

**Problem Set 3**  
**11. 481J, 1.284J, ESD.284J**  
**Spring 2006**  
**Due: Friday, April 21, 2006 (noon)**

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**PART A: China Interregional Input-Output Data**

The Chinese economy has been growing at about 9% per year for the past 15 years. One result of this growth has been increased needs for transportation freight and people around the country. Assume that in the current year, the Ministry of Transportation is trying to help meet this demand by constructing a major system of highways (not just one road) that runs from the North to the South of China. In this exercise, we arbitrarily divide China into the North and South regions, using the Yangtze River as the dividing line. The North includes all provinces and municipalities located north of the river; whereas the South represents all provinces and municipalities situated south of the river.

You, as a member of the Ministry staff, are responsible for analyzing the economic impacts of the highway construction on both regions. Your first task is to construct an accounting table for each of the two regions. You are provided with the 1987 statistical account information of both regions in the attached table. Although these are relatively old numbers, the staff would like you to construct the tables to help them determine whether such a set of accounts will be useful for their future work and what additional information they would need. [Note: The underlying numbers are actual 1987 data assembled by researchers at the Development Research Centre of the State Council and just released. Even so, we made some adjustments to the data for the purposes of this exercise, so that they should not be used for other studies.]

Your first task is to construct an accounting table for each of the two regions. You are provided with 1987 statistical-account information for both regions in the attached table<sup>1</sup>

- A1. From the information given in Appendix A and using the attached Excel worksheet REGION, construct an input-output table for each of the two regions, showing both intermediate and final transactions. You will have to create two regional input-output tables, one for North China and one for South China, based on the data provided in the attached table. When you enter the data into the worksheet REGION, the worksheet will automatically calculate the gross regional consumption and gross regional outlays for you, but you will need to enter the appropriate title and other information concerning the data. (50 points)
- A2. Specify the gross regional product in 1987 for each of the two regions. Please also specify the gross regional income in 1987 for each of the two regions. Explain why they are the same or different.  
(20 points)

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<sup>1</sup> Data Source: Ichimura, Shinichi and Wang, Hui-Jiong, ed. 2003. Interregional Input-Output Analysis of the Chinese Economy. World Scientific Publishing Co.

- A.3 The Ministry of Transport staff are puzzled by the term “Gross Product Originating.” They ask you to provide them with a brief (2-3 sentence) explanation of the term and the use they should or should not make of such information for planning the highway network. (10 points)
- A4. Give a brief explanation of the following entries:  
(12 points)
- a. The entries in the transportation column (hint: explain the cost structure of the transportation sector in each region);
  - b. The entries in the transportation row.

For your reference, Appendix B provides more detailed information about the two regions to be considered in this analysis.

**PART B: U.S. Gross National Product (GNP)**

The GNP definition attached in Appendix C was published in the Boston Globe.

(1) Explain whether or not the definition is correct and why. (2) What difference, if any, would it make if you were to comment on this as a definition of Gross Domestic Product, rather than Gross National Product?

## APPENDIX A

1987 DATA FOR NORTH AND SOUTH CHINA (million RMB)		
	NORTH	SOUTH
<b>AGRICULTURE</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	410,270	192,525
to industry	741,428	343,599
to construction	44,008	3,042
to transportation	321	258
to commerce and services	56,484	38,870
<i>Sales of final goods</i>		
to household consumption	1,464,816	611,855
to social consumption	27,086	26,570
to investment	158,584	66,728
to net foreign export	241,339	132,389
<i>Adjustment</i>	-46,180	0
<b>INDUSTRY</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	362,714	174,588
to industry	3,610,230	2,263,820
to construction	675,090	341,353
to transportation	138,537	66,315
to commerce and services	544,530	284,872
<i>Sales of final goods</i>		
to household consumption	1,571,945	858,947
to social consumption	40,984	23,915
to investment	1,207,336	879,571
to net foreign export	-272,739	-379,189
<i>Adjustment</i>	315,848	0
<b>CONSTRUCTION</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	0	18
to industry	0	25
to construction	15	5
to transportation	0	3
to commerce and services	0	282
<i>Sales of final goods</i>		
to household consumption	19	4,006

to social consumption	400	0
to investment	1,059,111	688,767
to net foreign export	371,680	57,201
<i>Adjustment</i>	-236,709	0
<b>TRANSPORTATION</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	22,323	26,505
to industry	221,337	111,815
to construction	61,349	30,507
to transportation	9,264	14,823
to commerce and services	48,980	15,862
<i>Sales of final goods</i>		
to household consumption	89,568	40,186
to social consumption	1,117	871
to investment	60,200	38,100
to net foreign export	-19,830	-25,500
<i>Adjustment</i>	30,125	0
<b>COMMERCE AND SERVICES</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	80,502	33,976
to industry	462,122	289,179
to construction	83,181	41,773
to transportation	40,768	15,090
to commerce and services	278,253	148,768
<i>Sales of final goods</i>		
to household consumption	610,174	325,235
to social consumption	779,079	371,154
to investment	96,163	68,085
to net foreign export	79,766	15,010
<i>Adjustment</i>	-63,083	0
<b>DEPRECIATION (Consumption of capital)</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	59,726	31,344
to industry	494,372	208,610
to construction	48,509	18,027
to transportation	87,070	44,969
to commerce and services	221,220	109,492

<i>Sales of final goods</i>		
to household consumption	n.a.	n.a.
to social consumption	n.a.	n.a.
to investment	n.a.	n.a.
to net foreign export	n.a.	n.a.
<i>Adjustment</i>	n.a.	n.a.
<b>LABOR INCOME</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	1,906,407	807,025
to industry	691,504	352,262
to construction	258,913	136,692
to transportation	71,345	46,423
to commerce and services	505,660	267,059
<i>Sales of final goods</i>		
to household consumption	n.a.	n.a.
to social consumption	n.a.	n.a.
to investment	n.a.	n.a.
to net foreign export	n.a.	n.a.
<i>Adjustment</i>	n.a.	n.a.
<b>WELFARE FUNDS</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	27,890	20,079
to industry	67,458	32,801
to construction	18,473	8,287
to transportation	5,599	3,886
to commerce and services	53,469	23,965
<i>Sales of final goods</i>		
to household consumption	n.a.	n.a.
to social consumption	n.a.	n.a.
to investment	n.a.	n.a.
to net foreign export	n.a.	n.a.
<i>Adjustment</i>	n.a.	n.a.
<b>PROFITS AND TAXES</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	161,366	68,518
to industry	1,491,946	841,508
to construction	68,690	38,808
to transportation	135,078	61,292

to commerce and services	539,785	326,564
<i>Sales of final goods</i>		
to household consumption	n.a.	n.a.
to social consumption	n.a.	n.a.
to investment	n.a.	n.a.
to net foreign export	n.a.	n.a.
<i>Adjustment</i>	n.a.	n.a.
<b>OTHER VALUE-ADDED</b>		
<i>Sales of goods and services to other sectors</i>		
to agriculture	104,063	24,156
to industry	308,274	176,377
to construction	43,220	24,881
to transportation	26,777	9,785
to commerce and services	219,634	71,445
<i>Sales of final goods</i>		
to household consumption	n.a.	n.a.
to social consumption	n.a.	n.a.
to investment	n.a.	n.a.
to net foreign export	n.a.	n.a.
<i>Adjustment</i>	n.a.	n.a.

Source: Shunichi Ichimura and Hui-Jiong Wang, eds. 2003. *Interregional Analysis of the Chinese Economy*. Hong Kong: World Scientific (data aggregated by Lee Kai-Yan from the regional data disk accompanying book. Data were adjusted slightly by Karen R. Polenske from those published to make the accounts consistent.)

## Appendix B

### SUMMARY OF CHINA'S NORTH AND SOUTH REGIONS IN 1987 (PERCENT)

Region	Provinces and Municipalities	Land	Population	GDP
North	Beijing, Tianjin, Hebei, Shandong, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Shanxi, Henan, Anhui, Hubei, Hunan, Jiangxi, Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang	61.7	73.3	65.0
South	Shanghai, Jiangsu, Zhejiang, Guangdong, Fujian, Hainan, Sichuan, Guizhou, Yunnan, Guangxi, Tibet	38.3	26.7	35.0

Source: Nobuhiro Okamoto and Takeo Ihara, eds. 2004. *Spatial Structure and Regional Development in China*, Chiba, Japan: Institute of Developing Economies (IDE), JETRO, p. 53.

Note: This table shows the North and South approximate regional shares of land area, population, and Gross Domestic Product in China's economy in 1987.

## APPENDIX C

### THE BOSTON GLOBE \* SATURDAY, JANUARY 26, 1991 ASK THE GLOBE

**Q.** How is the term "Gross National Product" defined? - *D.E., Somerville*

**A.** Barron's Dictionary of Finance and Investment Terms defines the Gross National Product (GNP) as the total value of goods and services produced in the United States over a particular period of time (usually a year). It is made up of consumer and government purchases, private, domestic and foreign investments in the United States and the total value of exports. Figures on an annual basis for the GNP, the primary indicator of the status of the economy, are released every quarter, as is an inflation-adjusted version, called "the real GNP."