With time, however, they do change. The historical consumption function is an expression of the relationship of consumption to disposable income over time -- a long enough period of time for consumers to change their habits, attitudes, etc. If we plot actual consumption expenditures against actual disposable income over a period of years, we are likely to get a function, still probably roughly linear, but with a smaller Y intercept. What this means is that the static consumption function has in fact gradually shifted upward. In the U.S., the historical consumption function for the period since World War II has a Y intercept of approximately zero; that is, the historical marginal propensity to consume is almost exactly equal to the average propensity. Jeffrey Williamson's studies indicate that a zero intercept is not typical in Asian countries; instead, the saving rate tends to rise with rise in income associated with development.[1/]

[1/] Jeffrey G. Williamson, "Determinants of personal saving in Asia: long-run and short-run effects," Discussion Paper No. 67-11, Institute of Economic Development and Research, School of Economics, University of the Philippines, September 15, 1967.

It is important for the forecaster to make the best possible estimate of both the static and the historical consumption functions. For very short-run forecasts, the static function may give the best answer. For example, he may be trying to predict the immediate (i.e. a few months) impact of a tax change on economic activity. For forecasts extending a year or more into the future, however, the historical function is likely to yield better figures. And in assessing the phasing through time of changes in economic policies, he may want to use the static function for immediate effects, then the historical function for longer-run effects.

The consumption function is an expression of the relationship between personal expenditures (PCE) and disposable personal income. This means that a technique must be derived for relating disposable personal income to GNP (GNI) or to Gross Domestic Product (GDP).[2/] If the data are good enough to permit regression analysis, workable functional relationships can usually be derived between DPI and PI, and PI and GNP, in addition to PCE and DPI. The former (DPI/PI) is, of course, a function of tax rates, plus changes in the

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2/ See Lewis and Turner, Business Conditions Analysis (McGraw-Hill, N.Y., N.Y., 1967) for a more complete discussion of this technique.

effectiveness of the collection procedures. Given assumed autonomous changes in each of those determinants, good estimates of the ratio of DPI to PI in the forecast period can usually be made. The latter relationship (PI/GNP) is more difficult, because so many variables intervene between GNP (GNI) and PI. By intervening variables I mean transactions that siphon gross receipts out of the income stream of governments, business, or foreigners, such as capital consumption allowances and indirect business taxes. The receipts so siphoned out of the income stream do not reach consumers as spendable income. A reverse flow is payments to persons of income received though not earned, chiefly government transfer payments. In the U.S., the PI/GNP ratio is quite stable with a slight contracyclical tendency reflecting chiefly variations in unemployment compensation benefits. Given the preliminary income hypothesis and a knowledge of probable autonomous changes such as a change in social security tax rate or benefit schedules, a reasonably dependable forecast of the PI/GNP ratio can be developed. In the Philippines, we found the ratio to be not nearly so stable largely, I think, because of rather extreme variations in the size and sign of the statistical discrepancy. We therefore went back to the

expenditure side of the accounts and correlated PCE directly with GDP. We found a linear functional relationship with a small, positive intercept. That is, PCE over a period of years was a reasonably stable but gradually diminishing percentage of GDP. The diminishing percentage could apparently be attributed, partly to an increase in the personal saving rate resulting, perhaps, from an increasingly skewed income distribution curve, but primarily to an increase in corporate saving including capital consumption allowances. To a minor extent it could also be explained by some increase in the proportion of income taken in direct taxes resulting, not from an increase in rates, but from improved collections -- though the evidence on this is not clear.

Having said this much about the definition and uses of the consumption function, I must add that, in no country that I have had any experience with, is the simple consumption function a full answer to the problem of analyzing consumer behavior. Consumers usually behave according to pattern, but not always. In the Philippines, if the data are correct, consumers were usually quite dependable. But they misbehaved occasionally, especially during the period of decontrol and devaluation -- or increased control -- of the

currency. In the U.S., consumers have at times increased their saving rate suddenly (e.g., in 1967 and early 1968), and at other times gone on a spending spree (e.g. late 1963 and, to a lesser extent, in the past few months).

Alternative versions of the consumption function which take into account income expectations, asset holdings, net worth of consumers, their liquidity position, etc., might give better results, but as of now the current time series on these variables necessary for short-term forecasting are not available, in the U.S. or elsewhere to my knowledge. These influences have to be treated as autonomous variables which the forecaster takes into account as best he can.

The other component of the GNE accounts which is both largely a dependent variable and of major importance to Southeast Asian countries is imports. Imports are a function of numerous variables, other than such autonomous ones as changes in import duties and quotas. The most important, of course, are the level of domestic spending, both consumption spending and investment spending, and relative prices. Comparisons of prices are tricky business because of differences of definitions, changing composition of imports, etc.

It has been my experience that, unless some major change such as devaluation is involved, the inclusion of relative price movements as one of the determinants of imports in short-run forecasting is not worth the statistical labor required. (This comment would not apply to well staffed and computerized forecasting organizations). Reasonable projections can be made by relating imports, by major category, to domestic demand, with only minor and subjective allowance for price effects.

In the Philippines, we found that total merchandise imports were well correlated with the sum of personal consumption and gross domestic investment (including government capital formation).[3/] The slope of the regression line was relatively high, i.e., over the period covered, an increase in consumption plus investment expenditures was associated with a significantly greater than proportionate increase in imports.

[3/] Note that government consumption was omitted, on the assumption that it was predominantly payments for personal services and the import component was therefore unimportant. Further experimentation including government consumption would probably be appropriate.

Non-merchanside imports (freight and insurance, tourist expenditures abroad, etc.) did not exhibit any simple functional relationship that we could identify; autonomous determinants were clearly at work. Lacking any better method, we simply added non-merchandise to merchandise imports in deriving our forecasting equation; the error so introduced was sufficiently small as not to affect our GNP forecast very much, though it may have had a significant effect on the balance of trade calculation.

We now had two components of demand, personal consumption expenditures and imports, that were a function of other types of expenditures. We had two equations with two unknowns, which could be solved by the usual methods.

Even for these dependent variables, however, the values for the forecast should not be based solely on relationships apparent in past data. We therefore adjusted the computed values for identifiable autonomous events that could be expected to affect consumption and imports during the forecast period. And finally, an estimate of net factor income from abroad (a small, negative number in the Philippine accounts) had to be made to derive GNP from GDP.

The process I have just described provides the GNE model. In logic, we should have proceeded next to calculate a receipts model to match the expenditure model, and this is what I normally do in forecasting in the U.S. In the Philippines, however, the GNI data are deficient and seriously lacking in necessary detail. Furthermore, the statistical discrepany is sizeable -- almost 10 percent of GNP in one year. We, therefore, turned to the third approach to measuring to national output: value added by industry, or national income by industrial origin. The data on value added by industry are perhaps the best there are in the Philippine accounts. This approach involved analyzing each of the industry categories for growth trends, investment programs, government subsidy programs, anticipated technological developments, and the like. There is a temptation in such industry analysis to fall back on mechanical extrapolation, and extrapolation in a developing economy is not without its uses. But it should be supplemented with careful analysis that will reveal probable changes in past growth trends, in either direction.

Given our figure for national income by industrial origin, all we had to estimate on the receipts side of the

accounts to obtain a figure for GNI was indirect taxes less subsidies and capital consumption allowances. Indirect taxes were divided into three groups according to the type of item taxed. Excise taxes on imports and import duties for example, were regressed against imports. Excise taxes on domestic products and certain other taxes on business were regressed on personal consumption expenditures. Real property taxes, a stable figure, were simply extrapolated after making allowances for a recently enacted increase in real property tax rates.

Capital consumption allowances ideally should be regressed against some measure of the value of depreciable assets. I know of no country, however, where adequate data for such an analysis exist. An alternative is to use a measure of the output of domestic capital, i.e. gross domestic product, as a proxy variable for the value of depreciable assets. Still a third alternative is simple extrapolation of what is typically a steady curve. In the Philippines for reasons which I believe pertain chiefly to the quality of the basic data, the last two methods yielded significantly different results. We used the regression

on GDP method, which yielded the smaller figure, simply because the resulting figure "looked" more reasonable. Further research on this point is clearly indicated.

Estimating net national product at factor cost (national income) by the value-added-by-industry method permits a calculation of total saving, but not saving by functional group, i.e. persons, governments and business. For economic analysis and policy formulation purposes, the latter figures are desirable if not essential. The various numbers that have to be forecasted are outlined in the attached receipts-expenditures format (sometimes called "Nation's Economic Budget"). This format, of course, has to be adapted to the particular detail of any country's system of national accounts -- if, indeed, the detail for the income side of the accounts is available at all. Because of this variation in accounting practice from country to country, I will not take the time here to discuss the estimating problem. Suffice it to say that, in the Philippines, very little detail on the income side of the accounts is provided, and our estimates were therefore necessarily rough. But perhaps they were close enough to point the finger at the source of some of the major problems.

Estimating national income by the value-added approach does not take care of the statistical discrepancy problem. This may not be a problem here; if it is not, you are lucky. If the statistical discrepancy is so small as to be well within the margin of forecasting error, the most convenient procedure is simply to force it to zero. In the Philippines, it was not that small. So we decided that the only honest thing to do was to let the forecast figures, item by item, stand as originally calculated, and show a substantial statistical discrepancy. There is no way of knowing, of course, where the statistical discrepancy comes from, that is, how much of the total error is attributable to each of the functional accounts. This means that the saving (or dissaving) calculation for each account, including the international account, must be calculated as two numbers, with and without the discrepancy. And the total saving-investment balance, or gap, calculation can be shown only as a range, with and without the discrepancy. And because these gaps are relatively small differences between large numbers, injection of even a modest statistical discrepancy can result in a substantial range. The forecast would be much cleaner and more useful to the policy maker if

he could be given one figure, rather than a range. But so long as we do not know which side of the accounts is more dependable, I see no honest alternative.

This, in summary terms, is the technique we used in the Philippines and which, I should think, could be used in any Southeast Asian country with a reasonably good set of national accounts extending far enough backward in time to permit simple regression analyses. More elaborate techniques can be developed if the quality of the data permits. You will note, for example, that I said nothing about lead-lag relationships. I find aggregative lead-lag relationships, such as the famous leading indicators of the National Bureau of Economic Research in the U.S., of little value in a Southeast Asian country -- or in the U.S. either, for that matter. The leading indicators are based on the implicit assumption of structural rigidity in the economy. And in effect, they assume away exogenous or autonomous events. These simply are not valid assumptions in a developing country, especially a relatively small one.

Identifiable leads and lags may, however, be found for specific components of total demand where the line of

causality is relatively clear and autonomous factors are not too much of a problem. Even here, however, the leads are likely to be measured in months, rather than years. Unless the annual data generally available are supplemented by good monthly or quarterly data, therefore, the leads are hard to spot.

It is also possible to build complete integrated econometric models involving many interrelationships among variables expressed in equation form. The U.S. Department of Commerce 49-equation model, described in their Survey of Current Business, is an example. Based on my limited experience in Southeast Asia, however, I conclude that such models would yield no better results than the judgmental type of model building that I have described. The reasons for this conclusion, in addition to the obvious problems of data inadequacies, are two. First, even the most elaborate econometric models require treatment of certain components of demand or income as autonomous, simply because those components are in fact autonomous. Values for these variables are "plugged" into the model, not derived from it. In a Southeast Asian country, however, autonomous events,

arising from either government policies or from events in other countries, are likely to predominate. Once all of the autonomous events have been correctly identified and quantified, there is not much left for the econometric model to do.

Second, econometric models implicitly or explicitly assume that the functional relationships incorporated in the model are stable. In a changing, developing economy, this is not likely to be the case for at least some of the functional relationships. Consequently, the model has to be continously revised to keep it relevant to the changing real world. In an organization that has to ration its manpower, the statistical labor involved is scarcely worth the effort.

Is macroeconomic forecasting of any type feasible in a Southeast Asian country? I have not had enough experience to give a definitive answer to this question, but let me give you my tentative conclusions.

First, forecasting is always more difficult in a small than in a large country, because of the greater

relative importance of external events. But, in some measure, this is a problem in any country, and it does not preclude reasonably good forecasts even in quite small countries. And even if the autonomous or exogenous events are so controlling as to preclude reliable forecasting in any absolute sense, the forecasting technique is useful for tracing out the effects of alternatively assumed autonomous events.

Second, statistical measures of economic activity, the national income and product accounts in particular, though greatly improved in recent years, are still less than adequate. If the only purpose of a set of national accounts is to give a reasonable estimate of total GNP and thus of the overall growth rate, present accounting systems may be good enough. (They would be true if we could assume that the errors in the sector accounts are random and therefore offsetting). But forecasting requires a higher degree of accuracy than that. It requires analyses of intersectoral relationships, and integration of the income and expenditure sides of the accounts. A large statistical discrepancy, for example, really confounds the forecaster, as I have intimated earlier.

Third, one of the most valuable tools in forecasting, to which I have adverted only briefly, is sample surveys of private intentions to spend or to invest. Such survey techniques are still in the process of development or refinement in the U.S., Canada and Western Europe, but significantly useful results have been available in most of those countries for a decade or two. I doubt that reliable macro-forecasting in Southeast Asian countries will be feasible until reasonably dependable similar techniques are developed here, at least as regards fixed investment spending.

Fourth, effective forecasting depends heavily on reasonably firm knowledge of government plans to spend, tax, and make transfer payments. This is something the economist and forecaster cannot do much about, of course. I mention it only to emphasize that forecasting is feasible only to the extent that government fiscal and budget programs are planned and implemented in a reasonably orderly way.

In spite of these problems, I think that forecasting that is rough but reliable enough to the useful in policy formulation is now, or soon will be, feasible in this part of the world. At least that was my conclusion as regards the Philippines.

Format for
Receipts and Expenditures by Economic Groups

			Receipts	Expenditure	Balance
PERSONS					
	Compensation of employees	xxx			
	Proprietor's income	xxx			
	Rental income of persons	xxx			
	Net interest	xxx			
	Corporate profits + IVA	xxx			
Equals:	National income[1]	xxx			
Less :	Undistributed corp. profits	xxx			
	Corporate profits taxes	xxx			
	Social insurance contributions	xxx			
	Excess of wage accruals over disbursements	xxx			
Plus :	Govt. transfers to persons	xxx			
	Business transfers to persons	xxx			
	Net interest paid by government[2]	xxx			
	Interest paid by consumers[2]	xxx			
Equals:	Personal income	xxx			
Less :	Personal direct taxes	xxx			
Equals:	Disposable personal income	xxx			
Less :	Interest paid by consumers[2]	xxx			
	Personal transfers to foreigners	xxx			
Equals:	Net available for consumption		xxx		
Less :	Personal consumption expenditure			xxx	
Equals:	Net personal saving (+)				xxx

		Receipts	Expenditure	Balance
BUSINESS				
	Undistributed profits + IVA	xxx		
	Capital consumption allowances	xxx		
	Excess of wage accruals over disbursements	xxx		
Equals:	Gross retained earnings	xxx		
Less :	Gross private domestic investment		xxx	
Equals:	Business deficit (-)			xxx
GOVERNMENTS				
	Personal direct taxes	xxx		
	Corporate profits taxes	xxx		
	Indirect business taxes	xxx		
	Contributions to social insurance[3]	xxx		
	(General Government income from property and entrepreneurship)[1]	xxx		
Equals:	Gross receipts of Govt.	xxx		
Less :	Govt. transfers to foreigners[4]	xxx		
	Govt. transfers to persons	xxx		
	Net interest paid by Govt.[2]	xxx		
	Subsidies	xxx		
Equals:	Net receipts of Govts.	xxx		
Less :	Govt. purchases of goods and services		xxx	
Equals:	Govt. surplus (+) and deficit (-)			xxx

		Receipts	Expenditure	Balance
FOREIGNERS				
Govt. transfers to foreigners[5]	xxx			
Personal transfers to foreigners[5]	xxx			
Equals: Total receipts		xxx		
Less : Net factor income from abroad[6]			xxx	
Net exports			xxx	
Equals: Net borrowing from abroad (-)[7]				xxx
Total (GNI, GNE)		xxx	xxx	xxx
Statistical discrepancy[8]		xxx		xxx
GNP		xxx	xxx	0

1/ The Philippine accounts include "General government income from property and entrepreneurship" in National Income, which must therefore be subtracted from National Income in calculating Personal Income and added to tax receipts of government in calculating gross receipts of government.

2/ These entries do not appear if Government and consumer interest payments are included in national income and in GPGS and PCE, as is apparently the case in the Philippine accounts.

3/ Included if social insurance is included as a government receipt-expenditure. In the Philippines, social insurance is treated as the equivalent of private insurance.

4/ In the Philippine accounts, this item with sign reversed, is "Current transfers from abroad".

5/ In Philippine accounts, "Current transfers from abroad" with sign changed.

6/ Included in "Net exports" in U.S. accounts.

7/ "Net foreign investment" with sign changed.

8/ The statistical discrepancy can be entered on either the receipts or the expenditure side, with appropriate change in sign. In the Philippines, it is entered on the expenditure side, in the U.S., on the receipts side.