ECONOMIC POLICY

RESEARCH PAPER SERIES

# A SOCIAL ACCOUNTING MATRIX FOR HUBEI PROVINCE

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## RESEARCH PAPERS ON

## ECONOMIC DEVELOPMENT

This report is part of a series of research studies on Chinese regional economic growth and development. Sponsored jointly by the Development Research Center and the World Bank, these studies are intended to contribute to policy dialogue and promote capacity development for policy research.

Special thanks are due to the ASEM fund, administered by the World Bank, for supporting this project, “Capacity for Regional Research on Poverty and Inequality”. To support a new generation of coherent policies addressing poverty and regional inequality, this activity is delivering empirical tools and training to a prominent national Chinese research institution and its regional counterparts. As several of China’s provinces are now among East Asia’s largest economies, more detailed insight into their own growth challenges and their role in national development is essential for both public and private stakeholders. This new capacity will enable the State Council and other Chinese agencies to better understand detailed incidence and facilitate more equitable growth, extending its benefits to the low-income majority of the country. The project includes original data development, research capacity development, collaborative prototype studies, and regional training and dissemination workshops.

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# TABLE OF CONTENTS


**1. INTRODUCTION ..... 1**

**2. BUILDING HUBEI MACRO SAM (1997) ..... 4**

2.1. CONSTRUCTION OF HUBEI MACRO SAM (1997) ..... 4

*2.1.1. Definitions and Explanations ..... 4*

*2.1.2. Data Sources and Balancing ..... 7*

2.2. COMMODITIES ..... 7

*2.2.1. Total supply ..... 7*

*2.2.2. Total Output ..... 10*

2.3. ACTIVITIES ..... 12

*2.3.1. Total Output ..... 12*

*2.3.2. Total Input ..... 12*

2.4. FACTORS ..... 15

*2.4.1. Factor revenues ..... 15*

*2.4.2. Factor expenditures ..... 15*

2.5. HOUSEHOLDS ..... 17

*2.5.1. Household Expenditures ..... 17*

*2.5.2. Household Revenues ..... 18*

2.6. ENTERPRISE ..... 19

*2.6.1. Enterprise's Revenues ..... 19*

*2.6.2. Enterprise's Expenditures ..... 19*

2.7. GOVERNMENT SUBSIDIES ..... 20

*2.7.1. Expenditures ..... 20*

*2.7.2. Revenues ..... 20*

2.8. LOCAL GOVERNMENT ..... 21

*2.8.1. Revenues ..... 21*

*2.8.2. Expenditures* ..... *22*

2.9. CENTRAL GOVERNMENT ..... 23

*2.9.1. Revenues* ..... *23*

*2.9.2. Expenditures* ..... *23*

2.10. EXTRA-SYSTEM ..... 24

*2.10.1. Extra-system Revenues* ..... *24*

*2.10.2. Extra-system Expenditures* ..... *24*

2.11. REST OF THE WORLD (ROW) ..... 25

*2.11.1. Revenues of the ROW* ..... *25*

*2.11.2. Expenditures of the ROW* ..... *25*

2.12. REST OF MAINLAND CHINA (ROMC) ..... 25

*2.12.1. Revenues of the ROMC* ..... *25*

*2.12.2. Expenditures of the ROMC* ..... *26*

2.13. CAPITAL FORMATION AND STOCK CHANGE ..... 26

**3. DOCUMENTING DISAGGREGATED HUBEI SAM (1997) ..... 27**

3.1. DETAILED DIVISIONS OF HUBEI MACRO SAM ..... 27

3.2. DISAGGREGATING HUBEI MACRO SAM ..... 31

**4. SCENARIOS ..... 45**

**5. LIST OF REFERENCES ..... 46**

# 1. Introduction

Located in central China, at the middle reaches of the Yangtze River, Hubei is one of the cradles of Chinese nationality and ancient culture. It has a population of over 6 million people and an area of 185,900 square kilometers, accounting for 1.94% of the whole nation. About 10 percent of the province is covered by lakes, earning Hubei the name of “province of a thousand lakes”. Known as a “communication’s hub”, its provincial capital of Wuhan has always been its most important transportation center, and an important transactions market.

As an inland province, Hubei’s economic development is not as strong as its coastal counterparts. Although it has made great progress in recent years, the pace of development is still relatively slow compared to the national level, and the ratio of the primary and secondary industries to the total GDP is still somewhat high. From 1996 to 2000, Hubei’s GDP annual growth rate averaged 10.8% and its share of total national GDP rose from 4.38% to 4.85%. From 2001 to 2004, the annual growth rate fell slightly to 9.96%, while its share of total national GDP dropped from 4.87% to 4.63%. In 2004 Hubei’s GDP reached 632 billion Yuan, consisting of 102 Billion Yuan from the primary sector, accounting for 4.92% of the nation and registering an increase of 6.5% over the previous year; about 300 Billion Yuan created by the secondary industry, making up 4.14% of the national level and representing an increase of 14.0%; the remaining 231 Billion Yuan of added value was completed by the tertiary industry, up 10.0% and accounting for 5.31% of the whole nation. Accordingly, the industrial structure adjusted from 14.8:47.8:37.4 in 2003, to 16.1:47.4:36.5 in 2004.

Its volume of foreign trade accounts for only a small fraction of the nation’s and still lags behind the average national level, but it too has sped in recent years. The total import and export value increased from 3.2 billion US dollars in 1997 to 3.22 billion US dollars in 2000, with an annual growth rate of only 0.21%, and its share of the total foreign trade volume of the nation

decreased from 0.98% to 0.68%. From 2001 to 2004, the total import and export value rose from 3.58 billion US dollars to 6.77 billion US dollars, with an annual growth rate of 23.66%. However, Hubei experienced a further drop in their share of national trade, from 0.70% to 0.59%. On the other hand, Hubei's degree of dependence on foreign trade was lower than the national average, consistently less than 10% of GDP in recent years. The dependence degree on foreign trade decreased from 7.7% in 1997 to 6.2% in 2000 and climbed from 6.4% in 2001 to 8.9% in 2004.

Although a greater portion of Hubei's labor force works in the tertiary industry than national average, its employment structure remains unreasonable and needs to be optimized. In 2003 the proportions of employment in the primary, the secondary and tertiary industries were 45.1%, 18.7% and 36.2% respectively. The proportions of the employment in the primary and the second industries were 4 percentage points and 2.9 percentage points lower than the average national level, while the proportion of the employment in the tertiary industry was 6.9 percentage points higher.

Hubei is China's traditional manufacturing base and one of the originators of its modern industry. Today, its automobile and steel industries are both domestically advantageous pillars.

Hubei is one of the major motor vehicle production centers in China, recently ranking third in China, behind Jilin and Shanghai. The Dongfeng Automobile Co. Ltd. is Hubei's most significant firm in this industry. Hubei's auto industry reached 90.6 Billion Yuan of sales revenue in 2004 and 3.51 Billion Yuan of profits, accounting for 18.52% of the sales value of industrial products of the whole province and 12.56% of its profits.

Hubei's steel industry has a long history and its output is perennially among the top five. The industry has formed a relatively comprehensive industrial system which includes geological prospecting, designing, construction, mining, separation, smelting and rolling. The Wuhan Iron

and Steel (Group) Corp. is one of the famous steel giants in China. The gross output value of the steel industry in 2003 arrived at 38.1 Billion Yuan, 9.53% of that of the whole province.

Additionally, Hubei is the leader in the fields of computers and software, lasers, optical fiber communication, electronic information, the chemical industry, biological technology, and new materials.

# 2.Building Hubei Macro SAM (1997)

## 2.1. Construction of Hubei Macro SAM (1997)

### 2.1.1. Definitions and Explanations

The 1997 Social Accounting Matrix for Hubei is a square matrix which encompass every transaction of Hubei in 1997, i.e. production, sale, consume, and distribution. The data sources for a SAM come from Hubei input-output table, income statistics, and household income and expenditure statistics etc.

A SAM is a square matrix in which each transactor or account has its own row and column. The payments (expenditures) are listed in columns and the receipts in rows. Algebraically, a SAM may be represented as the following square matrix:

$$T = \{t_{ij}\}$$

Where $t_{ij}$ is the value of transaction with income accruing to account i from expenditure by account j.

The 1997 Macro SAM for Hubei is a square matrix comprising 15 rows and columns forming separate accounts in the economy. Table 1 and table 2 denote the Macro SAM for Yunnan,1997. The non-zero intersections between rows and columns in the Macro SAM give the specific flows of funds between various accounts.

A SAM shows the circular flow among the accounts. “Activities” receive incomes from the sale of goods and services produced and distribute these incomes to other production activities, factors of production, and government. The factors of production (Labor and Capital), transfer income

to the institutions (Household and Enterprise) in the economy. Government and extra-budget account earn income by imposing tax and fee on production activities and other institutions (Household and Enterprise), as well as imported goods. The institutions (Households, Enterprise, Government and Extra-budget account) expend income on the production activities through consumption of goods and services. The capital account serves as the reserve of savings from institutions and ROW. Likewise, expenditure from the capital account occurs through the consumption of capital goods from the production activities. The ROW account collects foreign exchange from purchases of foreign goods and services from the production activities. The ROW distributes foreign exchange to the production activities through exports. Furthermore, there are many trivial transactions happens between accounts, e.g. various transfers and subsidies. ROMC account reflects the economic relation between Hubei and the rest of the China (mainland of China).

## e 2.1 A Descriptive Macro SAM For Hubei, 1997

| | Expenditure | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.<br>modities | 2.<br>Activities | 3.<br>VA- Labor | 4.<br>VA- Capital | 5.<br>Households | 6.<br>Enterprise | 7.<br>Local Gov. Sub | 8.<br>Central Gov. Sub | 9.<br>Local Gov. | 10.<br>Central Gov. | 11.<br>Extra-system | 12.<br>Capital Account | 13.<br>Stock change | 14.<br>Rest of the World | 15.<br>Rest of Chi |
| | Intermediate Consumption | | | Private Consumption | | | | Government Consumption | Government Consumption | Extra-budget Consumption | Gross Fixed Capital Formation | Changes in Inventories | Export | Outflow t ROMC |
| mestic duction | | | | | | | | | | | | | | |
| | Compensation of Employees<br>Depreciation; Operating Surplus | | | | | | | | | | | | | |
| | | Compensation of employees distr. to HH | | | Transfers to households | | | Transfers to households | Transfers to households | | | | | |
| | | | Capital income distr. to Enterprise. | | | | | | | | | | | |
| | Subsidy on Production (Negative) | | | | | | | Expenditure of Subsidy | | | | | | |
| | Subsidy on Production (Negative) | | | | | | | | Expenditure of Subsidy | | | | | |
| | Indirect Taxes | | | Income tax | Income tax | | | | Central Gov. transfer to Local Gov | | | | | |
| port tax . Tariff) | Indirect Taxes | | | | Income tax | | | Local Gov. transfer to Central Gov | | | | | | |
| | extra-budget fee | | | | | | | | | | | | | |
| | | | | Households savings | Enterprise savings | | | Government saving | Government saving | Extra-budget savings | | | Foreign Saving | ROMC Savi |
| | | | | | | | | | | | Changes in Inventories | | | |
| nports | | | | | | | | | | | | | | |
| for ROMC | | | | | | | | | | | | | | |
| Total mmodity upply | Total Cost of Production | Total Labor Payments | Total Capital Payments | Total Household Expenditure | Total Enterprise Expenditure | Total Local Gov. Subsidy | Total Central Gov. Subsidy | Total Local Gov. Expenditure | Total Central Gov. Expenditure | Total Extra-budget Expenditure | Total Investment Expenditure | Total Changes in Inventories | Total Foreign Exchange Earnings | Total interregior outflow |

### 2.1.2. Data Sources and Balancing

Table 1.2 shows the 1997 Hubei Macro SAM, built on data from various sources, e.g., *1997 Hubei Input-Output Table*, *1997 China Input-Output Table*, *1998 China Statistical Yearbook*, *1998 Hubei Statistical Yearbook* as well as other sources. The following content describes the cell entries of the 1997 Hubei Macro SAM and identifies their sources. The values of cell entries are all computed in 100 million Yuan.

## 2.2. Commodities

### 2.2.1. Total supply

*(1) SAM (2, 1): Provincial (municipal) Total Output (9293.25).*

**Source:** *Intermediate Use Part of Hubei IO Table (1997)*.

**Note:** Because no imbalances are assumed in the SAM, we choose the data from the input-output table as the regional total output, and potential errors are dealt with in balancing items.

*(2) Inflow: includes interregional inflows, imports, tariffs, consumption taxes and value added taxes on imports.*

*A. SAM (12, 1): Imports (125.75)*

**Source:** *China Foreign Economic Statistical Yearbook (1998),* Table of Regional Import Value of Commodities by Places of Destination.

**Note:** In provincial IO tables, the "Import" item includes both actual imports and their corresponding tariffs. Therefore, we choose figures from *China Foreign Economic Statistical Yearbook (1998)* instead. The United States Dollar (USD) values in the table are converted into their Renminbi (RMB) equivalent.

*B. SAM (11, 1): Tariffs, consumption taxes and value added taxes on imports (18.20)*

**Source:** *Final Use Part of Hubei IO Table (1997), China Foreign Economic Statistical Yearbook (1998),* Table of Regional Import Value of Commodities by Places of Destination.

**Calculating Method:** Tariffs, consumption taxes and value added taxes on imports = value of Imports from *Hubei IO Table (1997)* – value of SAM (12, 1).

**TABLE 2.2 1997 HUBEI MACRO SAM**

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Commodities | Activities | Labor | Capital | Households | Enterprises | Local Gov. Subsidies | Central Gov. Subsidies | Extra-system | Local Gov | Central Gov | ROW | ROMC | Investment | Stock Change | Total |
| 1 | Commodities | | 5899 | | | 1787 | | | | 41 | 175 | 56 | 196 | 1369 | 1098 | 84 | 10705 |
| 2 | Activities | 9293 | | | | | | | | | | | | | | | 9293 |
| 3 | Labor | | 2005 | | | | | | | | | | | | | | 2005 |
| 4 | Capital | | 939 | | | | | | | | | | | | | | 939 |
| 5 | Households | | | 2005 | 139 | | 50 | | | | 25 | | | | | | 2220 |
| 6 | Enterprises | | | | 776 | | | | | | | | | | | | 776 |
| 7 | Local Gov. Subsidies | | -27 | | | | | | | | 27 | | | | | | 0 |
| 8 | Central Gov. Subsidies | | -18 | | | | | | | | | 18 | | | | | 0 |
| 9 | Extra-system | | 311 | | | | | | | | | | | | | | 311 |
| 10 | Local Gov | | 79 | | | 5 | 81 | | | | | 101 | | | | | 266 |
| 11 | Central Gov | 18 | 106 | | | | 27 | | | | 28 | | | | | | 179 |
| 12 | ROW | 126 | | | 23 | | | | | | | | | | | | 149 |
| 13 | ROMC | 1267 | | | | | | | | | | | | | | | 1267 |
| 14 | Savings | | | | | 427 | 617 | | | 270 | 12 | 4 | -47 | -101 | | | 1182 |
| 15 | Stock Change | | | | | | | | | | | | | | 84 | | 84 |
| 16 | Total | 10705 | 9293 | 2005 | 939 | 2220 | 776 | 0 | 0 | 311 | 266 | 179 | 149 | 1267 | 1182 | 84 | |

*C. SAM (13, 1): Interregional inflows (1267.44)*

**Source:** *Final Use Part of Hubei IO Table (1997)*.

### 2.2.2. Total Output

*(1) SAM (1, 2): Intermediate Inputs (5899.15)*

**Source:** *Intermediate Use Part of Hubei IO Table (1997)*.

**Note:** Because no imbalances are assumed in the SAM, the data from the input-output table are chosen as the regional total output. Potential errors are dealt with in balancing items.

*(2) Final Consumption: includes Household Consumption, Local Government Consumption, Central Government Consumption and Extra-system Consumption*

*A. SAM (1, 5): Household Consumption (1786.92)*

**Source:** *Final Use Part of Hubei IO Table (1997)*.

**Note:** Household consumption in the *Hubei Statistical Yearbook (1998)* is different from that of the *Hubei IO Table (1997)*. This occurs because figures in statistical yearbooks are calculated in terms of market prices, but numbers in IO tables are recorded in terms of producer prices.

*B. SAM (1, 10): Local Government Consumption (174.54)*

**Source:** Summary Table of General Budget Revenue and Expenditure of China (*Finance Yearbook of China 1998)*.

**Note:** Because the *Hubei IO Table (1997)* has only one government consumption account, we have to decompose it into consumption by the local government, central government and extra system.

**Calculating Method:** We aggregate regular expenditures among operating expenses in the financial budget to find the consumption of Hubei's local government.

*C. SAM (1, 11): Central Government Consumption (56.27)*

**Source:** Summary Table of General Budget Revenue and Expenditure of China, Summary Table of General Budget Revenue and Expenditure of Hubei (*Finance Yearbook of China 1998)*.

**Calculating Method:** Assume the ratio of the subsidy Hubei receives from the central government to total subsidies for all provinces is equal to the ratio of consumption by the central government in Hubei to the total consumption of central government. Therefore, we use the values of subsidies and the total consumption of central government found in the *Finance Yearbook of China (1998)*, and solve for the consumption of the central government in Hubei.

*D. SAM (1, 9): Public Sector Consumption (40.77)*

**Source:** *Hubei IO Table (1997), Hubei Statistical Yearbook (1998).*

**Calculating Method:** Government consumption from IO Table minus the local government and central government consumption calculated above.

*(3) Provincial Exports: Include Exports to Foreign Countries (Actual Exports) and Exports to Other Provinces*

*A. SAM (1, 12): Actual Exports (195.91)*

**Source:** Total Exports by Region (by Domestic Origination), *China Foreign Economic Statistical Yearbook (1998)*.

*B. SAM (1, 13): Exports to Other Provinces (1368.91)*

**Source:** *Hubei IO Table (1997).*

*(4) Capital Formation: Includes Fixed Capital Formation and Net Stock Change*

*A. SAM (1, 14): Fixed Capital Formation (1098.47)*

**Source:** *Final Use Part of Hubei IO Table (1997).*

*B. SAM (1, 15): Net Stock Change (83.69)*

**Calculating Method:** The item is the difference between Total Demand and Intermediate Input, Final Consumption, Total Provincial Exports and Fixed Capital Formation.

## 2.3. Activities

### 2.3.1. Total Output

*(1) SAM (2, 1): Provincial Total Output (9293.25)*

See "Provincial Total Output," commodity accounts.

### 2.3.2. Total Input

*(1) SAM (1, 2): Intermediate Inputs (5899.15)*

See "Intermediate Inputs," commodity accounts.

*(2) Factor Inputs  Including Wages and Returns to Capital*

*A. SAM (3, 2): Wages (1154.30)*

**Sources:** *Hubei IO table (1997).*

*B. SAM (4, 2): Returns to Capital (938.60)*

**Sources:** *Hubei IO table (1997).*

**Calculating Method:** The sum of Depreciation of Fixed Assets and Operating Surplus.

*(3) Net Production Taxes: Including Subsidies from the Local Government, Production taxes paid to the Local Government, Subsidies from the Central Government, Production taxes to the Central Government and Extra-system Fees*

*A. SAM (7, 2): Subsidies from Local Government (-26.72)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998).*

**Calculating Method:** This item includes Subsidies for Enterprises Losses, Income Taxes Returned to Enterprises and Policy Subsidies.

*B. SAM (10, 2): Production taxes to Local Government (78.79)*

**Source:** 1997 Gross Taxation by Region and by Category (Local Taxes) in *Tax Yearbook of China (1998).*

**Calculating Method:** Aggregate related production tax items.

*C. SAM (8, 2): Production Subsidies from the Central Government (-18.4)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997), Local Budget Revenue and Expenditure,* and *Central Budget Revenue and Expenditure* in *Finance Yearbook of China (1998).*

**Calculating Method:** Although the total production subsidy from the central government to enterprises is available in the statistical yearbook, detailed production subsidies on a regional basis are not recorded. We assume that the ratio of the production subsidy from the central government to Hubei to the total production subsidy from the central government to all regions is equal to the ratio of general central government subsidies to Hubei to the total central government subsidies. Therefore, we can figure out production subsidy from the central government to Hubei by getting the other three items in the *Finance Yearbook of China (1998).*

*D. SAM (11, 2): Production Tax Distributed to Central Government (105.99)*

**Source:** 1997 Gross Taxation by Region and by Category (National Taxes) in *Tax Yearbook of China (1998).*

**Calculating Method:** Aggregate related production tax items

*E. SAM (9, 2): Extra-system Fees (310.76)*

**Source:** *IO table of Hubei (1997).*

**Calculating Method:** Subtract the total production subsidy and production tax from the net production tax in the IO table.

## 2.4. Factors

### 2.4.1. Factor revenues

*(1) SAM (9, 2): Wages (2005.08)*

See “Wages,” activity accounts.

*(2) SAM (4, 2): Returns to Capital (938.60)*

See “Returns to capital,” activity accounts.

### 2.4.2. Factor expenditures

*(1) SAM (5, 3): Labor Income (2005.08)*

See “Wages,” activity accounts.

*(2) Distribution of Returns to Capital: including Household Capital Income, Returns to Foreign Investment and Enterprises’ Capital Income*

*A. SAM (5, 4): Household Capital Income (139.23)*

**Sources:** Flow of Funds Table (Physical Transaction, 1997) in *China Statistical Yearbook (2000)*, Basic Conditions of Urban Households and Per Capita Net Income of Rural Households by Source and by Region in *China Statistical Yearbook (1998)*, Total Population over the Years in *China statistical Yearbook (1998),* Basic Conditions of Urban Households and Per Capita Net Income of Rural Households by Source and by Region in *Hubei statistical yearbook (1998)*, Total Population over the Years in *Hubei Statistical Yearbook (1998)*.

**Calculating Method:** Because there is no available statistical data of households' capital income, we estimate this figure. We first assume that the ratio of Hubei's capital income to national capital income is equal to the ratio of Hubei's property income to national property income:

$$\frac{\text{Hubei households' capital income}}{\text{National households' capital income}} = \frac{\text{Estimated property income of Hubei households}}{\text{Estimated property income of national households}}$$

We obtain Hubei households' capital income after estimating the other three items based on information from the data sources listed above.

*B. SAM (12, 4): Returns to Foreign Investment (23.32)*

**Sources:** Balance of Payments (1997) and Actual Foreign Direct Investment by Region in *China Statistical Yearbook (1998)*.

**Calculating Method:** Just like the households' capital income, we have to estimate returns to foreign investment due to lack of direct statistical data. We assume that the rate of return on foreign investment in Hubei is equal to the national rate of return on foreign investment:

$$\frac{\text{Returns to foreign investment in Hubei}}{\text{Returns to foreign investment in China}} = \frac{\text{Amount of foreign investment in Hubei}}{\text{Amount of foreign investment in China}}$$

We obtain returns to foreign investment in Hubei using figures for the other three items from the data sources listed above.

*C. SAM (6, 4): Enterprises' Capital Income (776.05)*

**Calculating Method:** Enterprise's capital income = returns to capital – households' capital income – returns to foreign investment.

## 2.5. Households

### 2.5.1. Household Expenditures

*(1)SAM (1, 5): Household Consumption (1786.92)*

**Sources:** *Final Use Part of Hubei IO Table (1997)* and *Hubei Statistical Yearbook (1998)*.

See "Household Consumption," commodity accounts.

*(2)SAM (10, 5): Individual Income Taxes (5.45)*

**Source:** *Tax Yearbook of China (1998)*.

*(3) SAM (14, 5): Household Savings (434.55)*

**Sources:** *Flow of Funds Table (Physical Transaction, 1997)* in *China Statistical Yearbook (2000)*, *China Statistical Yearbook (1998)*, *Hubei Statistical Yearbook (1998)*, and *Individual Investment in Fixed Assets in Rural Areas by Source of Funds and by Region* in *China Statistical Yearbook on Investment in Fixed Assets (1998)*.

**Calculating Method:** We compute this item by adding relevant data from the "Annual Increase in Saving Deposits of Urban and Rural Households" and "Individual Investment in Fixed Assets in Rural Areas". However, their sum at the national level in 1997 is much less than the total savings recorded in the *Flow of Funds Table.* Therefore, we assume that these two figures underestimate household savings at both at the national and provincial levels by the same proportion, and estimate total household savings of Hubei under this assumption:

Total Household Savings of Hubei / (Annual Increase in Saving Deposits of Urban and Rural Households of Hubei + Individual Investment in Fixed Assets in Rural Areas of Hubei) = Total

Household Savings of the Nation / (Annual Increase in Saving Deposits of Urban and Rural Households of the Nation + Individual Investment in Fixed Assets in Rural Areas of the Nation)

### 2.5.2. Household Revenues

*(1) SAM (5, 3): Wages (2005.08)*

See "Labor Income," factor accounts.

*(2) SAM (5, 4): Household Capital Income (139.23)*

See "Households' Capital Income," factor accounts.

*(3) SAM (5, 10): Transfer Payments from the Local Government to Households (25.12)*

**Sources:** *China Statistical Yearbook (1998)*, *Hubei Statistical Yearbook (1998)*, and *China SAM (1997).*

**Calculating Method:** Because it is difficult to find this figure in provincial official statistical data, we calculate it by adding up relevant items in local government expenditures. These include government expenditures for pensions and social welfare, price subsidies, retirement expenses of non-business and administrative units, and interest expenses. Interest expenses are using national data, i.e., by multiplying the share of annual increase in saving deposits of urban and rural households of Hubei with the interest expenses in *China's SAM (1997)*.

*(4) SAM (5, 6): Transfer Payments from Enterprises to Households (57.48)*

**Source:** Other Household Accounts.

**Calculating Method:** Household consumption + individual income tax + household savings – wages – household capital income – transfer payment from local government to households.

## 2.6. Enterprise

### 2.6.1. Enterprise's Revenues

*(1) SAM (6, 4): Enterprise's Capital Income (776.05)*

See "Enterprises' Capital Income," factor accounts.

### 2.6.2. Enterprise's Expenditures

*(1) SAM (5, 6): Transfer Payments from Enterprises to Households (57.48)*

See "Transfer Payments from Enterprises to Households," household accounts.

*(2) SAM (10, 6): Direct Enterprise Taxes Distributed to the Local Government (81.20)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998)*, and *Tax Yearbook of China (1998)*.

**Calculating Method:** We select items with characteristics of direct taxes in *Summary Table of General Budget Revenue and Expenditure of Hubei*, and find their sum to get the total value of direct enterprise taxes. Direct taxes are distributed to both the local government and central government. From *Tax Yearbook of China (1998)*, we can find the ratio of all direct taxes, enterprise and others, distributed to local governments versus the central government. We multiply this ratio with by our level of direct enterprise taxes to solve for the level of direct enterprise taxes paid to the local government.

*(3) SAM (11, 6): Direct Enterprise Taxes Distributed to the Central Government (27.27)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998)*, and *Tax Yearbook of China (1998)*.

**Calculating Method:** Subtract direct enterprise taxes paid to the local government, calculated above, from total direct enterprise taxes.

*(4) SAM (14, 6): Transfer Payments from Enterprises to Households (610.11)*

**Source:** Other enterprise accounts.

**Calculating Method:** Enterprises' capital income – transfer payments from enterprises to households – direct enterprise taxes distributed to the local government – direct enterprise taxes distributed to the central government.

## 2.7. Government Subsidies

### 2.7.1. Expenditures

*(1) SAM (7, 2): Production Subsidies from the Local Government (-26.72)*

See "Subsidies from the Local Government," activity accounts.

*(2) SAM (8, 2): Production Subsidies from the Central Government (-18.41)*

See "Subsidies from the Central Government," activity accounts.

### 2.7.2. Revenues

*(1) SAM (7, 10): Local Government Expenditure of Production Subsidies (26.72)*

**Note:** It is equal to "Production Subsidies from the Local Government", which indicates the local source of production subsidies.

*(2) SAM (8, 11): Central Government Expenditure of Production Subsidies (18.41)*

**Note:** It is equal to "Production Subsidies from the Central Government", which indicates the national source of production subsidies.

## 2.8. Local Government

### 2.8.1. Revenues

*(1) SAM (10, 2): Local Production Taxes (78.79)*

See "local production tax," activity accounts.

*(2) SAM (10, 5): Individual Income Taxes (5.45)*

See "individual income tax," household accounts.

*(3) SAM (10, 6): Direct Enterprise Taxes (81.20)*

See "Direct Enterprise Taxes Distributed to the Local Government," enterprise accounts.

*(4) SAM (10, 11): Subsidy Income from the Central Government (100.78)*

**Source:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998)*.

### 2.8.2. Expenditures

*(1) SAM (1, 10): Consumption of Local Government (174.54)*

See "Local Government Consumption," commodity accounts.

*(2) SAM (5, 10): Transfer Payments from the Local Government to Households (25.12)*

See "Transfer Payment from the Local Government to Households," household accounts.

*(3) SAM (7, 10): Local Government Expenditure of Production Subsidies (26.72)*

See "Local Government Expenditure of Production Subsidies," government subsidies accounts.

*(4) SAM (11, 10): Local Revenues Distributed to the Central Government (27.98)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998)*.

*(5) SAM (14, 10): Savings of the Local Government (11.86)*

**Sources:** *Summary Table of General Budget Revenue and Expenditure of Hubei (1997)* in *Finance Yearbook of China (1998)*.

**Calculating Method:** local production taxes + individual income taxes + direct enterprise taxes + subsides from central government – consumption of local government – transfer payment from local government to households – local government expenditure of production subsidies – local revenues distributed to central government.

## 2.9. Central Government

### 2.9.1. Revenues

*(1) SAM (11, 2): National Production Taxes (105.99)*

See “National Production Taxes,” activity accounts.

*(2) SAM (11, 6): Direct Enterprise Taxes Distributed to the Central Government (27.27)*

See “Direct Enterprise Taxes Distributed to the Central Government,” enterprise accounts.

*(3) SAM (11, 1): Tariffs, Consumption Taxes and Value-added Taxes on Imported Goods (18.21)*

See “Tariffs, Consumption Taxes and Value-added Taxes on Imported Goods,” commodity accounts.

*(4) SAM (11, 10): Revenues from the Local Government (27.98)*

See “Local Revenues Distributed to the Central Government,” local government accounts.

### 2.9.2. Expenditures

*(1) SAM (1, 11): Consumption of the Central Government (56.27)*

See “Consumption of the Central Government,” commodity accounts.

*(2) SAM (8, 11): Central Government Expenditure of Production Subsidies (18.41)*

See “Central Government Expenditure of Production Subsidies,” government subsidies accounts.

*(3) SAM (10, 11): National Revenues Distributed to Local Government (100.78)*

See “Subsidy Income from Central Government,” local government accounts.

*(4) SAM (14, 11): Savings of the Central Government (3.99)*

**Source:** Other central government accounts.

**Calculating Method:** national production taxes + direct enterprise taxes distributed to central government + tariffs, consumption taxes and value-added taxes on imported goods + revenues from local government - consumption of central government - central government expenditure of production subsidies - subsides income from central government

## 2.10.Extra-system

### *2.10.1. Extra-system Revenues*

*(1) SAM (9, 2): Extra-System Revenues (310.76)*

See “Extra-System Revenues,” activity accounts.

### *2.10.2. Extra-system Expenditures*

*(1) SAM (1, 9): Extra-System Consumption (40.76)*

See “Extra-System Consumption,” commodity accounts.

*(2) SAM (14, 9): Extra-System Savings (270.00)*

**Calculating Method:** Extra-system savings = Extra-system revenues – Extra-system consumption.

**Note:** It is regarded as the balancing item.

## 2.11.Rest of the World (ROW)

### *2.11.1. Revenues of the ROW*

*(1) SAM (12, 1): Imports (125.75)*

See "Imports," commodity accounts.

*(2) SAM (12, 4): Returns to Foreign Investment (23.32)*

See "Returns to Foreign Investment," factor accounts.

### *2.11.2. Expenditures of the ROW*

*(1) SAM (1, 12): Exports (195.91)*

See "Exports," commodity accounts.

*(2) SAM (14, 12): Foreign Savings (-46.85)*

**Calculating Method:** Foreign savings = import + foreign investment income – export.

**Note:** It is regarded as the balancing item.

## 2.12.Rest of Mainland China (ROMC)

### *2.12.1. Revenues of the ROMC*

*(1) SAM (13, 1): Imports from the ROMC (1267.44)*

See “Import from the ROMC,” commodity accounts.

### 2.12.2. Expenditures of the ROMC

*(1) SAM (1, 13): Exports to the ROMC (1368.91)*

See “Exports to the ROMC” in commodity accounts.

*(2)SAM (14, 12): Savings of the ROMC (-101.47)*

**Calculating Method:** Savings of ROMC = import from ROMC – export to ROMC.

**Note:** It is regarded as the balancing item.

## 2.13.Capital Formation and Stock Change

Capital formation refers to total savings and investment, both of which are derived above. Total savings is the sum of savings from other accounts in the SAM, and total investment is the sum of fixed capital formation and net stock change. Net stock change can be combined with capital formation or be listed independently, to distinguish between the two in total investment. Capital formation and stock change correspond to the fourteenth and fifteenth columns and rows in the SAM.

# 3. Documenting Disaggregated Hubei SAM (1997)

## 3.1. Detailed Divisions of Hubei Macro SAM

When constructing the Disaggregated SAM, much of the data comes from the IO table. However, the *Hubei IO table (1997)* delivered from the China Statistics Bureau (CSB) has 102 sectors, rather than the 53-sectors used in our Disaggregated SAM. (Note: CSB updated provincial IO tables in 2005, therefore we use the new Hubei IO table.) We aggregate the 102 sectors to 53 sectors according to their mapping relations. In the context of our paper, the data from the *Hubei IO table (1997)* refers to the data from our aggregated 53-sector version.

We disaggregate many accounts of the macro SAM, including accounts of labor, households and production taxes, in order to make it more suitable for our research. Detailed divisions are documented below:

**Table 3.1 The Disaggregated Sectors in Hubei SAM**

| Types | No. | Sector | Types | No. | Sector |
|---|---|---|---|---|---|
| ***Agriculture*** | 1 | Crops | ***Industry*** | 28 | Plastics |
| | 2 | Forestry | | 29 | Building materials |
| | 3 | Livestock | | 30 | Primary iron and steel |
| | 4 | Fishing | | 31 | Non-ferrous metals |
| | 5 | Other agriculture | | 32 | Metal products |
| ***Industry*** | 6 | Coal mining | | 33 | Machinery |
| | 7 | Crude oil and natural gas | | 34 | Special equipment |
| | 8 | Ferrous ore mining | | 35 | Automobiles |
| | 9 | Non-ferrous ore mining | | 36 | Other transportation equipment |
| | 10 | Quarrying | | 37 | Electronic machinery |
| | 11 | Logging | | 38 | Electronics |
| | 12 | Food Processing | | 39 | Instruments |
| | 13 | Beverages | | 40 | Other manufacturing |
| | 14 | Tobacco | | 41 | Electricity and stream water |
| | 15 | Textile | | 42 | Gas |
| | 16 | Apparel | | 43 | Water |
| | 17 | Leather | ***Construction*** | 44 | Construction |
| | 18 | Sawmills | ***Service*** | 45 | Transportation |
| | 19 | Furniture | | 46 | Postal and communication |
| | 20 | Paper | | 47 | Commerce |
| | 21 | Printing | | 48 | Restaurants |
| | 22 | Social articles | | 49 | Finance |
| | 23 | Petroleum refining | | 50 | Real estate |
| | 24 | Chemicals | | 51 | Social services |
| | 25 | Medicine | | 52 | Education & health |
| | 26 | Chemical fibers | | 53 | Public administration |
| | 27 | Rubber | | | |

(1) Activities: The Macro SAM account of Activities is divided into 53 sectors, which contain five agricultural sectors, 38 industrial sectors, construction and nine service sectors. The detailed sectors are shown in the above table 2.1.

(2) Commodities: Commodities are disaggregated into the same 53 categories for each of the 53 activities.

(3) Factors: Capital is further divided into two categories: land and non-land capital, while the labor is disaggregated into agricultural laborer, unskilled worker and skilled worker.

(4) Local government: The taxes raised by the local government are separated from the local government account and further divided into value-added taxes, business taxes and other production taxes.

(5) Central government: The taxes collected by central government are separated from the central government account and disaggregated into four categories; value-added taxes, business taxes, other production taxes and import taxes, including tariffs, consumption taxes and value added taxes on imports.

(6) Households: Households are disaggregated into rural and urban households, in line with the classification of the IO table.

After decomposition, the items of macro SAM are expanded to corresponding matrices. The dimensions of each sub-matrix are reported in table 2.2.

## Table 3.2 Dimensions of the 1997 Disaggregated SAM

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Commodities | Activities | Labor | Capital | Households | Enterprise | Local Gov. Subsidies | Central Gov. Subsidies | Extra System | Local Gov. | Local Taxes | Central Gov. | National Taxes | ROW | ROMC | Investment | Stock Change | Total |
| 1 | Commodities | | 53×53 | | | 53×2 | | | | 53×1 | 53×1 | | 53×1 | | 53×1 | 53×1 | 53×1 | 53×1 | 53×1 |
| 2 | Activities | 53×53 | | | | | | | | | | | | | | | | | 53×1 |
| 3 | Labor | | 3×53 | | | | | | | | | | | | | | | | 3×1 |
| 4 | Capital | | 2×53 | | | | | | | | | | | | | | | | 2×1 |
| 5 | Households | | | 2×3 | 2×2 | | 2×1 | | | | 2×1 | | | | | | | | 2×1 |
| 6 | Enterprise | | | | 1×2 | | | | | | | | | | | | | | 1×1 |
| 7 | Local Gov. Subsidies | | 1×53 | | | | | | | | | | | | | | | | 1×1 |
| 8 | Central Gov. Subsidies | | 1×53 | | | | | | | | | | | | | | | | 1×1 |
| 9 | Extra System | | 1×53 | | | | | | | | | | | | | | | | 1×1 |
| 10 | Local Gov. | | | | | | | 1×1 | | | | 1×3 | 1×1 | | | | | | 1×1 |
| 11 | Local Taxes | | 3×53 | | | 3×2 | 3×1 | | | | | | | | | | | | 3×1 |
| 12 | Central Gov. | | | | | | | | 1×1 | | 1×1 | | | 1×4 | | | | | 1×1 |
| 13 | National Taxes | 4×53 | 4×53 | | | | 4×1 | | | | | | | | | | | | 4×1 |
| 14 | ROW | 1×53 | | | 1×2 | | | | | | | | | | | | | | 1×1 |
| 15 | ROMC | 1×53 | | | | | | | | | | | | | | | | | 1×1 |
| 16 | Savings | | | | | 1×2 | 1×1 | | | 1×1 | 1×1 | | 1×1 | | 1×1 | 1×1 | | | 1×1 |
| 17 | Stock Change | | | | | | | | | | | | | | | | 1×1 | | 1×1 |
| 18 | Total | 1×53 | 1×53 | 1×3 | 1×2 | 1×2 | 1×1 | 1×1 | 1×1 | 1×1 | 1×1 | 1×3 | 1×1 | 1×4 | 1×1 | 1×1 | 1×1 | 1×1 | |

## 3.2. Disaggregating Hubei Macro SAM

*SAM (1, 2) "Commodities—Activities": Intermediate Consumption*

**Source:** *Hubei IO Table (1997).*

**Note:** Intermediate consumption is disaggregated into a 53×53 matrix. Every row represents the supply of individual commodities to production sectors, while every column reflects the consumption of each commodity used in production.

*SAM (1, 5) "Commodities—Households": Household Consumption*

**Source:** *Hubei IO Table (1997).*

**Note:** Households are split into two categories: rural and urban, creating a 2×53 matrix.

*SAM (1, 9) "Commodities—Extra system": Consumption of the extra system*

**Calculating Method:** Total consumption of the three public sector accounts (extra system, local government and central government) has been calculated in the construction of our Macro SAM. Total government consumption of every commodity is reported in the *Hubei IO Table (1997)*, but detailed consumption by each of the three public sector groups is not available. To create a detailed consumption account for each public sector, we assume that consumption shares of each commodity by the total government are equal to the shares for each branch of the public sector. The extra system consumption of each commodity is calculated by multiplying total consumption of the extra system (40.76) with the relevant consumption share.

*SAM (1, 10) "Commodities—Local government": Consumption of the Local government*

**Calculating Method:** The consumption of local government by commodity is estimated in the same way as above, that is, by multiplying total local government consumption (174.54) with the corresponding consumption shares.

*SAM (1, 11) "Commodities—Central government": Consumption of the Central government*

**Calculating Method:** The consumption of central government by commodity is calculated by multiplying consumption shares with central government consumption (56.27).

*SAM (1, 12) "Commodities—Rest of the World": Exports to the Rest of the World*

**Source:** *Hubei IO Table (1997).*

*SAM (1, 13) "Commodities—Rest of Mainland China": Exports to Rest of Mainland China*

**Source:** *Hubei IO Table (1997).*

*SAM (1, 14) "Commodities—Investment": Investment*

**Source:** *Hubei IO Table (1997).*

*SAM (1, 15) "Commodities—Stock Change": Net Stock Change*

**Source:** *Hubei IO Table (1997).*

*SAM(2,1)"Commodities-Activities": Provincial Gross Product*

**Source:** *Hubei IO Table (1997).*

**Note:** Provincial gross product is disaggregated into a 53×53 diagonal matrix. Diagonal elements represent sectored gross outputs, while all other elements in the matrix are zeros.

*SAM(11,1)"Central Government—Commodities":Tariffs, Consumption Taxes and Value Added Taxes on Imports*

**Calculating Method:** There are no statistical data available for disaggregated tariffs and other taxes, therefore we estimate them. We obtain nominal tax rates for each of the 53-sector imports based on data provided by the DRC. We then multiply gross import taxes from our Macro SAM (18.21) by the relevant sector proportion.

*SAM(12,1)"ROW Commodities": Foreign Imports*

**Calculating Method:** Commodity trade is computed in terms of CIF (Cost, Insurance and Freight) using Customs' statistics. Customs' statistics are calculated according to place of operation, thus we transform them into data in terms of place of destination. That is to say, we control the total of import in Macro SAM and take Customs' statistics which are computed in terms of place of operation as structural parameters, and then we can get the actual foreign imports.

**Note:** "Imports" in the *Hubei IO Table (1997)* include actual imports and tariffs, which are deduced proportionally, and their calculating methods refer to SAM (11, 1) and SAM (12, 1) mentioned above. The sum of these two items by sector is not equal to the IO table result for imports by sector. Therefore, we take the difference between our figure and the IO figure, and include it as a "stock change". This eliminates the differences and balances the commodity accounts.

*SAM(13,1)"ROMC—Commodities":Commodities imported from other Provinces*

**Source:** *Hubei IO table (1997).*

*SAM(3,2)"Labors—Activities": Wages*

**Calculating Method:** Labor is disaggregated into three groups—agricultural laborers, unskilled workers and skilled workers. Because there are only data for gross wages by sector, we use the following steps to divide labor into our three groups:

1. Calculate the size of the labor force at the end of the year in each of the 53 sectors in the disaggregated SAM using data taken from the "Work Force by Sector at the End of the Year Table and Industry Work Force at the End of the Year Table," *China Labor Statistical Yearbook (1998)*.

2. Calculate the number of employed people at the end of the year in each of the 53 sectors in the disaggregated SAM. The data is taken from "Statistical number of employed people disaggregated by 16 sectors in 1997,"*China Statistical Yearbook (1998)*. We use the size of the work force by sector at the end of the year in step one to calculate the number of employed people by sector.

3. Because the industry partition in the *China Statistical Yearbook (1998)* and in the *China Labor Statistical Yearbook (1998)* is different than our partition, we disaggregate the number of employed people for certain industries. We split the number of employed people from groups 18, 19, 35 and 36 sector of our SAM, according to their proportions in all of China (*Data Collection on the Third Industrial Census of China 1995*).

4. Decompose employed people in each sector into agricultural laborers, unskilled workers and skilled workers, excluding industrial sectors, according to their proportions in the China Occupational Distribution by Sector Table (*1% Spot Check of China's Population in 1995*). Assume there are no unskilled workers in agricultural sectors, and no agriculture workers in other sectors. There are seven types of labors in the China's Occupational Distribution by Sector Table. We group skilled workers and principals of governmental departments, the Party's Association and enterprises or business units in agricultural sectors as skilled workers. Other

people working in agricultural sectors are aggregated into the agricultural laborer group. The aforementioned groups in other sectors are also placed into the skilled workers group, while the remaining people working in other sectors are counted as unskilled workers.

5. All employed people in industrial sectors are disaggregated into unskilled workers and skilled workers according to the proportions in "Staff and Workers of Industrial Enterprises with Independent Accounting Systems by Townships Level and Above" (*Data Collection on the Third Industrial Census of China 1995*).

6. Calculate gross labor equivalents by sector. Here labor equivalents refer to weights given to laborers in terms of their different efficiency. Because efficiency varies among different labor groups, we find labor equivalents for each labor group, and assume wages are distributed accordingly. In the Micro SAM, labor equivalents of skilled workers, unskilled workers and agricultural laborers are 1.55, 1 and 0.5 respectively. We calculate gross labor equivalents in each sector by multiplying the number of each type of laborer in a given sector by their corresponding labor equivalent.

7. Calculate wages for the three types of laborers in each sector.

*SAM(4,2)"Capital—Activities": Returns to Capital*

**Calculating Method:** Returns to capital are decomposed into returns to land capital and returns to other forms of capital as follows:

1. Calculate gross sectored returns to capital by the depreciation of fixed assets plus operating surplus (*Hubei IO Table).*

2. Calculate the returns to capital for agricultural sectors. We get the returns to land capital by multiplying the gross sectored returns to capital by GTAP 4.0 coefficient. The returns to land capital subtracted from gross returns give the returns to other forms of capital.

3. Calculate the returns to capital for sectors other than agriculture. We suppose returns to land capital in these sectors are zero, so the gross returns to capital equal the returns to non-land capital.

*SAM(7,2)"Subsidies from the Local Government—Activities":Subsidies from the Local Government*

**Calculating Method:** There are no statistical data for subsidies to each sector from the local government, so we calculate them as follows:

1. Various types of subsidies from the government are listed in the Summary Table of General Budget Revenue and Expenditure of China (*Finance Yearbook of China 1998*). All the items are aggregated into four types of subsidies from the central government: agricultural, industrial, commercial and other sectors.

2. Suppose subsidies to each sector from the local government are proportional to subsidies from the central government to find the same four subsidies for the local government.

3. For agricultural sectors, subsidies by sector are proportional to their corresponding added value.

4. For industrial sectors, subsidies by sector are proportional to their corresponding loss.

5. For commercial sectors, subsidies are directly calculated in step 2.

6. For other remaining sectors, subsidies are proportional to their corresponding added value.

*SAM(8,2)"Subsidies from Central Government—*Activities*":Subsidies to All sectors from the Central Government*

**Calculating Method:** There are gross subsidy data from the central government in the Macro SAM, and subsidies from the central government are disaggregated into sectors in the same way as above.

*SAM (10, 2) "Local government—Activities": Production taxes distributed to the local government.*

**Calculating Method:** Production taxes are divided into three items: Value-added taxes, business taxes, and other production taxes.

A. Local value-added taxes:

1. The value-added taxes of agricultural sectors are set to zero.

2. For industrial sectors, the value-added tax is based on data from the "Main Financial Index of Industrial Enterprises with Independent Accounting Systems by Township Level and Above(Hubei)," *Data Collection on the Third Industrial Census of China 1995.* Sectored aggregation is calculated using corresponding national statistical data.

3. For services, we refer to the "Domestic Value-added Tax by Sector (Hubei)" in *China Tax Statistics (1998)*, which only includes commercial sectors. Because the *China Tax Statistics (1998)* has the value-added tax data classified by sector, we adopt the total amount of added value in *Tax Yearbook of China (1998)* for consistency. For simplicity, "Other Services" value-added taxes are summed into the "Restaurants" sector, and "Other Services" value-added taxes are set to zero. Because the data in *The China Tax Statistics (1998)* are actual value-added taxes, we convert it into payable value-added taxes using the following formula:

$$\frac{\text{Value-added tax of manufacturing sectors}}{\text{Actual value-added tax of manufacturing sectors}} = \frac{\text{Value-added tax of commerce and restaurant sectors}}{\text{Actual value-added tax of commerce and restaurant sectors}}$$

4. Multiply total local value-added taxes (26.27) over total (local plus central) value-added taxes by the corresponding sectoral value-added taxes calculated above, to solve for local value-added taxes by sector.

B. Local business taxes:

1. The business tax of industrial and agricultural sectors is set to zero.

2. For service sectors, we refer to "Domestic Business Tax by Sector (Hubei)", *China Tax Statistics (1998).*

3. Multiply total local business taxes (31.81) over total (local plus central) business taxes by the corresponding sectored business tax calculated above, to solve for local business tax by sector.

C. Other local taxes:

The calculating method is the same as calculation of extra-system fees.

*SAM (11, 2) "Central Government—Activities": Production tax distributed to the central government*

**Calculating Method:** The production tax distributed to the central government is also divided into three items: value-added taxes, business taxes, and other production taxes.

A. National value-added taxes:

Value-added taxes collected from enterprises are distributed between the local government and the central government at a ratio of 1:3. So the national value-added taxes by sector are three time those of the local government.

B. National business taxes:

We find national business tax by sector by multiplying the total national business tax by its shares of sectoral business taxes calculated above.

C. Other national taxes:

The calculating method is the same as calculation of extra-system fees.

*SAM (9, 2) "Extra-system—Activities": Extra-system fees*

**Calculating Method:** There are no data available for extra-system fees, consequently we estimate them as follows:

We subtract production taxes and subsidies from the net production tax of each sector, and get sectoral residues. Then we take these residues as structural parameters and the total extra-system fee as a controlling number, and find the value of extra-system fees by sector.

*SAM (5, 3)"Households—Labor": Labor income*

**Calculating Method:** Labor income is divided into a 2×3 matrix, reflecting earnings of rural and urban households by labor category.

1. We find the amount of rural and urban employment of Hubei from *China Labor Statistical Yearbook (1998)*, which is divided into 6 sectors.

2. Aggregate the employed people of 53 sectors according to above-mentioned 6 sectors, thus we can get the numbers of employment of 6 sectors.

3. In terms of the ratios of rural and urban employment calculated in step 1, we further subdivide the numbers of employment of 6 sectors calculated in step 2 into the numbers of rural and urban employment by sector and by three labor categories.

4. Merger these 6 sectors and get the numbers of rural and urban employment by three labor categories.

5. Multiply the figures obtained in step 4 by their corresponding labor equivalents.

6. Taking the total labor wages in *Hubei IO Table (1997)* as the controlling number and labor equivalents calculated in step 5 as structural parameters, we can easily get rural and urban labor incomes by labor categories.

*SAM (5, 4)"Households—Capital": Capital income*

**Calculating Method:** This account reflects the income of rural and urban households from land and non-land capital.

1. Capital income from land is assumed to be zero for urban households, therefore the returns to land capital calculated by disaggregating SAM (4, 2) are equal to rural households return from land.

2. Subtract the capital income from land from the total capital income to get the earnings of non-land capital.

3. Take the annual property income of residents of Hubei (*China Statistical Yearbook (2000)*) as structural parameters, and allocate capital income from non-land capital between rural and urban households.

*SAM (6, 4) "Enterprises—Capital": Enterprises' capital income*

See cell (6, 4), Macro SAM.

*SAM (12, 4)" ROW—Capital": Returns to foreign investment*

See cell (12, 4), Macro SAM.

*SAM (5, 6)"Households—Enterprise": Transfer payments from enterprises to households*

**Calculating Method:**

1. We find per capita transfer incomes of rural and urban households from the *Hubei Statistical Yearbook (1998)*, and then multiply them by the rural and urban population of Hubei to get gross transfer incomes for rural and urban households.

2. Taking transfer incomes as structural parameters, we can allocate the total transfer payments between rural and urban households.

*SAM (5, 10)"Households—Local government": Transfer payment from the local government to households*

**Calculating Method:** Similarly, we take transfer incomes as structural parameters, and allocate the total transfer payment from the local government to households between rural and urban households.

*SAM (10, 5) "Local government—Households": Individual income taxes*

**Calculating Method:** Because there is no statistical data available for rural and urban households, here we assume that 80% of individual income taxes come from urban households, while the other 20% come from rural households.

*SAM (14, 5) "Savings—Households": Savings of households*

**Calculating Method:** There is no statistical data available for rural and urban households. We find the national savings of rural and urban households from the *China Statistical Yearbook (1998)*, the *Finance Yearbook of China (1998)* and the *China Securities and Futures Statistical Yearbook (2002)*. Under the assumption that the ratio of urban savings to rural savings of Hubei is the same as that of the nation, we decompose the total household savings in the Macro SAM into urban and rural savings.

*SAM (10, 6)"Local government—Enterprises": Direct enterprise taxes collected by the local government.*

See cell (10, 6), Macro SAM.

*SAM (11, 6) "Central government—Enterprises": Direct enterprise taxes collected by the central government*

See cell (11, 6), Macro SAM.

*SAM (14, 6) "Savings—Enterprises": Enterprises' savings*

See cell (14, 6), Macro SAM.

*SAM (10, 7) "Local government—local government subsidy": Local government subsidy*

See cell (7, 2), Macro SAM.

*SAM (14, 9) "Savings—Extra-system": Savings of the extra-system*

See cell (14, 9), Macro SAM.

*SAM (10, 11) "Local government—Central government": Transfer payments from the central government to the local government*

See cell (10, 11), Macro SAM.

*SAM (11, 10)"Central government—Local government": Transfer payments from the local government to the central government.*

See cell (11, 10), Macro SAM.

*SAM (14, 10)"Savings—Local government": Savings of the local government.*

See cell (14, 10), Macro SAM.

*SAM (14, 11)"Savings—central government": Savings of the central government*

See cell (14, 11), Macro SAM.

*SAM (14, 12) "Savings—ROW": Foreign savings*

See cell (14, 12), Macro SAM.

*SAM (14, 13) "Savings—ROMC": Savings of the rest of mainland China*

See cell (14, 13), Macro SAM.

*SAM (15, 14)"Stock change—Investment": The total amount of stock change*.

See cell (15, 14), Macro SAM.

# 4. Scenarios

Proposed scenarios:

1. The impact of improvement of agricultural productivity on the scale of urban-rural migration.

2. The impact of the reform of land property rights and the Household Registration System (*Hukou*) on the scale of urban-rural migration.

3. The impact of the integration of urban and rural dual labor markets on the scale of urban-rural migration, reflected by the migration elasticity parameter.

4. The impact of urban-rural migration on poverty-reduction in sending areas, reflected by the changes in GDP and welfare.

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