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PAPER P-1028

NATIONAL INCOME ACCOUNTS OF VIETNAM

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November 1974



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Contract VN-46

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Chapter I

INTRODUCTION

A. OBJECTIVES AND SCOPE

The national income accounts of a country present a coherent, consistent framework for measurement of annual productive activity, income, and expenditures in the economy. This structure provides a picture of the status of various segments of the national economy and permits quantitative analysis of the relationships among a large number of economic phenomena.

A country needs such national accounts with reliable measurements to establish goals and to monitor progress of economic policies and development programs. Vietnam possesses a coherent national income accounting system but, lacking certain accounts, estimates them by use of a poor data base. An official Government of Vietnam (GVN) review panel recently questioned the reliability of the estimates presented in the accounts (Research Commission on the System of National Accounts, 1969). This panel pointed out only major problem areas and offered few suggestions for improvements. Additional criticisms of presently available estimates as unreliable and untimely (without specification of the problems or provision of recommendations) indicate that a detailed assessment of shortcomings and a strategy for correcting them should be made. A review of the accounts and the method for estimation reveals that past measures of the accounts are inaccurate and, in general, provide an understatement of actual economic activity. Normal lag time in publication is three years.

This report studies the reliability of the magnitudes (in current and real terms) presented in the national income accounts of Vietnam and suggests methods for correcting errors in measurement. Problems in the measurement of the national accounts are considered in two parts. Part 1 evaluates the estimates of the current values of production, income, and expenditures. These appraisals are made by a close examination of the underlying data-collection process, sample-survey procedures, and statistical-estimation techniques. The reliability of the estimates of the production accounts is first reviewed. "Production" refers to the contribution of each industry to Gross Domestic Product (GDP) as measured by its value added. "Value added" is defined as the value of output of an industry minus the value of intermediate inputs consumed. This paper then considers the accuracy of the estimates for different types of income receipts and the various classes of final expenditures; both income and expenditures are derived from the value added accounts. Each chapter will apply these findings to evaluating the capability of the accounts to measure economic activity and recommending specific improvements in data collection, survey procedures, and estimating techniques. The survey is limited to the summary accounts, because the estimates represent the summation across more detailed and specialized accounts for particular institutions or activities. An assessment of the format or the contents is not made, for two reasons: (1) for the most part, the elements of the accounts are correctly specified; (2) the existing format, though somewhat dated and lacking certain useful accounts, gives a reasonably detailed and consistent picture of the economy (lack of certain accounts is due largely to inadequacies and insufficiencies of data; see further discussion below).

Part 2 focuses on estimates of the national income accounts in real terms. Vietnam at present has no available estimates of sectoral contribution to gross domestic product in constant

prices. Hence, some discussion (supplemented by a technical appendix) is devoted to the theoretical and practical problems in estimating an industry's real value added. The general guidelines for selecting the appropriate method of deflation are considered, in view of probable errors in the measurement of outputs and intermediate inputs in real terms (i.e., the preferred method of deflation must take into account the relative reliabilities of output and input data as well as their movements). The general guidelines are used as a basis for determining specific procedures for deflation of the accounts. These procedures are then applied in the deflation of each product account. Deflation of the expenditure accounts is considered in light of the methods used to estimate real value added in the product accounts, since expenditures in current terms are derived from the product accounts in current values.

B. STRUCTURE AND DATA SOURCES OF THE ACCOUNTS

The national accounts of Vietnam, compiled by the National Bank of Vietnam, are organized along the United Nations format recommended in the early 1950s. This layout structures the national accounts around the following set of summary accounts:

- A production account, which summarizes the source of output by sector of production and the allocation of output by type of use.
- An income account, which itemizes the amount of different types of earnings from production and disposition of these earnings for different types of uses.
- Accounts for disposition and sources of receipts for households and nonprofit institutions, domestic capital formation, general government, and external transactions.

With some modification, a national income accounting system structured around these accounts is the most suitable of the available alternatives for monitoring the performance of the economic system and for development planning. While the

new U.N. system tends to obscure these interrelationships by deconsolidating each account, this format is the only one that structures the national income accounting system to yield (as a basic summary account) source of output by sector of production. In other words, it provides a picture of the major flows of economic activity among the different sectors. Such a structure of interrelationships is important to officials for formulating and evaluating changes in different types of economic activities. It focuses attention on an essential aspect of planning and policy in a less developed country--the aspect of changing the composition of output.

In terms of government policy-making, three changes in the existing system would improve its applicability. First, private nonprofit institutions should be incorporated into the production sector. Private nonprofit institutions correspond more closely to firms than to households, in that they operate more like firms than households (i.e., they sell or provide services similar to profit-making units). Thus, the homogeneity of the household sector is improved, without the necessity of setting up a new set of accounts for a relatively small segment of the economy. Second, an allocation of general government expenditures among different end uses should be made. Examples of groupings of government expenditures are general government services (including administration, public order, and safety), defense, education, health, and welfare. End-use classification of government activities improves the capability of evaluating the relationship of government activities to the private sector. Third, additional estimates of intersectorial flows should be made, to permit the construction of an input-output matrix. An input-output matrix would enable planners to examine better the ramifications to the production sector from alternative end-use objectives.

As in all countries, the data for the national income accounts are derived predominantly from the economic statistics compiled by various government agencies. For Vietnam, these government agencies are as follows:

- The Ministry of Agriculture (the complete name is Ministry of Land Reform, Agriculture, and Fishery and Animal Husbandry Development) provides the data for the agricultural sector.
- The National Institute of Statistics (NIS) collects and compiles data for urban sectors and for government enterprises.
- The Ministry of Finance compiles the data for government receipts and expenditures.
- The Ministry of Public Works supplies some of the required data for the transportation sector.
- The Ministry of Economy provides price data.
- In addition, questionnaires and interviews by the National Bank of Vietnam (NBVN) are used to obtain necessary data.

Part 1

Evaluation of the National Income Accounts
of Vietnam

Chapter II

GROSS DOMESTIC PRODUCT ACCOUNT FOR AGRICULTURE

Gross domestic product equals the gross value of output less intermediate inputs. The residual then amounts to payments for wages and salaries, interest, depreciation, profits, and indirect taxes less receipts for subsidies. Intermediate inputs represent materials (as distinct from plant and equipment) used for production.

This chapter (1) describes current methods of estimating value added for agriculture, (2) discusses the results from the evaluation of current value-added estimates, (3) considers GVN proposed changes in these methods, and (4) suggests ways of improving these estimates. All the secondary and tertiary production sectors are covered in the next chapter (Ch. III). This paper does not look at mining, because South Vietnam produces virtually no mineral products. Agriculture covers farming (rice and other crops), animal husbandry, forestry, and fishery.

A. RICE AND OTHER CROPS

1. Current Practices in Estimating Value Added

The National Bank of Vietnam (NBVN) computes value added from all agriculture based on data supplied by the Ministry of Agriculture (MOA). Rice output is derived from paddy production

figures. The Directorate of Agricultural Economics (DAE)¹ obtains paddy production from an annual survey of yield per hectare, covering about 50 percent of the area under cultivation. The sample for the survey is based on the 1960-61 census of agriculture: a sample hamlet was selected from a list of hamlets within provinces, and 40 farms within each hamlet were surveyed. The census itself was more a sample survey than a complete enumeration. It was set up by the FAO, and included 1,600 hamlets stratified by province and district. The list of hamlets was used to select randomly sample hamlets and households within hamlets. Households were assumed to be randomly located within the hamlets. Then, farmers were questioned on type of crops grown and yield (actual cutting), time of planting and harvesting, production methods, and inputs.

At present, production values are obtained at harvest time from actual cuttings of 50 square meters of land of sample farms. These cuttings are weighed (accounting for moisture) and used to estimate yield per hectare. An average of these estimates of yield per hectare is, in turn, multiplied by the estimated number of hectares in production in each province. The number of hectares under cultivation is obtained from agricultural service chiefs without checks for reliability or accuracy. Similarly, the reliability of reports on land under cultivation and on average yields per hectare for areas not included in the survey (obtained from these provincial service chiefs) is not questioned. To compute intermediate costs and value-added components, input requirements per hectare (based on the 1960-61 agricultural census) are used.

¹The Directorate of Agricultural Economics was formerly the Agricultural Economics and Statistics Section of the MOA. In 1972, the status of this section was upgraded to Directorate, and divided into three sections: statistics, production, and marketing.

For secondary crops, no systematic surveys on factors since the 1960-61 census have been attempted for estimating gross and net output. Yield, cultivated acreage, and input requirements are obtained from agricultural-province chiefs, whose information is not checked for accuracy or reliability.

Prices used to value the output of rice (and other crops) and inputs are obtained from the MOA. These price data are tabulated from biweekly hamlet reports to provincial chiefs. Though these prices are supposed to represent those received (output) and paid (inputs) by farmers, for some crops they are those prices that prevail in the provincial markets.

2. Evaluation of Current Practices

For rice, inadequate survey methods, dependence on provincial political sources for land under cultivation, and outdated factors for yields and inputs result in unreliable estimates of the volume of net output. These procedures tend to overestimate value added from rice.

Paddy production figures published by the DAE were compared to estimates of average consumption per capita per annum (see Table 1). To determine available rice supply from paddy production figures, it was assumed that only 50 percent of paddy is consumable, rather than the rule-of-thumb value of 60 or 65 percent usually used to estimate available grain after milling. The lower percentage of 50 percent was used as a conservation measure to allow for higher losses and wastes and for greater consumption (and other uses, such as livestock feed) than is usually assumed. It may be argued that 50 percent does not properly take these factors into account. Although a sample survey is undertaken by the MOA each year to determine yield, this estimate may not correspond to losses and wastes during actual harvest of paddy. In other words, cutting, threshing, and other processes of actual harvest may involve

Table 1. ESTIMATES OF RICE CONSUMPTION AND PRODUCTION

Year	Population ^a	Rice Imports ^b (MT)	Domestic Required Production Assuming per capita Annual Production of-- ^c			Reported Production ^g
			144 kg ^d	155 kg ^e	160 kg ^f	
1968	17,414	515,000	1,992,616	2,184,170	2,371,240	2,183,075
1969	17,867	599,000	1,973,848	2,170,385	2,259,720	2,557,500
1970	18,332	473,000	2,166,808	2,368,460	2,460,120	2,857,750
1971	18,809	233,000	2,475,496	2,682,395	2,776,440	3,162,100

^a NIS estimates, which are higher than those reported from the provinces.

^b Accounting for previous year's stocks of imports.

^c Assuming (1) that a fixed per capita consumption multiplied by the population will give an estimate of actual consumption and (2) that actual production equals actual consumption minus imports.

^d Estimated from NIS survey.

^e From FAO estimates of consumption in Southeast Asia.

^f Estimated from 1964 rice production of Vietnam, assuming that 1964 was the last "normal" year.

^g Estimates (by the Agricultural Economics and Statistics Section, Ministry of Agriculture) of paddy production divided by 2 (i.e., these values assume a 50-percent loss and waste in milling, etc.).

methods more inefficient than the sample survey. Moreover, this percentage may not properly consider the quantity of grain consumed by livestock (i.e., livestock may consume more than the 5-10 percent assumed). The MOA has little information on the quantity of grain used for livestock feed. However, given that the milling ratio of 60-65 percent is supposed to account for these factors, use of a 50-percent milling ratio seems to be a reasonable ratio with which to approximate available quantity of rice.

It was determined that, according to the DAE data, South Vietnam from 1969 on should have been self-sufficient in terms of rice. From Table 1, the reported production figures exceed estimated consumption from 1969 to 1971, assuming per capita annual consumption of 155 kilograms (kg). Yet imports of rice for consumption purposes (i.e., actually consumed and reduced by stocks) ranged from a high of 599,000 metric tons (MT) in 1969 to a low of 233,000 MT in 1971.

The estimates in Table 1 suggest overestimates of both paddy production and marketable rice. In terms of paddy production, overestimates are probably due to reporting methods. Even though an annual survey is taken by the MOA, provincial chiefs report the number of hectares under cultivation; and yield is reported in those areas not sampled. Political pressure, particularly with respect to goals of the five-year development plan, has been placed on these chiefs to increase the number of hectares, as well as yield. Because of this pressure, reported yields and cultivated areas may be overstated. Overestimates of paddy output in turn imply an overstatement of marketable rice. Moreover, the estimates in Table 1 (computed with a milling ratio of 50 percent) suggest that a ratio of 60-65 percent is possibly too high (i.e., a ratio of 60-65 percent to calculate rice available for consumption probably does not properly account for losses and

wastes in harvest--particularly for livestock feed). Feed grain can be estimated by sample survey, and this possibility will be discussed more fully below.

In addition, the survey itself is not wholly adequate. The present sample survey is based on the 1960-61 census. The list of hamlets used to select the sample is no longer relevant, because hostilities have produced large shifts in population as well as control of hamlets (one-third of hamlets are estimated to have been lost). The method of stratification of the sample by province and district (with emphasis on largely populated areas and large rice-producing areas) is probably incorrect. No adjustments are made in the sample selection. Moreover, the 1960-61 census involves problems with respect to the assumption that households were randomly located within the hamlet. In Vietnam, households tend to be clustered away from the fields. Hence, the method of selecting sample farm households may not be completely random; and the direction of bias would depend on which farm households (wealthy or poor) tend to locate away from the others.

For inputs, the table of input requirements per hectare (based on the 1960-61 agricultural census) tends to produce distortions in the estimates of value added, for several reasons. First, changes in materials used (e.g., increases in fertilizers and pesticides) are not fully considered, thereby tending to overstate value added. Use of fertilizers and pesticides has become more and more important as additional hectares are used to produce the new miracle rice (TN variety), which in 1972 contributed a relatively large proportion (42 percent)¹ to total paddy output. This variety requires applications of fertilizers and pesticides to attain the high

¹ADFA/ECON, Office of Domestic Production, "1971-1972 Crop Estimates," Agricultural Production Memo, No. 16, May 12, 1972.

expected yield (i.e., it is quite responsive to such applications--particularly in comparison to local-variety rice).¹ However, fertilizers and pesticides are also being used in the production of local-variety rice. Second, factor proportions have changed and are not fully taken into account. In the past 10 years, the number of males working on farms has decreased, due to hostilities (military draft); and women and children have taken over much of the farm work. Productivity for women and children tends to be lower than for males. Use of the table of input requirements assumes no such change and, hence, provides an overstatement of value added. On the other hand, increased use of tractors and water pumps (substituting for draft-animal power and labor) is not included in the computation of value added. The introduction of capital equipment would tend to raise the productivity of labor (women and children), compensating in part for reduction of male workers. Exclusion of capital equipment, then, tends to understate value added. The degree of over- and under-statement of value added (due to changes in farm labor-force structure and use of capital equipment, respectively) is difficult to measure. But if the two factors are counterbalancing, it may be concluded that value added for rice is overstated, because paddy production is overestimated and the rule-of-thumb milling ratio of 60-65 percent is too high.

For secondary crops, yield, cultivated area, and input requirements are obtained from agricultural-province chiefs (who, again, are not checked for accuracy or reliability). Because the GVN sets out annual production goals for each crop in terms of yield and hectares, it is assumed that reported

¹See Ray S. Fox, "Rice Cost of Production in Viet Nam, 1968/1969," USAID, Office of Associate Director for Food and Agriculture, Agriculture Economics Division, March 1971.

yield and cultivated area tend to be (as in the case of rice production) overstated by these chiefs. These data, however, are more difficult to check than the data for rice, since most of the focus of research has been on rice.

Input requirements for secondary crops also are based on the 1960-61 census, with very little variation in quantities used. Although much criticism has been waged by the MOA and USAID Agricultural Economics Division against the reliability of these data, little work has been done to determine their accuracy. Moreover, because materials used in production have changed,¹ criticisms made with respect to rice production are appropriate. For industrial crops (e.g., tea, rubber, and coffee), only output and price data are supplied by plantations. While these data may be considered relatively reliable, value added is based on a 1963 NBVN survey of input requirements and, hence, may represent an overstatement (i.e., the table of input requirements derived from the survey does not take into account changes in production techniques and materials, which appear to be important with respect to rubber).²

In terms of valuation, use of incorrect prices of output and inputs in the past contributed to the unreliability of value-added estimates. Prices were often quoted inconsistently in terms of units and products (e.g., the price of bananas may be in kilograms one year and by the "hand" the next, or the price of peanuts may be for shelled one year and unshelled the next). In addition, when farm prices of certain rice varieties

¹See Harold G. Walkup et al., "South Viet Nam's Fertilizer Situation and Alternatives for Production," Tennessee Valley Authority, 1971, for estimates of fertilizer used for all crops. This report indicates that farmers are utilizing techniques acquired for improving rice production in producing other crops.

²Ibid.

were not available, the NBVN was valuing rice at 10-15 percent below the nearest provincial mill, depending on the type of rice and mill.

3. Proposed Changes in Current Practices

The Directorate of Agricultural Economics (DAE) of the Ministry of Agriculture has begun an agricultural census for 1972-73. This census will involve a complete enumeration of farming households in 20 provinces, and a sample survey of the remaining 28 provinces (where the remainder represents proportionately little agricultural activity). The census itself will not provide the detailed information necessary for national income accounting purposes, because only such data as farm owner, farm size, types of crops grown, and production will be sought.

For prices of agricultural products, the DAE and the Agricultural Economics Division of USAID are in the process of developing a consistent series of farm and market prices and an index series. (Dr. Richard J. Foote is supervising the study of prices.) This study will be done in two parts. The first part involves a revision of published price data from 1960 forward. The revision will be based on DAE price data by province, with price per unit quoted in consistent units (e.g., kilograms or metric tons). These prices have been collected in provincial markets; and, unfortunately, they include distribution cost. Estimates of margins (based on surveys) will be made to determine farm prices of most agricultural products, including livestock. An agricultural price index will be derived by weighting these latter prices by quantity of production of each product in each province, thereby giving greater importance to large crop-producing areas. The second part involves plans to collect on a continuing basis wholesale and retail prices of agricultural products at major provincial

markets. In the retail price survey, prices of all products listed will be collected. On the wholesale level, prices of products will be collected only in those provinces in which they are grown. In the latter survey, prices will be collected at harvest time(s) of crops and, hence, will represent values at a time when the supply of each good is largest (and the price is lowest). The objective behind this procedure is to derive farm prices rather than to use wholesale prices, which would include some distribution costs. Using this procedure, it is believed that a consistent series of prices at the farm and the respective margins can be determined. From the surveys, two index series (retail and wholesale) will be estimated. To derive the index series, the prices will be weighted by quantities produced in each province, with base year 1969. The list of products in both retail and wholesale price surveys represent 99.7 percent of all agricultural production and will also include fish and fishing products.

Prices of inputs (labor, seeds, fertilizer, and pesticides) are collected on the hamlet level in 18 selected provinces on a biweekly basis. The provinces selected are generally major producing areas, and hamlets in these provinces are chosen randomly. These price reports are considered relatively reliable by both the MOA and the Agricultural Economics Division of USAID.

4. Suggestions for Improvement

Although improvements in the valuation of farm products and inputs are presently being made, work still remains to be done to improve the quantity data of output and inputs. The MOA agricultural census of 1972-73 will not provide the necessary data for value-added estimation. Once the census is completed,

the MOA plans to use the listing of farms to draw samples for surveys of required data in the future.¹

An alternative method (a sample survey for yields and outputs) should be undertaken, for several reasons. First, the census is quite lengthy in terms of time, and the data collected can be checked for errors only with a great deal of difficulty. Second, use of the census listing of farm households as a frame for future samples may be less practical than use of fields. Farms are not only generally small, ranging from one to three hectares, but farm households also tend to be located away from the actual land under cultivation. Data required for national-accounts purposes are area under cultivation and yield estimates of crops; hence, fields (not farms) appear to be the natural unit for the sample. Third, sampling of fields (rather than farm households) has been shown to provide relatively accurate data for less developed countries (e.g., India and the Philippines).

A sample survey of crop production requires information on total hectares under cultivation and types of crops grown. Ideally, detailed maps should be used as a frame from which to draw a sample. A controlled aerial survey photograph of the country would give an inventory and accurate measure of land

¹The census is a partial duplication of effort. The USAID Land Reform, under the Land-to-the-Tiller Program, has a partial listing of land used for rice and secondary crops, covering approximately one-third of cultivated land (about 0.8 million hectares registered--as of November 1972--under the program, compared to the estimated 2.9-3.0 million hectares of total cultivated land). This list gives plot number, owner, and amount of holdings in hectares. It is coded by an origin code (which refers to type of crop--rice or secondary crop) and by the HES location file, which divides the country into areas by military regions and by provinces, districts, and villages. The list of registered farm land also includes an average yield per hectare, which is required information under the program. These data, available at the Directorate General of Land Affairs, should be useful to the MOA in their census.

(error margin of one percent if a ground survey were taken) and the types of crops grown. Although it is expensive (estimated cost of US\$500,000), this inventory would be useful to the MOA for the Land-to-the-Tiller Program and to the Ministry of Finance for tax purposes, as well as to the MOA for crop surveys. If an aerial survey is considered unfeasible or too expensive, satellite maps are available that furnish a relatively good picture of areas under cultivation by crops. These maps can be used to draw a sample of fields, using various sampling methods, two of which are discussed below.

Point sampling is often used in agricultural surveys of crops. This method assumes that the probabilities of a point falling within the boundaries of different fields are proportional to the areas of the fields. Points selected on the maps must be identified with the fields on the ground and the crops growing on them recorded. The fields will have to be measured if the maps do not provide an accurate measure. It may be worthwhile to use a two-stage sampling process, in which the first stage involves demarcation of rectangular areas on the map and the second stage requires specification of the number of points taken within each selected area. Alternatively, it may be determined that only large districts or hamlets should be covered intensively, such that a stratified two-stage process would be necessary (i.e., those hamlets that are major rice areas may be separated from others, but fields within these hamlets or villages should be selected by the point method).

Line sampling is also suitable, and it is an alternative to point sampling as a means of determining proportions (of different types) within a given area. Particularly useful in undeveloped areas, line sampling is often used in conjunction with maps and aerial photographs. Line sampling takes sets of parallel lines or strips as sampling units. With this method,

lines can be marked on the maps and then surveyed on the ground.¹

Whether point sampling, line sampling, or both are used to select the sample of fields, these sampling methods would provide a comparatively good measure of total area under cultivation. Both methods require field investigators, who are in short supply at present. The possibility of using personnel from the Land-to-the-Tiller Program should be examined. The program will probably terminate by December 1973 (once the goal of 1.3 million hectares registered is reached) and will therefore release a large number of village-level agents who are trained to assist farmers with applications for the program. Use of these agents suggests several advantages, in that they are already in the villages and are well-liked and trusted by the farming population, according to Civilian Organization for Rural Development and Support (CORDS) reports. They can easily be trained for survey purposes.

Once the sample is drawn, average crop yield can be determined. The survey should be conducted just before the main harvest(s), and probably four times a year, according to the crop calendar or the seasons. Two methods of collecting data are suggested: an actual cutting of crops and an eye estimate. Small samples can be selected for actual cutting before harvest and measured for yield. Eye estimates of the yield of a sample of fields can be made, with subsequent calibration of these eye estimates by comparison with actual yields of some sample fields. Eye estimates would require a well-trained investigator, but would enable the investigator to cover rapidly a larger sample of fields at a given time. It is, however, suitable only for certain crops (e.g., root crops

¹For detailed discussion, see Frank Yates, *Sampling Methods for Censuses and Surveys* (London: Griffin and Co., Ltd, 1971).

cannot be estimated by this method). A survey of livestock production can be made along with the survey of certain crop yields, particularly rice. Livestock and grain are usually produced together in Vietnam, since poor quality grain or wastage is used for feed. Commercial producers of poultry and other livestock are few, and they can be interviewed for production and cost data separately. (Further discussion appears below, Section B of this chapter.) It should be noted that the U.S. Department of Agriculture (USDA) has trained personnel who are willing to assist in setting up a detailed sampling procedure for agriculture in Vietnam.

Having suggested some methods of determining the value of crop production by sample survey, we now turn to a discussion of improving estimates of factor inputs and production costs.¹ Except for rice, reliable cost data are not available; and even for rice, factors used to estimate input requirements are outdated. For the cost survey, the country should be divided into regions (Southern, Central Lowlands, and Central Highlands), because the types of crops cultivated in each differ. Tables 2, 3, and 4 list the major crops of each region by value of production and percentage of total regional production. Unfortunately, these tables exclude some farm products (e.g., papaya) and, hence, may present an underestimate of farm production. They do, nevertheless, point out the major crops.

A survey of production costs and factor inputs requires the assistance of the farmer; and, therefore, the farm household would appear to be the natural unit to sample. However, a complete listing of farms from which to draw a sample is not available (although if completed, the proposed agricultural census should give a listing of the majority of farms).

¹A separate survey to determine factor inputs is suggested, because surveying for both production and input data would involve a lengthy questionnaire (as discussed below).

Table 2. SOUTHERN REGION - CROPS IN ORDER OF RANK*

Item	Value (VN\$, millions)		1971	
	1970	1971	Percent of Total	Cumulative Percentage
Paddy	121,731	149,505	71.70	71.7
Tree fruits (citrus)	18,257	24,851	11.90	83.6
Bananas	5,996	6,953	3.30	87.0
Vegetables	3,750	5,355	2.60	89.5
Coconuts	3,589	3,656	1.80	91.3
Sugarcane	1,963	2,283	1.10	92.4
Sweet potatoes	1,844	2,181	1.00	93.4
Manioc	1,264	2,067	1.00	94.4
Watermelon	1,404	1,746	0.80	95.2
Tobacco	1,462	1,609	0.80	96.0
Pineapple	1,246	1,598	0.80	96.8
Mungo beans	1,097	1,376	0.70	97.4
Peanuts	782	1,224	0.60	98.0
Rubber	889	794	0.40	98.4
Soybeans	601	746	0.40	98.8
Corn	470	573	0.30	99.0
Sorghum	- -	546	0.30	99.3
Coffee	227	367	0.20	99.5
Yam beans and "other" tubers	230	332	0.20	99.7
Pepper	124	193	0.09	99.8
Fiber crops	66	73	0.04	99.8
All other crops	539	308	0.15	100.0
Total	167,531	208,516	100.00	

* Based on 1971 value of farm production (1970-71) and percent of 1971 total value.

Source: USAID, Agricultural Economics Division, Office of Domestic Production, "Value of Farm Production, 1970 and 1971, for Viet Nam: Total and by Major Regions," Agricultural Production Memo, No. 26, January 9, 1973.

Table 3. CENTRAL LOWLANDS - CROPS IN ORDER OF RANK*

Item	Value (VN\$, millions)		1971	
	1970	1971	Percent of Total	Cumulative Percentage
Paddy	21,378	28,278	68.1	68.1
Tree fruits (citrus)	1,543	2,333	5.6	73.7
Sweet potatoes	1,930	2,146	5.2	78.8
Manioc	1,030	1,470	3.5	82.4
Vegetables	1,166	1,258	3.0	85.4
Peanuts	830	1,099	2.6	88.1
Bananas	895	1,074	2.6	90.6
Tobacco	1,000	1,013	2.4	93.1
Sugarcane	626	803	1.9	95.0
Coconuts	499	631	1.5	96.5
Mungo beans	417	520	1.3	97.8
Corn	382	445	1.1	98.9
Watermelon	281	101	0.2	99.1
Tea	84	90	0.2	99.3
Pineapple	74	83	0.2	99.5
Soybeans	75	80	0.2	99.7
Yam beans and "other" tubers	51	65	0.2	99.9
All other crops	29	57	0.1	100.0
Total	32,290	41,546	100.0	

* Based on 1971 value of farm production (1970-71) and percent of 1971 total value.

Source: USAID, Agricultural Economics Division, Office of Domestic Production, "Value of Farm Production, 1970 and 1971, for Viet Nam: Total and by Major Regions," Agricultural Production Memo, No. 26, January 9, 1973.

Table 4. CENTRAL HIGHLANDS - CROPS IN ORDER OF RANK*

Item	Value (VN\$, millions)		1971	
	1970	1971	Percent of Total	Cumulative Percentage
Vegetables	2,479	2,940	28.8	28.8
Coffee	1,337	1,758	17.2	46.0
Paddy	1,493	1,684	16.5	62.5
Tea	1,545	1,626	15.9	78.4
Sweet potatoes	622	664	6.5	84.9
Potatoes	324	283	2.8	87.7
Tree fruits (citrus)	188	254	2.5	90.2
Mungo beans	138	215	2.1	92.3
Corn	134	186	1.8	94.1
Pineapple	73	150	1.5	95.6
Manioc	80	134	1.3	96.9
Bananas	96	120	1.2	98.1
Peanuts	79	108	1.1	99.1
Sugarcane	15	19	0.2	99.3
Soybeans	15	18	0.2	99.5
Tobacco	16	17	0.2	99.6
All other crops	21	36	0.4	100.0
Total	8,655	10,212	100.0	

* Based on 1971 value of farm production (1970-71) and percent of 1971 total value.

Source: USAID, Agricultural Economics Division, Office of Domestic Production, "Value of Farm Production, 1970 and 1971, for Viet Nam: Total and by Major Regions," Agricultural Production Memo, No. 26, January 9, 1973.

Moreover, the farm practice in Vietnam is to locate the farmhouse away from the cultivated fields. It seems reasonable that the type of frame described above for a survey of crop production could be utilized, along with regional divisions of the country. Once the fields were selected, owners or farmers could be identified and contacted.

The survey should cover the production costs of at least major crops, using some definition of main crops. For example, a rule may be used that crops that contribute one percent or more to total regional production be included in the survey. For the Central Highlands, a larger sample size than for other regions may be considered desirable. The Central Highlands region produces a more diversified variety of crops than the Southern and Central Lowlands regions, which are mainly rice-producing areas. However, the focus of the survey should be on rice, since it represents about 50 percent of total farm production in Vietnam.¹

In terms of the questionnaire, the Ministry of Agriculture before beginning the census had prepared a proposed questionnaire for a survey of crop production. If a survey of crops is undertaken as suggested, this questionnaire should probably be revised considerably. The questionnaire covers the whole area of production: area cultivated; type of crop; method of cultivation; inputs used (including fertilizers, pesticides, labor, draft animals, machinery, and their respective costs); yield of crop; costs of rents and credit; and family population, income, and expenditures. The questionnaire is quite long, and many of the questions appear repetitious (certain data can be derived from two other questions). Other questions appear

¹USAID/Agricultural Economics Division, Office of Domestic Production, "Value of Farm Production, 1970 and 1971, for Vietnam: Total and by Major Regions," Agricultural Production Memo, No. 26, January 9, 1973.

ambiguous, requiring judgments on the part of the farmer to determine their exact meaning or purpose. In addition, the questionnaire requests the name and address of the respondent, as well as information on income and expenditures.. Relatively reliable income and expenditure data however may be obtained only if the respondent is permitted to remain anonymous.

It is suggested that the proposed questionnaire be broken down into several parts. First, the yield and total number of hectares under cultivation should be surveyed several times a year, as discussed above, to obtain gross production; secondary crops and livestock, as well as rice, should be included in the surveys. Second, a survey of inputs should be made separately but, assuming slowly changing input-output ratios, would not have to be conducted as frequently as a crop survey. Perhaps every three to five years would be appropriate. The survey questionnaire not only should include the required current inputs (e.g., fertilizers, pesticides, seed, labor, and their prices), but also should request information on capital investment in the forms of farm construction and improvements (houses, irrigation systems, barns, and farm equipment). Costs of livestock production (including feed and maintenance) can also be included in this questionnaire, since livestock and rice are produced together. Third, if data on farm population, income, and expenditures are desirable, a separate survey should be made; and it should insure the farmer anonymity. In this manner, some assurance of relatively truthful information on income and expenditures can be attained. In all cases, the questionnaires should be designed to be as pertinent, short, and clear as possible.

B. ANIMAL HUSBANDRY

1. Current Practices in Estimating Value Added

Gross output is estimated from two sources. The first source is official slaughter figures from each provincial

slaughterhouse. To account for illegal slaughterings, a fixed percentage of official slaughter figures is added to these values. The percentage used was estimated in 1968 by the MOA,¹ and it depends on the type of livestock. For example, for buffalo, the percentage is 25 percent; and for cattle, it is 35 percent. Second, inventory data are used to determine production of livestock (e.g., chickens and ducks) for which controlled slaughter data are not available. The inventory data on the number of animals on farms are obtained from an annual livestock survey made by the MOA. This survey is conducted each year in November or December, to count physically by type the number of animals on sample farms in selected provinces. These provinces are mainly in the Southern region, and the basis for areas covered in the survey is mainly in terms of security (safety of enumerators). To estimate production, the inventory values are multiplied by a fixed percentage of about 50 percent.²

The current value of production is estimated by multiplying the gross output of each type of livestock by the price per unit. The Saigon market price is the series used. The price of each type of livestock is, however, quoted in kilograms; and quantity data are stated per head. To convert prices in kilograms to a per-head basis, an average weight per type of animal is assumed (e.g., an average buffalo is assumed to weigh approximately 250 kilograms). To estimate producers' prices

¹These percentages were developed by Dr. Le Thuoc (veterinarian), MOA, and are based on 1960-61 agricultural census data on number of animals, types, sex (from which production estimates are extrapolated), average dietary requirements per capita, and total population. The dietary requirements were derived from various public health studies on dietary habits of rural population. On the whole, the percentages appear to be arbitrary, although for pigs the percentages used differ by region, taking into account differing degrees of control of slaughterings.

²Ibid.

and, thus, the value of production at producers' prices, the Saigon market price per head is reduced by an assumed markup from the producer to the market (e.g., a 20-percent markup is assumed for buffalo and cattle, and a 25-percent markup for pigs).

Costs of production are based on a 1963 MOA survey of average feed and maintenance required by type of animal per year.¹ This survey consisted of interviews of individual small farmers in selected provinces, coupled with checks on survey results made from various studies of dietetic requirements (energy values) for breeding animals. From this survey, a fixed percentage of total animal production (by type of animal) is used to determine death losses and labor time spent per animal. For swine and chickens, these percentages are based on a NBVN survey of large livestock farms² around Saigon in 1965.

2. Evaluation of Current Practices

Unsupported estimating procedures and inappropriate proxy variables have resulted in poor and incomplete estimates of gross and net output of poultry and livestock. The percentages used to determine illegal activity are arbitrary. Controlled-slaughter figures vary widely from year to year, and no consistent relationship between controlled and illegal slaughter could be determined. It is impossible to estimate the degree of error or of illegal slaughterings from year to year. It is likely that use of constant percentages each year understates gross production, because legal slaughterings are a function

¹Dr. Le Thuoc conducted the survey for the MOA. He was not available to provide information on the details of his survey and sampling techniques, although one document outlining his procedures of determining average feed, maintenance, and labor time for pigs was supplied by the NBVN.

²Large livestock farms are defined as those with either 100-or-more swine or 1,000-or-more poultry.

of the degree of control (e.g., slaughterhouse standards and logistic control¹) and the level of official prices of livestock compared to black-market prices, while production (in kilograms) depends on birth and death rates of livestock, as well as feed and maintenance--the latter two factors having improved in recent years. Hence, even though production of livestock may have increased through better breeds and breeding methods, disincentive for legal slaughterings (such as tax avoidance) and the logistics requirement are not reduced. Use of inventory data to estimate poultry production may be considered a better method than controlled slaughter, but the percentages used are (as in the case of livestock) arbitrary.

For costs of production, the use of fixed percentages derived from the 1963 input survey may be outdated. The fact that new breeds of animals (mainly pigs and poultry) and cross-breeding methods have been introduced suggests that these factors used to estimate intermediate and factor inputs are no longer applicable. Moreover, it is claimed by the DAE and USAID that livestock and poultry are better maintained than in the past, particularly in terms of feed and vaccinations. Hence, estimates of intermediate and factor inputs are probably inaccurate.

With respect to valuation of output, the current method assumes various margins between the Saigon market prices and producers' prices, which appear to be arbitrary. For example, the NBVN uses a 25-percent markup for swine, while another study² estimates a 15-percent markup. In addition, not all

¹By logistics, we are referring to the requirement that all slaughtered animals must be transported first to Saigon before going to final destination, even though final destination may be nearby.

²Duane Hacklander, "Swine Marketing in South Viet Nam," USAID/ Food and Agriculture Division. Preliminary paper, 1972.

livestock are sold in Saigon. It appears that the NBVN method of estimating prices tends to understate the value of production. An additional source of understatement is the use of a constant average weight per animal, in order to convert quoted prices from kilograms to a per-head basis. If animals are better fed and maintained and new breeding methods produce a healthier stock of animals, it would be likely that the average weight would rise over time.

3. Proposed Changes in Current Practices

The DAE has recently adopted a method devised by the USAID/Agricultural Economics Division to estimate livestock production and slaughter, using inventory collected by the MOA.¹ The method employs fixed percentages of inventory and average weights for each animal. Though these percentages and weights are based partly on judgment, technological conditions (such as new breeds and better feeding methods) are taken into account. Thus, the percentages and weights may vary, depending on the animal. For example, improved feeding is taken into consideration for swine and chickens by increasing the average weight used to determine production in kilograms over time (1961-71).

Livestock production is estimated as a fixed percentage of beginning inventory. The derivation of the percentage can be illustrated by considering swine production (see Table 5). Swine production in 1971 is 0.89 of beginning inventory. This percentage was based on three sources. First, the 1960-61 agricultural census provided the number of pigs in the country divided by the number of males, females, feeder pigs, and sucklings, thereby giving an estimate of birth rates as a proportion of the total. Second, estimated production rates

¹USAID/Agricultural Economics Division, "Revised Livestock and Poultry Production Data for Viet Nam, 1961-71," Agricultural Production Memo, No. 25, December 8, 1972.

Table 5. PIGS: SLAUGHTER AND PRODUCTION, VIETNAM, 1961-72

Year	Beginning Inventory (thousands)	Pigs per Inventory (percent of inventory)	Number (thousands)					Average Weight (kg)	Total Weight (MT)	
			Production	Death Loss	Controlled Slaughter	Change in Inventory	Number* Slaughtered		Slaughter	Production
1961	3,620	86	3,113	253	1,139	-269	3,129	72	225,288	224,136
1962	3,351	86	2,882	235	955	-399	3,040	72	218,880	207,504
1963	2,952	86	2,539	207	909	379	1,953	72	140,616	182,808
1964	3,331	86	2,865	233	1,090	324	2,308	72	166,176	206,280
1965	3,655	86	3,143	256	1,249	-182	3,069	72	220,968	226,296
1966	3,473	85	2,952	243	1,093	-219	2,928	72	210,816	212,544
1967	3,254	87	2,831	228	1,163	- 69	2,672	72	192,384	203,832
1968	3,185	86	2,739	223	850	368	2,148	72	154,656	197,208
1969	3,553	87	3,091	249	1,060	218	2,624	73	191,552	225,643
1970	3,771	88	3,318	264	1,137	186	2,868	73	209,364	242,214
1971	3,847	89	3,424	277	1,148	224	2,923	74	216,302	253,376
1972	4,071	90	3,664	285	--	--	--	75	--	274,800

* Estimated; production minus loss adjusted for change in inventory

Source: USAID, Office of Domestic Production, Agricultural Economics Division, "Revised livestock and poultry production for Vietnam, 1961-71," Agricultural Production Memo, No. 25, December 8, 1962.

(goals) from the 1970-75 five-year plan were considered. Third, "theoretical" estimates of the maximum and minimum number of sucklings per stock female were made. Assuming that one stock male is bred with 12 stock females and that each female has 1.0-1.5 litters per year, litter size is varied from 8 to 10 sucklings. An average of all three sets of estimates gives 0.86 per unit of inventory, and this rate is assumed to increase to 0.89 in 1971 and 0.90 in 1972. To compute slaughter values, death loss (which is a fixed percentage of inventory) and the change in inventory from year to year are deducted from production estimates. Both production and slaughter figures are then converted into kilograms, assuming an average weight per animal. These percentages and weights used to estimate production will be revised as breeding and feeding methods change. Beginning with the 1971 accounts, the revised production estimates provided by USAID will be employed by the NBVN.

The USAID estimates of production may be considered some improvement over the NBVN estimates. A comparison of NBVN and USAID values from the years 1961-70 indicates that output tended to be understated by the NBVN, assuming that USAID values are correct. By use of inventory data, the USAID approach avoids the problem of approximating illegal slaughterings but introduces a problem of measurement of inventory. In addition, the USAID estimates include changes in production techniques (such as better feeding and maintenance and new varieties and breeding). However, the two methods of estimating production appear to be similar in some respects. Both employ fixed percentages and average weights of animals, although the actual numbers differ. While the NBVN values are based on judgment, the USAID estimates also depend to some extent on judgment. For example, in the USAID estimates, the ratio of births to inventory is derived partially from past information on birth and partly on judgmental factors, which are enumerated. It is difficult to measure the extent to which unexplained judgmental

factors enter into these estimates. Hence, although the USAID estimates probably represent some improvement, they are still questionable in terms of judgmental factors.

With respect to valuation, the prices of animals and input requirements are being revised by the DAE, under the direction of Dr. Richard J. Foote, USAID/Agricultural Economics Division. The revised price series and the collection of wholesale prices in major provincial markets should provide relatively accurate prices with which to value output and inputs. The revision and collection of wholesale prices of agricultural products have already been discussed fully in Section A of this chapter.

4. Suggestions for Improvement

Ideally, a survey of animal production should be made by the DAE. The sample survey suggested in the discussion of crop production is appropriate, since livestock and crops (particularly rice) are usually produced together (wastes are used for feed). Alternatively, if a survey of livestock production is considered unfeasible or undesirable, the DAE should probably collect additional data in the annual inventory survey. Information on the number of males and females in stock, the number of births per female per year, the number of deaths, and weights of animals sent to slaughter should be obtained. In this manner, the percentages and weights used in estimating production via inventory data would incorporate fewer judgmental factors.

A survey of costs of production should also be made. As in the case of livestock production, such a survey can be conducted in conjunction with the survey of crop costs. (See discussion in Section A of this chapter, above.) Particular attention should be given to quantity of feed consumed by animals, vaccinations required or given, labor, and other maintenance expenses.

C. FORESTRY

1. Current Practices in Estimating Value Added

The Ministry of Agriculture, Directorate of Forests, issues permits to cut "x" cubic meters of different types of timber. These permits are used to determine the quantity of lumber produced, as well as to tax loggers. Quantity is valued at prices supplied by the district forester. Intermediate costs (e.g., transportation) and factor (labor) costs are derived from interviews of timbermen by district foresters. No capital equipment data are available and, therefore, no depreciation costs are computed.

2. Evaluation of Current Practices

Reliance on tax and permit data for calculating forestry production results in a large underestimate of gross output. The amount of illegal cutting, which is believed to be a large (but unknown) percentage of total production is not included. Estimates of illegal activity range from 25 percent by the Directorate of Forestry to 50 percent by the USDA. Given that the tax rate is almost 80 percent of stumpage price to loggers, it seems likely that production is underestimated. Though there are check points of logs being transported, one would suspect that at this rate of taxation, these check points are not a very effective means of determining volume of timber cutting. Recent export data are considered fairly accurate. Transactions between buyers and sellers are being coordinated by USAID and the GVN. Timber exports, however, represent a small proportion of total production. Mr. Walter Pierce, Industrial Advisor, USAID/Industry Section, Forestry, has roughly approximated the proportion of exports to total production to be 12 percent.

For intermediate and factor costs, reports of district foresters are used without checks for reliability. Moreover,

wages and salaries are considered under-reported by the Directorate of Forests--and they probably are, assuming that some loggers desire to cover illegal cutting. Depreciation is not computed, because capital equipment data are not available. No estimates of destruction or preservation (reforestation-afforestation, as a form of capital investment) are included in national income estimates.

3. Proposed Changes in Current Practices

There are no plans to alter current practices. Currently, an inventory of forests is being made by the Directorate of Forests to determine available resources and to plan utilization. This inventory, which will be important to development planning, is relevant in terms of the proposed program of afforestation and reforestation.

4. Suggestions for Improvement

The output of this industry is difficult to estimate. Because the tax rate is high and large areas of forests are considered insecure (even after cease-fire), the volume of actual cutting is not easily determined. The possibility of surveying sawmills should be investigated. The Directorate of Forests has a listing of all sawmills in operation, divided by size--small, medium, and large. A sample may be drawn from this listing, selecting mills from each size group (taking, for example, every fifth mill from the list of large mills and every tenth and twentieth in the medium and small groups, respectively). These mills should be surveyed annually for data on the number of days of actual operation and the amount of lumber processed per day. Total timber production could then be estimated from this information. Alternatively, and as a check on data, the amount of electricity and fuel consumed by mills could be obtained. For electrically operated

mills, information could be obtained from electric companies annually or by checking meters monthly. Gasoline- or diesel-powered mills could be surveyed separately for data on fuel consumption. The amount of electricity (fuel) used could be employed to estimate the quantity of lumber that can be processed per kilowatt hour (or per liter of fuel). Spot inspection of electricity or gasoline consumed would provide verification of data supplied by the mills.

To determine costs, it is suggested that fixed factors by type of lumber be developed. Input data on services, labor, and capital equipment can be derived as a percentage of production. Loggers or sawmills could be surveyed to establish the transportation, labor, capital equipment, and other inputs required per type of timber and related to the production of each category. To survey loggers, permits (issued by the Directorate of Forestry and stated in number of cubic meters by type of timber) could be used to draw a sample. The permit data could be divided by type of timber, and a sample selected within each category for interviewing individual loggers. If sawmills are used, the same type of sample drawn for production surveys--listing of sawmills--could be used. Costs are likely to be relatively accurate, since they are not subject to taxation as revenues are.

However, the disadvantages of using this suggested method to determine costs should be noted. Costs (as a percentage of total production) will include, and may even compound, biases or errors (over- or under-estimates) in output estimates. In addition, technology and production methods may change, making fixed factors outdated. For example, the GVN is considering the possibility of selling lumber concessions to foreigners, in order to handle anticipated volume of exports. Domestic sawmills are considered inadequate in terms of technical expertise and equipment to process as large a volume as expected.

Therefore, the factors or percentages used to estimate costs should be kept current (i.e., a survey of input requirements should be made every few years--say every three to five years). Also, once the program of preservation of forests (reforestation and afforestation) is undertaken by the GVN, these activities should be included in gross domestic capital formation in the national accounts.

Valuation of output and inputs are based on prices supplied by the district forester. The Directorate of Forestry has kept no permanent records of price data in the past, except for charcoal. It is attempting to maintain a series of wholesale and retail prices as of 1972, in conjunction with the emphasis on development of forestry products for exports. It is suggested that the Directorate of Forestry obtain monthly or biweekly price reports on output and inputs from district foresters, similar to the collection of price data on crops and livestock by the DAE. Price reports should include all products, not just the four categories¹ provided at present. The NBVN has 15 additional classifications, including charcoal. Although prices of all categories may not be necessary, prices should be collected, at least, for those products that contribute at least one percent or more to total production. Not only would current price reporting be useful to national income accounting, but it would also provide a good basis from which price quotations for exports can be made.

¹The categories are (1) luxury wood for art objects and fine furniture, (2) high-quality construction wood, mainly hardwoods, (3) medium-grade construction wood, and (4) low-grade construction wood used for temporary construction, packing, etc.

D. FISHERY

1. Current Practices in Estimating Value Added

Quantity of output is taken from monthly reports of provincial chiefs of fishery service, who supply the number of catch by species and weight to the Directorate of Fisheries. Current value of production is the product of reported output of fishes by species and the respective price per unit. Prices derived from the Saigon wholesale fish market are collected monthly by the Directorate of Fisheries.

The Directorate of Fisheries also provides estimates of production costs, based mainly on reports of service chiefs. Either these costs are percentages of gross production, or they hinge on the number of boats and fishermen. Intermediate costs include losses and wastes as a percentage of total output and consumption of diesel oil (which is equal to estimated average consumption of diesel oil per motor per day multiplied by the number of motors, the annual average price of diesel oil, and average number of days worked). An average daily wage per fisherman is estimated as a percentage of total daily catch. Total wages are obtained by multiplying the average daily wage by the number of days worked--taking into consideration days off, days spent on repairs, and bad weather. Depreciation is computed on a unit-price (quantity) basis for each type of capital equipment: junks, motors, nets, and other machinery.

2. Evaluation of Current Practices

Under-reporting and absence of statistical adjustment produces incorrect estimates of gross and net output. Under-estimates are due in part to illegal sales on open seas, inaccessibility of fishing centers from the provincial centers, and attempts to avoid taxes (which average about 8 to 10 percent of total output). The Directorate of Fisheries estimates a

30-40 percent underestimation of output, based on several spot checks at fishing centers. No adjustments in reported catch, however, are made. Moreover, use of the Saigon wholesale-market prices as a proxy for producers' prices (prices received by fishermen) to value output may not be appropriate. A recent study (by the Industrial Development Bank) of distribution and marketing of fish from four major fishing centers showed that prices paid to fishermen in each center were approximately 250 percent less than prices on the Saigon wholesale market.¹ The markup between the Saigon wholesale market and the fishing centers is not properly taken into account by the NBVN. To the extent that prices are overstated and output underestimated, it is difficult to determine the degree of bias in the value of total output.

For costs of production, estimates of costs are probably reasonable approximations, because production methods have changed little and the total number of fishermen and boats is fairly accurate--at least at the provincial level. Fishermen must obtain licenses both for fishing and boats (declaring size, mode of propulsion, and use). The percentage used to compute daily wages is based on custom among fishermen, setting the proportion received by the boat owner and the fishermen. However, no checks have been made on the reliability of the estimates.

3. Proposed Changes in Current Practices

No changes in present estimation techniques have been made or proposed, other than revision of agricultural prices. The list of commodities for which wholesale prices in major provincial markets will be collected by the DAE includes fish

¹Economic Research and Management Service, Industrial Development Bank, *Quan Tri Xi Nghiep*, January 1973, No. 7. Kien Giang, Vung Tau, Phan Thiet, and Nha Trang were surveyed in the study.

(see discussion in Section A of this chapter). Valuation of output at the producer level, then, will be more representative than previously.

4. Suggestions for Improvement

Although the prices used to value output are being revised, data on output and costs of production still remain a problem. Better output data may be obtained by a method that does not require direct questioning of fishermen, since tax avoidance may be a reason for under-reporting. At each fishing center, trucks are used to transport fish to provincial or Saigon markets. Trucks may be used as units of observation. Enumerators may be stationed at fishing centers for several days at a time to count truckloads, estimate capacity, and determine species of catch. (Average capacity of a truck, estimated by the DAE, is about five metric tons--including ice, which requires approximately one-third of total truck capacity.) Because of the seasonality of the fishing industry, the collection of output data per fishing center should be made several times a year. Certain fishes are abundant at given times, and this factor should be taken into consideration. It may be desirable for the focus of the survey to be on major fishing centers (i.e., the number of days spent at major centers should be longer and collection of data more frequent than at smaller centers). It should be noted, however, that this method of estimating production will exclude any illegal activity that exists.

For costs of production, a sample survey of both boat and shore fishing may provide the data needed. All boats, whether engaged in fishing or other activities, must be registered yearly by size, equipment, mode of propulsion, and use. Boats are registered at the provincial level, but there appears to be no centralized file of registered boats (even though the total number of fishing boats is known). Such a file should

be compiled at the Directorate of Fisheries in Saigon, and the list separated by boat use per province. In addition, all fishermen (boat and shore) are required to purchase an annual license at a nominal fee (40 piasters). Fishing licenses are issued at the provincial level, and the listing should also be centralized and kept current at the Directorate.

These lists of boat registrations and fishing licenses may be used as a frame for selecting a sample. A stratified sampling method is suggested, using provinces and type of fishing (shore or boat). Of the 16 provinces where there is commercial fishing, fishing centers that provide the largest volume of production should be covered more intensely than others. For different types of fishing, the list of licenses can be correlated to boat registration, and proportional samples can be drawn for both shore and boat fishing. Within the boat-fishing sample, stratification by powered and nonpowered boats may be desirable if it appears that a large differential in production exists.

The problem in using lists of boat registrations and fishing licenses is the possibility of an incomplete universe. Accurate estimates of illegal or unreported fishing are not available. According to an October 1972 report by the Marine Police, the Marine Police checked 49,240 boats during the year, of which 536 were detained (including 15 for fishing violations). (According to DAE data, there were 95,063 fishing boats registered by December 1972.) Assuming that the Marine Police are effective regulators of navigation laws, there does not appear to be a great deal of illegal activity, at least in terms of boat fishing. The cost of fishing licenses at 40 piasters also suggests that the list may be relatively complete, but the Marine Police could also check licenses.

In terms of the questionnaire, expenses should include current outlays (fuel, bait, labor, maintenance) and capital

outlays (nets, traps, boat, engines). Average life of boats and other capital equipment can be estimated by the Directorate of Fisheries. Assuming no rapid changes in technology or production techniques, cost data can be collected periodically, say every five years.

(Table 6 provides a summary of this chapter.)

Table 6. SUMMARY OF CHAPTER II, 'GROSS DOMESTIC PRODUCT FOR AGRICULTURE'

1. Current Practices in Estimating Value Added	2. Evaluation of Current Practices	3. Proposed Changes in Current Practices	4. Suggestions for Improvement
<p><i>A. Rice and Other Crops</i></p> <p>Annual yield survey made of major crops. Data for unsurveyed areas, yield of secondary crops, and total area under cultivation provided by agricultural service chiefs, with no checks for reliability. Inputs estimated from table of input requirements based on 1960-61 agriculture census.</p> <p>Valuation of output and inputs from biweekly hamlet reports of prices, representing prices received and paid by farmers.</p>	<p>Total production tends to be overestimated. Service chiefs under pressure to report improved yield, more area under cultivation. Table of input requirements outdated.</p> <p>Prices of some products are those existing on provincial markets, and NBVN makes margin adjustments (arbitrary).</p>	<p>MOA agriculture census begun for farm owner, size, crops grown, average yield.</p> <p>MOA (DAE) developing consistent price series. Survey of wholesale/retail prices on major provincial markets begun; objective to derive farm prices. Input prices (from biweekly hamlet reports) relatively reliable.</p>	<p>Sample survey of all crops (major and secondary), to determine yield and land utilization and to provide relevant data more quickly and cheaply than a census. Sampling procedures outlined. Separate survey of inputs.</p> <p>{Proposed changes should furnish relatively reliable consistent price data.}</p>
<p><i>B. Animal Husbandry</i></p> <p>Gross output of livestock estimated from official slaughter figures plus fixed percentages for illegal activity. Inventory data (fixed percent) used to estimate poultry production. Per-head data converted into kilograms, assuming average weights. Costs estimated as fixed percent of output.</p> <p>Valuation from Saigon wholesale market (assuming fixed margins by type of animal) to determine producers' prices.</p>	<p>Percentages of controlled slaughter and inventory arbitrary. Gross output likely underestimated; production rising, but incentives to avoid legal slaughter remain. Conversion into kilograms assumes no change in weights of animals.</p> <p>Fixed percentages of total output do not account for changes in production techniques; outdated.</p> <p>Margins assumed between wholesale and producers arbitrary.</p>	<p>DAE and USAID devised new estimates of production from inventory data, taking into account changes in production techniques.</p> <p>Revision of agriculture prices will include livestock and poultry.</p>	<p>Ideally, survey of animal production, using sampling procedures from crops. But if survey undesirable, inventory survey with data on sex, birth/death rates, and weights (rather than using averages). Survey of input costs needed.</p> <p>{Proposed changes should give reliable price data.}</p>
<p><i>C. Forestry</i></p> <p>Permits to cut "x" cubic meters of timber used to estimate lumber production.</p> <p>Prices from district forester.</p> <p>Cost from interviews of timbermen by district foresters.</p>	<p>Gross output greatly underestimated, due to high taxes (80 percent of stumpage price), no adjustments in output estimates.</p> <p>Price data incomplete; no series maintained.</p> <p>Cost reports from foresters not checked for reliability. No depreciation computed.</p>	<p>No plans to alter current practices. Inventory of forests being made (importance lying in program of afforestation and reforestation).</p>	<p>Survey of sawmills to determine production (sampling procedures and methods outlined). Use of fixed factors to estimate costs (factors can be derived from survey and interview of loggers--from permit data--and sawmills; disadvantages pointed out).</p> <p>Monthly or biweekly price reports on output and inputs from district foresters, in manner similar to collection (by DAE) of price data for crops.</p>
<p><i>D. Fishery</i></p> <p>Output from monthly reports of provincial chief of fishery service for type of catch and weight.</p> <p>Output valued from prices derived from Saigon wholesale market.</p> <p>Costs based mainly on reports from service chiefs; averages of fuel, loss and waste, wages, depreciation computed.</p>	<p>Tendency of output to be under-reported (due to illegal sales, tax avoidance, inaccessibility of fishing centers).</p> <p>Use of Saigon wholesale market price may be inappropriate; IDB study shows large distribution/marketing margins between fishing centers and market.</p> <p>Costs probably fairly reasonable; little technical change, but reports of service chiefs not checked.</p>	<p>No plans to alter current practices in estimating output/input costs.</p> <p>Price revisions/collection by DAE will include fish prices.</p>	<p>Survey of output at fishing centers, using trucks as unit of observation (survey procedures outlined).</p> <p>{DAE price series should provide relatively good data.}</p> <p>Survey of costs (sampling methods outlined; lists of boat and fishing licenses to be used as frame).</p>

Chapter III

GROSS DOMESTIC PRODUCT ACCOUNTS FOR SECONDARY AND TERTIARY SECTORS

Though containing inadequacies, estimates of the net product give fairly reasonable approximations to the economic contributions of manufacturing, public utilities (electricity, gas, and water), banking and insurance, and general government (public administration and defense). The data and procedures used to calculate the net product for construction, transportation, wholesaling and retailing, and personal services produce unreliable estimates. Better survey procedures and more intensive use of existing or potential government accounting data should provide more reliable estimates of gross outputs, current inputs, and investment in secondary and tertiary production sectors. Reasonably reliable assessment of the needs for (and performance of) economic development plans for the urban areas will necessitate both more accurate data on the unit of activity and employment of secondary and tertiary production sectors.

A. MANUFACTURING

1. Current Practices in Estimating Value Added

The main source of data is the NBVN's annual questionnaire sent to all 3,000 manufacturing firms,¹ requesting information on output, price per unit, and all input costs. The response rate to the questionnaire is about 20 percent, with a great

¹The list of manufacturing firms is provided by the Syndicate of Industry and Artisans and the Syndicate of Handicrafts.

proportion of the respondents being large firms. The NBVN estimates that these responding firms represent approximately 80 percent of total manufacturing output, based on the National Institute of Statistics (NIS) industrial production index. Although the accuracy of the NIS industrial production index as an estimate of total output in manufacturing has not been verified, it is used to determine production of the remaining 20 percent of output (accounted for by the 80 percent of non-respondents), except for clothing and shoes; that is, the quantity of output obtained from the questionnaire is deducted from the NIS estimate of total output to give production excluded from the questionnaires. This latter figure is valued at an average price of these goods obtained from the Ministry of Economy (MOE). Other price data as well are furnished by the MOE. However, questionnaires are sent to the Syndicate of Industry and Artisans to obtain price data, which are compared to those from the MOE; and the higher one of the two data is used. Interviews are also used to obtain price data not provided by the MOE.

For responding firms, the questionnaires are used to compute value added and its components. To determine value added and its components for nonrespondents, a medium-sized or "model" firm is defined.¹ From the completed questionnaires, firms meeting the definition of "model" are selected and their costs (intermediate and factor) are used to calculate average percentages. These percentages are applied to the estimated 20 percent of total industrial production, which is derived as a residual of the NIS estimate minus production obtained from the questionnaires.

For clothing, shoes, and related industries, production is estimated from imported raw materials (valued at the official

¹The model firm has total annual sales less than VN\$1 million and greater than VN\$200,000.

exchange rate), assuming fixed percentages for stocks and services of the tailor, shoemaker, or artisan. Costs of production are also computed on the basis of fixed percentages determined by the NBVN some years ago.

2. Evaluation of Current Practices

Despite some gaps, past and present surveys could provide reasonably accurate estimates of gross and net output for manufacturing. The surveys furnish most of the information needed to compute value added, but corrections for biases and errors are not properly made. First, the NBVN method of calculating (from questionnaire data) value added probably results in an underestimate. The majority of responding firms report total production and sales that are less than total costs. There is a tendency for these firms to give relatively reasonable information on costs, but to understate receipts in order to avoid payment of such taxes as income and production taxes. The NBVN accepts reported quantity produced and/or sales as given and adjusts costs such that total revenue equals total costs. The adjustment in data should probably be in terms of receipts rather than costs. Hence, the NBVN estimation procedures tend to understate gross production and value added.

Second, the definition of a "model" firm (of the 80 percent nonrespondents, a medium-sized company, for estimation of value added) may be unrepresentative of excluded firms. Small firms are those that generally do not respond to the questionnaire. To the extent that the "model" firm is not representative of (excluded) small firms, the estimate of value added is too large if it is extrapolated on the basis of reporting firms.

An additional source of error in value-added estimates is incomplete questionnaires. Although many companies supply data on production, sales, and inventories, they are often less complete with respect to detailed cost information. It is

difficult to determine whether failure to report costs is due to inapplicability of such costs in producing the good(s), lack of records, or other reasons. The NBVN, in such cases, is forced to resort to extrapolation, averaging, and/or percentages. Moreover, the industries for which data are the weakest are the clothing and leather-goods industries. Estimates of gross and net output are questionable and unreliable, since gross output is a fixed percentage of imported raw materials and net output is derived as a percentage of gross output.

With respect to valuation, the NBVN uses the reported wholesale price of the good rather than producers' price, because many firms provide only wholesale prices. Ideally, the producers' prices should be used to value output. However, since the majority of the firms do not report the producers' price, the NBVN consistently uses the wholesale prices. Such consistency should be followed in cases for which prices are not available from questionnaires. In these latter cases, rather than using the higher of the two prices quoted by the Syndicate of Industry and Artisans and by the MOE, the NBVN should (if necessary) adopt one source and a method of systematic adjustment. The MOE prices often reflect official prices rather than prices actually charged. There is a group of commodities for which prices are controlled. Selecting the higher of two prices may not necessarily provide a "realistic" picture of gross and net output.

3. Proposed Changes in Current Practices

The NIS is conducting an establishment survey of several sectors: manufacturing, wholesale/retail trade, construction, and other sectors (including banking and insurance, transportation, and personal services). The survey will be conducted annually and quarterly--the quarterly survey being less detailed than the annual. The period to be covered is from 1972

on. The sample was selected from a listing of firms by *patente* tax, stratified by industry and size of tax paid. The focus of the survey is mainly on large companies in urban areas (specifically, Saigon, Gia Dinh, and Bien Hoa). The survey will seek many of the data needed to compute value added: value of gross production, value of intermediate inputs, factor payments to labor and capital (interest payments), and capital expenditures (including capital equipment, land, and structures). For the manufacturing sector, the response rate to the quarterly survey (first quarter of 1972) has been found to be good. The results are considered relatively accurate,¹ although the NIS expects that adjustments in the annual survey data will be needed because of under-reported revenues.

In addition, the NIS is presently revising the wholesale price index.² In January 1972, a new index (covering 85 items) was adopted in replacement of the previous index (which included only 49 items). The earlier price index included the following five groups: farm products, fuel, raw materials, semifinished goods, and manufactured products. A particular index was also computed for each of the five classifications. The revised index, however, will reflect the official prices of 22 commodities; and these controlled prices may not reflect the actual value of market transactions. To determine the proportions that each group contributes to total output, the weights used to compute the industrial production index were employed. These weights (considered outdated) will be revised on the basis of the results of the establishment survey. In other words, a new industrial production index will be developed. Checks are

¹Mr. Sol Helfand, U.S. Bureau of Census/NIS, is in charge of this project. Problems are expected with respect to under-reporting of revenues, and adjustments in survey results are planned. See Subsection 4 of this chapter (below) for further recommendations on these adjustments.

²Under the direction of Mr. George Johnson, U.S. Bureau of Census/NIS.

being made on survey procedures, list of commodities, and other problems for the revision of the wholesale price index.

4. Suggestions for Improvement

Two main suggestions are made: First, the NIS establishment survey will supply most of the data required for value-added estimation in the manufacturing sector. The NIS has the assistance of sampling experts and trained statisticians, and few suggestions for improvement can be made on the survey. However, it is suggested that a separate and more detailed survey of inputs be made. The survey should be conducted periodically, rather than annually, and would appear to be an efficient means of utilizing scarce resources, particularly in terms of trained enumerators, as well as statisticians and funding. These surveys could be made at three- to five-year intervals per sector (i.e., two or three sectors can be covered each year). Consequently, time can be devoted to consider specific questions peculiar to an industry, to draw a statistically sound sample, and to evaluate the sampling methods. The surveys would provide current and relatively accurate estimates of input costs, as well as the components of value added, which would still be incomplete. These periodic surveys would enable enumerators to spend additional time in determining the reliability of data. For example, the terminology used in the questionnaire can be clarified (responses to NBVN questionnaires suggest lack of understanding of some accounting terms and concepts), and checks can be made on the correspondence of costs to receipts, either in per-unit terms or in total terms. The present (annual) survey planned by the NIS attempts to obtain revenue and all cost information for all sectors at one time. Moreover, this latter survey requests a breakdown of only major costs. The specific allocation of expenditures (e.g., cost of transportation, banking and insurance, and other services) should be requested. These data

would aid in the development of an input-output table from which value-added estimates can be made rapidly and which can themselves be useful to taxation and development policies.

Second, the Ministry of Economy (MOE) has a store of unused data that can be used as an alternative source of information or as a check on present survey results. The MOE requires importers to provide annual reports of costs and sales, as well as value of imports. Coverage is over 1,200 firms, classified by direct and indirect end-user of imports. Many companies in the manufacturing and transportation sectors are included.¹ The data collected that are useful for national accounts purposes are the following: value of existing capital equipment and real estate; sales; number of employees and wages and salaries; direct and indirect taxes (by type); depreciation; interest payments; operating surplus; consumption of electricity, water, and petroleum products (quantity and value); lists of raw materials used (domestic and imported), the unit prices, quantity purchased, value of materials used, and end-of-year inventory; list of capital equipment purchased (by type, quantity, unit prices, and average utilization per day); and a list of spare parts purchased (quantity, value, and end-of-year inventory). A review of the data submitted to the MOE indicates that, in general, they are consistent and relatively reliable (i.e., reported costs plus profits balance with reported sales), at least when compared to data collected by the NBVN.

¹The industries included in these reports are agriculture and fishery (mainly capital imports); food processing; textiles, clothing, and leather; wood products, including furniture; chemicals, plastics, and petroleum products; paper and printing; nonmetal minerals (such as glass, bricks, cement); basic metal products; metal products for final consumers and producers; other manufactured goods (mainly office supplies); utilities; and transportation and communication.

In addition, the MOE Directorate of Economic Control collects price data from importers and large domestic producers.¹ The GVN has attempted to regulate prices of all commodities, either through direct control of price and/or profits or through homologation (official approval of prices charged), which covers most products. All firms are required to submit a detailed report on cost in terms of "per unit of output" to support price charged for each product. All intermediate and factor costs are included in these reports. Although all prices must be approved and any irregularities are supposedly investigated by the MOE and the Ministry of Finance,² only large firms and obvious violations are generally checked. However, if it can be assumed that the proportions of intermediate and factor cost per unit of output to the price per unit are relatively consistent or realistic (i.e., the degree of over- or understatement of price per unit is correspondingly over- or understated in cost per unit as a justification for the price charged), these data would be useful as a means of checking information collected by the NIS and NBVN on a per-unit basis.

¹Producers of domestic commodities (requiring only domestic inputs) must report to the prefecture in their respective provinces. See Ministry of Economy, Directorate of Economic Control, "Fixing the Beneficiary Margins and Conditions of Calculation of the Sale Price of Local Products," Decree No. 551-BKT/KSKT/PCTT/ND, January 13, 1971; "Fixing the Beneficiary Margins and Conditions of Calculation of the Sale Price of Imported Products," Decree No. 522-BKT/KSKT/PCTT/ND, November 9, 1970; and "1972 Setting Lists of Commodities and Profits under Various Price Regimes," Arrete No. 677/BKT/KSKT/PCTT/ND, December 30, 1971.

²For imports, the GVN fixes prices of two groups of commodities (rice and petroleum products) and controls profits of all others (via permissible margins at the wholesale and retail levels). For domestic products, five groups of commodities come under price control or fixing; and all others come under profit control, with varying margins at the wholesale (25- to 40-percent) and the retail (10- to 20-percent) levels.

B. CONSTRUCTION

1. Current Practices in Estimating Value Added

Gross output estimates are based on building permits. The NIS supplies data on permits issued in terms of number of structures and area (square meters) of construction. Nonpermitted construction is estimated as an additional and arbitrary 5-10 percent of total permitted construction, depending on security conditions.

To determine gross and net output values of private construction, the NBVN interviews 10 large firms in the Saigon-Cholon area. These interviews, including only commercial construction, do not consider other areas of the country. From these interviews, an average price per square meter is obtained, and this price is multiplied by the area (square meters) constructed (both commercial and residential), to determine gross value of output. Intermediate and factor costs are also computed from these interviews as averages per square meter constructed.

2. Evaluation of Current Practices

Dependence on construction permits and casual cost surveys to compute gross and net production probably has yielded a substantial underestimate of the contribution of this sector. Exclusions are the major problem involved in computing gross output from permit data. First, the 5-10 percent of total permitted construction that is allowed for the inclusion of illegal building is questionable. There is no basis (survey or outside sources) to substantiate the use of these percentages. However, given the large understatement of output, this method may be better than not considering illegal activity at all. Second, construction on the farms and the countryside (e.g., irrigation works) is excluded, indicating an additional source of underestimation. Third, the largest source of error in

estimating value added of this sector is the exclusion of U.S. military construction, both by military personnel and private contractors. Preliminary rough estimates of this construction¹ indicate that it represents a large proportion² of total construction for the period 1965-71; military construction is an important factor, particularly in view of the fact that such property is being turned over to the GVN. Fourth, the degree of understatement in gross output estimates is partially reduced, because they include permits issued but not used. The proportion of unused permits to total permits issued, however, has not been determined; and it seems likely that the exclusion in the gross output estimates outweigh this factor. In addition to the problem of incomplete data, building permits (expiring in three months) are permits to *begin* construction. Therefore, computation of construction value added does not represent work-in-place, since a lag is not taken into account.

Cost estimates derived from interviews of large firms in the Saigon-Cholon area are probably an overstatement of value added. Large firms may receive quantity discounts for materials. On the other hand, it is likely that they pay higher wages to labor. But possible cost differentials between large and small firms have not been verified. Moreover, cost differences between residential and commercial construction are not available. Similar remarks can be made about valuation of output, based on surveys of construction firms. Average price per square meter may be lower for large firms than for small firms. Total value of production, either in price per square meter or total value of contract, has not been ascertained accurately.

¹Capt. Robert C. Kelly, "Military Construction and Vietnamese Capital Formation," MACV Economic Affairs Office; unpublished paper. Value includes only structures such as roads, bridges, housing, and harbors considered usable by the domestic economy.

²The value of military construction ranges from a low of 59 percent (in 1965) of total gross domestic capital formation to a high of 150 percent (in 1971).

3. Proposed Changes in Current Practices

The NIS survey of establishments uses a separate and specific questionnaire for the construction industry (see discussion in Section A of this chapter, above). The questionnaire requests information on the rate of project completion (work-in-place), receipts from construction and other sources, costs of materials and supplies, total wage bill, taxes, and capital investment.

4. Suggestions for Improvement

While the NIS survey will provide data that were previously unavailable (particularly work-in-place), two major problems remain: incompleteness of the universe and lack of verification of the data collected. First, as previously discussed, the *patente* tax list was used to select sample firms. The *patente* tax is collected from all firms with a fixed place of business. Because there are many small individual entrepreneurs that do not have a fixed place of business and are exempt from the tax (legally or illegally), the *patente* tax list is not considered a complete list of all construction firms. A list of firms from the syndicate of the construction industry would provide a more complete universe for a sample selection.

Second, the data collected from the survey are difficult to verify. There are several (though not necessarily optimal) methods of checking the information. One method would be to use past and present estimates of gross and net output derived from permit data. For example, if the survey results in value added less than past NBVN estimates, then it is obviously not providing accurate information. Permit data (number of permits issued and area to be constructed) could be correlated to the information obtained from the construction survey. Average value and cost per square meter could be computed, as well as rates of completion or work-in-place. In order to provide a

realistic estimate, the number of permits actually used should be determined by a brief survey or by a check for reissuance of permits. An alternative possibility is the making of a series on building materials used in construction, in terms of quantities and prices. The series should include both domestic products (such as lumber¹) and imports of such goods as cement, pipes, and metal sheets. If an average proportion between the value of building-material inputs and total construction can be determined, it could serve as a check on value added from this industry. The series will also be useful in deriving deflated or real value added by construction.

In addition to these problems of sample universe and verification of data, a certain (though undetermined) amount of construction is excluded from the survey; that is, own-construction by firms and individuals and illegal activity are not covered by the survey. There are several means by which to estimate the former type of construction activity. First, the NIS questionnaires for other types of industries (such as manufacturing and transportation) should ask (under the section titled "capital investment") whether firms did their own construction. This "capital investment" section of the questionnaire requests information on land and structure purchase, but does not single out own-construction by the firm. Not only should the value of this type of construction be requested, but also costs of materials, supplies, labor, and equipment used should be included in a subsection. This survey could be conducted more periodically than annually. Second, use of permit data to check survey results for the industry (as discussed above) can serve a similar function in this case. However, in

¹Most buildings in Vietnam are built with cement and bricks, with wood trim, indicating that lumber represents a small portion of total construction cost. A large proportion of cement used in construction is imported; hence, data on this input should not be difficult to obtain.

checking permits issued and used, permits issued to construction firms should be excluded. Lastly, the level of illegal activity is still not included--and will not be unless regulations are properly enforced.

The last major exclusion from net production in the industry is military construction. The problem of incorporating estimates of military construction into the national income accounts is the determination of its value to the GVN. In other words, what is the value of this type of construction for civilian uses? Any method devised to compute these values would involve a great deal of subjective evaluation. A series should be derived for military construction revalued in terms of civilian uses as determined by the GVN and shown in the accounts separately from domestic construction. Cost data can be obtained from contracting companies to determine costs of materials, supplies, labor, and capital equipment. Construction by military personnel includes only material costs; no funds are allocated for labor. Labor costs for the latter can be imputed. A description of the methodology used in the calculations should also be provided. All important data on construction activity would then be available in the published accounts, but the decision to include or exclude military construction should be left to the user of the data.

C. ELECTRICITY, GAS, AND WATER

1. Current Practices in Estimating Value Added

The NBVN sends questionnaires annually to all electric, gas, and water companies. The publicly owned electric companies provide information on gross value of output and costs of inputs each year. Revenue data are also classified by province and by cities within provinces. In addition, electricity consumption is listed by groups (enterprises, government, and households), by unit price paid by each group, and by privately

produced electric power (generators). The one gas producer sends data on production, price per unit, and input costs. The water company returns the NBVN questionnaire each year with production and price per unit, and input costs are estimated by the NBVN as fixed percentages (established in 1962 by Harold Lubell) of gross output.

2. Evaluation of Current Practices

Because electricity dominates, the sales and cost reports of the publicly owned electric companies yield reasonably reliable estimates of the gross and net product of the sector as a whole. Electricity production represents about 90 percent of total production in the utilities sector.

3. Proposed Changes in Current Practices

The NIS survey of establishments includes electricity, gas, and water. Relatively accurate data have been obtained for the first quarter of 1972. However, the NIS survey will cover only large urban areas (specifically, Saigon-Cholon, Gia Dinh, and Bien Hoa). The NBVN has been collecting revenue and cost data from electric companies for the country as a whole. Although urban areas are likely to be the largest consumers of electricity, the availability of data for other areas of the country should not be ignored. Hence, the NBVN may consider it desirable to continue obtaining information from electric companies, at least either until it can be determined that the two surveys provide similar results or until estimates of proportions contributed from other areas of the country can be made.

D. TRANSPORTATION

1. Current Practices in Estimating Value Added

The transportation sector consists of five major groups: road transport, inland water transport, sea transport,

railroads, and airlines. For road transport, the NBVN uses the number of vehicles in operation and conducts interviews and surveys. The number of vehicles is obtained from the Ministry of Public Works, Directorate of Road Transport. For light road transport (taxis, lambrettas, pedicabs), individual drivers are interviewed for revenue and cost information around the Saigon-Cholon area. A median--"reasonable"--value of all responses is selected as representative and is multiplied by the total number of each type of vehicle. To determine revenues and costs, questionnaires are sent by the NBVN to all bus and trucking companies in Saigon.

For inland water transport, the Ministry of Public Works, Directorate of Navigation, supplies the number of different types of boats and the average value and life of each type. Ten boat owners are interviewed to obtain average annual revenues and expenses per boat. In terms of sea, rail, and air transport, questionnaires are sent by the NBVN to all firms. The railways, airlines, and shipping companies furnish all data necessary to compute value added.

2. Evaluation of Current Practices

Even though relatively accurate data can be obtained for sea, rail, and air transport, lack of representative sample surveys for public land and water transportation makes gross and net output estimates of the activities of this sector unreliable. First, all revenue and cost data derived from the Saigon-Cholon area are applied to other regions of the country. Revenues and costs are likely to be higher in Saigon-Cholon than in other provinces. However, it is believed that revenues and profits tend to be understated, although cost data are considered relatively accurate. For example, the NBVN interviews bus drivers as a check on reports from bus companies. Average fares charged to passengers and the number of passengers are

requested. The NBVN found that revenues as computed from interviews of bus drivers tend to be consistently higher than that reported by the bus companies. The under-reporting of revenues and profits is probably due to bus companies' efforts to avoid taxes. Second, use of the median of all responses for road transport is questionable; and, obviously, a sample of 10 boat owners based on availability¹ is statistically unreliable. In addition, the amount and degree of illegal activity are unknown.

3. Proposed Changes in Current Practices

The NIS establishment survey includes the transportation sector. Large firms (including airlines and shipping companies, which are mainly foreign firms operating in Vietnam)² provide reasonably accurate profit and loss statements. But difficulties in obtaining information for road transport and inland waterway transport have been reported by the NIS.

4. Suggestions for Improvement

The sample selected for the NIS establishment survey is not considered representative of this sector, particularly with respect to road and inland waterway transport. The sample was drawn from a *patente* tax list that is based on a fixed location of business, and many of these entrepreneurs do not have (or report) a location of business. A new population should be defined and a new sample drawn for road and inland waterway transport. Both vehicles and boats are required to be registered. Taxis, lambrettas, pedicabs, and other types of vehicles are registered with the National Police; and careful

¹The basis for interview selection is those boat owners with permanent addresses.

²The domestic airline company is, to a large extent, controlled by the government, which regulates fares, taxes, and subsidies to Air Vietnam.

checks are made on these registrations. All boats must register with the Directorate of Navigation at the province, district, or locality level. Registration requires area of operation, size in tons, propulsion (engine and sail, sail, oars, motor), and use (fishing, cargo, passenger). Transport boats should be separated from the registration list.

A systematic sample can be selected from the registration lists of vehicles and boats. For road transport, stratification of the sample should be made by cities or provinces; and the sample may be selected by taking every tenth or twentieth on the list, depending on the size of the city or province. Similarly, for inland waterway transport, stratification by area of operation (i.e., importance of water transport to the area¹) and size of boat should be made. The sample should probably focus on important areas of water transport operations and large boats (tons), taking every fifth, tenth, or twentieth boat according to these criteria. Owners or entrepreneurs can be interviewed using the questionnaire already developed by the NIS to obtain data on receipts. For cost data, a similar type of sample can be drawn. A survey of production costs should be made for both current and fixed outlays: fuel, labor, maintenance, and capital machinery and equipment. This latter survey can be made more periodically than annually.

However, even though a survey of revenues and costs may be conducted, the accuracy of responses is difficult to check--a problem that the NIS already faces. Two methods of checking the data are suggested. First, the MOE collects revenue, cost, and capital investment data from all importers (including the transportation sector). As discussed previously (in Section A.4 of this chapter), the data collected include the following:

¹For example, the Delta region in normal times is dependent (to a large extent) on inland waterways to transport goods in and out of the area.

value of existing capital equipment and real estate; sales; number of employees and wages and salaries; direct and indirect taxes (by type); depreciation; interest payments; operating surplus; consumption of electricity, water, and petroleum products (quantity and value); lists of raw materials used (domestic and imported), the unit prices, quantity purchased, value, and end-of-year inventory; list of capital equipment purchased (by type, quantity, unit prices, and average utilization per day); and a list of spare parts purchased (quantity, value, and end-of-year inventory). A review of data indicated that they are relatively reliable and consistent.

These data may be compared to survey responses, either directly or as percentages of total receipts, to determine discrepancies in reporting and to provide a basis for adjustment. Second, a series of all required inputs (such as labor, fuel, motors, and replacement parts) may be constructed, in terms of quantities and values. The MOE also requires importers to report employment and wage data, and the Ministry of Labor (MOL) has been conducting surveys on employment and wages in Saigon. In the latter (MOL) case, the sample size is small (20 firms) for the transportation sector. Other inputs (including fuel and motors) are imported, and data are available. The input series can be related to gross receipts and used as checks on survey responses.

E. WHOLESALING AND RETAILING

1. Current Practices in Estimating Value Added

To compute gross output, an estimate of the value of all goods entering the market is made by the NBVN. This estimate is the sum of agricultural products entering the market,¹

¹This value is obtained by subtracting estimated farm consumption of agricultural goods valued at farm prices from total production of agricultural products.

industrial production, and imported goods. A markup is applied to each sector. For agricultural goods, the markup is the difference between retail prices and farm prices. For manufacturing commodities, it represents the difference between producers' prices and retail prices.¹ For imports, it is the difference between official prices and FOB values.

The markup represents value added plus costs of materials and services (including transportation) used. For domestic products, these intermediate costs as well as factor costs, are computed as percentages of total output. The percentages were derived in 1962-63 on the basis of a survey of commercial establishments in Saigon. Official percentages are used for imports (i.e., an official decree was issued for the computation of prices of imports and the percentages permitted for each type of cost).

2. Evaluation of Current Practices

Use of arbitrary and official margins on the estimated gross output of the agricultural and manufacturing sectors and on imports to compute gross and net output tends to underestimate the net product of this sector. Valuation of agricultural products may be considered relatively reasonable, to the extent that farm prices are available. The problem of availability of farm-price data should be diminished when the DAE completes the survey of provincial wholesale and retail prices of agricultural goods (see discussion in Section C.1.a of Chapter VI).

The estimated markup for industrial commodities is incorrect. Use of reported wholesale prices (from NBVN questionnaires) rather than producers' prices tends to overestimate

¹As already discussed in Section A of this chapter, the NBVN values industrial output at the wholesale prices reported on the questionnaires, since producers' prices are often not given. The NBVN also uses price data obtained from the Syndicate of Artisans and Industry and the Ministry of Economy.

gross production in the manufacturing sector. Further, the wholesale-retail markup is computed as an arbitrary percentage of total sales, valued at reported wholesale prices. The percentages used (ranging from 15 to 20 percent of total sales) are low--compared to similar activities in other countries, and even compared to official percentages permitted by the MOE.¹ The MOE official decree permits a 40-percent markup for wholesale and a 20-percent markup (above wholesale value) for retail. If the percentage difference between the wholesale and producers' prices (as provided in the questionnaire) were consistent (say around 20 percent), the percentages used to obtain markup would give relatively accurate estimates. But the reported wholesale prices range from 7 percent to 24 percent of producers' prices in one industry and from 9 to 36 percent in another. Hence, an across-the-board markup of 15-20 percent probably does not properly correct for the diverse interpretations of "producers' prices" versus "wholesale prices," as requested in the NBVN questionnaire. Rather, it is difficult to determine the degree of bias in the estimates of markup.

With respect to imports, use of official prices tends to produce a large underestimate. Although the prices of many imported goods are controlled by the GVN,² such pricing policies are not necessarily followed.

The computation of intermediate and factor costs as percentages of total output is questionable. The survey was conducted in Saigon, and percentages were applied to other areas

¹Ministry of Economy, Directorate of Economic Control, "Fixing the Beneficiary Margins and Conditions of Calculation of the Sale Price of Local Products," Decree No. 551-BKT/KSKT/PCTT/ND, January 13, 1971.

²Ministry of Economy, Directorate of Economic Control, "Fixing the Beneficiary Margins and Conditions of Calculation of the Sale Price of Imported Products," Decree No. 522-BKT/KSKT/PCTT/ND, November 9, 1970.

of the country. The costs (even on the average) may differ in other areas of the country. Moreover, use of fixed cost percentages of unreliable estimates of gross output tends to compound the error because of the NBVN method of valuing industrial output and computing markup (i.e., output is valued at reported wholesale prices, which span a wide range over producers' prices, and an arbitrary percentage is used to compute markup). Use of fixed percentage costs of markup likely introduces additional error in the estimates of value added, particularly if the NBVN markup estimates are lower than actual. The official percentages for imports are also likely to be inaccurate. The fact that the GVN declares permissible profit margins on the value of imports, along with appropriate cost percentages, does not necessarily correspond to reality. USAID, Joint Economic Office¹ has computed actual markups for selected imports. It was found that the actual wholesale markup alone ranged from 40 to 50 percent above legal margins, indicating that value added (at least the profit component) is very much understated. Hence, value added and its components are unreliable estimates.

3. Proposed Changes in Current Practices

The NIS establishment survey includes this sector. (See discussion in Section A of this chapter, above.) The preliminary results of the survey for the first quarter of 1972 show about 23,350 firms responding with data on total sales, employment, and wages. Reliability of the data has not yet been checked; but, in terms of employment and wages, information may be questionable. The Ministry of Labor² has been collecting

¹Mr. Peter Kau has been working on the price series for USAID internal use. The NIS or the NBVN may find it desirable to determine Mr. Kau's approach and begin such a series for their own use.

²Mr. Howard Kumin, USAID/U.S. Department of Labor, is the statistical advisor for the Ministry of Labor project.

employment and wage data for all secondary and tertiary sectors in the Saigon area for the past three years. Results of the MOL survey for wholesale/retail trade and services are considered poor, because the firms report widely fluctuating employment figures from month to month. Comparison of data from the MOL and the NIS shows similar information.

One important statistic, which was previously not available but which the NIS survey will collect, is the value of end-of-year inventories. The questionnaires request detailed information for "Other Industries" and "Manufacturing," so that inventory values are obtained if distribution is the firm's main activity or if the manufacturer engages in wholesale trade. In most countries, wholesale/retail trade usually holds a large proportion of total inventory stock. Stocks of inventory are needed not only in computing stock values in the gross domestic capital formation account, but also as a means of monitoring economic activity. For example, large holdings in inventory may reflect a down-turn or falloff in demand--or hedges against inflationary pressures. However, the possibility of obtaining accurate answers is generally not optimistic. Past experience of the NIS has shown that survey data on inventories are usually unreliable. On the other hand, some companies reporting to the NBVN provide detailed information on inventories (including raw materials held, goods-in-process, and finished goods), indicating that concepts of cost accounting are not entirely unknown.

4. Suggestions for Improvement

With respect to the NIS survey, there are certain data specific to wholesaling and retailing that should be added to (or clarified in) the "other industries" questionnaire. First, a measure of margins on goods is needed. A set of questions requesting the value and quantity of cost of goods sold (as

reflected in the strict accounting sense) and the piaster value and quantity of sales should be inserted for both wholesaling and retailing. If these margins can be established, estimates of gross production can be checked by adding margins to the value of goods from agriculture, manufacturing, and imports. The margin values would also be useful in construction of a price series for deflation purposes, particularly at the wholesale level. This suggestion is not without problems, particularly to the extent that government pricing regulations encourage under-reporting of prices and markups. However, the margins (even based on official percentages) would provide a framework from which to make adjustments in the data and would, at the very least, supply a more consistent basis from which to compute gross output than the procedure used at present.

Second, a problem related to a determination of margins is that there is no separation of wholesale and retail trade. In order to estimate total volume of wholesale trade versus retail trade, the questionnaire should clarify the difference--i.e., it should request information on the type of outlet (wholesale or retail), along with sale revenues. Total retail sales and total wholesale sales could be estimated and related to total volume of sales in this sector. This procedure assumes that the sample selection process provides a random distribution between retail and wholesale outlets. On the other hand, it may be desirable to attempt such a separation only after initial surveys give a basis for selecting two samples for retailing and wholesaling.

For costs of production, it is suggested that a separate and detailed questionnaire be sent periodically (say every five years) to wholesale and retail establishments. The survey should request expenses of materials, supplies, utilities consumption, labor, depreciation, maintenance, and capital investment (equipment, machinery, and structures). Moreover, in this

sector, value added is comprised mainly of wages and profits. If the NIS survey is able to obtain relatively accurate employment and wage data for this sector, it may be possible to derive factors with which to compute value added. The MOL employment-wage survey has provided reasonable estimates, although the sample size is quite small. The NIS survey results may be compared with MOL data (as well as with MOE reports from importers) as a check on reliability. However, the sample universe probably should extend coverage for the country as a whole (rather than only large urban areas) to take into account possible differences. Also, derivation of factors for computing value added should provide some adjustment(s) for the likelihood of under-reported total sales.

F. BANKING AND INSURANCE

1. Current Practices in Estimating Value Added

Financial reports to the NBVN from banks and insurance companies serve as a reasonably reliable data base for estimating the gross and net outputs. Banks and insurance companies are among the few establishments that maintain accounting records (e.g., statements of financial position and profit-and-loss statements). All commercial banks and financial intermediaries are required to report to the NBVN.

2. Proposed Changes in Current Practices

The NIS establishment survey includes banking and insurance. Being consistent with MOL data, survey results for the first quarter of 1972 are considered relatively accurate. However, because all commercial banks and financial intermediaries are required to report to the NBVN, the NIS survey may be a duplication of effort; and the NBVN may consider it desirable to continue present procedures for banking. In either case, these reports would be useful as checks on NIS survey results.

G. PERSONAL SERVICES

1. Current Practices in Estimating Value Added

This sector encompasses a diverse group of establishments: private schools, sanitary and medical services, domestic services, and miscellaneous services of hotels, restaurants, doctors, and lawyers. The NIS provides the number of schools, medical facilities, doctors, lawyers, architects, and accountants; and the Vietnam Tourist Bureau provides the number of hotels and restaurants.

For schools, medical facilities, and hotels, NBVN questionnaires requesting receipts and expenses are sent to all establishments. The response rate is between 5 and 10 percent, with a large proportion of large establishments reporting. The mean value of all responses is taken as representative of each type of establishment, and gross and net outputs are estimated from these averages.

Rough estimates are made of family spending on restaurants and troop spending on theaters, bars, and nightclubs (an average soldier is assumed to spend US\$90.00 a month on entertainment). Restaurants and nightclubs are also sent questionnaires and interviewed to obtain data on expenditures. The mean of questionnaire and interview values is used to compute costs of inputs, in terms of percentages. Percentages of total revenues are computed, based on such estimation methods, to determine value added.

The services of doctors, lawyers, architects, and accountants are evaluated from questionnaires and interviews. Responses to the questionnaires sent to all professionals are around 10 percent of the total. Averages of answers are taken as representative. In addition to questionnaires, follow-up interviews (representing approximately 10 percent of the population) are made, based on availability. Where there is a

large differential between the responses from the questionnaire and the interview, the interview is used. Gross and net outputs are computed from these data.

From the NIS class and population data, the NBVN sets out percentages of middle and working classes that are able to afford domestic services, assuming that an average family consists of five members. Next, inquiries are made of middle-class families about average salaries paid for domestic services. Average salaries multiplied times the number of domestics (as computed from the proportion of the population able to afford these services) are used to determine value added from domestic services.

2. Evaluation of Current Practices

Under-reporting and lack of coverage for many of the activities of this sector result in a poor estimate of gross and net outputs from personal services. Even though the response rate appears to be low, no adjustments are made in the data. Instead, averages are taken as representative. For each category, there tends to be a bias toward large establishments and successful professionals. This bias exists even when interviews are used as follow-up to questionnaires, since the NBVN usually selects its sample for interviews on the basis of availability and size (i.e., large establishments and successful professionals in close proximity to the NBVN). Hence, one may initially conclude that gross output and intermediate costs are overstated. Based on the differing responses between questionnaires and interviews, however, the NBVN believes that there is a tendency to understate receipts of income. Understatements of income are likely due to avoidance of taxes, particularly the income tax. The NBVN uses the results to the interview when large discrepancies occur between the responses to the interview and the questionnaire. No other adjustments are made,

however. Considering the upward bias in the estimates because of the use of averages of large establishments and successful professionals and the probable understatement of incomes, it is difficult to evaluate the direction or amount of the net bias.

3. Proposed Changes in Current Practices

The NIS establishment survey includes the personal services sector (hotels and restaurants, health, education, and miscellaneous services). Results of the survey for the first quarter of 1972 survey are considered unreliable, because the response rate was poor compared to other sectors. Receipts are believed to be understated, although these data have not yet been checked for accuracy.

4. Suggestions for Improvement

Because the sample for services is drawn from the *patente* tax listing, which is considered unsatisfactory for the construction and transportation sectors, it is suggested that the tax list be compared with other sources to determine completeness of the population universe. For example, the Vietnam Tourist Bureau has a listing of hotels, restaurants, and professional associations (doctors, lawyers, and architects). If the *patente* tax list is determined to be incomplete, a new sample should be drawn from these lists and stratified by service activity (e.g., hotels separated from professional services and listed by size of operation). Output data can be collected, using the questionnaire already prepared by the NIS. For input data, a similar sample may be drawn and the survey conducted periodically. Information on materials, supplies, utilities consumption, labor, maintenance, and depreciation should be collected.

Even though sample selection procedures may be improved, problems in obtaining reasonably accurate information on revenues and costs remain. For costs, an intensive survey conducted periodically (see discussion in Section A of this chapter, above) and independently of revenues may provide relatively reliable information. Taxes are not collected on costs. Tax avoidance seems to be the main inducement for firms and entrepreneurs to under-report revenues. Past experience of the NBVN and the NIS has shown that this tendency exists and is likely to continue. Hence, a method of checking revenue and value-added estimates is needed. One method would be to estimate labor costs, which are one of the major components of value added from services. If employment and wage data can be collected with relative accuracy, a factor may be derived to estimate value added. The Ministry of Labor has had little success in obtaining accurate information; the series for the service sector appears to be inconsistent. Results of the NIS establishment survey for the first quarter of 1972 have not as yet been checked for reliability. However, if it is possible to determine the error or biases in the survey results, corrections can be made; and an estimate of value added made from the data on employment and wages.

H. PUBLIC ADMINISTRATION AND DEFENSE

1. Current Practices in Estimating Value Added

Value added represents the sum of wages and salaries received by civil servants and military personnel. For central government, the NBVN receives data on actual and budgeted receipts (from the Directorate General of Taxation) and on actual and budgeted expenditures (from the Directorate General of Budget and Foreign Aid). Receipts and expenditures are classified by economic category. For local government, total receipts and expenditures and wages and salaries are given.

Estimates of receipts and expenditures by economic category are made by use of percentages (derived in 1963 by H. Lubell).

2. Evaluation of Current Practices

Dominance of the central government with its reasonably accurate financial records makes the estimates of gross and net outputs fairly good. Estimates of local government activities are considered inaccurate, since failure to keep detailed records forces the NBVN to resort to percentages.

The main deficiency with this account is that payments in kind to military personnel are omitted, because the central government does not provide this information. According to American military sources,¹ such payments are quite sizable and, to this extent, output is understated.

3. Suggestions for Improvement

While central government records are fairly accurate, payments in kind should be delineated from other types of expenditures. For local government, better financial reporting should be required. Improvements in financial reporting may be obtained through education of civilian personnel in accounting principles, through providing standardized financial forms, and/or through centralized bookkeeping.

(Table 7 provides a summary of this chapter.)

¹MACV, Economic Affairs Office, estimates government consumables paid to the military to be US\$0.7 billion for the years 1964-71.

Table 7. SUMMARY OF CHAPTER III, 'GROSS DOMESTIC PRODUCT ACCOUNTS FOR SECONDARY AND TERTIARY SECTORS'

1. Current Practices in Estimating Value Added	2. Evaluation of Current Practices	3. Proposed Changes in Current Practices	4. Suggestions for Improvement
<i>A. Manufacturing</i>			
Main source of data for NBVN annual questionnaires, supplemented by NIS production estimates and MOE price data.	Survey could provide reasonable estimates of value added, but correction for biases and errors not properly made: (1) adjustments made to costs, although revenues tend to be understated (due to tax avoidance); (2) NBVN uses unrepresentative firm(s) to estimate nonresponding firms' activities; (3) questionnaires often incomplete, and NBVN uses averages and extrapolation to fill in gaps; (4) valuation at wholesale (rather than producers') prices incorrect.	NIS establishment survey will include this sector; based on a scientific sample drawn from <i>patente</i> tax list, will collect data needed for value-added estimation. NIS presently revising the wholesale price index to include additional commodities (weights will be changed, based on results from establishment survey).	A separate, periodic survey of inputs (to allow more intensive detailed coverage, as well as to use scarce resources more efficiently). MOE data on importers and price regulation can also be used to estimate and/or check survey results.
<i>B. Construction</i>			
Output based on building permits (square meters). Price and costs per square meter derived from interviews of 10 large firms in Saigon-Cholon.	Production probably understated because of exclusions of farm and military construction, but underestimate partly reduced by inclusion of permits issued (to begin construction) though not used; work-in-place not taken into account. Use of interviews for cost data not representative, because differences between large/small firms or Saigon-Cholon/other areas not taken into account. Also, data collected applicable to commercial (not residential) building.	NIS establishment survey will include this sector (using a separate specific questionnaire) and will provide data required for value-added estimation, including work-in-place.	Use of <i>patente</i> tax list for the NIS survey may not provide a complete universe; use of list from Syndicate of Construction Firms should be considered. Verification of survey results by checking past estimates and constructing a series of consumption of building materials (domestic and imported) to determine proportion of materials to total construction. Data on own-construction by firms should be collected in NIS survey of other sectors.
<i>C. Electricity, Gas, and Water</i>			
NBVN questionnaires used to estimate value added. While electric and gas companies provide detailed data, water company provides only production and price per unit; cost for production estimated by percentages.	Value-added estimates reasonably reliable for sector as a whole because electricity dominates (represents 90 percent of total output).	NIS establishment survey includes this sector, but NBVN may consider continuing its survey of electric companies; NBVN survey includes the country as a whole, while NIS survey covers only large urban areas.	(No suggestions for improvement)
<i>D. Transportation</i>			
NBVN questionnaires and interviews used to obtain data needed to estimate value added. Ministry of Public Works provides number of vehicles and boats.	Data supplied by sea, rail, and air companies fairly reliable. Value-added estimates for road and inland waterway transport questionable because NBVN survey (interviews) not representative. Saigon-Cholon results applied to other areas without checks on applicability; use of median value of responses questionable. Sample small, based on availability.	NIS establishment survey covers this sector, but problem of incomplete unions exists, due to sample selection on basis of <i>patente</i> tax list.	A new sample for road and inland waterway transport, based on vehicle and boat registrations (Police and Directorate of Navigation). Data from survey should be checked using MOE data from importers, which includes transportation; construction of a series of required inputs based on import data; MOL employment data, since most of value added is wages and profits.
<i>E. Wholesaling and Retailing</i>			
A markup applied to all goods (agricultural, industrial, imported) entering the market. Markup equals value added plus costs of materials and services (transportation).	Though margins estimated for agriculture relatively reliable, incorrect for industrial and imported goods. Arbitrary, fixed percentages used for industrial goods tend to underestimate gross and net output because percentages too low and valuation of output at wholesale prices not representative. Official markups for imports generally too low. Costs (estimated as percentages of gross output) unreliable; percentages used arbitrary and outdated.	Wholesale/retail trade covered by NIS establishment survey, which will try to divide wholesale from retail trade, as well as to determine inventory. Results for first quarter of 1972 not yet checked.	Additional questions in NIS survey, to determine wholesale and retail margins. Intensive (rather than annual) surveys of costs. MOL employment-wage data may be used to estimate and/or check value-added estimates, since wages and profits are a large component of this sector's value added.
<i>F. Banking and Finance</i>			
NBVN questionnaires used to estimate value added. All banks required to report to NBVN.	Banks and insurance firms among the few that maintain accounting records. Reliable estimates.	NIS establishment survey includes this sector, but NBVN may want to continue its survey (since all banks are required to report to NBVN).	(No suggestions for improvement)

(continued on next page)

Table 7 (continued)

1. Current Practices in Estimating Value Added	2. Evaluation of Current Practices	3. Proposed Changes in Current Practices	4. Suggestions for Improvement
<p><i>G. Personal Services</i></p> <p>Value-added estimates based on NBVN questionnaires and interviews in Saigon-Cholon. Value of domestic services derived from NIS class and population data.</p> <p><i>H. Public Administration and Defense</i></p> <p>Value added is the sum of wages and salaries paid to civilian and military personnel at central and local levels.</p>	<p>Under-reporting and lack of coverage result in poor estimates of gross and net outputs. Response rate to questionnaires low, with under-reporting of receipts. Interviews generally based on availability. Averages of results used as representative.</p> <p>While data for central government relatively reliable, detailed records not kept for local levels, forcing use of arbitrary percentages. Central government, of course, dominates this sector. Main problem involves no data on payment in kind.</p>	<p>NIS establishment survey includes this sector, but response rate survey (first quarter of 1972) poor. Receipts to be understated.</p> <p>(No proposed changes in current practices)</p>	<p>New sample selection, using alternative sources for lists of establishments (rather than <i>patronne</i> tax list). Intensive, periodic survey of costs. Employment-wage data may be used to estimate and/or check value-added estimates, since wages comprise largest portion of value added, assuming reliable data can be obtained.</p> <p>Payments in kind should be separated from other expenditures. Better financial reporting required (esp. for local levels), in terms of education of civil servants, standardized financial forms, and centralized bookkeeping.</p>

Chapter IV
CLASSES OF INCOME RECEIPTS

The income account tabulates income generated from productive activity by five classes: compensation to employees, income from unincorporated enterprises, income from property, saving of corporations, and direct corporate taxes and government income from property. Estimates for these classes of income are generated predominantly in the calculation of the value added (or net product) of individual productive sectors. The national total for a particular class of income therefore represents the sum across the different production sectors. As a result, the national total for a particular class of income generally is unreliable since, at best, it mixes good and poor data.

A. COMPENSATION TO EMPLOYEES

1. Current Practices in Estimation

This estimate incorporates all the wage and salary payments made by the productive sectors. All wages and salaries of each sector (computed from the estimation of value added) are summed, and wages and salaries paid to foreigners are deducted. The latter value is estimated from data provided by the Balance of Payments Division of the NBVN. Because foreigners are permitted to send 50 percent of their income abroad, their wages and salaries are assumed to be double the value of transfers. For each productive sector, the estimation procedures are varied.

In agriculture, workers' wages in rice and other crop production are derived from a table of input requirements per hectare; the table provides the number of men, women, and children needed in crop cultivation per day. To get the total wage bill, the following computations are needed: first, the number of workers is multiplied by the average number of days worked per hectare and average wage by type of worker (these average values are provided by the Ministry of Agriculture), to give total wages per hectare; second, this value is multiplied by the number of hectares under cultivation. For livestock production, wages are computed as a percentage of the original purchase price per animal. The percentages used were developed from two surveys: a 1963 MOA survey on average feed and maintenance required per type of animal and a 1965 NBVN survey of large farms to determine average feed and maintenance. (See discussion in Chapter II, Section B.) Forestry wages and salaries are based on provincial service chiefs' reports to the Directorate of Forestry. The Directorate of Fisheries provides a wage estimate based on an average daily wage and the number of days worked. The average daily wage is computed as a percentage of total daily catch, and the percentage used is based on custom among fishermen. The number of days worked takes into consideration days off, bad weather, and days spent on repairs.

In the secondary sectors, manufacturing wages and salaries are calculated from the NBVN questionnaire. In the construction industry, wages and salaries are derived on the basis of square meters of construction. These estimates are obtained from NBVN inquiry of costs of 10 large construction firms in the Saigon-Cholon area. Though the water company refuses to provide detailed cost data, the electricity and gas producers furnish all information needed to compute wages and salaries.

The tertiary sector includes transportation, wholesale/retail trade, banking and insurance, and personal services. Airlines and shipping companies supply data on wages and salaries, including those paid to Vietnamese by foreign companies. For other forms of transportation, NBVN questionnaires and interviews are used to obtain wages and salaries; and a "reasonable" median value is used. In wholesale/retail trade, rough markup percentages developed in 1963 are used to calculate wages and salaries. Banks and insurance companies furnish all information needed to derive wages and salaries. In the personal-services sector, NBVN questionnaires and interviews are the main sources for computing wages and salaries. Some categories (e.g., hospitals and schools) provide accurate information, and rough percentages of revenues are used to estimate wages for nightclubs, theaters, and domestic services.

Central and local governments (including administrative organizations) supply information on wages and salaries paid to all civilian and military personnel.

2. Evaluation of Current Practices

The unreliable results for payments for labor employed in agriculture, construction, transportation, wholesaling and retailing, and services are the cause for the poor quality of the estimates for compensation to employees. Generally, the data compiled for wage and salary payments in manufacturing, government, public utilities, banking and insurance, and the U.S. sector provide reasonably reliable estimates. As a whole, this income class suffers from the usual shortcoming of excluding wage elements involved in the income from unincorporated enterprises.

For agriculture, data on wage rates paid to workers in rice and other crop production are obtained from biweekly hamlet reports of prices of all inputs in selected (generally, major producing) provinces. These data are considered relatively

reliable by both the MOA and the Agricultural Economics Division of USAID. However, the total wage bill (the product of the number of required workers per hectare, wage rate per worker, and the number of cultivated hectares) tends to be overestimated, for several reasons: First, the number of hectares under cultivation is overstated. Second, the total number of workers per hectare may be overestimated, because the table of input requirements that was derived from the results of the 1960-61 agricultural census is probably outdated. The table lists the number of required workers (men, women, and children); the number of women and children working in agriculture relative to the number of males (inducted into the military) has probably increased. Use of the table does not take this change into account. Also, the ratio of labor to capital has probably changed, and increased use of capital is not included in the table. Third, farmers are assumed to receive wage income rather than unincorporated-business income, since they are included in the number of required workers.

For livestock production, wages (as a percentage of the original price per animal) are a rough estimate; and they are understated by the underestimate of animals slaughtered. The Directorate of Forestry considers wages reported by provincial service chiefs to be understated, particularly because foresters and loggers desire to cover illegal activity, which comprises a large proportion of production relative to reported cuttings. Fishermen's wages may be considered to be a reasonable approximation, although reliability has not actually been checked. The percentage used to compute daily wages is based on a long-standing custom among fishermen, setting the proportion received by the boat owner and the fishermen. Moreover, the total numbers of fishermen and boats is fairly accurate, since fishermen must obtain licenses both for fishing and boats.

In the secondary sector, estimates of wages paid in the manufacturing and utility industries may be considered good. Use of NBVN questionnaires to determine manufacturing wages and salaries provides reasonable values, because costs of production (not being subject to tax) are usually reported truthfully. However, employee-compensation estimates suffer from the same deficiencies as estimates of gross and net output, to the extent that results from the questionnaires are not corrected for errors. For utilities, although the water company provides no information on costs, relatively accurate data are supplied by the electric and gas companies. On the whole, wage estimates are good because electricity production (representing about 90 percent of total production) dominates.

Wages and salaries for the construction industry are inaccurate. Wages and salaries are estimated from costs per square meter of construction of 10 large firms in the Saigon-Cholon area. They tend to be overstated, since a higher wage is likely to be paid in the Saigon-Cholon area than other regions of the country. However, estimates of total construction output tend to be understated, since they exclude a large (but unknown) percentage of illegal activity, farm construction, and military construction. This incomplete coverage probably outweighs the possible overestimate of wages.

For tertiary industries, relatively reliable wage information from airlines and shipping companies are summed with estimates derived from questionable statistical techniques. For the latter estimates of wages in the transportation sector, NBVN interviews of 10-20 entrepreneurs in road transport and inland water transport are used. The sample for inland water transport is selected on the basis of availability. NBVN questionnaires are sent to bus and trucking companies. A median "reasonable" value of all responses is used to determine wages. Incompleteness and doubtful sampling techniques make estimates

for wages in road transport and inland water transport unreliable. One additional error in the computation should be noted. For road transport, only wages and salaries of bus and truck drivers are included, while none is calculated for other types (including taxis, lambrettas, and pedicabs). Compensation to the latter groups is considered to be profits. A wage should be imputed to these drivers, as well as the operating surplus, and should come under income to unincorporated business, rather than being called "profits."

In wholesale/retail trade, rough percentages of markup (developed in 1963) are used to calculate wages and salaries. This estimate is unreliable, because the markups computed by the NBVN (representing official margins and a confused collection of wholesale and retail margins¹) are not correct. In general, the markup estimates tend to be low; hence, wages would tend to be understated.

While banks and insurance companies supply financial statements from which to compute wages and salaries, the value of compensation to employees in personal services is unreliable. For personal services, NBVN questionnaires and interviews obtain accurate data for some categories (e.g., schools and hospitals) and provide the basis for rough percentages in others (e.g., nightclubs, theaters, and domestic services). Lack of complete coverage and use of rough percentages of revenues suggest that wage and salary estimates are questionable.

Wages and salaries paid to civilian and military personnel are furnished by the central and local governments. Although supplementary wages are provided, there are not data on payments in kind. These payments are quite large (particularly since 1965) and are available from U.S. military sources.

¹For a complete description, see discussion in Chapter III, Section E (above).

3. Proposed Changes in Current Practices

The Ministry of Agriculture has begun an agricultural census for 1972-73, which will determine the number of farms (households), as well as other data, in terms of hectares under cultivation and yield per hectare. For the secondary and tertiary sectors, the NIS establishment survey that began in 1972 will collect employment and wage data. The accuracy of the information for the first quarter of 1972 has not yet been determined. The Ministry of Labor (MOL) has been conducting an employment and wage survey in the Saigon-Cholon area for the past three years, with small success in those industries (e.g., construction and personal services). The main problems of this survey center around lack of responses and inconsistent (widely fluctuating) monthly data. The MOL sample size is quite small for most industries and, in this respect, the NIS survey (which covers a range of firm sizes and a large number of firms) may provide some improvements in results.

4. Suggestions for Improvement

From the agricultural census, it may be possible to use the data on number of farms and farming population to estimate the total wage bill in this sector. Alternatively, a revision of the table of input requirements per hectare may be made. A revision, of course, would require data on all inputs, such that the proportions of males and females and labor to capital can be determined. It is suggested that a sample survey of costs of production be made in the agricultural sector (as discussed in Chapter VI, Section C, below).

For the secondary and tertiary sectors, if the NIS establishment survey or the MOL employment survey is successful in determining wages and salaries, compensation to employees could be readily estimated. However, these surveys will undoubtedly face similar difficulties for those sectors in which

problems now exist. For example, revisions are required in the sample populations used by the NIS for construction, transportation, and services. As previously discussed, an intensive (though periodic) survey of all input costs should be made in these areas, coupled with checks on survey results. One method of checking data would be a comparison with existing sources (e.g., the MOE financial reports from all importers and the MOE costs of operating reports for government pricing regulation). Another method would be to derive sets of series of required intermediate inputs for sectors such as construction and transportation. These series can be developed from other (particularly import) data sources. (See discussion in Chapter III, above.)

B. INCOME FROM UNINCORPORATED ENTERPRISES

1. Current Practices in Estimation

This income class covers predominantly the earnings of small urban enterprises (e.g., retailers, manufacturers, self-employed professionals, and farmers). No attempt is made to derive the value of this element in the national accounts. Income of unincorporated enterprises is computed from estimates of other accounts:

- Profits before direct taxes (from value-added estimates)
- + Interest from the public debt
- Direct taxes from corporations
- Net capital revenue and revenue from real estate paid the rest of the world
- Government rental income
- = Revenue to enterprises (corporated and unincorporated) and income to property (including interest on the public debt)
- Property income
- = Revenue to all enterprises

- Savings of corporations
- = Income to unincorporated enterprises

2. Evaluation of Current Practices

This estimate of income from unincorporated enterprises is highly questionable. First, according to standard accounting practices, corporate profits before direct taxes can be divided into three components: direct corporate taxes, dividends, and corporate savings. If the initial value in the above NBVN "equation" really represents profits before taxes for *all* enterprises, then the deduction of these three items should provide an estimate of income to unincorporated enterprises. Yet, of the three items, the list includes only two (direct corporate taxes and corporate savings).

Second, the rationale is quite unclear for adding or subtracting interest on the public debt, net capital revenue and revenue from real estate paid the rest of the world, government rental income, and property income. These latter receipts and/or payments, if not directly related to the primary activity of the firm, should be treated as such in the income statement (often called "extraordinary" receipts/expenses or receipts/expenses not directly related to sales) for both corporate and unincorporated businesses. Hence, the income statements for both types of enterprises should already have included these flows before computing profits before taxes.

Third, even if the appropriate items (corporate taxes, dividends, and corporate savings) are deducted from profits before taxes for all enterprises, the residual will incorporate all errors and biases in the three estimates. Of course, there is no way of telling if this residual would yield a poorer result than direct imputation, since most of the shortcomings in economic statistics arise from activities of unincorporated

businesses. The use of a residual procedure would tend to discourage the possibility of improving the estimate of this element.

3. Proposed Changes in Current Practices

The questionnaire used for the NIS establishment survey requests information on the legal status of the company: corporation, single proprietorship, partnership, or cooperative. From this information, it would be possible to separate out unincorporated business. Estimates of income can then be made, assuming that reliable data with which to compute value added are obtained. However, given the existing problems in obtaining accurate revenue and profit data for several sectors, methods for checking and adjusting survey results should be considered.

4. Suggestions for Improvement

Classification of earnings should be clarified. For example, returns to farmers as well as unincorporated business income should be included in this account. For these latter sectors, the NIS survey should provide some means with which to separate unincorporated businesses from corporations. The reliability of data collected would depend partly on sample selections; that is, as indicated in previous discussions, samples selected in several sectors (including transportation, construction, and services) should be revised and the population properly defined to include all firms. The use of the *patente* tax list has been considered to be inadequate.

In addition to defining the sample populations properly, it is suggested that the NIS establishment survey be separated into two surveys: one covering revenues, employment, and wages annually; and the other, costs of all inputs periodically and intensively (see Ch. III, above). In this manner, information collected may be relatively accurate, at least in terms of

costs that are not subject to tax. The results of the two surveys should, however, be checked for reliability. The sources of comparative data suggested in the previous subsection can be used to check survey results. The personal service sector has been, and will probably continue to be, the most problematic in obtaining reliable data on gross and net outputs. For this sector, it is suggested that a factor be derived from employment and wage data to estimate value added and, thereby, income from unincorporated business or operating surplus. The MOL has had difficulties in obtaining consistent employment and wage data for this sector, and the NIS results have not yet been checked for reliability. Because, in terms of sample size and distribution, the coverage of the NIS survey is larger than that of the MOL survey, it may be possible to determine the error or biases in survey results and to make corrections. Estimates of value added and income from unincorporated business can then be made. (See discussion in Chapter III, Section G.)

C. INCOME FROM PROPERTY

1. Current Practices in Estimation

Estimates of this type of income are based on property tax rates and the number of structures. The NBVN receives estimates of the number of houses and buildings from the NIS. The NIS figures are based on construction permits. Average rental values of different types of structures are provided by the Directorate General of Taxation. Rents paid by foreigners are separated out from total rents, since foreigners must pay a surtax; all other rents are imputed.

Total rental values are divided into two types: rents paid by firms (data from the Directorate General of Taxation) and rents paid by households (a residual). Net rent is computed from rough percentages based on a 1963 survey of rents:

Gross or total rent	100 percent
Maintenance	10 percent
Capital consumption allowance	12 percent
Indirect taxes	10 percent
Net rent	68 percent

Net rent (or value added) is income from property.

2. Evaluation of Current Practices

The estimates of this type of income are incorrect. First, the total number of structures (based on construction permits) is understated. Use of construction permits excludes illegal construction, farm construction, and rents paid for land and equipment (e.g., use of farm land and equipment). Second, average rental values tend to be underestimated, because they are derived from property taxes. The property tax rates provide a strong incentive to under-report actual rents paid. Third, rents paid by households (as a residual) introduces additional error. In computing gross rents, average rental values paid by firms is used. Differences between average commercial and residential rents have not been determined. To the extent that there are errors and biases in the estimate of commercial rents, residential rents (as a residual) will include them. There is no way of determining the over- or under-statement of commercial rents as a proportion of total rents and, hence, the direction of bias in residential rents. However, understatement of average rental values and the number of structures probably outweighs this factor. Relatively correct values have been obtained from USAID and U.S. Embassy leases, which must be reported by the mission to the Ministry of Finance.

3. Suggestions for Improvement

It is suggested that a sample survey of dwellings can be made to determine actual rents paid. A list of different types of housing, villas, or flats (classified by size) should be

available from the NIS or the tax authorities, and a sample can be selected by types of housing. The sample size does not have to be large, but should include other cities as well as Saigon. In addition, inasmuch as rent is essentially a price, the survey should be conducted frequently--at least quarterly. The survey would have to be less direct than others, assuming that lessors and even lessees will tend to under-report. Interviewers can be prospective renters, looking for different types of living accommodations (e.g., one may be looking for a villa; another, for a one-room flat). Information on key money and actual rental rates can thus be obtained, and a realistic rent can be imputed for services from dwellings.

There are several shortcomings to the suggested survey. First, to the extent that the number of illegally constructed houses is excluded, the total value of gross rents will be underestimated. Second, rents paid for farm land, houses, and equipment are excluded. These data can be collected in the survey of production costs for agriculture. Land rents should be separated from other types, since it is a nonreproducible tangible asset and is treated differently in the accounts; that is, transfers of land are not included in the capital formation account, except for dealer's margins and other transfer costs involved. Net rent from land (exclusive of real-estate taxes) is part of property income. Third, if the survey is conducted frequently, owners may become aware of the objective of the survey and again under-report rents. On the other hand, the interviewer may not appear to be seriously interested, or the owner may not wish (for whatever reason) to "lease" to the interviewer. Hence, a higher than ordinary rent may be quoted, exaggerating gross rent estimates.

Costs can be obtained from a separate short survey, with no subterfuge being required. The sample, which can be drawn from the list of dwellings, should be stratified by

type of housing. Property owners can be questioned on the costs of maintenance (including materials, supplies, and labor). Because such maintenance costs should exclude major improvements and/or additions, the definition of maintenance costs should be clarified in the questionnaire. To estimate depreciation or capital consumption allowance, estimates of price and of length of life are needed. Original price values or current market prices can be requested, but both are likely to be questionable. Some subjective valuations will have to be made. Taxes can be obtained from the government. Even though the taxes that would have been collected had rents been correctly reported would be higher, the taxes actually paid to the government should be recorded. The survey of costs should be made periodically (say every five years), assuming that no major changes occur in the relation of costs to gross rents.

D. SAVINGS OF CORPORATIONS

1. Current Practices in Estimation

Saving of corporations is a residual of profits before taxes (from the estimation of value added) minus income taxes and dividends (from the Directorate General of Taxation). Corporations include the manufacturing, banking, and transportation sectors.

2. Evaluation of Current Practices

The results presented for corporate savings substantially underestimate their actual magnitude, because of tax evasions and use of incorrect prices to value total output. The reliability of data used differs in each sector. Values for the banking and insurance sector are relatively accurate, but it is known that transportation companies tend to under-report their revenues and receipts. Valuation of manufacturing products is supposedly at wholesale prices, determined either from

NBVN questionnaires and interviews or from the MOE. However, the prices used from the NBVN questionnaires are a confused collection of prices, often varying within an industry. In most cases, the reported prices are less than permitted by the government. (See discussion in Chapter III, Sections A and E.) Therefore, saving is likely to be understated. Another source of underestimation is the exclusion of plantations, which are legally corporations. Because the Directorate General of Taxation has no data on dividends, they are included in households.

3. Proposed Changes in Current Practices

The NIS establishment survey will collect many of the data needed. The questionnaires request information on legal status, such that the corporations can be separated from other forms of businesses. The survey will collect revenue and cost data from which to compute value added and, therefore, savings from corporations. However, these estimates will depend on the reliability of survey results. Whenever possible, the data collected from the survey should be checked against independent sources of information, such as the MOE reports from importers and from price regulation.

4. Suggestions for Improvement

As stated before, the samples selected for several sectors (e.g., transportation and services) by the NIS for the establishment survey are not necessarily the best. The population must be redefined to include all relevant firms. In the questionnaire, a question on the distribution of profits (retained earnings and dividends) should be included, if the firm is incorporated. Most importantly, reliable data have to be collected in order for the account to provide a reasonable

estimate of corporate saving. Collection of reliable data will hinge on the success of the survey in each sector.

E. DIRECT CORPORATE TAXES AND GOVERNMENT INCOME FROM PROPERTY

These elements are probably the only accurate estimates of any class of income, because they reflect actual payments to the government. The Directorate General of Taxation provides data on income taxes and taxes on total revenues received from corporations. Government income includes rent paid by the private sector for the use of forests and other land for agricultural production.

(Table 8 provides a summary of the discussion in this chapter.)

Table 8. SUMMARY OF CHAPTER IV, 'CLASSES OF INCOME RECEIPTS'

1. Current Practices in Estimation	2. Evaluation of Current Practices	3. Proposed Changes in Current Practices	4. Suggestions for Improvement
<p><i>A. Compensation to Employees</i></p> <p>Sum of wages and salaries paid in each productive sector (agriculture, secondary, and tertiary) minus payments to foreigners.</p>	<p>Mixes good and bad estimates. Problem sectors are agriculture (input requirements outdated, though wage rates reliable), construction, transportation, wholesale/retail trade, personal services (for which "reasonable" averages and rough percentages used).</p>	<p>MOA planning a census that will determine farm population. MOL employment-wage survey and NIS establishment survey include secondary and tertiary sectors, but MOL has had little success in those industries for which NBVN estimates unreliable.</p>	<p>For agriculture, a survey of costs of inputs (rather than a census). For secondary and tertiary sectors, intensive periodic surveys of costs, coupled with checks on survey results, via MOE data and construction of series of required inputs (from import data).</p>
<p><i>B. Income From Unincorporated Business</i></p> <p>Derived as a residual of all other income accounts.</p>	<p>Also, as a residual, includes all errors and biases in estimates used to derive it and, hence, highly unreliable. Method of calculation highly questionable; no sound accounting principles apparent.</p>	<p>NIS establishment survey requests information on legal status of firm, enabling separation of unincorporated business.</p>	<p>Clarification of types of earnings needed, as well as means of separating unincorporated from incorporated business. Division of NIS survey into two surveys: one covering revenues, employment, wages; the other for costs to be collected periodically and intensively. Checks on surveys can be made via MOE data, series of required inputs, and MOL employment-wage data.</p>
<p><i>C. Income From Property</i></p> <p>Based on number of structures (permit data) multiplied by average rental value (tax rates), with deductions for maintenance, depreciation, and taxes, computed as fixed percentages.</p>	<p>Estimates incorrect because number of structures based on building permits (which exclude illegal, farm, military construction); property tax rates a strong incentive to under-report rents. Rental values refer to commercial (not residential) rents.</p>	<p>(No proposed changes in current practices)</p>	<p>A small survey of rents paid in major urban areas for different types of housing, using subterfuge (to determine key money and actual rents paid). Separate survey of costs can be made periodically for maintenance and depreciation.</p>
<p><i>D. Savings of Corporations</i></p> <p>Residual of profits before taxes minus income taxes and dividends; corporations include manufacturing, banking, and transportation sectors.</p>	<p>Underestimated, due to tax evasions and incorrect valuation of output--particularly for manufacturing. Plantations (legally corporations) excluded, due to lack of data.</p>	<p>NIS establishment survey will collect much of required data, including legal status of firm. Results should be checked against independent sources, such as MOE data.</p>	<p>Redefinition of population for NIS survey may be needed for several sectors. Also, survey should request data on distribution of profits.</p>
<p><i>E. Direct Corporate Taxes and Government Income From Property</i></p> <p>Data (provided by Directorate of Taxation) on income taxes received from corporations; government income includes rent paid for uses of forests and other land for agriculture.</p>	<p>Estimates accurate, because reflect actual payments to government.</p>	<p>(No proposed changes in current practices)</p>	<p>(No suggestions for improvement)</p>

Chapter V

MAJOR END-USE ACCOUNTS

One of the primary purposes of the national income accounting system is to lay out the disposition of the income of society among various end uses and the type of receipts (class of income or of transfer) available for a set of end uses. National accounting systems generally group end uses into four classes: household expenditures, general government expenditures, domestic capital formation, and external transactions. Though the dominant item under household expenditures is private consumption, they also include direct taxes, transfers to government and the rest of the world, and saving. General government includes transfer payments and saving, in addition to purchases of goods and services. Domestic capital formation covers inventory investment and fixed capital formation. External transactions incorporate imports and current transfers to the rest of the world. For the three domestic sectors, receipts include earnings for productive services, tax collections, and transfers. The receipts for the external account are exports, net factor income from abroad, and transfers from abroad.

A. HOUSEHOLDS AND PRIVATE NONPROFIT ENTERPRISES

1. Current Practices in Estimation

The basic procedure used to compute private consumption is the commodity-flow method. Total domestic production valued at market prices is allocated by commodity into final

consumption of goods and services, intermediate consumption, and capital goods.

There are several methods of allocation: First, when information can be obtained from independent sources (e.g., exports, construction, and agricultural stocks) commodities are classified directly. Second, when the nature of the commodity is clearly destined for a given group, 100 percent is allocated. Third, if a commodity can be used by several sectors, a ratio of total production (developed 10 years ago) is used to allocate. Fourth, imports are allocated separately, since they are reported by commodity groups. Government expenditures and exports are deducted from final consumption to yield private consumption.

These methods can be seen by reviewing the actual allocation of output for the productive sectors. For some sectors (e.g., electricity, water, and insurance), the companies identify intermediate and final purchasers. For others, arbitrary percentages are used to allocate goods. The MOA supplies survey summaries of purchases of agricultural products by final consumers, industry, and exports. Products omitted from the survey are allocated on the basis of inputs required per unit of output. In the case of industrial products, the NBVN can, in most cases, determine the amount of final-goods consumption from its industry survey. When data are lacking, percentages of output based on an educated guess about flows of industrial products are estimated for final consumption. For transportation and banking services, fixed ratios of total output (developed 10 years ago) are applied, to determine final and intermediate consumption. Private rents are a residual of total rents paid by the U.S. government and rents paid by industry. In the service sector, all educational and medical services are considered final consumption, but arbitrary percentages are used for other services.

The receipts of households from productive services are compensation to employees, income from unincorporated business, and income from property. The method of estimation has been discussed above.

The estimate of saving represents a residual. Saving is computed as the difference between receipts (of households and private nonprofit institutions) and expenditures, which includes direct taxes, other current transfers to the government, and current transfers to the rest of the world.

2. Evaluation of Current Practices

The estimate of private consumption not only reflects all the deficiencies in the computations of the gross value of domestic output and imports but also suffers from the use of arbitrary factors used to allocate output and imports among different end uses. These deficiencies have been described for each sector (Ch. II and III). Even though purchasers of output are identified in some sectors, in most cases, rough percentages (e.g., 50-50, 60-40, 70-30) are used to allocate output between intermediate and final consumers.

The shortcomings of receipts of households have been discussed in Chapter IV. These estimates, too, suffer in terms of reliability.

Saving, as an arbitrary residual, does not provide a reasonable index of private saving. It is the difference between receipts of households and private nonprofit institutions and expenditures. Not only are the estimates of receipts questionable because of incomplete coverage, but also included in receipts is a statistical adjustment, which represents half of the difference between the sum of the demand categories (computed from the commodity flow) and GDP as estimated from value added. Half the difference (considered to be "statistical discrepancy") is shown as an adjustment in national income; the

other half is used to adjust private consumption. If this measure is a discrepancy, then the total value should be included as an adjustment. The unreliability of estimates of receipts and the arbitrary allocation of expenditures by commodity flow thus make the value of saving a doubtful measure of private funds.

3. Suggestions for Improvement

There are several possibilities that may be used to estimate private consumption and saving and to check estimated values. First, the NIS conducted an expenditure survey of Saigon, Can Tho, Dalat, Nha Trang, and Danang in 1969-70. The survey requested income, expenditures, and profession of head of household (professional, clerical-trade worker, farmer or production worker, services worker, military personnel, and others). The data were compiled by the amount of expenditures in five categories (food, clothing, domestic help, housing and furnishing, and miscellaneous) and by income classification (building-villa class, commercial class, middle class, lower class, and semirural class). The survey results may be used to determine the proportions of expenditures spent on different groups of products. It will not provide as detailed a breakdown as would be required in the commodity-flow method. Nor will it provide a measure of rural consumption. For this latter value, the agricultural survey may include questions on own consumption. Also, the use of nutrition studies in rural areas¹ may provide a check for this value.

Second, the NIS establishment survey can be used, particularly with respect to purchases of raw materials, supplies, and services. If data can be obtained, the breakdown between final

¹See, for example, Tran Vy, M.D., "Nutritional Value and Composition in Foodstuffs of the Diet of the Vietnamese Rural Adult," *The American Journal of Clinical Nutrition*, XXIV (January 1971), 38-40. These studies provide a listing of average diets in terms of quantity consumed and caloric content per day.

and intermediate consumption can be made. Although reasonable measures of raw materials and supplies may be expected (assuming that the survey of inputs is conducted as recommended), the consumption of services is likely to cause problems.

Third, revenue and cost data collected by the MOE for all importing firms and for regulation of commodity prices (see discussion in Chapter III, Section A) may be used as an alternative means of allocating final and intermediate consumption and/or as a check on NIS survey results. A review of these data showed they were relatively reliable, at least when compared to NBVN data.

Lastly, a complement to these three suggestions would be better estimates of government expenditures and gross domestic capital formation (these accounts are discussed in Sections B and C of this chapter, below). Of course, even improved estimates of government expenditures and gross domestic capital formation would not provide a method of determining both consumption and saving, but would provide a check on the allocation procedure. A better estimate of saving hinges on both improved estimates of receipts and expenditures--the latter value probably being the more problematic of the two.

None of these suggestions for improvement is optimal, since there is no real way of measuring the exact amounts of final and intermediate consumption of each product, short of extensive surveys of marketing and distribution of commodities. Some use of arbitrary percentages as a means of allocation will still be likely. However, the NIS establishment survey, coupled with checks on reliability by using independent sources (such as the MOE data), could be used to collect input (current) purchases and capital expenditures; and, for the allocation of products, it would prove a more reasonable basis than the procedure now being used.

B. GENERAL GOVERNMENT

1. Current Practices in Estimation

The Ministry of Finance and the Directorate General of Taxation provide data on actual and budgeted expenditures and receipts of the central government, respectively. Expenditures include wages and salaries and consumption of goods and services by type. Included in general government are the receipts and expenditures of administrative organizations.

Local governments supply information on receipts and expenditures. Approximately two-thirds of expenditures are explained by purchase, and the remaining one-third is allocated by fixed percentages of the total.

For public enterprises, only total receipts and expenditures are available. To include the activity of public enterprises, the NBVN treats the balance of receipts and expenditures as an indirect tax (positive balance) or a subsidy (negative balance).

2. Evaluation of Current Practices

The total for general government expenditures and receipts are reasonably accurate, since the central government maintains fairly accurate records and comprises the major proportion of total government expenditures and receipts. However, the expenditures estimates do not show completely the purpose of various types of purchases. For the central government, payments in kind to the military are not specified and, thus, are included in general expenditures because of lack of detail. For local governments, there is no basis for the fixed percentages used to allocate the one-third unexplained portion of expenditures. Rather, they are "questionable." Treatment of public enterprises (excluding administrative organizations) is incorrect. More detail of receipts and expenditures are needed

to include their activities properly in the accounts. Moreover, the NBVN's treatment of the account is not in accordance with U.N. recommendations, to the extent that prices charged are greater than or equal to costs. In this case, since such organizations are not considered directly engaged in general government activity, they should be separated out of the government account. But because of the lack of cooperation of these organizations in providing detailed revenue and cost data, it is impossible to determine in which account they should be included.

3. Proposed Changes in Current Practices

The GVN has proposed to institute a uniform accounting system for the government, in conjunction with the four-year (1971-75) development plan. They plan to centralize all records and data on revenue and expenditure kept by public finance accountants and treasurers, in order to form a budget summary and general summary of accounts. Also, centralization of both records on materials and national assets and accounts of local authorities, public agencies, and government-owned enterprises will be made. Improvements in accounting regulations (auditing) and application of program budgeting techniques are also planned.

4. Suggestions for Improvement

Assuming that the government does improve its own accounts of expenditures and receipts on the central and local levels, as well as for public enterprises, there should be no problems in estimation in the national income accounts. As stated above, however, the account for public enterprises may not be properly treated in the accounts.

C. DOMESTIC CAPITAL FORMATION

1. Current Practices in Estimation

Gross domestic capital formation includes (on the expenditure side) stock changes, construction, and capital equipment. Changes in stocks are computed for the manufacturing, agricultural, and mining (salt) sectors. There are no figures available for other sectors. Investment in construction is taken from estimates of value added from construction. For capital equipment, imports are allocated between final and intermediate uses by fixed percentages developed 10 years ago. Some adjustments are made in these percentages if an industry expands or contracts production.

The receipts side includes savings of households, savings of corporations, savings of government, capital consumption allowance, and transfers from the rest of the world. The computation of savings of corporations and households has been discussed (in Section D of Chapter IV and Section A of this chapter, respectively). Government saving is taken from the government accounts; and transfers from the rest of the world are taken from the balance-of-payments accounts. Capital consumption allowance is the sum of depreciation computed from each productive sector's value added.

2. Evaluation of Current Practices

Both the expenditures and receipts for this end use are incomplete and, therefore, underestimate actual transactions. On the expenditures side, inventory changes in wholesale/retail trade are excluded; and the value and volume of construction are under-counted. Exclusion of inventory is particularly important, because this item comprises a large proportion of stocks generally. Moreover, stock data for agriculture, manufacturing, and mining include mainly finished goods, because items such as work in progress and raw materials are usually

not reported. As discussed previously, construction omits illegal activity and military construction. While the volume of illegal construction is not known, both the value and amount of construction by the U.S. military (and U.S. contractors) is quite sizable (see discussion in Chapter III, Section B, above). Valuation is also a problem, since average values for the Saigon-Cholon area are applied to other regions and are not necessarily representative of costs in these regions. For capital equipment, allocation of capital imports by fixed percentages is inaccurate.

On the receipts side, savings of corporations and savings of households are underestimated. Corporate savings are understated because of the under-reporting of revenues, exclusion of savings of plantations, and use of incorrect prices to value output (market value). The unreliability of household saving lies in under-reported property income, exclusions from wages and salaries, and the arbitrary calculation of income from unincorporated business as a residual and the derivation of expenditures by fixed percentages via commodity flow. While saving by the government, the deficit, and transfers (both public and private) to the rest of the world are relatively accurate, the item subject to largest error on the receipts side is provisions for capital consumption. Several factors make this figure unreliable. First, because total capital stock is not known, depreciation is calculated either on the basis of rather arbitrary values and expected life of various equipment and buildings or as a percentage of total output (gross). Second, depreciation is not computed when capital purchases are unknown, as in the case of forestry. Third, depreciation is understated to the extent that construction and capital formation are underestimated; that is, illegal construction and capital formation on the farm (such as irrigation works) are not included.

3. Suggestions for Improvement

If the construction industry survey is corrected for exclusions (as discussed in Section B of Chapter III, above), it can be assumed that relatively good estimates of value added would be available.

For machinery and equipment, most of the goods are imported, and very little is produced domestically. The Commercial Import Program (CIP) has a list of importers and type of imports, divided into categories of chemicals, textiles, machinery, and agricultural commodities. The list provides for each commodity import the following information: the commodity code using the Brussels Commodity Code System (BTN), the company importing the good, its import license or matriculation number, the quantity, and the FOB value. CIF values can be obtained from license applications or customs data. The CIP listing includes all imports coming into the country under its program and under the GVN licensing system, although the latter list is not considered as complete as desired.¹ This procedure developed under CIP should be completed and continued by the GVN.

In order to determine capital investment in the country, the list can be used as follows: First, those goods classified as capital equipment (excluding consumer durables, such as passenger cars and motorcycles) under the U.N. national income accounting system² should be selected from the list. These goods would include all transport equipment and machinery and equipment for both agriculture and manufacturing. Second, these capital imports can then be related to end users. The Ministry of Economy, Directorate of Industrial Supply, has a record of end users under the import licensing system. The

¹Imports between CIP and GVN licensing are about 50 percent and 50 percent, with a slightly larger portion (55 percent) under CIP in recent years.

²See United Nations, *A System of National Accounts*, pp. 114-15.

Capital Assistance Program under CIP (which handles project values over VN\$500,000) required until recently all importers of capital equipment to be end users. Having checks on delivery and installation before payment is made, the Industrial Development Bank, which finances a number of capital projects, also has this requirement. In cases in which the importers are not end users, a sample of importers may be selected and interviewed to determine the final purchasers. The process of selecting capital imports should not be difficult, for the data have been systematized by computer, and these goods can be called from the total listing of imports via the BTN.

Third, customs data should be related to the list of capital imports and end users to determine whether the commodities were delivered. This check is essential, particularly since the lag time between approval of license applications and delivery may be a year or two. Fourth, the goods should be valued at purchasers' values (i.e., the value in piasters, converted from U.S. dollars at the official exchange rate, plus taxes and duties and margins, where applicable).

This method will provide an estimate of total capital investment in machinery and equipment. If it is desirable to allocate these commodities by sectors, end users will have to be classified by industry. The NIS establishment survey can be used as a check on these estimates (or vice versa), since information on capital investment is requested from all sectors.

For domestically produced goods, individual producers can be interviewed by a sample survey.

D. EXTERNAL TRANSACTIONS

1. Current Practices in Estimation

Export and import data are obtained from the Balance of Payments Division of the NBVN and the Directorate of Customs

in terms of U.S. dollars. To convert these data into piasters, the official exchange rates were used: VN\$80 per U.S. dollar, until 15 November 1971, at which time the rates used became VN\$275 per U.S. dollar for commodities and VN\$410 per U.S. dollar for GVN purchases. Added to exports are American expenditures in the country, obtained from MPC (dollar) sales. From these sales, the NBVN estimates amounts paid to Vietnamese personnel and final consumption expenditures (nonfactor payments).

Imports are valued at CIF values, since the Balance of Payments Division provides only CIF values. The NBVN must estimate insurance and freight for domestic-factor use and foreign-factor use. Conversion from U.S. dollars to piasters is at the official exchange rates. Valuation includes duties, taxes, and official markup. In addition, 10 percent of PX sales are added to imports, to estimate American goods smuggled onto local markets.

2. Evaluation of Current Practices

Estimates of expenditures and receipts are understated, because illegal transactions are not included and exports and imports are valued incorrectly. The accounts exclude transactions stemming from foreign exchange "black market" activities, which are difficult to evaluate. These activities affect both exports and imports, through illegal dollar exchange and smuggled goods. Official dollar sales are used to measure consumption of domestic goods by foreigners (thus underestimating exports). PX items are included in imports by assuming an arbitrary 10 percent of total PX sales smuggled into local markets. But whether or not this percentage is a good estimate has not been verified.

The major problem with these accounts is valuation. Export and import data are converted from U.S. dollars at the official

exchange rates of VN\$80:US\$1, until 15 November 1971, at which time the rates used became VN\$275:US\$1 for commodities and VN\$410:US\$1 for GVN purchases. The official rates have changed since June 1966, rising substantially by October 1970. Although both exports and imports are understated, the value of imports includes an additional downward bias. Not only is the 80:1 rate used to value imports, but also added to the value is the official (rather than the actual) markup (i.e., imports in piasters equals imports valued in U.S. dollars multiplied by VN\$80:US\$1 plus duties and taxes plus the official markup). But part of the undervaluation is offset (at least by June 1971), since the inclusion of the perequation tax essentially brings the exchange rate up to VN\$118:US\$1.

The last problem with the external transactions account is the treatment of U.S. aid transfers. While all transfers to the government are identified, current transfers to households and capital transfers are not. Current transfers include all items under Public Law 480, Titles 1, 2, and 3; and capital transfers are a residual of total aid minus transfers to households and government. This estimate of capital transfers includes items that are current in nature (e.g., salaries for technical advisors). Because not enough detail is provided, capital versus current transfers is not identifiable. More importantly, U.S. aid, like exports and imports of goods and services, is incorrectly valued at an 80:1 exchange rate and, therefore, is understated.

3. Suggestions for Improvement

For exports, values obtained from the Balance of Payments Division of the NBVN should be checked against Customs data. All exporters must obtain licenses from the Office of Foreign Exchange and visas from the NBVN (visas control foreign-exchange earnings). From the licenses, price and quantity

data and (therefore) total sales can be obtained. The importance of Customs data lies in actual delivery of goods. There should be no need to convert exports from dollar values back to piaster values, since they are in piasters originally. However, separation of export subsidies should be made from actual values.

Imports should be valued at the appropriate exchange rate(s). That is, different goods come into the country at different rates; for example, by July 1972, the rate for aid funds was 290:1, while the rate for GVN imports was 425:1. In addition, because the Balance of Payments Division provides data only in CIF values, arbitrary estimates of freight and insurance involving domestic-factor use and foreign-factor use must be made. The determination of freight and insurance using domestic factors should be made by a small survey of shipping and insurance companies.

With respect to the aid transfers, USAID has a breakdown of uses of all aid funds and, as long as these funds continue, can provide the necessary data with which to compute capital transfers to households.

(Table 9 provides a summary of this chapter.)

Table 9. SUMMARY OF CHAPTER V, 'MAJOR END-USE ACCOUNTS'

1. Current Practices in Estimation	2. Evaluation of Current Practices	3. Proposed Changes in Current Practices	4. Suggestions for Improvement
<p><i>A. Household and Private Non-profit Enterprises</i></p> <p>Private consumption estimated via commodity flow, allocating total output by commodity into final consumption, intermediate use, and capital goods. Methods used depend on nature of good, independent data sources, and fixed percentages. Private consumption = final consumption minus government spending and exports.</p> <p>Receipts = compensation to employees + income from unincorporated business + income from property.</p> <p>Savings = residual of receipts minus private consumption.</p>	<p>Consumption estimate (including deficiencies of estimates of gross production from each sector) derived basically from arbitrary percentages used to allocate goods among end uses.</p> <p>Receipts unreliable, due to incomplete coverage of incomes received by the household sector.</p> <p>Savings (as a residual of two unreliable estimates) questionable.</p>	(None)	<p>Consideration should be given to alternative data sources to check estimates: (1) NIS consumer expenditure survey (1969) provides some measure of proportions of expenditures spent on different types of goods; (2) NIS establishment survey can provide estimates of intermediate consumption; (3) MOE data on importers and price control also supply measures of intermediate consumption.</p>
<p><i>B. General Government</i></p> <p>Central government provides breakdown of most of expenditures by type, but fixed percentages used to allocate some local government spending. Public enterprises included as indirect tax (positive balance of receipts over expenditures) or as a subsidy (negative balance). Receipts estimates fairly reliable.</p>	<p>Although general expenditures and receipts fairly accurate, purpose of expenditure not often given (e.g., payments in kind). Local government spending estimates based to some extent on "guesstimates" (arbitrary percentages). Public enterprises not treated according to U.N. recommendations.</p>	<p>GVN plans to institute uniform accounting system, centralized records, and improved accounting regulations and auditing.</p>	(None)
<p><i>C. Domestic Capital Formation</i></p> <p>On expenditure side, includes stock changes, construction, and capital equipment. Stock changes computed for manufacturing, agriculture, and mining; value added, from construction used for construction; capital equipment, from allocation of imports between final and intermediate uses.</p> <p>Receipts = savings of households, corporations, and government + depreciation and transfers from rest of world.</p>	<p>Expenditures and receipts incomplete and underestimate transactions. Stock changes (excluding inventory in wholesale/retail trade) include mainly finished goods. Construction (excluding illegal, farm, and military construction) valued incorrectly. Unreliable estimate given by allocation of capital imports by fixed outdated percentages.</p> <p>For receipts, savings of households and corporations inaccurate, due to under-reporting of revenues, property income, and other exclusions. Depreciation computed from arbitrary values and expected life of capital; estimates excluded in cases for which capital data unavailable.</p>	(None)	<p>Assuming that the survey of construction is corrected for exclusions, estimates should be improved. For capital equipment, since most capital is imported, the CIP list of importers, type of imports, and end users can be correlated with customs data (arrivals) to estimate capital according to U.N. definitions. Valuation should be in purchasers' prices, and conversion from U.S. dollars to piasters should be at the exchange rate appropriate to the commodity.</p>
<p><i>D. External Transactions</i></p> <p>Export and import data from Balance of Payments and Customs. Conversion from U.S. dollars to piasters at official exchange rate(s) existing during the period. U.S. expenditures in country (from dollar sales) added to exports; estimated illegal PX sales on local markets added to imports--at CIF values (including duties taxes) and official markup.</p>	<p>Estimates understated (due to exclusion of illegal transactions), but main problem involving valuation. Conversion from U.S. dollars to piasters made using incorrect (undervalued) exchange rate. Also, imports undervalued by use of official (rather than actual) markup. U.S. aid transfers (current transfers to households and capital transfers) not properly identified.</p>	(None)	<p>No need to convert exports into piasters (in which originally quoted). Data can be obtained from NBVN and Customs. Subsidies, however, should be separated from actual values. Imports should be valued at proper exchange rate(s), taking account of differing rates for different goods. CIF values can be divided into domestic- and foreign-factor use for freight and insurance through small surveys. USAID can provide data to compute capital and current aid transfers to households.</p>

Part 2

Deflation of the National Income Accounts of Vietnam

Chapter VI

DEFLATION OF THE NATIONAL INCOME ACCOUNTS OF VIETNAM

A. INTRODUCTION

This part of the paper develops guidelines for deflation of the product and expenditure accounts. It discusses first the general methodology for estimating real product (or value added). Based on this general discussion, the product account of each sector is treated, considering both the ideal conceptual approach and the best available substitute, given data availability. The last section covers the expenditure accounts. Expenditures at current prices are derived from the sector product accounts (at current prices) via the commodity-flow technique. Deflation of the expenditure accounts can best be considered after we know the method of estimating real value added from each sector. Moreover, this information would be useful in the review of the present procedure used by the National Bank of Vietnam (NBVN) to estimate real expenditures.

B. METHODOLOGY

Real product of an industry or sector is defined as value added at constant prices. Conceptually, the objective is to deflate value added at current prices by the appropriate index(es). However, because the components of value added at current prices, compensation to employees, depreciation, operating surplus, and net indirect taxes cannot all be divided into a quantity unit or price per unit, there is no way either to measure the real values of each component and preserve the

identity of value added¹ or to derive an appropriate price index that includes all components.

There are two basic approaches to estimating real product: double deflation and single deflation. The double-deflation method measures both gross production and intermediate inputs at constant prices. Value added at constant prices by this method can be derived in the same way as value added at current prices (i.e., as the difference between gross production at constant prices and intermediate inputs at constant prices). To estimate gross output and intermediate inputs at constant prices, the appropriate price indexes for each can be used to deflate current value of output and inputs. Alternatively, it can be measured by extrapolating base-year figures by appropriate volume indexes derived from quantity data of output and inputs.

The alternative technique to double deflation is single deflation. In using single deflation, gross output or intermediate inputs are used as indicators of movements in value added--gross output being the most commonly used. Gross output can be used if the total value of output and the ratio of value added to total output are known. Total output can then be deflated (by an output deflator) to obtain real value of total output. Assuming that the ratio of value added to total output remains the same as in the base period, the ratio can be applied to the real value of total output to obtain a measure of real value added. A similar procedure is followed to use intermediate inputs as an indicator of movements in real value added when the total value of intermediate inputs and the ratio of value added to total output are known.

¹See T. P. Hill, *The Measurement of Real Product: A Theoretical and Empirical Analysis of the Growth Rates of Different Industries and Countries* (Paris: Organization for Economic Cooperation and Development, 1971).

In selecting the appropriate technique (double deflation or single deflation), availability of relatively accurate output and input data must be determined, and then the technique that will provide precise, reliable estimates of real product must be decided on. In general, whether double deflation or single deflation is the better technique depends upon the percent of value added in total output (or the percent of intermediate inputs to total output). This dependence can be seen by viewing real value added estimated by double deflation as a weighted average of output and input indexes, where the weights used are determined by the ratio of total output to value added in the base year. The output index refers to the volume index of total output, and the input index refers to the volume index of intermediate inputs. This formula is also applicable in using single deflation. If total output is used as an indicator of movements in real value added, a weight of 1 is assigned to the output index and 0 to the input index; if intermediate inputs are used, the weights are 0 and 1 for the output and input indexes, respectively. (See attached technical appendix for the mathematical formulation of the following discussion.)

Two criteria are used to determine the appropriate technique: bias and error in the estimates of real value added. That is, the conditions under which double deflation is preferable to single deflation hinge on the dispersion of random errors in the output and intermediate input indexes, compared to the degree of bias introduced by use of single deflation. Double deflation will provide an unbiased estimate of value added but may include a large variance of error. In practice, both the indexes of gross output and intermediate inputs are subject to errors in measurement. The error in the latter is quite likely, since less information tends to be collected for inputs than for outputs. Any measure of real product by

double deflation is subject to errors in both indexes of output and intermediate inputs.

Assuming that errors in measurement are random, single deflation will (under certain conditions) provide more reliable estimates of real value added than double deflation. According to statistical theory, the variance of the difference between two random errors is equal to the sum of their respective variances. Real product derived by double deflation would involve a variance of error that depends on the errors in the output and input indexes, multiplied by the respective weights assigned to each index. These errors tend to be cumulative. Thus, real value added obtained by double deflation is more sensitive to error than the two indexes from which it is derived.

On the other hand, single deflation based on output or intermediate inputs alone would provide a biased estimate of movements in real product, since it does not account for any real divergence between movements in output and inputs. The degree of bias is a function of the percent of value added (or intermediate inputs) in total output and the "true" difference between the output and input indexes. The general rule may be stated that the less the divergence between the output and input indexes, the smaller would be the bias in using single deflation. If the degree of bias involved is considered to be small, the choice between using output or intermediate inputs as an indicator of movement in real value added must be made, taking into account the relative reliabilities of each series. Generally, intermediate inputs would be used when little or no data on output are available.

Hence, the choice for estimating real product is between double deflation, which provides an unbiased but possibly erratic estimate, and single deflation, which gives a more stable but biased estimate. In practice, the parameters of

error and bias for determining the better method of estimating value added can only be surmised. They are basically a function of subjective evaluation by the national income accountant, but certain practical (though perhaps arbitrary) limits can be set out.

These limits can be seen by considering three cases: a very small ratio of intermediate inputs to total output, a ratio of intermediate inputs to total output of 0.50, and a very large ratio of intermediate inputs to total output. Suppose the ratio of intermediate inputs to total output is very small (say 0.01). Single deflation would be used instead of double deflation. In this case, the percentage of value added in total output is quite large (0.99), and use of total output as an indicator of real value added would be a close approximation of the desired measure. (This case refers to T. P. Hill's case of the ratio of total output to value added approaching 1.) Use of single deflation based on total output would involve a small bias, and the related error would be only in terms of the estimates of total output. The double-deflation techniques would require additional, reliable data on intermediate inputs, while providing a measure of real value added similar to that provided by the single-deflation technique.

If the ratio of intermediate inputs to total output is 0.50, a comparison of bias and error indicates that double deflation would be preferred to single deflation. Single deflation would provide a relatively biased estimate of real value added, compared to the expected degree of the error involved in using double deflation. The bias in using single deflation tends to be larger the greater the divergence between the output and input indexes; or, alternatively, the higher the

percentage of intermediate inputs to total output¹ the larger the degree of bias is likely to be.

This case of an intermediate-input/total-output ratio of 0.50 suggests that, as the ratio rises, double deflation should be used. However, beyond a certain ratio, this generalization does not hold. Consider the case in which the ratio of intermediate inputs to total output is 0.99. Value added would be a very small component of total output (0.01), and the output and intermediate input indexes would tend to diverge little. Alternative interpretations are that movements in the price of intermediate inputs determine the price of output or that the price of output reflects movements in the costs of intermediate inputs. The bias in using single deflation would tend to be less than the errors in using double deflation. Use of double deflation would involve large variance errors, since it would include errors in estimates of both the output and input indexes--the errors being cumulative. It can be shown that the larger the ratio of intermediate inputs to total output the larger the error in using double deflation will tend to be, because the variances are weighted by the ratio of total output

¹The measure of bias is a function of the difference between the output and input indexes. Assuming that the difference is 5, the bias would be 5, using the formula:

$$(z - 1)(x - y) = (2 - 1)(5),$$

where z is the ratio of total output to value added in the base year and x and y are the output and input indexes, respectively. The degree of error would be 3.2, assuming a large variance of 0.64 in estimates of the output and input indexes (standard deviation of 0.80):

Estimated error = $z^2 E(\epsilon^2) + (z - 1)^2 E(\delta^2)$; and $\epsilon^2, \delta^2 > 0$, where $E(\epsilon^2)$ and $E(\delta^2)$ are the variances in the estimate of the output and input indexes, respectively. (See the technical appendix, below, for the derivation of these formulas for estimates of bias and error.)

to value added in the base year.¹ Use of single deflation would then involve a choice between using intermediate inputs or total output and would depend on their relative reliabilities. In practice, intermediate input data tend to be less accurate than output data, because less information is usually collected and/or fewer records are kept (by individual firms) for inputs than are kept for outputs.²

Generalizing, single deflation based on intermediate inputs should be used when little is known about output data. Single deflation based on total output should be used when total output data are relatively more reliable than intermediate input information and the input-output ratio is very large or very small. In all other cases, double deflation should be used. However, the cases just discussed cover only three specific ratios of intermediate inputs to output (0.01, 0.50, and 0.99). Ranges of values of the ratio may be determined, but the limits are rather arbitrarily set, depending on the individual's evaluation of the values at which bias or error may be considered large or small. The limits set out for the ratio of intermediate inputs to output for the deflation of Vietnam's national accounts reflect the author's personal opinion of what is a large or small degree of bias and error.

¹Using the formula (cited in the previous footnote for estimating error)

$$z^2 E(\epsilon^2) + (z - 1)^2 E(\delta^2) ,$$

assume that the variances in the output and input indexes are small (and equal at 0.01). The total error in using double deflation would be

$$(100)^2(0.01) + (100 - 1)^2(0.01) = 198 ,$$

while the bias would be 99, assuming that the "true" difference between the output and input indexes is 1 and that intermediate inputs comprise 0.99 of total output.

²T. P. Hill argues that in this case intermediate inputs should be used (pp. 21-23). However, it appears that unless output data are not available, single deflation based on total output would generally provide a better estimate of real value added than intermediate inputs would.

On this basis, the ranges of values of the ratio of intermediate inputs to total output (which will be used to determine the appropriate deflation technique for the national accounts of Vietnam) are defined. Except for the case in which no output data are available and only intermediate input data are relatively reliable, single deflation based on total output will be employed when the ratio of inputs to output is small (between 0.00 and 0.30) or large (between 0.70 and 1.00). The double-deflation technique will be used when the ratio is between 0.30 and 0.70. For the latter technique, the range of input-output ratios assumes that the errors (standard deviation) of the estimates of the output and input indexes are no greater than 0.20. In reality, however, the actual values of the errors involved are conjectural. For cases in which the errors in the indexes are judged to be greater than 0.20, single deflation should be used and the choice of using output or intermediate inputs would depend on the relative reliabilities of the two indexes.¹

In addition to the problem of determining the appropriate deflation technique to be used in deriving real product and expenditures, certain data problems specific to Vietnam should be pointed out. Estimates of national accounts as compiled by the NBVN are evaluated and suggestions for improvements in the estimates are made in a separate section. Even if NBVN estimates are considered acceptable, additional complications are presented by price statistics. First, the fact that Vietnam has been experiencing an average rate of inflation of 30 percent per year for the past six years, in conjunction with

¹The value of the error involved would be based on the judgment of the national income accountant and cannot be derived. However, according to Hill's analysis, if the ratio of intermediate inputs to output approaches 0.30 or 0.70 and the errors (standard deviations) in the output and input indexes are both around 0.20, the single and double deflation techniques provide equally poor estimates of real value added (i.e., in terms of bias versus error).

differential price controls, suggests distortions in any price series. In other words, changes in relative prices have occurred; and any continuous series over a period of time may not be comparable. Even though the price series are updated periodically to incorporate changes, each update reflects different weights. This problem is particularly relevant in Vietnam, for new weights were developed in 1972 (updating from 1963), during which decade there was rapid inflation and wide official controls of prices (particularly the foreign exchange rate). The two series may not be entirely comparable. Second, the wholesale price index of certain groups of products may be considered appropriate theoretically, but the series actually developed may not be representative. The wholesale price index of Vietnam includes official prices of many products. This coverage of the index is small, including a small number of products (85) and the Saigon wholesale market only.

C. ESTIMATION OF VALUE ADDED AT CONSTANT PRICES BY SECTORS

The following subsections describe suggested methods of estimating real value added for each sector, taking into account data availability. The NBVN does not at present provide estimates of real value added by sector.

1. Agriculture

The agricultural sector includes four major categories of commodities: crops, livestock, fishes, and forestry products. Because each category represents a completely different type of commodity produced under differing conditions and input requirements, separate estimates of real value added should probably be made.

a. Crops

For crops, the double-deflation technique should be used, for several reasons: First, crop production has undergone (and

is still undergoing) a number of technological changes in such forms as new crop varieties, new types of crops, and new machinery and equipment. Second, output and intermediate input indexes are likely to diverge significantly because crop production is subject to external factors (e.g., weather, crop disease, and hostilities) that affect the ratio of intermediate inputs to total output. Use of single deflation would likely introduce biases in the estimate. Third, to estimate real value added from crops,¹ most countries use double deflation, because of probable divergencies between output and intermediate input indexes.

Ideally, within the crop category, real value added from rice production should probably be estimated separately. Rice production comprised in 1971 approximately 50 percent of all farm production in the country and about 68 percent (each) of total crop production in the Southern and Central Lowlands regions.² Moreover, the Ministry of Agriculture (MOA) devotes most of its data-collection efforts to obtaining data on rice production. Hence, output and input data for other crops tend to be less accurate. Compared to data for rice, the relative unreliability of data for other crops may introduce errors in the estimate of real value added for all crops.

The main difficulty in separating data for rice from that for other crops is that data on intermediate inputs (e.g., fertilizers and pesticides) are not adequate. With the exception of seeds used, estimates of quantities of inputs used specifically for a given crop are not accurate. These estimates have been derived from an outdated table of input

¹See Hill, Table I, pp. 50-51.

²USAID/Office of Food and Agriculture, "Value of Farm Production, 1970 and 1971, for Viet Nam: Total and by Regions (Revised)," Agricultural Production Memo, No. 27, March 12, 1973. The former percentage includes livestock production; the latter excludes livestock production.

requirements (per hectare of land), developed from the 1960-61 agricultural census. The technological changes that have occurred in agriculture between 1960 and the present suggest the inadequacy of such a table. However, relatively reliable data are available in the aggregate; that is, for fertilizers and pesticides (most of both of which are imported), aggregate data (quantity, price per unit, and value) are available. USAID/Agricultural Economics Division has a series (beginning with 1969) of total fertilizer and pesticide imports per year, including ending stock. If such a series can be continued by the DAE, small surveys can be made to determine the amount of fertilizers and pesticides used in the production of crops other than rice (e.g., vegetables, fruits, and sorghum), and the residual amount from total values may be applied to rice production. Such surveys can be conducted relatively easily, since rice (the predominant crop) tends to be more variable in terms of input requirements in the production process. Alternatively, if an agricultural survey is completed (as suggested in Part I on evaluation and recommendations for improvement of estimates of national accounts), both output and input data would be improved for rice as well as other crops. Separate estimates of real value added from rice production and other crops would then be possible.

To estimate real value added by the double-deflation technique, total output and intermediate inputs of rice and other crops must be deflated by appropriate price indexes. It is suggested that Paasche indexes be used to deflate the series. A Paasche price index uses the current-year quantities as weights in the index, whereas a Laspeyres index uses base-year quantities. Current year's output (intermediate inputs) in base-year prices is the desired measure(s), and the Paasche price index provides a more suitable index for this purpose than a Laspeyres index provides.

A gross output deflator can be developed from the revised agricultural price index. The MOA, Directorate of Agricultural Economics (DAE), and USAID/Agricultural Economics Division are preparing a revised index series of crop and livestock prices. (Dr. Richard J. Foote, USAID/Agricultural Economics Division, is supervising the revision of the agricultural price index.) This series will be set up on a consistent, annual basis. First, the prices quoted will correspond to the same product each year, to replace the mixture now used; for example, the price of peanuts (shelled and unshelled) has been used alternatively. Second, an average price of a representative product will be selected, since quality control is nonexistent; for example, the price of "ordinary" rice will be used as a representative median of all (four) varieties of rice. Third, prices will be weighted by quantities of appropriate product; that is, prices in those provinces producing large amounts of a given commodity will be given a larger weight. Fourth, margins between farm and provincial market prices will be derived. However, the revised agricultural index is based on Fisher's ideal formula, which is a geometrical average of the Laspeyres and Paasche indexes, and the deflators should be recomputed as Paasche price indexes. To determine the total output of rice in real terms, the price of rice will have to be separated out from other crops, and a deflator developed in terms of a Paasche price index. The price of "ordinary" rice is the only consistent series available; and, hence, the assumption underlying the deflator using this price series is that the prices of all varieties of rice move together. For other crops, an index can be derived from DAE data (excluding rice). For intermediate inputs (assuming that either an agricultural survey or small surveys of input requirements for other crops are made to determine quantities of inputs used in rice and other crop production), fertilizer and pesticide imports, along with value of seeds used, can be deflated by the appropriate prices of each

to determine the intermediate input index. The difference between real value of total output and real value of intermediate inputs will provide estimates of real value added from rice and from other crops.

b. Animal Husbandry

To estimate real value added from animal husbandry, single deflation based on total output would probably provide a better estimate than double deflation, given presently available data. Ideally, double deflation would be preferable, because the ratio of intermediate input to total output is likely to diverge from year to year. The production process has been undergoing a number of changes, such as better feed (corn instead of wastes from rice), vaccinations against disease, and new breeds of animals. Moreover, the intermediate input-to-output ratio is around 0.27-0.28¹ quite close to the upper limit of 0.30 set for use of single deflation. The size of this ratio suggests that some bias is likely to be introduced in the estimate of real value added by using single deflation.

However, reliable and detailed information on intermediate inputs is not available at present; they are estimated on the basis of average maintenance (excluding improved methods, such as vaccinations) per animal. In addition, estimates of quantity of production are derived from fixed factors of birth rate, death rate, and average weights of each type of animal, given end-of-year inventory from the MOA annual livestock survey. To the extent that the fixed factors and assumed average weights are inaccurate, gross production would be questionable. The probable errors involved, then, in deriving an output and intermediate input index to estimate real value added by the

¹These percentages are derived from 1968-69 national accounts data (source: NBVN). It should also be remembered that the 0.30 limit for the intermediate input-to-output ratio is rather arbitrarily determined.

double-deflation technique would tend to be quite large. Hence, the bias in using single deflation based on total output is likely to be relatively smaller than the degree of error in using using double deflation.

To deflate total output, livestock prices (being collected along with crop prices for the agricultural price index) can be used. Livestock prices should be separated from the total agricultural price index, since animal husbandry is quite different from crop production and comprises a relatively large proportion of total farm production (about 30 percent, according to Agricultural Memo No. 26). As in the case of crops, a Paasche price index is suggested. Deflated total output multiplied by the base-year ratio of value added to total output will provide an estimate of real value added. If an agricultural survey is completed and relatively reliable output and input data become available, double deflation can be used to compute real value added from animal husbandry.

c. Fishery

For fishery, use of single deflation based on gross production would provide a better estimate of real value added than double deflation would. Because the ratio of intermediate inputs to total output is low (ranging from 0.05 to 0.08), the degree of bias would tend to be small. To deflate gross production, fish prices (being collected by the DAE for the agricultural price index) can be used. These prices can be separated out from the index series and used to develop a deflator, based on the Paasche price-index formula.

d. Forestry

For forestry products, single deflation using gross output should be used. Intermediate input data (including only transportation services, which are roughly estimated) are incomplete.

The ratio of intermediate inputs to total output ranged from 0.25 to 0.35 in past years, overlapping the upper limit of 0.30 set for using single deflation. However, because total output data (as well as information on intermediate inputs) are relatively unreliable,¹ use of double deflation would probably introduce a larger error than the bias introduced in using single deflation.

In addition, records of prices of various types of woods and lumber have not been kept over time. Although attempts in maintaining records began in 1972, they cover only five major categories of wood. In this case, a quantity index should be derived from production data. To estimate real value added, this index can be used as a factor of base-year value added. On the other hand, should major technological changes occur, this estimate of real value added is likely to include distortions. Forestry products have become a major export commodity in the recent past, and methods of supplying the expected volume of foreign demand (including new production techniques) are being considered. Consequently, changes in the production process may occur. But, unless surveys are conducted to determine output and input values, a quantity index would probably provide the best basis of estimating real value added.

2. Manufacturing

The manufacturing sector consists of a large variety of products, ranging from processed foods to semifinished and finished goods (such as chemicals, textiles, and ceramics). Because the characteristics and production processes for these commodities differ widely, each industry should be treated separately, taking into consideration the intermediate input-

¹See discussion in Chapter II (above) on the accuracy of estimates of forestry production and value added.

to-output ratio and the reliability of both output and input data.

Before considering estimates of real value added for each industry, available price data should be discussed. Recently, the National Institute of Statistics (NIS) adopted a new wholesale price index (base year 1969) covering 85 items, to replace the previous index, which included only 49 items. This price index includes the following five groups of commodities: farm products, fuel, raw materials, semifinished goods, and manufactured products. A particular index is also computed for each of the five classifications. To determine the proportion that each price contributes to the index (relative importance in total annual transactions), the weights used to compute the NIS industrial production index are employed. The industrial-production-index weights will be revised when results are obtained from the establishment survey of the secondary and tertiary sectors, which is presently being conducted. The establishment survey will collect production and input data. Although the price index is available, it is not suggested that the index necessarily be used. Rather, because the price data collected for the wholesale price index include representative products of all industries in the manufacturing sector, these price data should be used whenever possible. It should, however, be pointed out that in using the wholesale prices of products (or the wholesale price index), the underlying assumption is that the share of wholesale distribution costs is relatively constant. Such an assumption does not represent realities, because such costs vary from industry to industry--even though the Ministry of Economy permits a uniform percentage above production costs for wholesale distribution. Producers' prices are not available. Hence, use of wholesale prices may introduce some distortions in the estimates of real value added, to the extent that wholesale prices are not a constant fraction of producers' prices.

Data from 1965-69 for the 32 industries included in the manufacturing sector were reviewed to determine the most suitable method of estimating real value added, following the guidelines already set out in Section B of this chapter.¹ These guidelines suggest several methods. First, industries for which double deflation should be used to estimate real value added are alcohol, cement, glass, paper, and textiles. The ratios of intermediate inputs to output are between 0.50 and 0.60, except for paper. For paper, the ratio ranges from 0.63 to 0.73. Although the ratio overlaps the 0.30-0.70 limit set for using double deflation, the gross output and intermediate input data for the paper industry, as well as the other four industries, are relatively reliable. Use of single deflation would probably introduce a large bias (compared to the error involved in using double deflation). Ideally, to deflate current values, the appropriate prices of output and inputs should be used. These prices could be requested either in the survey questionnaires or by individual interviews. However, if the price data are not available by these means, wholesale prices can be used (i.e., gross production at current prices can be deflated by the index of wholesale prices of each commodity). Because raw materials comprise the greater proportion of total intermediate inputs, and because unit prices of services are difficult to determine, the prices of each type of raw material used in each industry can be used, assuming that input prices can be obtained. Alternatively, the wholesale price index of raw materials can be used to deflate the intermediate input series. Use of this index, however, introduces certain distortions, because it includes

¹Data from NBVN estimates of national income. To the extent that these estimates are grossly inaccurate, these suggestions may be erroneous. However, for the four years considered, the intermediate input-output and gross production-value added ratios were relatively constant for most industries.

not only the wholesale distribution costs, but also a number of other commodities not used specifically by these industries. Hence, the error associated with the intermediate input series would increase.

Second, industries for which the intermediate input-to-output ratio is low (less than 0.30) are beverages, matches, rice milling, tobacco, and sugar. Because the ratios of intermediate inputs to output are low, the degree of bias in using single deflation based on gross output would be minimal (compared to the error involved in using double deflation). It should be noted that for the sugar industry the ratio varied from 0.24 to 0.38, overlapping the limit set for use of single deflation. However, estimates of intermediate and factor inputs are based on fixed percentages of gross value of production, which were derived by the NBVN and tend to be unreliable.¹ The fact that the intermediate input to output ratio is relatively low (overlaps the 0.30 limit) and input data are generally unreliable suggests that the error involved in estimating real value added by double deflation would be greater than the bias in using single deflation. Gross production of each industry can be deflated by the wholesale price of each commodity or the wholesale price index.

Third, single deflation based on gross output should be used to estimate real value added for beauty-sanitary products, pharmaceuticals, plastics, metal products, paints, and rubber. The ratios of intermediate inputs to total output are high

¹A review of the sugar company's reports to the NBVN shows that costs are overstated by about 45 to 50 percent, assuming that sales are reported truthfully (i.e., reported total costs were 45 to 50 percent greater than reported total sales). The NBVN reestimates total production, based on NIS production and import data multiplied by an average price per ton. Intermediate and factor costs are then derived as arbitrary percentages of total value of output. It is difficult to determine the accuracy of these percentages.

(greater than 0.70), indicating that the errors in using double deflation would be quite large relative to the bias in using single deflation.

Fourth, except for clothing, pastries and bakeries, printing, boat-building, aluminum, and "miscellaneous" industries, real value added from other industries should be estimated by single deflation based on gross output. For these latter industries, gross output is roughly estimated by the NBVN on the basis of questionnaires and NIS production data. (See Chapter III, above, for the exact NBVN procedure used to incorporate NIS data.) Intermediate inputs, as fixed percentages of gross output, are quite questionable. Even though the intermediate input-to-output ratios range between 0.30 and 0.70, it is believed that the bias introduced by using single deflation would be less than the errors involved in using double deflation. Gross production of each industry can be deflated by the wholesale price of each commodity or the wholesale price index.

Fifth, use of a quantity index of output is suggested for boat-building, aluminum, and "miscellaneous" industries. The production of junks, sampans, and other boats is based on the change in the number of boat registrations from year to year. Total value of output is obtained by multiplying these changes by an estimated average price per type of boat. Intermediate input costs and value added are based on input requirements per type of boat, thereby assuming no change in productivity of factors of production for the past 10 years. Because intermediate inputs (as well as the average price per boat) are questionable values, a quantity index of output along with base-year value added would probably prove to be the best estimate of real value added. Gross production of aluminum products is derived from the NIS industrial production index multiplied by an estimated average price per unit, and intermediate inputs are derived by fixed percentages of gross

production. These percentages are based on the cost structure of a firm whose production represents approximately four percent of total industry output. Moreover, the ratio of intermediate inputs to output (based on these percentages) ranged from 0.63 to 0.71, overlapping the 0.70 limit for using single deflation. Use of a quantity index assumes that quantities produced are uniform over time; for example, all newly constructed boats are the same or similar each year. To the extent that the quantities are not uniform, the index would involve some degree of error. However, the assumption of consistent or uniform output underlies the present NBVN method of estimating value added. Use of a volume index of output would exclude the errors in estimated average price per unit of output and intermediate inputs, and it would involve a relatively small bias (compared to possible errors in using double deflation). The miscellaneous category includes such industries as light bulbs, radio-television assembly, and candles. For most of these small industries (small in terms of gross production), the estimates of gross production and intermediate inputs are unreliable. It is believed that a volume index derived from quantity of production, in conjunction with base-year value added, would provide the best estimate of real value added, even though it would be biased. The errors involved in using double deflation would outweigh the bias, particularly in view of the fact that the intermediate input-output ratio (about 0.69) is quite close to the 0.70 limit.

Sixth, in the clothing, pastry and bakery, and printing industries, gross production is estimated from imported raw materials of textiles, flour, and paper, respectively. Other intermediate inputs (services) are estimated as rough percentages of gross production. Since little is known about gross output, single deflation based on raw materials used can be used to estimate real value added. Estimated value of raw

materials consumed can be deflated by the appropriate prices of these materials. Prices of these imports are available from the NIS wholesale price index or from the Ministry of Economy. Alternatively, a quantity index of these inputs can be developed to estimate real value added from base-year value added. Import data are available in terms of quantity and value.

3. Construction

Gross production, intermediate costs, and factor payments are unreliable estimates in the construction sector. Gross production is based on NIS data on building permits (in square meters) and is understated by an unknown amount of farm, military, and illegal construction. Intermediate and factor costs (derived as percentages of gross production) are based on interviews of 10 large firms in the Saigon-Cholon area. These cost percentages, which are applied to other provinces in the country, are not necessarily representative of other areas or of small construction companies. (See Chapter III, above, for the evaluation of value added estimates in construction.)

Because gross production is essentially an unknown value and presently available input data are unreliable (due mainly to the poor sampling procedures), it is suggested that a new intermediate input series be developed to estimate value added in current and real terms. If an average proportion between the value of building-material inputs and total construction value can be established, this series can be used as a check on estimates of current value added and as a means of determining real value added.¹ The input series should consist

¹Present NBVN estimates of the proportion of value of building materials to value of total construction average about 0.60 (a rather high percentage, at least by U.S. standards). But alternative methods of checking or determining this proportion are available. A small sample of firms (continued on next page)

of all building materials (including those produced domestically, as well as those imported). Domestic building materials can be derived from the gross production estimates of these industries (e.g., bricks, sand, and lumber, exclusive of exported quantities--although a small quantity of timber is actually used in buildings in Vietnam). Imports of construction materials such as cement, steel pipes, and refractory bricks can be obtained from balance-of-payments data. To determine the materials used in construction, a few construction firms can be interviewed. It should, however, be pointed out that errors would exist in the input series to the extent that there are (1) exclusions of some building materials and (2) inclusions of inputs used by industries other than construction. These errors are likely to be small, since construction materials are generally easily identifiable--and if construction firms provide a list of materials used.

Assuming that the proportion of the value of building materials to the value of total construction can be established, the intermediate input series can be deflated by a price index of building materials. The price index should be a weighted average of prices of materials (based on quantities used) and should be derived according to the Paasche price-index formula. The wholesale prices of construction materials can be separated out from the NIS wholesale price index. The proportion of building materials to total construction¹ and

(cont'd) (including large, medium, and small companies) can be made to estimate the fraction of building materials needed in construction of buildings (both residential and commercial). Data from military construction (as discussed in Chapter III, above) can also be used to check estimates of the proportion. Contracting firms and construction by the military have provided such information.

¹One (1) minus this proportion (or the proportion in the base year) will provide an estimate of the ratio of value-added to output. It will, however, exclude costs of services used; services are a small fraction of total costs.

the intermediate input series (in real terms) can be used as an indicator of movements in real value added. This estimate of real value added will be biased, particularly since its use implies the assumption of no changes in factor productivity. But it is believed that it would provide a more accurate measure than an estimate based on presently available data on construction.

If such an input series is considered impossible to derive, gross production can be deflated by the price per square meter. The NBVN has devised a price-per-square-meter series based on data obtained from interviews of 10 Saigon-Cholon construction firms. Alternatively, since the value of gross production is estimated by multiplying the number of square meters of construction by the estimated price per square meter, a quantity index may be derived and used with base-year value added to estimate real value added. This latter method would exclude errors in the estimation of price per square meter.

4. Electricity, Gas, and Water

Ideally, double deflation should be used to estimate real value added from this sector. The ratio of intermediate inputs to output is 0.60 (between 0.30 and 0.70), and use of single deflation would introduce a large degree of bias (relative to errors involved in using double deflation). However, detailed intermediate input data are not available.

The publicly owned electric companies furnish data by region and type of purchaser (private, industrial, government), on the production of electricity in kilowatt-hours and price per kilowatt-hour. Prices charged differ by regions and types of purchaser. Detailed data on factor payments and taxes paid are provided, but only total value of intermediate inputs are listed. It is suggested that detailed information on intermediate inputs used in electricity production be collected in

order to estimate real value added by double deflation. Similarly, detailed input data should be collected for water. Only gross production and price per cubic meter are supplied, and intermediate input costs and value added are computed as fixed percentages of gross production. These input data, as well as prices available for deflation purposes, should be checked for reliability. For gas production, the intermediate input-output ratio is low (less than 0.30), and use of single deflation would introduce a relatively small bias (compared to possible errors of the double deflation method).

If reliable intermediate input data and corresponding prices are impossible to gather, it is suggested that single deflation based on gross output be used, since gross-output data are the most reliable of presently available information. Gross production of electricity, gas, and water can be deflated separately by the appropriate prices of each. For electricity, it may be desirable to weight prices by quantity of production and by region or type of purchaser, because prices differ by region and type of purchaser. Alternatively, since quantities of production by the three industries are provided, quantity indexes may be derived for each industry. The index for each and the respective base-year value added can be used to estimate real value added for each industry.

5. Transportation

This sector is comprised of five major different types of transport: air, sea, inland waterways, railroads, and light road transport. Different methods of estimating real value added are suggested for the various modes of transport, based on the guidelines already developed (in Section B of this chapter). According to these guidelines, double deflation should be used for air transport, inland waterways, and railroads, for which the intermediate input-to-output ratios are 0.59-0.64, 0.29-0.40, and 0.43-0.57, respectively. For air

transport, foreign companies provide relatively reliable data for computing value added, and the domestic airline (fares, taxes, subsidies) is controlled by the government. To deflate gross value of output, a price index can be developed by deriving a price per unit in terms of passenger- and ton- (cargo) kilometers traveled and total revenues. Intermediate inputs can be deflated by the appropriate prices, weighted by the quantities used. The double-deflation technique is not suggested, however, for railroads and inland waterways. Since 1966, at least 50 percent of value added from railroads is comprised of subsidies, and use of double deflation will not properly take this factor into account. For inland waterways, gross production and intermediate input data, which were obtained through questionable survey and sampling techniques,¹ are quite unreliable. Single deflation based on gross output should probably be used for the latter two industries, even though it will provide a biased estimate of real value added. The errors in using double deflation will tend to be large in these cases. Methods of single deflation are discussed below.

Single deflation using gross output should be used to estimate real value added for sea transport and light road transport. The ratio of intermediate inputs to output ranges between 0.25 and 0.32 for sea transport and between 0.22 and 0.47 for light road transport. In both cases, the ratios overlap the 0.30 limit set for use of single deflation. For sea transport, the range is quite close to the limit of 0.30; and it is believed that the bias (relative to the error involved in using double deflation) would be small. For light road transport, gross production and intermediate input data are derived from a survey that is based on poor sampling methods (i.e., 10 to 20 entrepreneurs in Saigon-Cholon are interviewed,

¹See discussion of survey and sampling techniques in Chapter III, above.

and a "reasonable" median of all responses is used to estimate total revenues and costs for the whole country).¹ Hence, the errors in using double deflation are likely to be large (compared to the bias in using single deflation).

To estimate real value added from railroads, inland waterways, and sea transport by single deflation, it is suggested that a quantity index for each industry be derived, using ton-kilometers or passenger-kilometers as the unit of output. Ideally, this definition of output units should be adjusted for average length of haul, since short-distance hauls would obviously involve a larger amount of value added per ton-kilometer than long-distance hauls would. However, data on average length of haul are not available, although the Ministry of Public Works and the Directorate General of Customs (for sea transport) provide data on ton- and passenger-kilometers traveled for all types of transport, except light road transport. The quantity index based ton- and passenger kilometers traveled for each mode of transport (with the base-year value added) can be used to estimate real value added. But this estimate will be an underestimate/overestimate if most of the cargo or passengers travel shorter/longer distances than they did in the base year.

For the retail price index, the NIS collects light-road-transport data on fares for taxi, pedicab, lambretta, and bus rides. These data can be separated out from the retail price index and used to develop an index of fares, weighted by proportions of total output contributed by each. This index can be used to deflate gross production.

6. Wholesaling and Retailing

Estimates of gross production, intermediate inputs, and value added for this sector may be considered rough approxima-

¹Ibid.

tions. Gross output of the distribution sector is computed by the NBVN as an average 15 percent of the total value of available commodities entering the marketplace: domestic production from agriculture at farm prices and manufacturing at producers' prices,¹ plus imports at CIF values (plus taxes); that is, output of wholesale-retail trade is an assumed 15 percent markup of the value of all domestically produced and imported products. This markup represents value added plus intermediate inputs, which include material costs, transportation, and other services. To estimate intermediate inputs and value added, fixed percentages of gross output of wholesale retail trade (or the markup) are used.² Intermediate inputs are approximately 30 percent of gross output; and value added, 70 percent. If this procedure for estimating gross output, intermediate inputs, and value added is deemed to be reasonable, then, according to the guidelines developed (the ratio of intermediate inputs to output is less than 0.30), single deflation should be used. The degree of bias introduced would be small (compared to the errors involved in using double deflation, particularly considering the reliability of output and input data).

To determine the appropriate deflator, the components of value added were reviewed. Although *a priori* labor costs may be expected (by NBVN estimates) to be a major component of value added, it is calculated as only 14 percent of total output from distribution (or about 20 percent of value added),

¹As already pointed out in Chapter III, the NBVN values industrial output at the wholesale prices reported on the questionnaires, since producers' prices are often not given. Conceptually, this procedure used by the NBVN assumes that there is a 15-percent markup between producers' prices and wholesale prices (i.e., 15 percent of output at wholesale prices deducted from output at wholesale prices gives output at producers' prices).

²These percentages were developed on the basis of a brief survey of wholesale and retail establishments in the Saigon-Cholon area in 1962-63 by Harold Lubell.

while profits (or operating surplus) represent 47 percent of gross production (or about 68 percent of value added).¹ Profits (as a pure residual) have no unit of output or price per unit associated with them.

If the percentages used by the NBVN to compute the components of value added are considered realistic, an ordinary price index may be assumed to be a reasonable proxy for deflating gross production. There are several price indexes available: the wholesale price index, the middle-class retail price index (with and without rent), and the working-class retail price index (with and without rent). It can be reasonably assumed that the retail price indexes (including rent) would not be suitable, since rental payments are not a part of distribution activity. The wholesale price index may also be considered inappropriate, because profits are computed as the largest portion of value added. In this case, the index that reflects the general rise in prices would be the most appropriate. The retail price indexes provide the best measure of inflation in Vietnam. The middle-class retail price index, the working-class retail price index, or a combination of the indexes can be used. A review of the NIS consumer expenditure survey of 1969 suggests that the middle-class consumer is the most representative (or average) purchaser (see *Statistical Yearbook of Viet Nam, 1971* for the results of this survey). Hence, it is suggested that this index series be used to deflate gross output.

Alternatively, if the fixed percentages are not considered reasonable, labor may be assumed to be the major component of value added. This assumption can be defended on the grounds that "profits" (as calculated by the NBVN for this sector) are

¹The remaining 14 percent of total output (or 12 percent of value added) consists of taxes (11 percent) and depreciation (1 percent).

essentially income to unincorporated business; and conceptually, this income can be considered part of compensation to employees (wages and salaries), as assumed in the United States. An index of wage rates may be used to deflate gross production. A series of average monthly wages received per worker and an index of employment for wholesale trade has been collected by the Ministry of Labor (MOL) only since 1970. These data refer only to paid workers (excluding administrative or management personnel, as well as unpaid family members). The sample is quite small (36 establishments) and is biased toward large establishments.¹ Despite the problems with the data, the average wage may be used to derive a wage index; or the index of employment may be used as an indicator of gross production. Use of the latter would necessarily assume that there would be no gains in productivity, but assumed increases in productivity may be incorporated in the index if desired. Another source of data is the NIS establishment survey, which will also collect wage and employment data and which can be used in a similar manner. The NIS survey may provide more reliable information than the MOL survey provides, because the NIS survey will cover both retail and wholesale trade and all sizes of firms.

In any case, if improved data become available, the distribution sector should be reviewed in terms of reliability of both output and input data, to determine the preferred method of estimating real value added, given the new information.

7. Finance and Insurance

Because of the ratio of intermediate inputs to output of this sector is low (about 0.20), the degree of bias involved in

¹Ministry of Economy, Directorate General of Labor and Social Security, Research and Statistics Section, "Index of Employment in Establishments of Selected Industries, Saigon Metropolitan Area, 1970, 1971, and 1st, 2nd, 3rd quarters, 1972," Index of Employment, Report No. 7.

using single deflation would be relatively small (compared to the errors introduced by using double deflation). However, the unit of output for this sector is difficult to define. The primary sources of income to banks and insurance companies are from property income (plus service charges) and premiums received less claims paid. While many countries use employment and wages of workers employed in this sector as an indicator of gross production, the major component of value added for these two industries in Vietnam is profits or operating surplus (58 percent of value added and 46 percent of gross production) rather than labor (25 percent of value added and 19 percent of gross production).

In this case, a combined index of prices and wages is suggested. To take into account the proportion of value added that is comprised of profits, a retail price index may be appropriate. As just stated in Subsection 6 (above), because there is no unit of output or price associated with profits, a retail price index (without rent) can be used for this purpose. For the labor component of value added, an index should be used that reflects real compensation received by employees in banking and insurance. There are two sources of wage data: (1) The MOL collects wage and employment data (for banking only), which are considered to be relatively reliable; average monthly wage per worker in banking may be used to derive an index of wage rates for the whole sector. (2) The NIS provides a wage-index series of skilled workers, in nominal and real terms (see *Statistical Yearbook of Viet Nam, 1971, "Labor"*). This series, in nominal terms, may be used as a proxy for wages received by banking and insurance workers. A composite index can be derived from the retail price index and the wage index, weighting them by relative importance in value added. The suggested weights are 0.70 for the retail price index and 0.30 for the wage index, since these weights are the approximate fractions contributed to value added (excluding taxes and depreciation, which comprise

0.17 value added) by profits and wages, according to NBVN estimates.

8. Ownership of Dwellings

If a rent survey is undertaken and relatively accurate estimates of key money and actual rent paid are obtained, an index can be developed for deflation of total rents. Since accurate rental data are not presently available, the next best alternative is the NIS retail price indexes. The NIS collects rental data for the middle-class and working-class retail price indexes. It is suggested that these data be factored out of the indexes and that a separate index be derived for rents. This index can be used to deflate gross production.

9. Other Services

This sector covers a number of diverse activities (education; medical services, entertainment, professional services, and domestic services). Measurement of value added at constant prices involves two main problems: First, transactions are not readily factored into quantity and price. Second, the NBVN estimates of gross production, intermediate inputs, and value added are unreliable (see Chapter III, above).

The difficulties can be overcome, in part, by considering the ratio of intermediate inputs to output and the components of value added. The ratio (at least as computed from NBVN estimates) is low (0.26), such that use of single deflation would involve a small degree of bias (relative to possible errors in using double deflation). Value added, representing over 70 percent of gross output, is comprised mainly of labor costs.¹ Hence, it is suggested that either employment data be

¹The proportions of wages and salaries are as follows: schools, 0.70 of value added and 0.66 of gross production; medical services, 0.57 of value added and 0.50 (continued on next page)

used as an indicator of real value added or wage data be used to deflate gross production.

The NIS establishment survey of services (quarterly and annually) will provide both employment and total wages covering all workers, management personnel, and others. The quarterly survey will collect data on paid workers only, and the annual survey will also provide information on unpaid family workers. Although the survey is new and only preliminary results are available (first quarter of 1972), statisticians at the NIS believe that the data collected on employment and wages are relatively reliable. They show a consistent series for the three months of the first quarter of 1972, and they are comparable to MOL results. The latter survey includes 26 establishments, while the NIS sample covers over 5,000. Moreover, the NIS sample is scientifically stratified by size of firm. A wage index can be derived from the total wage-bill data and used to deflate gross production. However, because an index of wages derived from these data may involve large errors (due to estimations of average wages per worker, as well as imputed wages to family workers), the employment data should probably be used to develop an employment index. The main problem in using an employment index as an indicator of real value added from services is that its use assumes no productivity changes in labor. Nominal gains in productivity may be assumed and incorporated into the index, but they will hinge on judgmental factors--thereby introducing some error into the index.

(cont'd) of gross production; and other services, 0.41 of value added and 0.32 of gross production. For the whole sector, they are 0.43 of value added and 0.32 of gross production.

10. Public Administration and Defense

Government expenditures in Vietnam consist mainly of expenditures on wages and salaries paid to civilian and military employees. In other words, intermediate inputs are minimal; and wages and salaries are equal to value added and to output, essentially. Therefore, deflation of output or value added, using labor input or wages, would be reasonable. Ideally, value added at current prices should be deflated by an index of wage rates of government employees to estimate real value added. However, wage rates of government employees are not available as explicit data. The GVN provides employment data on the military and civilians (classified by career, contract, daily-wage earners, and temporary) and total wages paid to military personnel and to civilian employees (central and provincial governments).

Because wage-rate data are not available, an index of the quantity of labor employed in government is suggested. This index multiplied by base-year output or expenditures will give a reasonable estimate of real value added for public administration and defense.

If a wage-rate index is considered desirable, the employment and wage-bill data can be used to estimate an average annual wage paid to military and civilian personnel. A wage-index series can be constructed from the computed averages--weighted by the proportion of each type of employee (civilian or military)--of total wages and salaries paid to government personnel. This index can be used to deflate current output or expenditures.

However, both indexes will provide the same estimate of real value added. Assuming that wages and salaries paid to all government employees equal value added as well as gross output (and government expenditures), let L represent labor; w , the average wage rate; E , output or expenditures; and O

and 1 subscripts for the base year and year 1, respectively. Then

$$E_0 = L_0 W_0 = \text{base year output; and}$$

$$E_1 = L_1 W_1 = \text{output in year 1 .}$$

The index of employed government labor would be L_1/L_0 , while the wage index would be W_1/W_0 . Use of the labor index would yield

$$\frac{L_1}{L_0} E_0 = \frac{L_1}{L_0} L_0 W_0 = L_1 W_0 ,$$

and use of the wage-rate index would yield

$$\frac{E_1}{W_1/W_0} = \frac{L_1 W_1}{W_1/W_0} = L_1 W_0 .$$

That is, both indexes give an estimate (valued at the base-year wage rate) of current-year labor employed. Hence, though either index can be used, the index of labor employed would require fewer manipulations of data than the wage-rate index.

D. DEFLATION OF EXPENDITURES

The NBVN has developed a set of deflators for the expenditure account, as follows: the working-class consumer price index is used to deflate private consumption; an average of the middle-class consumer price index and an estimate of the wage index of government employees is used for government expenditures; an arithmetic average of the wholesale price indexes of manufactured goods, semifinished products, rice and paddy, and raw materials is used for gross capital formation; and an average of a price index for exported products and the middle-class consumer price index is used for exports; and the wholesale price index of imported products is used for imports.

The rest of this section discusses the deflation of each expenditure account and suggests the most appropriate index, along with the rationale for its use.

1. Consumption Expenditures

The procedure used to estimate private consumption expenditures is the commodity-flow method. The product accounts of all sectors valued at market prices are first classified by the ISIC and then allocated into three groups: final-demand or consumer goods, construction and capital equipment, and intermediate goods (used in production). Exports and government consumption of goods and services are subtracted from total available consumer goods to give private consumption expenditures.

Private consumption expenditure is comprised of agricultural products, manufactured products, imports, and services. A review of the composition of private consumption (as computed by the NBVN) shows that food items (including processed foods) range between 60 and 65 percent of total consumption for 1968-70; manufactured (nonfood) goods, from 6 to 9 percent; and services, about 26-30 percent, of which rents are 15 percent (or rents represent 5 percent of total consumption expenditures).

If it were possible to deflate consumption of each product by an appropriate retail price (e.g., the price used to deflate product accounts), the sum of deflated values would provide an estimate of real consumption. But it will be recalled that such prices were not always available, particularly for services. The NIS provides two price indexes: the middle-class consumer price index and the working-class consumer price index. These indexes were recently revised, including additional commodities (125 items from 96 for the middle-class index, and 119 items from 90 for the working-class index); and different

weights were used in deriving the indexes.

The weights used to derive the indexes were compared to the composition of consumption expenditures (according to NBVN estimates). The weights are (1) for middle class, food items (including processed foods), 60 percent; manufactured goods, 24 percent; services, 13 percent; rent, 2 percent; and (2) for working class, food items (including processed foods), 65 percent; manufactured goods, 25 percent; services, 9 percent; and rent, 1 percent. Except for food, the percentages differ significantly from NBVN estimates. A new price index may be derived using the prices collected by the NIS and weighting them according to NBVN estimates. On the other hand, if this procedure is considered impossible, a combination of the two consumer price indexes may be used to deflate consumption expenditures (i.e., a weighted average of the two may be used). Suggested weights are 0.30 for the middle-class consumer price index and 0.70 for the working-class index. Although no definitive rationale¹ can be given for using such weights, the NIS consumer expenditure survey of 1969 was reviewed in terms of NIS definitions of middle and working classes and distribution of the sample population, in order to provide some basis for the weights. While these weights are subject to question, they are not entirely arbitrary. The NIS sample tended to be biased towards higher-income groups. Of the total spending units or households surveyed, only 30 percent were from the working class and 65 percent were from the middle and upper classes--whereas the majority of Vietnam's population is considered working class.²

¹See *Statistical Yearbook of Viet Nam, 1971* for the results of the survey.

²As a percentage of total individuals surveyed (in contrast to households), only 20 percent interviewed were in the working class.

2. Gross Domestic Capital Formation

Gross domestic capital formation consists of construction and of machinery and equipment. A review of the composition of this account indicates that construction and imported machinery and equipment represent approximately 40 percent and 55 percent, respectively; and domestic production, about 5 percent. Use of two indexes is suggested, deflating construction separately from machinery and equipment.

For imported machinery and equipment, balance-of-payments and customs data provide total value and quantity of imports, classified into several groups (e.g., chemicals, textiles, and capital equipment). (These data are available from the USAID/Commodity Import Program.) It may be decided that domestic capital can be excluded, since it contributed such a small fraction to total machinery and equipment purchases. Price per unit of imported machinery and equipment can be computed. A price index can be developed, using these price data on imported capital and the price per unit for domestic capital and weighting them by proportions of total expenditures on machinery and equipment contributed by the two types of capital. An alternative may be to use the same index that is used to deflate total imports (see below). This alternative, however, would include many commodities other than machinery and equipment. It should be noted that use of these computed import prices assumes that distribution costs are a constant proportion of the price.

For construction, a procedure of computing gross output (or expenditures) in real terms has been discussed above (Section C.3 of this chapter). These values can be added to estimates of real expenditures on machinery and equipment to give gross domestic capital formation in real terms.

For stocks, agricultural stocks should be deflated by the agricultural price index. Manufacturing stocks should be

deflated by the appropriate product prices of these stocks. However, if such price data are not available, the wholesale price indexes of semifinished products and manufactured products may be used as proxies, depending on the type of good.¹

3. Government Expenditures

Because the government expenditure account consists mainly of wages and salaries paid to civilian and military personnel, the index used to deflate the public administration and defense account (product accounts) would be a representative deflator. An index of labor employed in government, multiplied by base-year expenditures, may be used to estimate rare expenditures. (See discussion in Section C of this chapter, above.)

4. Exports

Although an export price series is not available, an export price index may be developed on the basis of current exports. The main exports of Vietnam are agricultural commodities. The prices of such products as fish and shrimp, timber, and rubber can be separated out from the agricultural price index² to derive an index for exports. This index should be based on the Paasche price-index formula, in order to take into account possible shifts in the quantity of each type of commodity export. It should be checked annually to determine any changes in the composition of export items (i.e., new groups of commodities).

¹The NIS wholesale price index is classified by type of product (rice and by-products, other food products, fuels, raw materials, semifinished and manufactured goods) and by origin (local and imported products).

²Prices of imported timber are collected by the Directorate of Forestry, Ministry of Agriculture.

5. Imports

Deflation of this account presents several problems. Three of the most important are (1) how to treat the devaluation(s) of the exchange, (2) how to deal with the system of multiple exchange rates, and (3) how to deal with external inflation. External inflation refers to the fact that countries that export to Vietnam are experiencing inflation; and to this extent, Vietnam (although essentially a floating system, with rates changing relatively quickly as trade and domestic conditions change), rates are held constant for discrete periods of time. To this extent, the rate may be considered fixed.

Because domestic prices of imports would not properly take into account multiple earnings, external inflationary conditions, and devaluation, it is suggested that a combined index of the exchange rate and the (U.S.) dollar price of imports be used. An index of the exchange rate can be developed from multiple rates, weighting specific rates for groups of commodities (e.g., ordinary imports, CIP, and Public Law 480) by the proportions contributed to total imports. Each change in the rate should be included in the index. The index of dollar price of imports can be derived from the export price indexes of major exporters to Vietnam (the United States, Japan, and Taiwan). These export price indexes should be weighted by relative importance (i.e., dollar volume of each country's exports to Vietnam). The composite index, which is the product of the index of the exchange rates and the index of the dollar price of imports, could then be used to deflate current piaster value of imports in the national accounts. This procedure assumes that duties, taxes, and markups (included in the piaster value of imports) comprise a relatively

constant fraction of current value.¹

Conversion into piasters should be at the market exchange rate(s) existing during the year, since the objective of this measure is to determine the impact of imports on the domestic economy. Either the black-market rate of exchange or the rate existing under the present flexible system may be used. However, although the present exchange-rate policy may be considered essentially flexible (with rates changing relatively quickly as trade and domestic conditions change), rates are held constant for discrete periods of time. To this extent, the system may be considered fixed. If the exchange-rate policy reverts to one with exchange rates held at artificial, unrealistic levels, the black-market rate can be used as a proxy for the market rate. The additional complication of multiple rates can be overcome by using the relevant exchange rate for specific items (e.g., CIP and Public Law 480).

(Table 10 provides a summary of this chapter.)

¹Another approach would be (by using appropriate indexes) to separate out duties, taxes, and markups and to deflate each.

Table 10. SUMMARY OF CHAPTER VI, 'DEFLATION OF THE NATIONAL INCOME ACCOUNTS OF VIETNAM'

Product Accounts*	Recommended Deflation Technique	Recommended Index(es)	Additional Data Requirements
1. Agriculture			
a. Crops	Double deflation: separate estimates for rice and other crops.	Paasche price index derived from agricultural price index of output; input prices, DAE.	Small survey of intermediate inputs (fertilizers, pesticides) used in other crops. Residual of total applied to rice.
b. Animal Husbandry	Single deflation based on output. (Double deflation preferable, but intermediate input data unreliable.)	Paasche price index from agricultural price index.	
c. Fishery	Single deflation based on output.	Paasche price index from agricultural price index.	
d. Forestry	Single deflation based on output.	Quantity index and base-year value added. No price data.	
2. Manufacturing			
Alcohol, cement, glass, paper, and textiles	Double deflation.	Wholesale prices of these commodities; wholesale prices of raw materials used or NIS wholesale price index of raw materials.	
Clothing, pastries, and printing	Single deflation based on inputs (output based on raw materials).	Wholesale prices of imported raw materials used; or quantity index of inputs and base-year value added.	
Boat-building, aluminum, and miscellaneous	Single deflation based on output.	Quantity index of output derived from production data and base-year value added.	
Other	Single deflation based on output.	Index of wholesale prices of these commodities; or NIS wholesale price index.	
3. Construction	Single deflation based on output.	Price index of building materials.	Construction of series of materials suggested.
4. Electricity, Gas, and Water	Single deflation based on output. (Double deflation preferable for electricity, but detailed input data unavailable at present.)	Price index for each industry (electricity, water, gas).	Additional detail on intermediate input data recommended for electricity.
5. Transportation			
Air transport	Double deflation.	Price index derived from passenger- and ton-kilometers (price index of intermediate inputs).	
Light road transport	Single deflation based on output.	Price index of fares derived from NIS retail price index.	
Other transport	Single deflation based on output.	Quantity index derived from passenger- and ton-kilometers traveled and base-year value added.	
6. Wholesaling and Retailing	Single deflation based on output.	Either NIS retail price index (middle class) or an index of wage rates paid or an employment index in the sector derived from employment-wage data.	Employment-wage data (available from MOL or NIS).
7. Finance and Insurance	Single deflation based on output.	Composite index derived from NIS retail price index and wage index of skilled workers; or a wage index can be derived from MOL employment-wage data for banking.	
8. Ownership of Dwellings	Single deflation based on output.	Index of rents derived from NIS retail price index(es).	A rent survey, suggested to obtain estimates of key money and actual rents, rather than NIS price data.
9. Other Services	Single deflation based on output.	Either an employment index or a wage index derived from MOL and NIS surveys.	
10. Public Administration and Defense	Single deflation based on output.	Index of labor employed in government.	

(continued on next page)

* For the product accounts, the NBVN does not estimate real value added.

Table 10 (continued)

Expenditure Accounts	Present Method	Recommended Deflation Technique	Additional Data Requirements
1. Consumption Expenditures	Working-class retail price index used to deflate consumption.	An index based on NIS retail prices, weighted by NBVN estimates of proportions of consumer expenditures on various goods. Alternatively, a combined index of the NIS middle-class and working-class retail price indexes. Suggested weights are 0.30 for middle-class index and 0.70 for working-class index.	
2. Gross Domestic Capital Formation	Deflated by an average index of wholesale price indexes of manufactured goods, semi-finished goods, rice and paddy, and raw materials.	Deflation of construction by method used to deflate value added, and deflation of capital equipment by price index of capital goods derived from capital import data and price of domestic capital (latter index should weight imported and domestic capital by proportions contributed by each to the total).	
3. Government Expenditures	Deflated by an average index of middle-class retail price index and index of wages of government employees.	An index of labor employed in government (used to deflate public administration and defense).	
4. Exports	Deflated by an average index of exported goods and middle-class retail price index.	Paasche index derived from prices of main exports of Vietnam (mainly agricultural products).	
5. Imports	Wholesale price index of imported goods used.	A composite index, derived from an index of the exchange rate and a suggested index of export prices of major exporters to Vietnam. Index of exchange rate can be derived from multiple rates and rate changes. Index of export prices from export price indexes of major exporters to Vietnam, weighted by proportions of relative importance to total imports.	Export price indexes of major exporters to Vietnam. †

Chapter VII

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Essential to effective decision-making for future economic development in Vietnam are reliable and timely national income estimates. A thorough review of the accounts has shown that past estimates are unreliable and untimely, and for most sectors, underestimate the level of economic activity in Vietnam.

This problem is a result of a number of factors, not the least of which is the low priority given to the national accounts in the government's statistical program. This summary outlines the major problem areas, and the reasons that they arise are briefly discussed. Actions that may be taken by the GVN are suggested, to improve the accounts and to make them an integral part of the government's economic goal-setting and monitoring functions.

This summary only highlights the main problems involved in estimation of national accounts and provides overall guidelines for improving and using the accounts. Without careful consideration of the previous chapters, it should not be used as a basis for planning changes in the present system.

A. PROBLEM AREAS

In the estimates of national income in current prices, the main problem areas are poor methods of collection and techniques of estimation. The degree and direction of biases in the estimates are often indeterminate, making corrections of the accounts (even by approximations) impossible. No estimates of the product accounts in constant prices are presently available,

and alternative methods of deflating expenditures can be found to determine more reliable estimates than those obtained from the price deflators used at present.

1. Method of Collection and Estimation Techniques

Though a program for improving data collection and estimation procedures should have been planned in the past, it has never been developed. Data for national accounts are derived from economic statistics compiled by various government agencies without checks into quality (i.e., sampling procedures, statistical techniques, and coverage are not examined). Moreover, new and perhaps better sources of data are often unknown. This problem reflects in the past a general absence of alternative data sources and a shortage of personnel not only to seek out new data series, but also to review the reliability of statistics provided. These shortcomings indicate a requirement for better economic data, as well as a need for better communication and cooperation between the various data-collection agencies and the National Bank of Viet Nam (NBVN), which is responsible for national income estimates. The NBVN should be aware of new statistical series, and should review data-gathering procedures, particularly with respect to national accounts requirements.

a. Agricultural Reports

In the agricultural sector, which comprises about 34 percent of total gross domestic product (GDP), aggregate output is obtained by multiplying yield per hectare by total hectares under cultivation. The Ministry of Agriculture conducts surveys to determine crop yields of major crops, but depends on reports of agricultural service chiefs for area under cultivation and production of secondary crops. These latter reports are not checked for reliability. Political pressure on the service chiefs to report the best possible results tends

to cause overstatement of crop production, particularly for rice cultivation. Costs of inputs are estimated from a table of input requirements that was developed from the 1960-61 agricultural census and that is obviously no longer relevant. Production and costs for animal husbandry, fishery, and forestry are even less complete than for crops. Production in these industries tends to be understated, due to dependence on reports of service chiefs (which are not checked for accuracy) and, more importantly, to tax avoidance by producers. This latter problem is particularly relevant for forestry products, which are very heavily taxed at 80 percent of stumpage price. No attempts, however, are made to adjust for these problems.

b. Secondary and Tertiary Sectors

The primary source of output and cost data is NBVN questionnaires and interviews of industries (such as manufacturing, transportation, and construction). This method of data collection involves a number of problems. First, surveys often cover only the Saigon-Cholon area, and the results are applied to other provinces without checks on (or adjustments for) the representativeness of the results. For examples, the results used from the survey of costs in the construction industry do not consider the possibility of higher wage payments in Saigon-Cholon compared to other areas; and coverage of only 10 large firms has not been checked for possible quantity discounts. In computing receipts and expenditures in services and transportation, it is assumed that there are no price differences between Saigon-Cholon and other provinces. Second, survey responses tend to be dominated by large firms, as in the manufacturing sector. For this sector, the response rate to questionnaires is about 20 percent of the sample (100 percent survey), but output reported by responding firms is estimated to be 80 percent of total manufacturing production,

based on NIS estimates of industrial production.¹ Yet costs for these responding companies are used as a basis for determining costs for nonresponding (generally small) firms, whose processes of production may not necessarily correspond to those of the responding companies. Third, the criteria used in selection of a sample are frequently convenience and availability (i.e., proximity to the NBVN, as in the case of professional services or available addresses of boat owners to determine transportation services from inland waterways). Not only is the sample limited in coverage, but also the simple averaging of the survey results suggests that the estimated revenues and costs for these industries may not be characteristic. Fourth, adjustments in the data are not properly made. A review of NBVN-questionnaire results indicates that firms often report total costs greater than total revenues. To balance the accounting statements, costs are reduced to equal total sales, although tax avoidance is a strong inducement to under-report revenues. These problems do not apply to some sectors (e.g., financial institutions, which supply complete accounting statements), but supporting statistics provided by various ministries often offer little improvement in NBVN data. For example, the number of construction permits from the NIS is used to compute area building, but these permits represent permits to begin construction, not work-in-place.

c. Income and Expenditure Accounts

Both sets of aggregate accounts are derived from value added from each sector and, hence, incorporate errors in these estimates. In the income accounts, for example, included in wages and salaries are income to unincorporated business, because income to farmers and individual entrepreneurs in the

¹No checks have been made to determine the accuracy of NIS estimates of total industrial production.

service sector (transportation) is not properly defined. Income to unincorporated business (computed as a residual of all income) provides no way of checking for this type of error. In the expenditures accounts, arbitrary percentages are used to allocate domestic output and imports to private consumption and investment (government purchases and exports are first deducted). These percentages were derived 10 years ago, and no checks of their present relevancy have been made. Moreover, estimates are lacking on the disposition of government expenditures among various end uses.

d. Valuation

Prices used to value output are not representative of market transactions at the producer or wholesale/retail levels. First, the interpretations of producers' prices and wholesale prices as requested in NBVN questionnaires are diverse. Some companies report unit cost of goods sold, while others report only sales prices. Second, when alternative price data are lacking, official prices or prices fixed by law are used, though they are not necessarily what is received by individual producers or wholesalers and retailers. Such valuation methods tend to produce distortions in the accounts, particularly in terms of expenditures (e.g., private saving, which is defined as the difference between income and private consumption). In addition, in computing market prices of domestic products, a 15- to 20-percent markup is assumed between producers' prices and market prices. These percentages are low (compared to similar activities in other countries--or even to the margins permitted by law).

2. Deflation

The NBVN calculates the expenditure accounts in real terms, but it does not compute in constant prices the value added from industries. Problems in estimating real products are related to

those in estimating in current terms the value added. The selection of the appropriate deflation technique (double deflation or single deflation) depends largely on the procedure used in measuring in current prices the value added, particularly in terms of possible errors in the estimates. Although, in practice, some errors in measurement are expected, the evaluation of the accounts for Vietnam indicates that many types of errors in the estimates exist. Despite these problems, NBVN estimates are the only available measures of national income; and these data provide the basis for determining the appropriate deflation method for each product account. Selection is based on the ratio of intermediate inputs to output and the two criteria (bias in using single deflation, compared to the error in using double deflation). Explicit, though perhaps arbitrary, guidelines are given for weighing these criteria. In addition, should new and better data become available, it is suggested that the deflation technique(s) be reviewed in order to improve estimates. For the expenditure accounts, presently used deflators were reconsidered; and alternatives are suggested, in light of the deflators used in the product accounts (since expenditures are derived from the value-added accounts) and other data sources.

B. RECOMMENDATIONS

The unreliability of national income estimates cannot be considered entirely the responsibility of the Directorate of Statistics and National Revenue of the NBVN. The staff of this Directorate performed an enormous task (given available resources). Improvement in the estimates would require better coordination and cooperation between data-gathering agencies and the NBVN, as well as procedures for providing better basic data within the agencies. It is also suggested that an input-output table be developed within the next five years in order to provide not only timely estimates, but also a coherent

framework for economic policy-making.

1. Coordination and Communication

There are a number of ministries collecting (or planning to collect) data that provide estimates better than from present NBVN sources and, hence, that are quite useful to national accounts. On the other hand, although many of the data collected would be useful for national accounts purposes, certain gaps still exist. These gaps will be pointed out, along with briefly described suggestions for improvement.

First, the NIS is presently surveying industrial activity in several sectors (manufacturing; wholesale/retail trade; construction; and other large and small firms, including banking, personal services, and transportation). This establishment survey, which is based on scientific sampling techniques, will provide a better method of determining industrial activity than present NBVN procedures, which are limited in coverage and often based on convenience. The survey will furnish data such as total sales, production costs, wages and salaries, and capital investment. Despite present problems with definitions of the sample universe and nonrespondents, a relatively reliable data base for the secondary sector and most of the tertiary sector may be expected in approximately one or two years. It is assumed that the NIS will continue to review and revise the survey for inadequacies.

Second, the Ministry of Agriculture (MOA) is planning to conduct an agricultural census for 1972-74. The objective of the census is more to obtain a listing of farms, owners, respective sizes, and average yield than to compute net contribution to GDP from agriculture. The MOA expects to use the census listing of farm households as a basis for drawing samples for future surveys of crop yields and input requirements. However, instead of a census, it is suggested that a

sample survey of yield, land utilization, and costs be undertaken. In terms of cost, length of time required, and methods for checking data accuracy (errors), a survey would be a more partially implemented project than a census. It would provide information similar to that desired from the census, as well as data useful for national accounts. A survey of land utilization, production, and costs would be an improvement over presently unreliable estimates of cultivated hectares and yields (secondary crops) and the outdated table of input requirements. If a sample survey of production and input data for crops (as well as livestock) were begun by the end of the year, reasonable estimates may be expected in two or three years.

Third, the Ministry of Economy (MOE) has a store of unused data. The MOE requires importers to provide annual reports of costs and sales, as well as value of imports. Coverage is over 1,200 firms, classified by direct and indirect end-user of imports. It includes many companies in the manufacturing and transportation sectors.¹ The data collected that are useful for national accounts purposes are as follows: value of existing capital equipment and real estate; sales; number of employees and wages and salaries; direct and indirect taxes (by type); depreciation; interest payments; operating surplus; consumption of electricity, water, and petroleum products (quantity and value); lists of raw materials used (domestic and imported), the unit prices, quantity purchased, value of materials used, and end-of-year inventory; list of capital

¹The industries included in these reports are agriculture and fishery (mainly capital imports); food processing; textiles, clothing, and leather; wood products, including furniture; chemicals, plastics, and petroleum products; paper and printing; nonmetal minerals (e.g., glass, bricks, cement); basic metal products; metal products for final consumers and producers; other manufactured goods (mainly office supplies); utilities; and transportation and communication.

equipment purchased (by type, quantity, unit prices, and average utilization per day); and a list of spare parts purchased (quantity, value, and end-of-year inventory). A review of the data submitted to the MOE indicates that, in general, they are consistent and relatively reliable (i.e., reported costs plus profits balance with reported sales)--at least when compared to data collected by the NBVN.

The MOE, Directorate of Economic Control, also collects price data from importers and large domestic producers for the government's price-regulation program. This program attempts to control prices of all commodities, either through direct control of prices and/or profits or through homologation, which covers most products. All firms are required to submit a detailed report on cost per unit of output to support price charges for each product, including all intermediate and factor costs. These data may be considered relatively reliable, since all prices charged must be approved and any irregularities are investigated by the MOE and the Ministry of Finance. These data would be useful as checks on information collected by the NIS and the NBVN.

Fourth, the Ministry of Labor (MOL) has been surveying industries in the secondary and tertiary sectors for employment and wage data for the past three years. Although the MOL believes that present estimates in some industries are unreliable because of inconsistencies in monthly reporting, they are continuing work in improving the quality of the data. Moreover, for many industries, MOL estimates are comparable to preliminary results from the NIS establishment survey. These data would be useful in estimating or checking value-added measures from such sectors as services (for which presently available information is sketchy and difficult to collect, and wages comprise a large fraction of value added).

Fifth, USAID can supply information on the role of U.S. presence in Vietnam (such as major imports, U.S. construction, and employment and wages of domestic labor).

Given these abundant data sources (and assuming proposed changes are instituted), it is recommended that the NBVN terminate its survey activity to obtain basic data and to devote resources in the near future to estimation of national accounts. This recommendation, however, does not preclude the necessity of canvassing all data sources and of checking reliability and usefulness of these data for national accounts purposes. All agencies should be urged to provide on a current basis information on data series or plans for collection of new data.

2. The Input-Output Table

It is suggested that in the next five years an input-output table for Vietnam be constructed. An input-output table would provide a framework for timely and consistent GDP estimates and for economic decision-making. Because the table displays the structural relationships within the economy (or describes the dependence of a productive sector on other sectors in terms of production and value-added coefficients), it is a useful tool--particularly in terms of development and planning. It will provide, first, a means for rapidly estimating output and investment implications of alternative development goals and conditions (e.g., the selection of sectors and the amount by which they must expand or contract to achieve stated targets). It also allows description of the interaction among economic aggregates without reliance on extensive time series. Lastly, it provides a basis for estimating resource requirements for economic growth among the productive sectors (as well as final output of any given sector, which depends on the inputs of the product of other sectors).

The size of the table should probably be at least 15x15-- and possibly extended to 20x20. A 15x15 table is suggested, given the nature of the Vietnamese economy. For example, the agricultural sector contributes a relatively large portion (approximately 34 percent) of total output. Also, each type of activity in agriculture differs considerably in terms of input requirements, method of production, and type of output. Similarly, in the manufacturing sector, food processing, textile, and clothing industries may be deemed important (compared to others) in terms of output, as well as probable potential for future economic development in Vietnam. Although presently available estimates of national accounts from the NBVN are not wholly adequate or accurate, a preliminary attempt was made to estimate a 15x15 transactions table for 1969. This experiment showed that many of the intersectorial flows could be determined (see Table 11).

The construction of an input-output table, of course, involves problems. While the MOE data on raw materials used in production may be used to estimate the allocation of these materials between intermediate and final consumption, the largest problem will be the service sector, as was shown in estimating the experimental 15x15 table. That is, the allocation of intermediate service inputs (such as transportation, rent, financial services, and other services) among the processing and final demand sectors will require additional information. The NIS establishment survey may provide more reliable data for these service industries, but it should be coupled with separate and detailed surveys of intermediate and factor costs in all industries in the secondary and tertiary sectors.¹

¹Small surveys for this purpose can be conducted every five years or so, on the assumption that these costs do not change rapidly. The MOE price-regulation reports from firms would be an additional source of data. Moreover, for the surveys, it may be useful to collect data on a (continued on p. 164)

Table 11. TRANSACTIONS TABLE FOR CONSTRUCTION OF INPUT-OUTPUT TABLE, 1969

[VN\$ million]*

Input \ Output	Production or Processing Sector															Losses and Waste
	Agriculture				Manufacturing				Service Industries							
	Crops	Livestock	Fishery	Forestry	Processed Foods/Tobacco	Textiles/Clothing	Rubber/Chemical Products	Other Manufacturing	Construction	Utilities	Transportation/Communications	Financial Institutions	Wholesale/Retail Trade	Other Services	Public Admin./Defense	
1. Agriculture ^a																
a. Crops	4,490	3,116			9,057	700	1,487								64	
b. Livestock	488					2									8,214	
c. Fishery					23,910										855	
d. Forestry								514	1,451	149					85	
2. Manufacturing ^b																
a. Processed Foods/Tobacco					raw materials											
b. Textiles/Clothing ^c					13,988	7,341	8,834									
c. Rubber/Chemical Products ^d	656	9,072					10,475			3,480		8,852	5,456			
e. Other Manufacturing ^e											5,371					
3. Construction ^f									2,652							
4. Utilities ^g										1,801						
5. Transportation/Communications ^h	1,357	1,132														
6. Financial Institutions ^h												14,808				
7. Wholesale/Retail Trade													6,892			
8. Other Services ⁱ														10,022		
9. Public Administration/Defense															2,404	
Imports ^j	4,937	8,691			6,198	2,122		24,286					215			
Households	39,785	3,864	27,643	378	6,329	2,840	949	2,793	5,913	937	3,153	1,874	14,315	19,077	108,837	
Profits	56,851	13,223	5,501	595	3,904	1,577	1,410	1,651	1,564	342	11,749	4,355	47,081	14,689		
Direct Tax	1,318	529	427	17	759	57	237	472	221	90	99	567	2,991	1,075		
Indirect Tax	3,305	67	2,884	294	15,502	457	391	848	1,109	348	349	399	3,565	6,762		
Depreciation	1,321	969	4,132	0	575	459	232	560	--	557	2,740	389	1,377	1,769		
Total Gross Outlay	155,464	69,024	64,626	2,114	48,642	14,290	13,846	19,515	22,647	5,753	30,381	16,383	99,882	80,952	111,305	

* The reader should be wary of the exact numbers in Table 11, because in some instances they do not add up to the totals given in the last column (see facing page) and across the bottom row--and, in other instances, no attempt was made to allocate all the expenditures. Allocations of raw materials and services purchased by industries were made if data were available; otherwise, the figures placed vertically in the columns represent all intermediate inputs purchased by processing sectors. Figures boxed across several columns indicate the output purchased by processing sectors of that row's industry. Transactions are valued in purchasers' prices, although they should properly be stated in producers' prices (which, however, were available only in the agricultural sector).

^a Agriculture is classified into four major categories, because each category represents a completely different type of output and input requirements; to distinguish these costs from others, an additional column shows "Losses and Waste."

^b Division of manufacturing into four categories follows the International Standard Industrial Classification.

^c Textiles and clothing includes footwear, hats, and leather goods.

^d Rubber and chemical products includes rubber, plastics, matches, sanitary and beauty products, pharmaceuticals, paints, and gas products (oxygen, acetylene, and carbolic acid).

^e Other manufacturing includes metal products; wood and furniture products; paper and printing; tiles, bricks, and ceramics; cement; glass products; junks, sampans, and other boat-building products; and other miscellaneous manufactured products (such as office supplies and candles).

^f Construction includes construction maintenance.

^g Utilities includes water and electricity.

^h Financial institutions are banks and insurance companies.

ⁱ Other services includes ownership of dwellings (rents).

^j The additional row for imported intermediate inputs is to distinguish (for purposes of development planning) between domestically substitutable and nonsubstitutable imports.

Source: National Bank of Vietnam, "National Revenues of Viet Nam, 1969" and "Estimation of the Flows of Product, 1969." (NBVN worksheets for each industry and sector were also used to estimate some of the intersectoral flows.)

Final Demand Sector						Total Gross Output (Producers' Prices)	Total Gross Output (Purchasers' Prices)	Output Input	
Households	Government Purchases	Gross Domestic Capital Formation	Inventory Changes	Exports	Imports (Goods and Services				
117,054	6,020		1,281	1,171	18,719	131,818	155,464	1. Agriculture	
64,620			3,904	4	7,842	52,945	69,024	a. Crops	
31,871				18	2,722	42,734	64,626	b. Livestock	
					70	1,710	2,114	c. Fishery	
								d. Forestry	
39,182	3,204				4,263		48,642	2. Manufacturing	
12,150	2,140				12,947		14,290	a. Processed Foods/ Tobacco	
12,778					440		13,846	b. Textiles/Clothing	
2,696					432		19,515	c. Rubber/Chemical Products	
								d. Other Manufacturing	
12,304	5,880				11		22,647	3. Construction	
3,351	820	1,677			7,074		5,753	4. Utilities	
28,269	1,722	2,603		1,459	23,001		30,381	5. Transportation/ Communications	
				2,168			16,383	6. Financial Institutions	
19,603	253			22,436	9,744		99,882	7. Wholesale/Retail Trade	
	3,116	1,366					80,952	8. Other Services	
							111,305	9. Public Administration/ Defense	
								Imports	
				23,569	531			Households	
				2,371	1,541			Profits	
								Direct Tax	
								Indirect Tax	
								Depreciation	
448,827	130,414	49,323	6,222	122,365	135,157			Total Gross Outlay	

Alternatively, factors may be developed to allocate the output of these service industries as intermediate inputs among the processing sectors. These factors may be derived in a number of ways: One is to obtain information from brief surveys of various service industries to determine main clients or buyers of the service. Another approach is to divide output of a service industry among different industries in proportion to their real gross value of output.¹ Also, statistics of countries similar to Vietnam in terms of level of development and structure of the economy may be used for comparative purposes. Estimates are also lacking on the disposition of general government expenditures among various end uses. The GVN, presently instituting new accounting procedures and systematization of budget data, should be able to provide such information in the near future. The problem of insufficient and incomplete data on private fixed capital formation and inventory investment may be corrected through the NIS establishment survey and MOE data on importers.

The development of an input-output table can be begun in a year or two, using presently available data. Work can be continued as new and better data become available, assuming that the various data-gathering agencies described above will be able to collect improved data series within the next two or three years. It is estimated that at least two economists and probably a statistician, working full time from 6 to 12 months, would be needed to develop a table. However, given the limited personnel resources of the NBVN, it is not necessarily recommended that energies be diverted to the develop-

(cont'd) per-unit-of-output basis, as collected by the MOE for price regulation, in view of the inaccurate reporting obtained from NBVN questionnaires (due mainly to tax avoidance).

¹See Bruce Grimm and Rolf Piekartz, "A Macroeconomic Planning Model for Viet Nam," IDA Working Paper, unpublished, for a fuller explanation of the development of these factors.

ment of an input-output table, even if the national accounts division were to hire additional personnel. Consideration may be given to contracting this project to an outside firm or agency. One possible group is ECAFE, which employs economists trained in the area of national income accounting for less developed countries.¹

Even if it is decided that an input-output table is not feasible, efforts to obtain better national income estimates should continue. Improvement in economic policies and development planning necessitate assignment of high priority to reducing the shortcomings of the data incorporated in the national income accounts. Economic decisions require the organization of economic data into the coherent and consistent framework of the national accounting system. Given a proper national accounting structure, accurate estimates provide the inputs essential to better economic-policy decisions. It provides greater assurance of proper specification of the problem(s) and furnishes improved capability to monitor the response of the economy to government policies and programs.

¹The cost of this project is roughly estimated to be about \$100,000 for two economists and support staff for six months' work. The time estimate was based on time required to set up the 1969 basic transactions table for Vietnam.

TECHNICAL APPENDIX

TECHNICAL APPENDIX

The mathematical formulation of the arguments and conclusions drawn (in Section B of Chapter VI) for the selection of the preferred method of deflation (double deflation or single deflation) are presented in this appendix. This analysis provides additional clarification of the basis for determining the criteria set for use of either of the two techniques.

To compare the two techniques, the relationships between the index of real value added and the indexes of output and intermediate inputs can be stated in equation form. Let P and Q refer to price and quantity of output, respectively; p and q , to the price and quantity of intermediate input, respectively; and subscripts 0 and t , to the base year 0 and year t , respectively:¹

$$\Sigma P_0 Q_0 - \Sigma p_0 q_0 = \text{value added at current prices in year 0;}$$

$$\Sigma P_t Q_t - \Sigma p_t q_t = \text{value added at current prices in year } t.$$

The Laspeyres index of real value added² (double deflation) can be stated as

$$\theta = \frac{\Sigma P_0 Q_t - \Sigma p_0 q_t}{\Sigma P_0 Q_0 - \Sigma p_0 q_0} . \quad (1)$$

Let

$$x = \frac{\Sigma P_0 Q_t}{\Sigma P_0 Q_0} \quad (2)$$

be the Laspeyres volume index of output,

¹The following discussion is from Hill, pp. 15-22.

²The Laspeyres version will be used in the discussion, although the Paasche can be easily substituted.

$$y = \frac{\sum P_0 q_t}{\sum P_0 q_0} \quad (3)$$

be the Laspeyres volume index for intermediate inputs, and

$$a = \frac{\sum P_0 q_0}{\sum P_0 Q_0} \quad (4)$$

be the ratio of the value of intermediate inputs to the value of output in year 0. Subsequently, we shall refer to x as the "output index" and y as the "input index." Equation (1) can be expressed as

$$\theta = \frac{\sum P_0 Q_t / \sum P_0 Q_0 - \sum P_0 q_t / \sum P_0 Q_0}{1 - \sum P_0 q_0 / \sum P_0 Q_0}$$

or

$$\theta = \frac{x - ay}{1 - a} . \quad (5)$$

If z is defined as the ratio of gross output to value added in the base year:

$$z = \frac{\sum P_0 Q_0}{\sum P_0 Q_0 - \sum P_0 q_0} , \quad (6)$$

then

$$z = \frac{1}{1 - a} . \quad (7)$$

Then, Equation (5) can be rewritten as

$$\theta = zx - (z - 1)y \quad (8)$$

or

$$\theta = x + (z - 1)(x - y) , \quad (9)$$

which shows that the value-added index is a weighted average of the output and input indexes. $(z - 1)$ can be interpreted as the ratio of intermediate input to value added:

$$z - 1 = \frac{\Sigma P_0 q_0}{\Sigma P_0 Q_0 - \Sigma P_0 q_0} .$$

There are two basic conclusions that can be drawn from Equation (9). First, θ can never have a value between x and y , given that $(z - 1)$ is positive: if $x > y$, $\theta > x$; and if $x < y$, $\theta < x$. Hence, $\theta > x > y$; or $\theta < x < y$; or $\theta = x = y$.

In other words, the output index x is a weighted average of the index of primary inputs θ and the index of intermediate inputs y and lies between the two.

Second, if $x > y$, θ lies between x and infinity; and if $x < y$, θ lies between x and negative infinity. These relationships hold, because as the ratio of intermediate inputs to output (a) approaches 1, z and $(z - 1)$ approach infinity. Thus, there is no upper limit to $(x - y)$. If $(x - y)$ is positive, θ can range from x to infinity; and if $(x - y)$ is negative, θ can range from x to negative infinity. This conclusion tells us that value added at constant prices can be negative, although in the real world, production will not continue under this condition. Thus, this latter result may be excluded in further discussions.

This formulation shows that estimation of real product by double deflation assigns a weight of z to output and $-(z - 1)$ to intermediate inputs. Use of single deflation based on output assigns a value of 1 to output and a value of 0 to intermediate inputs; and single deflation using intermediate inputs assigns a value of 0 to output and a value of 1 to intermediate inputs. However, it does not provide information on conditions under which one technique or the other would provide a more reliable estimate of real value added, although it does show that the selection depends essentially on the ratio of intermediate inputs to output.

Based on the ratio of intermediate inputs to output, two criteria are used to determine the preferred technique of

deflation: the degree of error in the estimate of real value added derived by double deflation compared to the degree of bias in the estimate based on single deflation. Any measure of real product by double deflation is unbiased but is subject to errors in both indexes of output and intermediate inputs. In practice, errors in the output and intermediate-inputs indexes are likely to exist, particularly in the latter index, since less information tends to be collected on inputs. Assuming that errors in measurement are random, single deflation (under certain conditions) will provide a more reliable estimate of real value added than double deflation will provide. According to statistical theory, the variance of the difference between two random errors is equal to the sum of their respective variances. Real product derived by double deflation has an error that depends on the difference between the errors in the output and input indexes. These errors tend to be cumulative. (See discussion below.) Real value added obtained by double deflation is more sensitive to error than the two indexes from which it is derived. On the other hand, single deflation based on either output alone or intermediate inputs alone will provide a biased estimate of movements in real value added, because it does not account for any real divergence between movements in output and intermediate inputs.

Therefore, whether double deflation or single deflation is preferable depends on the dispersion of random errors in the output and input indexes relative to the degree of bias in using single deflation. Since Equation (9) tells us that x always lies between θ and y , only two sets of comparisons of reliability are needed: between x and θ and between x and y .

The two criteria can be stated in terms of previously derived equations. Let ϵ and δ represent independent measures of random errors with expected values of 0; and let b and c be measured values of x and y (the outputs and intermediate input indexes):

$$b = x + \epsilon \quad (10)$$

$$c = y + \delta . \quad (11)$$

Assume that the expected values of the errors are zero:

$$E(\epsilon) = E(\delta) = E(\epsilon\delta) = 0.$$

Similarly, let the measured value of real product obtained by double deflation be d:

$$d = zb - (z - 1)c \quad (12)$$

or

$$d = \theta + z\epsilon - (z - 1)\delta . \quad (13)$$

Equations (10) to (13) can be used as a means of comparing the bias introduced by using single deflation and the errors involved in using double deflation. To determine the bias involved in using single deflation, Equations (10) and (11) can be rewritten:

$$b = \theta - (z - 1)(x - y) + \epsilon \quad (14)$$

$$c = \theta - z(x - y) + \delta . \quad (15)$$

Equation (14) shows the bias in using single deflation based on output: $-(z - 1)(x - y)$. The bias would be relatively small if the difference between the output and input indexes $(x - y)$ is small or if z approaches 1. The alternative interpretations are that the bias would be relatively small if (1) the output and input indexes do not diverge significantly and (2) the ratio of intermediate inputs to output is very small. If intermediate inputs are used as an indicator of movements in real value added, the bias equals $-z(x - y)$. The degree of bias in using intermediate inputs is always greater than the bias in using output, if z is greater than 1. Because z (the ratio of output to value added) in the real world would not be less than 1 (firms would not operate under this condition), it may be argued that output data (rather than intermediate inputs) would be used

in most cases, unless little or no information on output is available.¹ In general, output data tend to be more reliable than input data.

To compare the variances of the three methods of estimating real value added, the expected values of errors in measurement are

$$E(b - x)^2 = E(\epsilon^2) ; \quad (16)$$

$$E(c - y)^2 = E(\delta^2) ; \text{ and} \quad (17)$$

$$E(d - \theta)^2 = z^2 E(\epsilon^2) + (z - 1)^2 E(\delta^2) . \quad (18)$$

Equations (16) to (18) imply three results: First, d (the double-deflation technique) has a variance greater than b (the output index), if $z > 1$. Second, if the variance for the output index $E(\epsilon^2)$ is greater than or equal to the variance of the input index $E(\delta^2)$, the variance of d is always greater than that of both b and c. Third, if z (the ratio of output to value added) is greater than or equal to 2, the variance of d is necessarily greater than that of both b and c, no matter how large the variance of c.

Summarizing the analysis, the conditions under which single deflation based on output would be preferred to double deflation are when--

- (1) The variance of errors affecting the output index is very large.
- (2) The variance of errors affecting the input index is very large.

¹Hill gives a second case in which intermediate inputs would be used as an indicator of real value added: that in which the difference between the output and input indexes is small and thus the bias is small (see pp. 21-23). However, it is the same argument for using output. Moreover, it can be argued that in this case, output and intermediate inputs do not diverge greatly (i.e., the price of output is determined by the prices of inputs, and the indexes tend to move together), and output would provide as good an estimate (perhaps better) of real value added--particularly if output data are more reliable than input data.

- (3) The bias involved in using single deflation based on output, where the bias equals $(z - 1)(x - y)$, is small.

In practice, the information required to determine the preferred method depends on unknown parameters, which can only be surmised. The general rule may be stated that, if the movements of output and intermediate inputs at constant prices move together, single deflation using output would provide a better estimate than double deflation would provide. When the prices move together, double deflation (despite relatively accurate data on both output and intermediate inputs) is likely to introduce unnecessary random variation in the estimate.

Single deflation based on intermediate inputs would provide a better estimate than one using output when--

- (1) The bias involved is small and the input index would provide a more reliable estimate of real product.
- (2) There is little or no information on output.

However, input data usually tend to be sketchy, and the degree of bias involved in using inputs tends to be larger than that in using output. This fact can be seen by comparing $z(x - y)$, the bias introduced by using intermediate inputs, and $(z - 1)(x - y)$, the bias involved in using output.

From Equations (10) to (18), the choice of methods of estimating real product is between double deflation, which provides an unbiased but possibly erratic estimate (especially if the ratio of intermediate inputs to output is relatively high), and single deflation, which gives a more stable but biased measure. These equations show that the choice of technique depends basically on the ratio of intermediate inputs to output, but they do not provide specific limits on the values of the ratio in order to make the selection. In other words, they do not provide specific values of a large or small degree of bias, a large or small degree of error, or significant divergences in the output and input indexes. These limits on ratios are

arbitrarily determined, depending on personal opinions of what is a large or small degree of bias and errors.

To determine the limits on the ratio of intermediate inputs to output, three cases were first considered:

- (1) The ratio of intermediate inputs to output is very low (0.01); or $z = 1.01$.
- (2) The ratio is very large (0.99); or $z = 100$.
- (3) The ratio is 0.50; or $z = 2$.

In the first case, Equation (14) shows that, because the bias would be very small, single deflation should be used. In other words, the proportion of value added to output is very large (0.99), and use of single deflation based on output would provide a very close approximation of the desired measure. In the second case, the output and input indexes do not diverge greatly; or, stated another way, the price of output is largely determined by the prices of inputs. Use of double deflation in this case would involve a large expected variance of error in the estimate of real value added (relative to the bias in using single deflation), as can be seen from Equations (14) and (18). A comparison of the bias and the error shows that single deflation would be preferred to double deflation, no matter how small the variances in the output and input indexes are assumed to be. In Case (3), a comparison of the bias in using single deflation to the expected variance of error in using double deflation indicates that double deflation is the preferred technique, no matter how large the variances in the output and input indexes are assumed to be.

The examination of these three cases shows that without knowledge of the values of the variances of error (standard deviations) of the output and input indexes (and, therefore, the degree of error in using double deflation), it is difficult to set limits on the ratio of intermediate inputs to output for the selection of the appropriate technique. These values can

only be surmised. Hence, the level of the variance at which one can say that the estimate of the output index (or the input index) is reliable or unreliable depends essentially on personal opinion. A variance of 0.04 (standard deviation of 0.20) of the output and input indexes was arbitrarily selected as the level at which decisions on the reliability of the indexes can be made: if the variances are judged to be less than 0.04, the output or input indexes are considered to be relatively reliable; and if the variances are judged to be greater than 0.04, they are considered to be relatively unreliable. Using this assumed value of variance, it was determined that single deflation based on output should be used when the ratio of intermediate inputs to output is between 0.00 and 0.30 and between 0.70 and 1.00; double deflation should be used when the ratio is between 0.30 and 0.70. Single deflation based on intermediate inputs should be used when few or no data on output are available.