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WHY ECONOMIC-DEMOGRAPHIC MODELS HAVE NOT BEEN USED IN THE PHILIPPINES

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The original purpose of writing this note was to consider the extent to which economic-demographic models have been of use to policy makers and planners in the Philippines. These models are expensive to construct, and it is of some interest to see whether they have served some practical purpose outside the classroom. However, it turns out that such models have not been systematically used in the Philippines for policy planning, so we may ask the reasons why. To serve as background to the question, section I describes briefly the three published economic-demographic models of the Philippines, section II the current five-year development plan, and section III the report of a committee to review the population program. Section IV is addressed to the question.

Economic-Demographic Models of the Philippines

There are three such models, using empirical relationships based on Philippine data: the Bachue-Philippines model (5), the Ruprecht model (6), and what may be called the University of the Philippines School of Economics (UPSE) model (2).

The Bachue model is a large one with some 250 equations. There are three submodels with links among them: economic, labor market including income distribution, and demographic. In most of the simulation runs reported, aggregate demand and investment are exogenously determined. Marriage rates, fertility, mortality and migration are endogenously determined in the demographic submodel. The fertility function used is based on international cross-section data, as the authors felt that Philippine data and previous work in the

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area did not suffice to give fertility declines as expected. The authors also use international cross-section data to generate mortality projections. The model, intended to be helpful in policy evaluation, generates alternative future time paths of the variables under different sets of assumptions. Policy makers could therefore, in principle, compare different futures (and their associated costs) and make a choice. The "reference run" considered most likely yields a population of 83 million in the year 2000, growing at more than 2.0 per cent per annum.

Unlike the Bachue model, the Ruprecht model has production functions (for agriculture and nonagriculture) and saving functions (for government, households, and business) play a role. Population projections are, however, exogenous to the model. Population size and structure affect saving and investment, employment and production. A declining fertility assumption gives a population of 80 million in the year 2000, growing at 1.9 per cent. Comparison of alternative runs of the model indicates that "economic gain or benefit derived from reducing fertility significantly depends on the particular economic conditions and development policies or strategies pursued" (6, p. 118) and therefore, not surprisingly, that "fertility decline is neither a necessary nor a sufficient condition for economic development" (6, p. 135).

The UPSE model is the simplest of the three models. Its novelty lies in the specification of marital fertility, making this a nonlinear function of family income because of the effects of better health and nutrition: fertility rises with income up to a "threshold value" (the minimum wage rate) and then decreases. The "most plausible" run of the model, assuming moderate success with the family planning program and moderate nuptiality delay, gives a year 2000 population of 70 million growing at 2.0 per cent.

The Five-Year Development Plan 1978-82

The current Five-Year Plan (3) was prepared when the three models mentioned above were already available. (The Bachue model had appeared earlier in installments in the International Labor Organization's (ILO) World Employment Programme working paper series.) None was used in its entirety in formulating the plan, though it is reported that some relationships and equations were taken into account in staff discussions.

The Plan expresses the usual concerns regarding basic needs, income inequality and regional disparities, unemployment and under-

employment, balance of payments, inflation, energy and environmental problems. And population growth, "unless reduced to a more manageable level . . . will compound problems currently facing the country and make solutions more difficult to reach" (3, p. 7).

There is some, but very little, discussion of population matters in chapter 9, "Health, Nutrition, and Family Planning." The main thrust is to increase the coverage and effectiveness of the family planning (fertility reduction) program, although there is recognition of interrelations between demographic and socioeconomic variables. The objective is "to reduce the annual rate of population growth" (3, p. 189) and the "population level target" for 1987 is said to be 56 million (3, p. 184). However, the "specific objective" of the family planning program is "to reduce the targeted population size of 56.0 million in 1987 to 55.1 million" (3, p. 193). This confusing terminology is not explained in the Plan document but it appears that the 56 million target is the 1987 figure in the National Census and Statistics Office (NCSO) "low" projections based on the 1970 Census (cf. 4, p. 12). At the same time, the Plan uses a different set of population figures for the various sectoral plans — for projecting demand for food, educational services, etc. — viz. the NCSO "medium" projections.

The NCSO has prepared revised (lower) projections based on the 1975 Census, which were known at the time the Plan was drafted but not yet officially released. This may explain why "population level targets" were to be reduced. The revised "medium" projection of NCSO for the year 2000 is 80 million growing at 2.2 per cent, which may be compared with the "medium" projection of the University of the Philippines Population Institute (UPPI), which is 73 million at 2.0 per cent (4, p. 13).

The 1978 Review of the Population Program

In January 1978, the President of the Philippines created a committee to "evaluate policies and programs related to population in the context of the overall development goals of the country" and to "recommend program and policy directions in population for the future" (4, p. xi). The committee's report is silent on the use of population-development models, but among their numerous findings and recommendations, the following may be pertinent:

> "Findings: While some efforts have been taken to link the Philippine Population Program with the other economic and social dimensions of development, to a large extent, the program has remained up to this time a family planning program . . . . While (the law) provides for an integrated popu-

lation policy, in operational terms, the country's population policy seems to have been focused only on fertility reduction. Most social and economic policies have been evolved with minimum consideration of their impact on demographic objectives. Moreover, existing policies which already have direct demographic effects are confined to a small sector of the population, e.g., women employed in the organized sector of the labor market, income tax paying segment of the population, etc.

"Recommendations: The Philippine Population Program should be designed on a broader scale and be fully integrated in the national development of the country. Economic, social and institutional policies as programs should be evolved with a conscious consideration of their impact on demographic behavior and objectives" (4, pp. 122-23).

Assessment

Projections under "medium" assumptions from economic-demographic models and the demographic "medium" projections of the NCSO and UPPI give different figures for the year 2000 population and the growth rate at that time:

Source	Population in 2000	Growth rate in 2000
Bachue	83 million	2.0 per cent
Ruprecht	80	1.9
UPSE	70	2.0
NCSO	80	2.2
UPPI	73	2.0

Faced with such ranges, the government planner may well wonder whether any particular model is to be relied upon. Arthur and McNicoll (1), who have questioned the usefulness of large simulation models to development planners, appear to be correct in the Philippine case. Because of the complexity of the Bachue model, for instance, a number of technical errors — pointed out by Sanderson (7) — were probably overlooked due to resource constraints of the Bachue staff.

Why have the available economic-demographic models not been used in the Philippines? There appear to be several reasons.

a. The data base is inadequate for building a relatively comprehensive economic-demographic model. In order to get numerical coefficients and plausible model implications, the model builders

have had to make simplifying assumptions which lack independent justification.

b. The estimation of the national income accounts and various economic time series has been revised and improved over the past few years, so that relationships estimated by using old unrevised data are subject to question.

c. The models are not directly usable by planners because of the lack of operational handles in the model specifications. Planning and policy staffs need to know what their ministries are supposed to do or recommend to the National Economic and Development Authority (NEDA — the overall planning body chaired by the President), in quantitative terms, but this is not forthcoming from the models without further work.

d. Policy decisions (e.g. the reduction in the number of dependents eligible for income tax deductions, the inclusion of population education topics in the schools, the requirement on large business firms to provide family planning services to their female employees) do not appear to need a comprehensive model.

e. In the case of one model, the UPSE model, the planners probably find it awkward that fertility levels of the very poor and least educated would rise with improvements in their income.

f. The planning staffs must find confusing the sometimes conflicting research results used by the models and the different implications derived from them. Apparently there is a general lack of confidence as to what is known in the population-development field.

g. Finally, relatively few people in the ministries are knowledgeable in this area. It will be some time before the universities produce the people needed. (The University of the Philippines School of Economics instituted a graduate degree program in demographic economics only in 1977.)

The lessons to be learned from the Philippine experience with population-development models are probably evident from what has been said above. A good data base is needed, the model specifications must be convincing, the model should be supplemented by submodels operationalized for use by different ministries, and more people in the population-development field should be produced. As for the matter of conflicting research results, this is a problem that can only be solved (at least temporarily) through more definitive research.

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