CHAPTER SEVEN
A SOCIAL ACCOUNTING ANALYSIS OF ECONOMIC LINKAGES AND DIVERSIFICATION

1 Introduction

Successful economic diversification depends upon the income potential of alternative production activities for households, which in turn depends ultimately on the downstream linkages of these activities to the rest of the regional, national, and global economy. Some activities may be profitable in some areas, where linkages are well articulated, and fail in others that lack appropriate connections to downstream activities and markets. For this reason, elucidating linkages can do much to improve the quality of diversification decisions and increase the ultimate returns to factors allocated to diversified activities.

After examining these issues with a variety of analytical techniques (discussed below), we offer three general conclusions of relevance to the larger research activity:

1. Existing patterns of farming are not realizing the region's potential for more diversified agricultural activity. There appears to be significant scope for crop substitution in the direction of products that are more marketable and profitable at the regional, national, and international level. Moreover, given the relatively small market share of Northern Mountain Region (NMR) products in the Rest of Vietnam (ROV) and in total Vietnamese exports, such shifts could rapidly increase rural incomes and savings, accelerating both economic growth and the diversification process.
2. NMR trade with both ROV and the Rest of the World (ROW) is well below national averages, and far below the potential indicated by its relative production costs. Because of these small market shares, the agricultural terms of trade for the region, internally and nationally, would likely remain stable even if agricultural trade increased by multiples of its present levels. For this reason, greater market orientation in regional agriculture should be strongly promoted.
3. Despite low production costs, the margins for agricultural marketing in the region are relatively high because of insufficiency in transport, communications, and other commercial infrastructure. For this reason, the government should make investments in improved market access an essential component of and program for agricultural diversification and trade promotion. Without these, it may be unreasonable to expect many farmers to emerge from subsistence production patterns.

One of the most widely used tools for analyzing economic linkage is the Social Accounting Matrix (SAM), a double entry book keeping device that details bilateral transactions across a region, nation, or global economy, at any level of detail for which data are available. In the case of Vietnam, we are fortunate to have a recent national SAM (2000) which was estimated at an exceptionally detailed level. In this report, we use this SAM and other data to produce several new datasets, including macro SAMs for each of the fourteen provinces in the NMR, an NMR regional SAM with disaggregation comparable to the national table, and finally a singly two-region (NMR-ROV) table which clearly delineates direct and indirect income-expenditure linkages within and between the two regions and with respect to the rest of the world. All these tabular datasets can provide new insights about income determination and distribution in the region.

The tables produced as part of this project are unprecedented data resources for Vietnam, and making them available will stimulate and sustain new research on the region for at least 5-10 years. In addition to developing and disseminating new data resources, however, the present study is intended to provide direct analysis and policy guidance. We begin this chapter with an overview of how the tables were estimated, and then follow this with discursive analysis and examples of detailed analytical applications.

2 SAM Analysis

2.1 Overview

The direct impact of income diversification can be studied quantitatively with survey data and qualitatively with focus groups. However, at least as important as the direct impact of income diversification on participating households are the indirect (or multiplier) effects. These effects can occur through three channels: backward production linkages, forward production linkages, and consumption linkages.

- Backward production linkages refer to the effect of income diversification on the demand for inputs into the production activity, particularly locally-produced inputs. For example, the growth of a fishery industry may result in additional demand for locally produced fish food, fingerlings, pond construction services, and so on.
- Forward production linkages refer to the effect of income diversification on downstream users of the commodity, including both agro-industry and consumers.

For example, the same fishery industry development may lead to new fish curing and drying enterprises, generating income for employees and owners.

- Consumption linkages refer to the impact of income diversification on the consumer demand by participating households. For example, households whose incomes have been increased by aquaculture may increase their purchases of meat, fruits, and vegetables, with indirect effects on producers of these commodities.

In order to study these linkages, the project has constructed a social accounting matrix (SAM) that represents the economy of the NMR, as well as 14 other supporting tables of complementary and independent interest. The NMR SAM is adapted from a national SAM constructed by two of the international consultants and two of the local consultants included in this proposal (see Tarp et al, 2001, Tarp et al, 2002a, Tarp et al, 2002b, and Tarp and Roland-Holst, 2002). This SAM was calibrated to represent the Vietnamese economy in 2000 and has a relatively large number of agricultural commodities and services represented in it.

2.2 SAM Estimation

Here we discuss the estimation procedure used for three types of social accounting matrices:

1. Macroeconomic SAMs for each of the 14 provinces in the Northern region and the NMR as a whole
2. A detailed microeconomic SAM for the Northern region
3. A two region SAM delineating transactions within and between the Northern region and the rest of Vietnam (ROV).

Construction of the 2000 Macro SAMs for Individual Provinces in the Northern Region

In this Section, we show how the Macro SAMs for 14 Vietnamese northern regions were developed. The macro-table is essentially a double entry representation of the usual macroeconomic accounting identities. It is used to ensure that the more detailed activity, commodity, factor, and other institutional accounts in the disaggregated SAM are consistent with existing macroeconomic information. Table 2.1 depicts a generic Macro SAM in terms

of the standard macro accounting identities. Note that in this case intermediate goods are netted out.[1]

With these macro accounts in mind, consider the tableau with generic Macro SAM accounts for the NMR, given in Table 2.2. Intermediate goods are included explicitly, and production is decomposed in the activity and commodity accounts. While there is a little more detail in this table, it continues to represent a double entry accounting version of the traditional macro accounts. Relying on the data supplied by the GSO (2002) and the Vietnamese Macro SAM developed by Tarp et. al. (2002), 14 regional Macro SAMs for northern Vietnam were developed. The regions covered include: Ha Giang, Cao Bang, Lao Cai, Bac Kan, Lang Son, Tuyen Quang, Yen Bai, Thai Nguyen, Phu Tho, Bac Giang, Quang Ninh, Lai Chua, Son La and Hoa Binh.

This section refers to detailed estimates in Annex tables A7.1.1-7.1.15. Values (in millions of 2000 VND) have been assigned to all of the cells in Table 2.2 for which a transaction between two accounts took place and for which data were available from the GSO or other sources. Detailed notes on data sources, assumptions, and procedures are also outlined in Annex A7.1. Throughout, the relevant cell in Table 2.2 is referred to as (i, j) where i refers to the row and j to the column.

Background, definitions and labels

This Section documents the steps involved in constructing the 14 regional Macro SAMs for Vietnam, and in what follows, reference is made to the individual cells in Table 2.2. 10 rows and 10 columns are involved. Corresponding rows and columns share the same label. For example, row three and column three are both labeled “factors”. In the Macro SAM, entries are in the form of macroeconomic aggregates, and the row/column labels are defined below.

[1] See Reinert and Roland-Holst (1997) for a more extensive introduction to Macro SAMs and SAM estimation.

Table 2.1: An Open-Economy Macro SAM with a Government Sector

		Expenditures				
Receipts	1	2	3	4	5	Total
1. Suppliers	-	C	G	I	E	Demand
2. Households	Y	-	-	-	-	Income
3. Government	-	T	-	-	-	Receipts
4. Capital Accnt.	-	S_h	S_g	-	S_f	Savings
5. Rest of World	M	-	-	-	-	Imports
Total	Supply	Expenditure	Expenditure	Investment	ROW	

Additional Variables:

$t_{42} = S_h$ = private savings
$t_{32} = T$ = tax payments
$t_{43} = S_g$ = government savings
$t_{15} = E$ = exports
$t_{45} = S_f$ = foreign savings
$t_{51} = M$ = imports
$t_{13} = G$ = government spending

Accounting Identities:

1. $Y + M = C + G + I + E$ (GNP)
2. $C + T + S_h = Y$ (Income)
3. $G + S_g = T$ (Govt. Budget)
4. $I = S_h + S_g + S_f$ (Saving-Investment)
5. $E + S_f = M$ (Trade Balance)

Table 7.2: A MacroSAM for the Northern Mountain Regon - Generic Macro Accounts

Receipts	Expenditures								
	1. Activities (97)	*2. Commodities (97)*	*3. Factors (14)*	*4. Private Households (16)*	*5. Enterprises (3)*	*6. Recurrent State (1)*	*7. Investment Savings (1)*	*8. Rest of World (94+1)*	*9. Total*
1. Activities (97)		Marketed Production							Total Sales
2. Commodities (97)	Intermediate Consumption			Private Consumption		State Consumption	Investment	Exports	Total Commodity Demand
3. Factors (14)	Value Added								Value Added
4. Private Households (16)			Wages, Salaries and Other Benefits		Distributed Profits	Social Security and Other Current Transfers to Households		Net Foreign Transfers to Households	Private Household Income
5. Enterprises (3)			Gross Profits			Enterprise subsidies		Net Foreign Transfers to Enterprises	Enterprise Income
6. Recurrent State (1)	Value Added Taxes	Trade Taxes	Produc-tion Taxes	Income Taxes	Enterprise Income Taxes			Net Foreign Transfers to State	State Revenue
7. Investment Savings (1)				Household Savings	Retained Earnings	State Savings			Total Savings
8. Rest of World (94+1)		Imports			Enterprise Remittances	Government Remittances			Imports
9. Total	Total Payments	Total Commodity Supply	Total Factor Payments	Allocation of Private Household Income	Total Enterprise Expenditure	Allocation of State Revenue	Total Investment	Total Foreign Exchange	

In a social accounting matrix (SAM), rows track receipts, while columns track expenditures. Hence, row and column sums represent, respectively, total receipts and total payments by a given account/institution. In the tradition of double entry accounting, row sums must equal column sums.

2.3 Data Resources for the NMR Vietnam Macro SAM

Data resources have been surveyed around the country in official and unofficial media, and we also undertook a review of relevant data in the hands of bilaterally and multilaterally sponsored activities. The results pointed to two essential sources, General Statistics Office and the 1998 Vietnam Living Standards Survey. To take full advantage of these resources, we have retained three local research professionals and made a small data acquisition agreement with GSO.

In a particular, GSO has supplied the macro accounting information available for each of the fourteen provinces in the North Mountain region. This information is essential, but sufficient, to calibrate the Macro SAM for the region and make it consistent with the economy-wide Vietnam Macro SAM. We have already received this and other supporting data, consisting of fourteen spreadsheets of detailed national income and product accounts.

The second primary source of regional data is the VLSS, a detailed household survey for which there are several thousand representative households in the Northern Region. From this dataset, we plan to extract information on income sources, expenditure patterns, and savings behavior in a manner consistent with the detailed (97 commodity) final demand accounts of the national SAM. This will give us income and expenditure information for the region's rural poor at an unprecedented level of detail and ultimately facilitate the linkage analysis that will begin later this month. We have already obtained full access to the VLSS database and a team of international and local experts is at work on the extractions.

As was indicated at the inception workshop, we intend to subject the new regional SAM to intensive multiplier decomposition analysis, further elucidating the direct and indirect linkages between the rural sector and its urban counterparts in the Northern Region and elsewhere in the country.

Data obtained from GSO for construction of North Mountain SAM

Type of data	Details and source
Marketed Production	The gross output number as defined in GSO (2001) page 90 - 94 for the year 2000.
Intermediate Consumption	The intermediate consumption number as defined in GSO (2001) page 90 - 94 for the year 2000.
Private (Household) Final Consumption	The private consumption number as defined in GSO (2001) page 134 for the year 2000.
State (Government) Final Consumption	The state consumption number as defined in GSO (2001) page 134 for the year 2000.
Investment/Gross Capital Formation	The investment number as defined in GSO (2001) page 134 for the year 2000 (i.e. gross fixed capital formation and change sin inventories)
Net Commodity Resource Flow	This net flow calculated as residual from a supply/use balance table for each province
Value Added	The value added number as defined in GSO (2001) page 90 - 94 for the year 2000. The compensation of employees number as defined in GSO (2001), page 121 - 127 for the year 2000.
Consumption of Fixed Capital.	The consumption of fixed capital number as defined in GSO (2001), page 121 - 127 for the year 2000
Operating Surplus	The operating surplus number as defined in GSO (2001), page 121 - 127 for the year 2000.
Production Taxes	The production tax number as defined in GSO (2001), page 121 - 127 for the year 2000.
State Savings	The state savings calculated as revenue minus expenditure.
State Expenditure by its Various Components	Figure representing the various categories of state expenditure, including transfers such as the social security payments and other current transfers from the state to households, state to enterprises, and state to central government for the year 2000.
State Revenue by its Various Components	State revenue by its various components disaggregated by standard categories

A version of the actual NMR Macro SAM, conformal to the schematic Macro SAM described above, is presented in the next table. The complete NMR Macro SAM is presented in Annex 7.1 below, including disaggregated Provincial and Central Government Accounts. Since the data we obtained from GSO and elsewhere was disaggregated by province, we actually estimated Macro SAMs for each of the fourteen provinces in the NMR. These tables are also presented in Annex 7.1.

Table 7.3: Macro SAM for the Northern Mountain Region, 2000

Receipts (Bill. VND)	Expenditures (Bill. VND)								
	1. Activities (97)	*2. Commodities (97)*	*3. Factors (14)*	*4. Private Households (16)*	*5. Enterprises (3)*	*6. Recurrent State (1)*	*7. Investment Savings (1)*	*8. Rest of World (94+1)*	*9. Total*
1. Activities (97)		58,776							58,776
2. Commodities (97)	25,863			22,472		7,475	7,732	16,286	79,827
3. Factors (14)	27,120								27,120
4. Private Households (16)			22,407		383	2,939		2,984	28,712
5. Enterprises (3)			4,692			355		843	5,891
6. Recurrent State (1)	5,793	3,700	20	1,607	2,236	4,392		186	17,934
7. Investment Savings (1)				4,633	41	395			7,732
8. Rest of World (94+1)		17,352			609	2,337			20,298
9. Total	58,776	79,827	27,120	28,712	5,891	17,934	7,732	20,298	

2.4 Estimation of the Microeconomic SAM for the Northern Region

The microeconomic SAM for the Northern Region was estimated at the same level of disaggregation as the economywide 2000 Vietnam SAM estimated by Tarp et al (2002). This table includes the following primary institutional groups

97 Activity/Commodity Categories
12 Occupational categories of Labor
Capital as a factor of production
Land as a factor of production
Natural resources as a factor of production
8 Types of households
3 Types of enterprises
Provincial and Central government accounts
A variety of fiscal instruments
Consolidated capital account
Trade flows with respect to the Rest of Vietnam and Rest of World

To estimate the Northern regional SAM, four types of basic data were used:

1. The regional Macroeconomic SAMs
2. Detailed microeconomic survey data from the 1998-99 Vietnam Living Standards Survey (VLSS), a nationally representative household survey with direct sampling in the Northern Region
3. Independent data on regional trade flows and sectoral activity levels.
4. The national SAM for 2000.

The basic estimation procedure consisted of a combination of direct survey and non-survey methods. In particular, all direct survey data were combined in the same layout as the national microeconomic SAM, and used as controls to reconcile imputed compositional values for the remaining accounts. Imputation was carried out by maximum entropy estimation techniques.[2]

[2] See, e.g. Robinson and El-Said (1998, 2000) for discussion of these methods.

The complete Micro SAM for the Northern Region is presented in Annex table A7.16. For expository purposes, a 38 sector representative aggregation is provided in the following table. This aggregation forms the basis of the structural narrative in the next section. Although we aggregate from 97 sectors in the original national and NMR Micro SAMs, activities of most relevance to NMR household income determination, 18 original agricultural and commercial service sectors, are maintained in the 38 sector aggregation.

As a service to policy makers and the research community, the following tables will be made available electronically.

1. Complete NMR Micro SAM (252x252)
2. Structural aggregation of the NMR Micro SAM (107x107)
3. Macro SAMs for NMR (and its 14 constituent regions)
4. Complete two-region NMR-ROV Micro SAM (199x199)

3 An Overview of the Structure of Supply, Demand, Value Added, and Factor Income

The next table presents a variety of disaggregated economic statistics extracted from the 38 sector aggregate regional SAM.[3] In column 1, for example, shares of economy-wide marketed gross output are given for all 38 sectors and aggregates representing primary, industry, and service activities. One would expect that, for an economy at Vietnam's stage of development, most of output is concentrated in primary and secondary activities. However, the high level of subsistence agriculture in the Northern Mountain region means that agriculture is a relatively small share of marketed output and GDP. The figure of 17.36% is actually below the national average, because in more market oriented regions agriculture is an important source of money income. Any casual observer of production activity in the NMR would conclude that the region is far from realizing the income potential of its resource allocations to agricultural activities. This is of particular relevance to more remote areas, where farming occupies the energies of well over the national average of two-thirds of the population, because of the large subsistence or non-market component of agricultural output.

There are many indications that NMR agricultural potential, and especially its marketable component, could be expanded significantly and sustainably, but ideally this would be done in ways that respond to more attractive output prices and greater value-added capture. In terms of the former, this would mean shifting the composition of crops toward higher value varieties. More domestic food processing capacity could also be developed, independently or in foreign partnership, and preferably located in rural regions where the income gains would be most significant.

More detailed inspection reveals that over half of gross output is in primary and light industry sectors, with the highly capital intensive-type industry accounting for less than 8% of total output. Primarily because of capital insufficiency, Vietnamese industry generally, and

[3] The sectoral classification used in the following tables is based on a distinction among primary, secondary and tertiary sectors that is different from the classification used by the GSO. For example, GSO classifies Mining as a secondary sector of production together with Industry. Abbreviations used in Table 4 are the following: X = output, Sd = supply for domestic market, E = exports, C = consumption, I = investment, Dd = demand for domestically produced products, M = import, VA = value added, LVA = labour value added, KVA = capital value added, TVA = land value added.

NMR industry in particular, is only beginning the path to modernization and manufacturing diversification commensurate with its population size and resource base. For this reason, processed food, construction materials, and labor-intensive light industries dominate its secondary sector.

Excluding the construction sector, less than one third of NMR's gross output takes the form of marketable services. Service output, employment, and value added are the hallmarks of developed countries, the average in the OECD exceeding 65%, and Vietnam is only beginning to develop this component of economic activity. As economic diversification, incomes and rural-urban migration rise over time, however, the share of services in overall output will grow substantially.[4]

The second column of the table gives sectoral shares of domestic supply, i.e. domestic output delivered to the domestic market. Generally, the differences between these and the gross output shares are better understood by reference to Columns 3 and 4, which give the corresponding export shares, a measure of supply-side trade dependence for each sector. Despite its heavy reliance on primary sector activities, NMR marketable exports are more concentrated in sectors classified as industrial (one half to two-thirds). The main reason for this is the Textile and Apparel sector, which accounts for a large share of total exports in 2000.

More detailed examination of these shares reveals many opportunities for regional development, however, especially via agricultural diversification. For example, food and non-food crops, such as rice and coffee, have significant export shares already but are generally thought to be producing well below their long-term output and revenue potential. Food processing activities could also animate more extensive market linkages in the NMR.

In manufacturing, even a cursory review of column 3 indicates that NMR has not yet captured the export potential of dynamic growth sectors in Vietnam or elsewhere in ASEAN. These sectors not only leverage external demand for domestic employment and capacity development, but also accelerate modernization and confer many growth externalities on the domestic economy. In other economies of the region, the primary catalysts for development of these sectors were foreign capital and sustained state commitments to human capital development via education and labor market liberalization.

A more focused comparison between production for domestic and external markets can be made with the ratios given in the fifth and sixth columns of the table. Here the export

[4] Note that Services are well ahead in terms of value added, largely because market factor prices in this sector are closer to (higher) national norms than other activities.

orientation of certain sectors, such as cash crops and energy, comes into very high relief. Several agricultural sectors, including rice and fishery, are still directing the vast majority of their output to intra-regional markets, while their export potential at the margin is only beginning to be realized. Given that rice is an inferior good, its export potential at the margin of a growing economy is considerable. Conversely, fishery supply may increasingly be diverted to the domestic market as Vietnamese per capita incomes rise. In the latter case, export shares will depend heavily on capacity expansion in aquaculture, since marine fisheries in the region are being exploited near or even beyond sustainable capacity. Significantly, export ratios for food processing are also very low, indicating that the export potential of the NMR agricultural sector, apart from classical cash crops like coffee and rubber, is far from being realized. Unless progress can be made in this area, rural incomes are unlikely to keep pace with growth of the overall economy.

The challenge facing the NMR in an era of globalization can be clearly seen in the average export ratios for primary and industry, which indicate a regional economy with very low levels of external supply orientation in the growth inducing sectors that have accelerated development and living standards elsewhere in Asia. Without more external market linkage in a variety of essential industrial activities, NMR is likely to be a chronic underachiever in the Asian modernization process. Again the main reasons are inadequate productive diversity, capital insufficiency, and lack of access to technology, but institutional conditions can do much to overcome this, facilitating commercial and multilateral trade partnerships to leverage the region's rich human and natural resource base.

Service sector export ratios are also very low. While it would be nice to see higher levels in externally oriented sectors like transportation and hotels/restaurants, low service exports are typical of all but the most advanced economies.