

ABSTRACTS OF DISSERTATIONS AND THESES

Ph.D. Dissertations

✓ Norma Tan, *Economic Protection and Resource Flows in the Philippines*, School of Economics, University of the Philippines, 1978.

This study analyzed the Philippine structure of protection in 1974 based on the combined impact of tariff revision and the changes in the overall system of protection. The basis of analysis was the effective protection rate (EPR) framework under assumptions of fixed production coefficients and partial equilibrium. Two sets of estimates were used in the analysis: the first set was based on existing tariffs and indirect taxes in 1974 and the second, on tariffs, indirect taxes and Board of Investment subsidies. As distinguished from nominal protection, EPR was defined in the study as the measure of the effects of the structure of nominal tariffs on the production pattern through the effects on the value added rather than on the product price of the protected industry.

Estimates for the Philippines in 1974 showed that the nominal rates and the EPRs differed substantially among sectors although the EPRs were more dispersed around their mean than were the nominal rates. The nominal rates exhibited such characteristics as the "cascading" of tariff rates. Protection of industries, while mainly resulting from tariff protection, appeared to be markedly strengthened by domestic indirect taxes.

The country's EPR structure seemed to penalize a number of domestic industries as indicated by negative EPRs. On the other hand, there were also industries with very high EPRs. In general, the primary and agricultural sectors had EPRs much lower than the manufacturing sectors which reflected the protective bias for the domestic processing industries. Negative EPRs of most export-oriented industries implied a bias against exports in the protection structure.

On the average, the EPR estimates were significantly higher than the nominal rates implying that the weighted average of the tariffs and their equivalent on the inputs must be less than the weighted average of the tariffs and their equivalent on the products. The general effect of differential tariffs on inputs and outputs was to exaggerate the degree of protection given to industries.

In terms of discrimination among industry groups, effective protection in 1974 retained the 1965 pattern wherein consumption goods received very high EPRs; intermediate goods, substantially lower protection; and capital goods and inputs into construction, the lowest rates. Furthermore, the undervaluation of the foreign exchange eroded substantially the degree of protection to industries.

Compared to tariffs and indirect taxes, subsidies were a very minor source of protection to domestic industries. The effect of the combined tariff — indirect tax — BOI subsidies to industries reflected the incentive effects of tariffs dominating over those of the indirect taxes and tax subsidies.

The implications of differential incentives associated with the structure of EPRs appeared to be consistent with the changes in the structure of production in the economy since the 1950s. The favored position of

manufacturing in terms of protection coincided with the rapid growth of this sector in the 1950s.

This study confirmed the importance of EPR in stimulating domestic production for import substitution and its effectiveness as a policy instrument over nonpolicy variables in changing the structure of import substitution and resource flows in the economy. Further tests conducted by the study provided these inferences: (1) that the system of protection had misallocated resources from the more efficient sectors to the less efficient ones by artificially raising the profitability rates of the latter through protection; (2) that the protection system had not promoted labor-intensive industries relative to capital-intensive ones for employment generation purposes; (3) that it was biased in favor of the relatively heavy users of foreign exchange, contradicting the policy to conserve foreign exchange; and (4) that it provided less incentives to the more export-oriented firms than the more domestic market-oriented industries, which was inconsistent with the national export promotion policies.

The study recommended several tasks for further research namely:

- (1) Continue the calculation of the EPR under partial equilibrium assumptions and on a more refined, standardized, and less aggregative system of industrial classification.
- (2) Refine further estimation procedures through better averaging of tariffs, taxes and subsidies.
- (3) Expand EPR concept to incorporate not only the effects of tariffs taxes and BOI subsidies but also of other government and private entities which distort relative prices from their trade levels.
- (4) Include general equilibrium repercussions in calculating EPRs.

Fred S. Avestruz, *Uncertainty in the Choice of Technique in Philippine Sugar Factories, 1965-74*, School of Economics, University of the Philippines, 1979.

The role of uncertainty in the selection between the modern diffusion process and the conventional mill tandem process in ten Philippine sugar factories established during the period 1965-74, was investigated by this study. Using the case approach, it described the alternative techniques, and the relevant conditions surrounding the decision-makers during this period; developed a methodology to estimate the expected returns of the alternative techniques; and made a social cost benefit evaluation of the alternative techniques.

To estimate the expected returns of alternative techniques, a multi-period profit determination model was developed. The factors used to differentiate the alternative techniques from each other were: recovery rates, operating costs and financial costs. The model simulated the daily operations of the factory from the start of factory operations until the end of factory life which was taken as 33 years. Both technical and financial events in the factory were simulated. Each simulation assumed a certain state of the diffuser, the boiling house and operating costs. A series of simulations representing all possible combinations of the various states of recovery and operating costs was made. From the set of estimates of net present values of the diffuser, average values based on *a priori* and on

ex post information were obtained.

Results based on *a priori* information showed that the diffuser was the preferred technique; these coincided with decisions of eight sugar factories. Estimates based on *ex post* information showed the mill tandem as having higher values than the diffuser. These also coincided with the decisions of three sugar factories set up after a few years of industry experience with eight diffusers.

These results pointed out that better information was needed for technology selection decisions and that a decision between a new technique and a time-tested one could be analyzed without estimating risk and risk preferences. The problem was handled by specifying the appropriate probabilities of the various states of uncertainty. The study has shown that the factories considered did not ignore risk in the decision-making process. Rather, the probability of breakdowns of the new technique was underestimated.

The following were also noted to have influenced the decisions in favor of the diffuser: (1) the decision-maker's dual role as factory owner and sugarcane planter, (2) low equity required from the decision-makers, and (3) annual loans extended by banks to factories to meet revenue shortages. Thus, the study contended that one or two factories, rather than eight, should have been initially established to serve as test cases for the new technology. One other way proposed to avoid errors in technology choice was for banks to caution loan recipients in the adoption of new technology.

On the other hand, a social cost benefit evaluation of the alternative techniques was done by converting market data to their social values and reestimating the same model used in the private estimates. Results based on *ex post* information showed the mill tandem to be the more appropriate technique.

Differences between the expected returns of the two techniques were seen to be more emphasized in the social analysis than in the private analysis. The latter tended to ignore the expected returns of non-factory owning planters, and the experience gained in operating the new technique under the environmental conditions of the country.

Results based on private analysis suggested that without government financial subsidy, most of the sugar factories may not have been established because of poor financial feasibility from the private sector's point of view. Positive returns resulting from the social analysis suggested a justification of government intervention. Likewise, the factors ignored in private analysis could also justify the extent of government support that may have led to the choice of the diffuser.

Rosario G. Gregorio, *An Economic Analysis of the Effects of Philippine Fiscal Incentives For Industrial Promotion*, School of Economics, University of the Philippines, 1979.

This paper investigated how and to what extent the present Philippine incentive package promotes its primary objectives. Specifically, the study quantified, whenever possible, the effects of selected incentives

embodied in RA 5186 and RA 6135 (as amended, as of March 1978) on the rate of return, factor prices, and relative factor use.

The concept of the internal rate of return, which relates profitability with the flow of investment to particular industries or projects, was used to trace the effects of the various incentives on the profitability of projects. The concept of the user cost of capital, which relates factor price with the factor choice, was used to analyze the effects of the various provisions on factor prices. To measure the impact of the various incentive provisions on relative factor use, the study utilized estimates of the elasticity of substitution obtained from previous studies.

Findings showed that the rate of return was increased by about 2 percentage points due to accelerated depreciation; by 2 percentage points due to the tax exemption on imported capital equipment (by 3 percentage points due to the tax credit on the purchase of domestically manufactured capital equipment); by 3 percentage points due to the expansion reinvestment allowance; and up to 4 percentage points due to the additional deduction of direct labor and local raw material costs. These increases were relative to a rate of return of 10 per cent without any incentive; project life was assumed to be 20 years.

Further, the user cost of capital was reduced on the average by 14 per cent due to accelerated depreciation (at the maximum allowable rate of four times as fast as the normal rate for an asset with a 20-year life span); by 15 per cent due to the tax exemption on capital equipment (by 17.7 per cent due to the tax credit on domestic capital equipment); by 10 per cent due to the tax credit for withholding tax on interest on foreign loans; and 19.7 per cent due to the expansion reinvestment allowance (when $K = .5$). The direct labor cost, on the other hand, was reduced by at most 3.5 per cent due to the tax deduction of labor training expense in the year the incentive was claimed and by at most 18.4 per cent due to the tax deduction of direct labor and local raw material costs. These estimates held for a 20-year project when the rate of interest was assumed to be 15 per cent.

The effect of the various provisions on the labor-capital ratio was the same for the user cost of capital in both magnitude and direction, and for the direct labor cost in magnitude but not in direction.

The study pointed out that some of these provisions diminished or negated the effectiveness of each other in attaining the goals of the incentive laws. Thus arises the need to formulate incentives which are neutral in terms of the relative use of capital and labor in production. The circuitous ways of achieving the goals of the two incentive laws had also been noted. A straightforward subsidy on employment, exports or value-added in domestic production was recommended rather than encouraging labor use, exports or domestic production in preferred industries by subsidizing the purchase of equipment, easy credit term and other such measures.

The finding that BOI incentives exerted negligible effects on the overall structure of protection indicated the need to thoroughly revise the Philippine protection system as embodied in the tariff and indirect tax

structure which at present favors import substitution, penalizes export activities, and creates biases against employment generation. The Board of Investment should not be expected to counteract all these distortions. Rather, its incentives should be viewed as a venue through which the growth of infant industries may be promoted.

Chowdhury S. Ahammed, *Bangladesh Jute in the World Market: An Econometric and Policy Simulation Analysis*, School of Economics, University of the Philippines, 1980.

This dissertation presented a two-region (Bangladesh and the rest of the world) and a two-commodity (raw jute and jute manufactures) spatial equilibrium model of the world jute trade with particular emphasis on Bangladesh. The model was developed to examine the dynamic effects of various government instruments on the jute economy.

The basic framework for the analysis was a simultaneous equations model of the world jute market with 36 equations estimated from data within the period 1947/48 — 1977/78. Annual equations of varying complexities were estimated to explain acreage, yield, mill consumption, production, etc., using ordinary and two-stage least squares and their corresponding Cochrane-Orcutt technique whenever necessary. The linear functional form of the structural equations had been assumed throughout the model and their specifications had been a matter of experimentation with alternative sets of variables. Generally, goodness of fit and *a priori* expectations were the criteria for the selected specifications. The regional models were such that while production, consumption and manufacturing were structurally determined, prices were determined from the solution of identities, and stocks were given as residual categories. The structural equations for Bangladesh were specified to include the policy environment which existed in the Bangladesh jute market.

The model was then used to conduct base dynamic and multiplier policy simulations. The results of base dynamic simulations showed that the model was capable of reproducing the principal features of the world jute trade flows between 1969/70 — 1977/78. Considered in the policy simulation analysis were five of the most commonly used government instruments: (1-2) the effect of a change in government credit to jute mills and jute exporters, (3) a change in grower's price of jute, (4) a change in farmgate price of rice and (5) imposition of export tax on raw jute. With the stability condition of dynamic commodity models satisfied, the final form of the restricted reduced form equations was utilized to obtain impact, interim, cumulative and equilibrium multipliers. The values of the latent roots of submatrix were used to describe the time paths for endogenous variables. Both monotonic and sawtooth components were found to be present.

The study yielded numerous general conclusions about the jute market. One of the major findings was that the world jute economy is very much sensitive to what happens in a single producing country, namely Bangladesh. The prevailing government instruments were found to be influential in controlling production, manufacturing, export and prices of raw jute and jute manufactures. The useful aspect of the study was that the time paths of the target variables were obtained for specified time paths of the instruments allowing for inter-temporal feedback effects.

M.A. Theses

✓ Sookmin Lee, *Family Income, Education and Fertility in Korea, 1974: A Threshold Hypothesis*, School of Economics, University of the Philippines, 1979.

The objective of this study was to test an empirical fertility model concerning the effects of family income and the wife's educational level on the number of children ever born in Korea. This model hypothesizes that below a certain level, the marginal effects of family income and education on fertility are positive and that above it, their effects are negative. Data obtained from the 1974 Korean National Fertility Survey were analyzed by the ordinary least squares multivariate regression method.

Results revealed that there existed a threshold level of family income in several very low-income communities. However, with regard to the effect of education on fertility, findings showed a negative relationship at all levels and subsamples. This result was analyzed in the light of Encarnación's (1974) study using data from the 1968 National Demographic Survey. The said study found that the marginal effects of both income and education were positive at levels below the threshold and that at levels above it, the marginal effect of education was negative while that of income was insignificant or barely significant. Since approximately half of the families fell below the threshold, this implied that raising family income just induced parents to have more children and that, while raising the educational level of the women would in the long run reduce the birth rate, it might temporarily increase fertility.

Unlike the Philippine case, however, the threshold level of family income in the Korean study was much lower than the subsistence level and only 3.5 per cent of the population belonged to this. Thus, the study's findings implied that improvements in family incomes may be conducive for lowering fertility in Korea. Additionally, these findings suggested that using education in Korea tended to reduce fertility, and, in contrast with the implication in the Philippine case, there was no threshold level that must be attained first before the negative impact of education on the birth rate would be felt.

The study explained its findings thus: educational level affecting fertility behavior might be very low, consisting of a few years of schooling, while the average educational level of Korea was already high enough not to show the threshold. Hence, a clear threshold value could be expected in LDCs such as some Southeast Asian and African countries that have very low average educational attainment and income. As these countries develop, the threshold hypothesis would not be able to fully explain the relationship of family income and education on fertility.

✓ Martin T. Malaluan, Jr., *The Leather and Leather Goods Industry in the Philippines: A Domestic Resource Cost Study*, School of Economics, University of the Philippines, 1979.

The leather and leather goods industry in the Philippines is considered one of the dollar earners for the economy at present and a major one in the future. Besides, it substantially generates employment and value-added in the economy.

Evaluating the industry based on the domestic resource cost (DRC) criterion across the years, it was found that only the tanning process had relatively efficient production in 1969. In 1974, the leather goods sub-industries emerged comparatively advantageous. The change in the competitive position of the three sub-industries across the years was due mainly to increase in costs and changes in implicit tariffs. Based on firm-level data for 1977, the footwear and other leather products sub-industries had DRC estimates lower than the estimated shadow exchange rates which were consistent with the 1974 results.

DRC variation across firms was found to be caused by the age of the plant, the capacity utilization rate and factor intensities of the firm. However, the most important factor was the differences in factor intensities. The study revealed that the more capital-intensive (or the less labor-intensive) was the firm, the greater was the absolute value of DRC.

Almost all of the respondents agreed that their business operations would be affected adversely if government incentives offered to them were withdrawn. The respondents also agreed that the government could help them succeed in their ventures, including their decision to export, by easing credit, giving technical assistance, stopping the hoarding of raw materials and components, and instituting price control on raw materials. Export information should also be disseminated.

The results showed that the present policy environment should be reassessed in the light of the firm's operation. Further restructuring the protection offered to the sub-industries, in particular, lowering the tariff duty on leather imports would enable the economy to save or earn more foreign exchange. This would also encourage the production of better quality exports of leather manufactures.

Abdul Rachman Panetto, *Some Economic Effects of Rice Price Control in South Sulawesi*, School of Economics, University of the Philippines, 1979.

Concentrating on the particular economic effects of rice price control in South Sulawesi, this study tested the hypothesis that, *ceteris paribus*, rice price control via the buffer stock system could help stabilize the rice price within the range of ceiling and floor prices set by the government. To measure this, the coefficient of price variation during the period of no rice price control via the buffer stock system (1959-1965) was compared with that for the period of rice price control with the buffer stock system (1969-1975). It dealt with the analysis of market injection and procurement as a way to facilitate rice price stabilization. Rice production and consumption were also looked into for supportive analysis. Regression analysis was used to measure the influence of average rice price on area of ricefield planted by farmers and on the output of rice.

Findings showed that in South Sulawesi, the coefficient of intra-regional price variation (0.19) was higher than that of interregional price variation (0.17) at the provincial level. Moreover, price coefficient of variation between regencies and municipalities ranged from 0.08 to 0.21 in South Sulawesi while the provincial level ranged from 0.13 to 0.22.

Under the stabilization policy, the study revealed a high violation

of the floor price within the 7-year period under study. For 11 months of 1969 and 6 months of 1975, the rice price was lower than the floor price. Despite these violations, however, the region was shown to have lower price variation than before the rice price control via the buffer stock system was enforced. The price coefficient of variation was 0.18 during the period 1969-1975, compared to 0.55 for the period 1959-1965. This price control indicated, on the other hand, that the increment of the rice price could be lowered by 68 per cent for the former period, compared to the latter.

The study also found insignificant influence of rice price on the area planted with rice but considerable influence on the output of rice. This meant that, to increase the output in the region, the government should set an appropriate floor price and prevent the fall below this floor so as to influence farmers to develop new techniques of rice production. This policy would therefore indicate a higher growth for the region.

Under this policy, domestic rice price was lower than the price of rice for import, and the consumers — who largely belonged to a low-income group — were subsidized by the government. However, the yearly price increase was due to technological changes aside from improving the farmers' standard of living. Likewise, subsidy to the consumers declined as their income increased. Hence, income distribution was effected by the rice price control in Indonesia, including South Sulawesi.

To increase future rice output, the study proposed that regional planners first investigate the following:

1. the resources in the province and the farmers' level of technology;
2. the yearly target of production;
3. the increase in rice production given the existing technology and the technological changes needed to cope with the target;
4. the resources and skills the regional and national government should contribute to the farmers to provide these technological changes; and
5. the causes of failure to reach their targets.

The study concluded that if these measures are not resorted to, the province would experience gradual reduction of rice procurement because of a yearly population increase.

✓ Girish Pant, *Certain Aspects of Fluctuations in Export Earnings: The Nepalese Case*, School of Economics, University of the Philippines, 1979.

This study sought to determine the sources of export instability by examining the relationship between export earnings and primary-product specialization, specialization in one major commodity concentration and geographic concentration. Likewise, it explored whether the instability in export earnings could be due to land-lockedness and other non-quantified features. The period studied was 1956/57 to 1969/70.

Export instability was defined here as deviations from the general trend in export earnings. To get the amplitude of fluctuations, indices of

export instability were computed using two methods namely: a) obtaining the absolute difference in export earnings from year to year, and b) obtaining the average of percentage deviations from the least-squares trend line through the actual annual values.

To make the disaggregate on analysis, separate regressions were run for India and Tibet using ordinary least square method. To check the presence of auto-correlation, the Durbin-Watson test was conducted at 2.5 per cent on the small number of observations. To test the hypotheses, R^2 was examined on the basis of F-ratio at the 1, 5, 10 and 20 per cent levels of significance. Estimated coefficients of the explanatory variables were also tested at these significance levels using t-statistic.

The study revealed the following findings:

1) Primary-product specialization ratio and specialization in major commodity group ratio were not significant explanatory variables of total export earnings fluctuations. However, the latter was quite significant to Tibet.

2) Commodity-concentration index had a slightly significant positive relationship when export earnings from Tibet alone were considered; it had a negative association with total export earnings.

3) Geographic-concentration index seemed to be a significant variable accounting for fluctuations in export earnings.

4) Fluctuations in export earnings could also be fairly inferred as arising from non-quantified sources such as poor transit routes, inferior quality of exports and unpredictable demand and supply conditions.

On the basis of these findings, the study made several policy recommendations, namely:

(i) Since primary-product specialization ratio and specialization in one major commodity group ratio played ambiguous roles, their shares in total exports should be reduced. Nepal could move into the export of semi-manufactured goods.

(ii) Though it may not be advantageous for Nepal to diversify her trade from the export stabilization point of view, it needs convertible foreign exchange to import capital goods from overseas countries. These two conflicting objectives should be reconciled.

(iii) Commodities exported to various countries should be diversified. However, this need not apply to Tibet.

(iv) The existing treaty of transit should be amended so that India grants Nepal exclusive rights over her goods passing through Indian territories.

(v) The quality of tradeable products should be improved with such methods as careful packaging, for a start. The products could gradually be restructured provided that the marginal gain exceeds marginal cost.

Fluctuations in total export earnings, which have been worsened in Nepal by its topography, could hamper the overall growth of the economy if needed capital goods could not be imported due to a scarcity of foreign exchange. Nepal's reliance on the inflow of foreign aid and the like, under the present international situation, could be a vulnerable policy. The study therefore concluded that expansion and diversification (especially commodity wise) of exports in every aspect would be the best alternative.