Institute of Economic Development and Research
SCHOOL OF ECONOMICS
University of the Philippines

Discussion Paper No. 68-34   December 13, 1968

FORECASTING IN SOUTHEAST ASIAN COUNTRIES

by

lemens

ROBERT C. TURNER

NOTE: IEDR Discussion Papers are preliminary versions
         circulated privately to elicit critical comment.
         References in publications to Discussion Papers
         should be cleared with the author.

FORECASTING IN SOUTHEAST ASIAN COUNTRIES

ROBERT C. TURNER
Visiting Professor, University of the Philippines

If the title of my talk implies that I intend to attempt to prescribe a forecasting procedure that can be used in Southeast Asian countries in general, let me hasten to say that I shall not be so presumptuous. Although there are many similarities, the basic economies of the Southeast Asian countries differ significantly in many respects. So does the availability of the requisite data. There is great variation in the relative importance of exogenous and endogenous influences, and in the role of government. Any specific procedures that I might prescribe would therefore be of very limited relevance to any one country.

What I plan to do, therefore, is discuss briefly the role of macroeconomic forecasting in economic planning, the theory underlying contemporary forecasting techniques, some of the problems we encountered in applying these techniques to the Philippine economy, and the extent to which we were able to surmount those problems. Also, although I cannot be sure of their relevance to this country or any other individual country, I shall try to generalize a bit as to the feasibility of forecasting in this part of the world.

Economic planning has many definitions and takes various forms in various countries, of course, but reduced to its bare essentials the steps are usually somewhat as follows:

(1) Identification and, wherever possible, quantification of economic goals. These goals usually pertain to real standards of living (consumption) of the population, rates of real economic growth, in the aggregate and per capita, desired changes in the structure of the economy and in the distribution of income, levels of employment and unemployment, the price level, and the balance of international payments. It is normally the case that certain of these goals are in conflict with others, so that some compromise among competing objectives must be worked out.

(2) Analysis of the recent economic record. What progress is being made toward achievement of these goals, and why have economic events, good or bad, developed as they have?

(3) A forecast of the direction and magnitude of economic change assuming certain policies -- usually a continuation of present policies.

(4) An appropriate revision of present policies if the forecast indicates that satisfactory progress toward achievement of the goals will not be achieved.

(5) Possibly a reassessment and revision of the goals, if experience -- actual and projected -- indicates that their achievement is unrealistic.

I enumerate these familiar steps to emphasize that, much as we might prefer otherwise, and uneasy as we may be about the feasibility of forecasting, it cannot be avoided in the real world of the economic planner. The problem cannot be avoided simply by looking at the recent past. To do so is to engage in _implicit_ forecasting -- to extrapolate the past into the future. The planner must provide an answer to the question: In what direction and in what magnitude will the economy move in the future in the absence of policy change? Only by answering this question can he design policy changes appropriate to that future. The same is true, incidentally, of the business manager, planning the policies of his business. Only by forecasting the future economic environment can he maximize the success of his business by adapting effectively and promptly to that environment.

It is obviously desirable to express the quantified

goals and the forecast in the same units of measurement, so

that comparisons can readily be made. The most convenient,

and most widely-used, method of doing this, a GNP model. Not

all of the goals can be expressed in a GNP model, but the

major ones can. And inferences as to other goals (e.g.

distribution of income) can be derived from such a model.

Ideally, if the data permit, the basic model should

take the following form:

(1) A model of gross national expenditure (GNE) by

functional groups, i.e. persons (personal consumption

expenditures), business (gross private domestic investment),

governments (government purchases of goods and services),

and foreigners (exports and imports). Each of these should

be broken down into subcategories -- again to the extent that

the data permit -- both for purposes of policy definition in

setting goals and for purposes of isolating specific deter-

minants in forecasting. For example, a distinction between

consumption expenditures for non-durable goods and services,

and durables is often helpful. Direct personal investment,

chiefly residential construction, should be separately

identified. A distinction should be made between fixed

capital formation and changes in stocks. Government con-
sumption expenditures should be separated from government
investment (capital formation). Other obvious breakdowns
are often desirable for specific purposes.

(2) A model of gross national receipts or income
(GNI), sometimes called "charges to gross national product".
The breakdown of gross receipts should be in categories
which parallel, as nearly as possible, the categories of GNE.
To do this, we need figures for the receipts accruing to
each of the sectors (persons, business, government, and
foreigners) plus transfers among sectors and taxes to give
us net receipts by sector.

(3) These two models -- an expenditure model and an
income model -- should, of course, be integrated and con-
sistent. From them can be calculated the balance between
receipts and expenditures for each of these functional
groups. From these data can be calculated the saving-
investment balance, or gap, the fiscal posture of government,
and the balance in international transactions on current
account. This latter balance is the essential starting point
in analyzing balance of payments problems.

(4) In addition to these integrated models, the
economic planner will probably want to parallel this receipts-
expenditure approach with a forecast of national income by
industrial origin, for detailed investment planning purposes.
Indeed, it is sometimes the case in developing countries that
the value-of-output-by-industry figures are the most reliable
figures in the entire system of national accounts. Similarly,
for business planning purposes, the business economist will
want to derive estimates of expenditures by industry and by
category of product.

Let me emphasize the distinction between the goals
model and the forecast. The goals model is a statement of
objectives. It is based on assumptions that are optimistic --
realistic but nevertheless optimistic. It assumes that
desirable public policies will in fact be effectuated,
including the enactment of necessary legislation. It assumes
reasonable success in obtaining foreign assistance, where
such assistance is planned. It assumes that the private
sector response to public policy will be favorable -- again
a realistic but an optimistic assessment of that response.
In effect, it would normally assume that the output of the
economy will expand, within a reasonable time and with due

allowance for public preferences for leisure versus income
and for current consumption versus future consumption, to the
realistic limits of its potential -- to limits which are set
by physical, demographic, and institutional facts of life
which, during the period covered by the plan, are not
amenable to policy control. And it assumes that the compo-
sition of this potential output will, subject to the same
limiting factors, conform reasonably well to the long-run
objectives of public policy.

The limiting factor or factors on output will vary
from country to country. In some countries, the limiting
factor may be the supply of labor, especially skilled labor.
Such is often the case in economically advanced countries.
In some economies, it may be the supply of real capital.
Capital is especially likely to be the limiting factor in
countries where the bulk of capital, or at least strate-
gically important capital items, must be imported. In still
other countries it may be raw materials, including productive
land and energy materials. Incidentally, it does not seem
appropriate to me to identify foreign exchange as a limiting
factor. Foreign exchange is always a limiting factor in the
sense that if a country could import more, it could no doubt

expand its productive capacity faster. But a shortage of
foreign exchange simply reflects the fact that some <u>other</u>
factors are limiting output, for either domestic consumption
or for export. The <u>shortage of foreign exchange is a
symptom</u>, not a basic determinant. Whatever may be the
limiting factor or factors for a given country, the reason-
able goal, in aggregative terms, is an estimate of the
potential output of the economy under realistically favorable
assumptions as to this limiting factor or factors.

The <u>forecast</u>, on the other hand, is a coldly analy-
tical assessment of what will actually happen in the economy,
under certain realistically assumed conditions. It is not a
statement of goals or targets. The forecast should be free
from wishful thinking. It should be neither optimistic nor
pessimistic, but should reflect the forecaster's best judgment
as to the most probable <u>actual</u> course of economic events.
Indeed, if the quality of the data permit, the forecast could
well be expressed in probability terms. Even an intuitive
statement of the degrees of probability inherent in the fore-
cast may be helpful to the policy makers who will use the
forecast.

The goals model will probably extend into the future three, four or five years, in recognition of the fact that economic change takes time and that planning well into the future must therefore be undertaken. The forecast model, on the other hand, will probably be limited to a year or so, in overt recognition by the forecaster, if he is an honest forecaster, that his analytical techniques and the data he has to work with are severely limited. In the Philippines, we restricted our forecast to fiscal 1969, a fiscal year that was already four months old when we made the forecast, plus some preliminary figures for the following fiscal year, FY 1970.

Incidentally, it may or may not be desirable to make public the forecast. If, for example, the forecast shows a probable serious short-fall in economic output below the goals of policy, or an actual decline in output, a public announcement of that forecast might be sufficient to induce an even greater decline. Furthermore, in such a situation, the job of the forecaster, in his parallel role as policy maker (or policy recommender) is to design policies that would prevent the decline -- that would make his forecast come wrong. One's reputation as a forecaster is not enhanced

by such experiences, even when the forecaster-planner can properly claim credit for the result.

The first problem that the forecaster runs into is the obvious fact that economic causation is two-way: aggregate expenditures are a determinant of incomes, but income is a determinant of expenditures. The two-way causation, however, is not complete or symmetrical. Certain types of expenditure, in the short run, are relatively independent of income, and conversely, certain types of income, in the short run, are independent of expenditures. This convenient circumstance enables the forecaster in short run forecasting to break out of the circular reasoning involved in two-way causality by the familiar technique of successive approximations. That is, he starts with a preliminary hypothesis, a guess -- hopefully a reasonably good one -- as to his final result, total GNP or GNI. Then he proceeds with forecasting the components of GNE, using this preliminary hypothesis in instances where, and to the extent that, total income is a determinant, and ignoring it where more autonomous or exogenous causation is involved. Because autonomous causation is involved to some extent, the final result will probably not coincide with his preliminary hypothesis, in

which case he makes a second approximation, using the result
of the first approximation as a guide. And so on until the
final result coincides with his hypothesis.

Obviously, it is a great advantage in this type of
forecasting to utilize computers. They are not essential,
however. The extent of mathematical manipulation of relation-
ships among variables can range from relatively little --
within the limits of an ordinary calculating machine -- to
elaborate equation solving that would be quite impractical
without computers. Obviously, the level of mathematical
manipulation will be importantly influenced by the quality
of the basic data; there is not much point in doing multi-
variate regression analyses with data that have a 20 or 30
percent margin of probable error.

Whatever the level of application of mathematical
techniques, the starting point in the forecast -- after having
made the preliminary hypothesis -- is the same: identification
of those components of aggregate demand that are relatively
autonomous in character. These components will differ among
countries. In some, government expenditures, both of the
national government and of local governments, are highly

autonomous in the short run. Exports are usually autonomous
or, more precisely, exogenous; that is, in the short run they
are primarily determined, not by the level of economic
activity in the exporting country, but by events elsewhere.
(Note that I said "the level of economic activity." Exports
can, of course, be influenced by such events in the exporting
country as changes in exchange rates, export quotas or taxes,
export promotion programs, and the like. But, aside from
such changes which I would identify as autonomous changes,
the level of exports is primarily a function of events in
customer countries, which are clearly exogenous.)

In some countries, again in the short run, fixed
investment expenditures are highly autonomous -- a function
of capital budgets of business firms and government actions
such as business taxation, investment incentive programs,
and monetary (i.e. central bank) policy. Beyond the first
few months or so of the forecast period, however, endogenous
forces play an increasing role in determining investment
expenditures, because fixed capital formation is a function
of anticipated future demand. And current sales are an
indicator of future sales.

Changes in stocks of agricultural products may be highly autonomous -- a function of the weather etc., whereas changes in inventory of manufactured products may or may not be an autonomous variable, depending on whether the inventory change was an intended change or an unintended one.

The reason for starting the forecasting exercise with estimates of these autonomous or quasi-autonomous components of total spending is because they are the factors which normally initiate changes in the level of aggregate income. If the only type of spending was consumer spending, and if consumer spending was solely a function of consumer income, forecasting would be easy. Say's Law would be all we would need. It is changes in these autonomous categories of demand that instigate changes in the level of income and hence cause economic disequilibria and fluctuation. So the first job is to analyze these relatively autonomous variables, drawing upon knowledge of government policies and prospective actions, business policies and psychology, and events abroad, to derive a reasonable and hopefully accurate figure for each.

I suspect that our experience in the Philippines in forecasting these quasi-autonomous categories of demand may not be particularly relevant to other Southeast Asian countries, but let me mention briefly some of the methods we used. National government expenditures, of course, were a translation of government budgetary programs for the current and up-coming fiscal years into income and product account terms. More than a little guesswork had to go into this translation. Under Philippine budget procedures, the Congress typically appropriates considerably more than can be financed from available revenues. Over the years, a substantial backlog of "unprogrammed", i.e. unspent, appropriations has been built up. This means that the President has much room for maneuver during the course of a fiscal year in deciding which appropriations to program for expenditure. The effective constraint in a given fiscal year is actual revenues, plus ability to finance the deficit. Nevertheless, the Budget, a statement of original intentions, modified to reflect events since it was submitted, is a guide to the government's expenditure plans. Incidentally, as we examined past Philippine data, we noted a distinct tendency for government expenditures to rise in election years. We adjusted our forecast accordingly.

Estimates for local governments must be added to the national figures. Usually these are relatively small and stable, so that simple extrapolation is accurate enough. In some instances, however, particularly where there has been a substantial change in financial support to local governments by the national government, the extrapolation line has to be bent one way or the other. The Philippine national accounts, unfortunately, do not separate national from local expenditures. Using Government Accounting Office reports, however, we were able to work out a reconciliation of budget figures with the national accounts that looked reasonable.

Fixed investment spending in the Philippines is subject to extensive government influence via tax exemptions, subsidies, loans from government-owned lending institutions, and the like. Much of the capital equipment, however, has to be imported, which means that the availability of foreign exchange imposes a constraint. Within the limits of this constraint, we tried to assess the response of business to government incentives and to derive figures that, from past experience, looked probable. In some countries, sample surveys of business plans to spend for new plant and equipment

can be very helpful. In the Philippines within the past
year a private organization has launched such a survey of
manufacturing only. Although it is helpful, not enough
experience has been accumulated to test its reliability.

We tried several approaches for exports, including
regressing total exports against measures of demand in
principle customer countries -- a technique which gives
workable results in t.xerv.S. but did not, for us, in the
Philippines. We finally concluded that the best technique
was a commodity-by-commodity approach; that is, an analysis
of prospective supply conditions and markets for the ten
commodities which make up some 85 per cent of Philippine
exports. Even this approach was complicated by the fact
that during and preceding the period of foreign exchange
decontrol, i.e. from about 1957 or 1958 through 1962 and
perhaps through 1964 a great deal of technical export
smuggling apparently occurred. At least, comparisons of
Philippine export statistics with import statistics of
customer countries so indicate. This means that historical
analysis is limited to the years beginning with 1965 -- not
a long enough period of time to permit very meaningful

analysis. We therefore called upon experts from the several government agencies concerned with these ten export commodities to give us the benefit of their detailed knowledge of current and prospective supply and demand conditions. For the remaining 15 per cent of exports, a miscellaneous assortment, we simply extrapolated the trend.

The inventory change figures in the Philippine accounts are, unfortunately, not very dependable -- as is the case in many other countries. Good data for recent years on changes in certain agricultural stocks, notably of rice, are available. But forecasts of changes in stocks of agricultural products are difficult because these changes are chiefly a function of crop yields, which requires forecasting the weather. Changes in industrial stocks were apparently significantly affected by speculation during the period of decontrol and devaluation. Central Bank constraints on credit for imports were also an influential factor. In U.S. forecasting, we treat non-farm inventory change as an endogenous variable, which is subsequently adjusted to reflect exogenous events such as a steel strike. In the Philippines, because no data on the absolute level of inventories are available, such

treatment was not possible. The forecast figures we finally

derived were highly subjective in character, and reflected

our net judgment of the interplay of endogenous and exogenous

factors.

Next come the endogenous categories of demand -- those

that are more-or-less dependent on the aggregate level of

income. The largest and by far the most important of these

is personal consumption expenditures. In short-run fore-

casting of PCE, I find the Keynesian consumption function to

be a useful tool.

It is important in forecasting, however, to make a

clean distinction between the static and the historical

consumption function -- a distinction that is sometimes

forgotten in discussions of more elaborate consumption,

functions. The static consumption function refers to the

consumption response to alternative levels of disposable

income, of either the individual household or the nationa,

at a point in time. Consumption spending does not occur

instantaneously, however, in a period of zero time dimension.

To be realistic about it, therefore, in economic analysis

and forecasting we have to stretch the phrase "point in time"

to a period long enough to permit measurement. The time
period used for measurement, however, should be short enough
that consumer attitudes, habits, plans, and all the other
determinants of consumer responses, do not change signifi-
cantly. Perhaps three months is the outside limit of a
working definition of "a point in time."

It is usually assumed from studies of consumer
behavior, that the static consumption function **is roughly linear**
with a substantial Y intercept. That is, extrapolation of
the function backward to the axis would yield a substantial
volume of consumption at zero income. A linear function
with a positive intercept (the value of "a" in the equation:
C = a + bY) means that, if the constant <u>marginal</u> propensity
to consume is less than 1.0, the <u>average</u> propensity diminishes
with increases in income. If it is an aggregative consumption
function that we are concerned with, at levels of income that
are normally relevant to economic analysis, the marginal
propensity to consume is likely to be substantially less
than the average propensity. This is a reasonable construct,
given the fact that consumers habits, attitudes, etc. change
slowly and only after appreciable lags.