main determinant of the growing rice demand in the Philippines. Simulations for 1978-92 showed production growth rate approximately keeping pace with population growth rate. When domestic sources were used to accumulate and release stocks, price fluctuations declined but not spectacularly. Furthermore, the marginal effect on price stability decreased with an additional reserve stock. With available imports and exports, price fluctuations fairly stabilized for all sizes of reserve storage and price levels expectedly decreased. However, if production were to grow faster than demand, a reserve stock would provide added protection for producers if export markets were not readily available.

On the basis of estimated production and demand functions, likely production and corresponding rice prices were projected for the period 1978-92. Alternative sets of assumptions on irrigated areas were used, one taking an irrigated area as continuing to grow at its past rate and the other using projections of NEDA's five-year development plan. Results suggested that Philippine rice production will likely still lag behind demand or at most only keep pace with it.

The study concluded that it appeared economically impractical for the government to keep a reserve stock if foreign trade was assured. Due to the uncertainties of the current world market however, it would be ideal to maintain a relatively small reserve stock — about 150 to 300 thousand metric tons — supported by imports and exports. Instead of releasing the stock during a productive shortfall and importing when the stored stocks were insufficient, it would be better to explore import possibilities and use the reserve stock only when imports were not available at a reasonable price. On the other hand, during years of production surplus, replenishing the reserve stock should take precedence over exports.

Erlinda M. Medalla, *Estimating the Shadow Exchange Rate Under Alternative Policy Assumptions*, School of Economics, University of the Philippines, 1979.

The chief concern of this study was the estimation of the shadow

price of foreign exchange (also termed the shadow exchange rate or SER). The SER estimate was intended for use in project evaluation to correct the distortion in relative prices between traded and nontraded goods and resources due to the protection structure. The study presented two methodologies for measuring how much the SER had diverged from the official exchange rate (OER) resulting from this distortion: (1) the Unido method which measured the social value of foreign exchange under the existing protection system and (2) the Bacha-Taylor method which considered the free-trade equilibrium exchange rate as the shadow price of foreign exchange. An element of inconsistency was noted in the UNIDO method, due to its assumption of continuing protection. On the other hand, the study suggested that the free-trade assumption be modified to account for the various market failures likely to be present in the LDCs.

A model for estimating the SER, assuming an optimal intervention system, was formulated. Improvements over previous methodologies were also suggested, relating to the estimation of implicit tariffs, derivation of weights and the treatment of domestic sales taxes.

Shadow exchange rates under alternative policy assumptions were then estimated for the Philippines using 1974 data. The computations yielded a value of 1.34 of the OER as the UNIDO "second-best" estimate, 1.32 of the OER as the Bacha-Taylor estimate and 1.16 of OER as the "first-best" SER estimate under the assumption of an eventual optimal intervention system. The wide gap between the "first-best" and the "second-best" estimates implied that some projects viable at UNIDO shadow prices under protection would not be socially profitable under the optimal trade regime. In using an SER higher than the "first-best" optimal intervention, there would be a risk that enterprises will be started whose vested interests may eventually hinder the adoption of the optimal intervention system. The "first-best" shadow exchange rate was therefore recommended for project evaluation.

In obtaining good estimates of the implicit tariffs which provided the core of the SER estimation, Balassa's general estimates of trade elasticities were used due to difficulties in getting particular estimates for the Philippines. Future research regarding the estimation of these trade elasticities was also recommended.

On how selected projects in the private sector could be made commercially profitable, the first-best method was said to correct the distortion directly at the source. In the Philippines, the substitute procedure of granting BOI incentives could result in a host of undesirable side-effects. These indirect ways of promoting industries could be avoided if the optimal intervention system were adopted.

Finally, the study pointed out that available data and techniques had limited the study to the derivation of "second-best" shadow pricing of factors. The SER estimated in this study incorporated general equilibrium effects of changes in the protection system. This suggested a need to develop a framework for estimating "first-best" shadow prices of factors along similar lines. The derived shadow prices would more accurately represent the relative prices in the optimal situation, thus substantially improving the project evaluation method.

M.A. Theses

✓ Linda Lao-Castillo, *The Effects of Extension and Technical Knowledge on Farmer Productivity in Nueva Ecija*, School of Economics, University of the Philippines, 1979.

Focusing on extension and technical knowledge as central ingredients in a strategy to improve agricultural productivity, this study specifically examined the following:

1. the relationship between (a) extension, yield and income, (b) technical knowledge, yield and income, and (c) extension and technical knowledge;
2. the costs associated with the different extension methods;
3. the relative effectiveness of the different extension methods in raising the level of technical knowledge, yield and income; and
4. the optimum combination of extension methods that would maximize yield levels, considering the budget constraint of extension. The hypotheses of the study were tested through tabular and regression analysis.

A production function was estimated to measure the effect of technical knowledge (TK) on yield; results showed that the impact of TK was not significant. Based on the work by Huffman and Welch, an income function was applied to capture a wider range of TK effects. The coefficient of TK was highly significant, implying a very strong allocative effect of TK, not reflected in the production function.

The study also tested the hypothesis that extension contributed to productivity as an explicit factor in production and as an implicit factor through its impact on levels of technical knowledge. It was found that the direct effect of extension was smaller than its indirect effect on yield which accounted for its nondescript performance in the productivity functions.

The marginal productivities of the three extension methods examined (visits, demonstrations and propaganda) were proven to be different from each other. The visits method was the least effective approach in the area while the demonstration method contributed the most to increases in productivity and in technical knowledge. However, a successful extension program was seen to be a combination of the three methods as based on the law of diminishing marginal productivity of inputs.

To determine the optimum combination of inputs, the production function and the cost function were entered into a yield maximization model with the extension methods as choice variables. A combination of levels of each method in minutes/season was derived from the first order conditions. The input levels or exposure levels were 27 minutes, 188 minutes and 13 minutes for demonstrations, propaganda, and visits, respectively.

Extension was found to increase productivity significantly through its input on technical knowledge. Since further advances in technology are expected in the future, the farmer has to continually keep up with these improvements to avail of the benefits of technology. This would call for a greater role of extension in altering the technical knowledge of the farmer.

Sah-Hun Kim, *Determinants and Consequences of Rural-to-Urban Migration in Korea*, School of Economics, University of the Philippines, 1979.

Two objectives were pursued in this study: (1) to examine the impact of the conventional socioeconomic factors on rural-to-urban migration, and (2) to investigate the changing status of in-migrants in their adjustment to the urban setting.

To look into the determinants of migration, aggregate data from the 1975 Census of Korea were analyzed using ordinary least squares (OLS) estimation technique. The consequences of migration were investigated by applying the logit model to data from the 1977 Social Statistics Survey. Due to data limitation, the impact of migration was limited only to individual migrants and not on areas of origin and destination.

These major findings were revealed:

- (1) Educational status strongly encouraged mobility, especially for males.
- (2) Geographical distance inhibited migration for both sexes, even with the schooling variable included.
- (3) Urban population density, as a measure of gravity at destination, positively influenced migration, though slightly more for females than for males.
- (4) Males were more sensitive to job opportunities at destination, than females.
- (5) Todaro's model for expected earnings which implies that men depend more on expected earnings than women do in their decision to move, was supported by the study's variant of Todaro's model.
- (6) The stability and quality of migrants' employment at destination seemed to improve over time, especially for males.
- (7) Employment status at destination was a positive function of age, education and migration for both sexes.

The findings carried a number of policy implications. First, the distance variable could be an important policy instrument for migration. Secondly, the government policies against over-urbanization of large cities should make the most of the inhibitive effect of distance on mobility. Also, the stream of migrants may be redirected to such proposed alternative destinations provided that employment (or income) opportunities there are enhanced. The current migration-discouragement policy (or even the depopulation policy of the Seoulites) should not be exhaustive enough to sacrifice much of the efficiency of the resource allocation process. Finally, future migration research should examine mainly the economic and social effects of both sending and receiving areas, to contribute

towards future urbanization policy and to correct the imbalance in the research effort.

Celia P. Manalaysay, *Estimating the Shadow Price of Capital for the Philippines*, School of Economics, University of the Philippines, 1979.

The primary objective of this paper was to estimate the shadow price of capital, using the formula $SPK = (1-s)q/i-sq$. The marginal productivity of capital (q) was estimated, based on manufacturing data, the macroeconomic approach and stock yields. The marginal propensity to reinvest (s) was estimated from the plan data while the social rate of discount (i) was estimated using the Keynes-Ramsey rule which showed it to be an upper limit of i . Another estimate was thus made by assuming an elasticity of marginal utility of 2 which was the upper limit suggested by Squire and van der Tak.

The derived values of SPK reflected the premium attached to capital goods over consumption goods, and implied that investment or saving was more valuable than consumption. For example, if q was 16 per cent, s was .27 per cent and i was 9 per cent, there was a premium of 150 per cent attached to capital goods over general consumption goods, the latter serving as the numeraire. This implied that the social value of ₱1 worth of capital good was ₱ 2.50 in terms of the numeraire and that funds devoted to investment are valued at 150 per cent more than funds for average consumption.

The study recommended a method for estimating the shadow price of capital and the relevant parameters. No particular value was assigned to SPK however; its value depended indirectly on some value judgements underlying the social rate of discount. Different values of i had different implications on the government's attitudes toward the distribution of consumption, whether intertemporal or intratemporal. It was up to the government or the central planning body to determine the weight assigned to future consumption compared to present consumption and to the income of the poor as compared to that of the rich. Once the value of i had been chosen, then a single value of SPK could be obtained. The study only presented the likely values of SPK based on its own interpretation of present government attitudes and economic data.

The derived values of SPK using current data were pointed out as also applicable to the future, assuming that q , s , and i were constant. Since these parameters may change over time, the estimates to be used in evaluating future projects should therefore be adjusted.

Once the government had achieved its optimum rate of saving and investment, it would be indifferent as to whether an additional ₱ 1 goes to consumption or investment. SPK at this point would be equal to unity if population growth were equal to zero. To get i in this case, the K-R rule should be used. Due to population growth, however, there was still a need for a premium for saving.

Finally, the study concluded that using the shadow price of capital for project evaluation implied valuing capital at its social opportunity cost rather than its nominal cost. This meant favoring labor-intensive

projects over capital-intensive ones because applying the SPK to the cost of the original investment would reduce the net present benefits much more for the latter than the former. The results seemed to imply that capital should be made more expensive to the user. However, the study proposed further studies in this area before making definite policy recommendations.

Enrique A. Manalo, *The Credit Implications of Commercial Bank Holdings of Reserve-Eligible Government Securities (1960-1974)*, School of Economics, University of the Philippines, 1979.

The historical and descriptive approach was employed to study the implications on bank credit and demand deposits of commercial bank holdings of reserve-eligible government securities. The period from 1960 to 1974 was examined on an annual year-end basis, with the Central Bank as the main data source. The study compared the changes in the volume of certain stock variables such as outstanding commercial bank credit, demand deposit liabilities and outstanding holdings of reserve-eligible government issues. An annual flow variable — government spending — was also examined.

From 1960 to 1974, the government relied on commercial banks to finance disbursements that exceeded operating receipts in every year. The study hypothesized that spending of government funds acquired through the purchase of reserve-eligible government securities (which in turn were deposited with the commercial banks) would increase bank reserves. Data indicated that the non-bank sector was not averse to holding a certain portion of the money stock in the form of demand deposits rather than currency. This implied that a certain portion of government disbursements to this sector was deposited with commercial banks thereby increasing bank reserves and the banks' ability to expand credit, relative to a situation where government securities could not be used as reserves. During this period, the Central Bank allowed banks to hold an increasing portion of their required reserves in the form of government securities. Commercial banks held, on the average, roughly 39 per cent of their required reserves in the form of government securities from year-end 1960 to 1974.

The study pointed out that under the existing institutional framework where certain government securities could be used as reserves, government borrowing from commercial banks might not induce the initial contractionary monetary effects normally expected from such an operation. Thus there was a need to consider more fully how government operations could enhance the role of the banking system in effecting changes in the level of the money stock.

It was recommended that further studies be continued regarding government borrowing from commercial banks via sales of its reserve-eligible securities; and government spending; and whether these two operations had created an expansionary bias in the economy. Though the study did not make definite conclusions on these topics, it revealed that the annual net increases in outstanding demand deposits and reserve-eligible securities were simultaneously high relatively (greater than the average annual rate for both variables from 1960 to 1974) in certain years. These significant increases during the same period, in view of increasing government borrowing, warranted closer examination.