

CIP Database Round 1.0

Technical Notes^{*}

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This “Technical Notes” defines the indicators of the China Industrial Productivity (CIP) Database Round 1.0 and briefly introduces how they are constructed with the available data sources as well as existing studies on data problems. The data construction procedures in detail are reported in a discussion paper (DP). The DP will also report the results of preliminary labor productivity analysis based on the CIP 1.0 data.

Coverage

CIP Database Round 1.0 covers the entire Chinese economy at the industry level in a framework of the Chinese System of National Accounts (CSNA) for the period 1987-2008. This period begins with the first SNA-type Chinese Input-Output Table (CIOT) 1987, and includes five full-scale CIOTs with an interval of five years. We have made the constructed employment accounts exactly match the CSNA framework.

Industrial Classification

CIP 1.0 industrial classification standard is in line with the classifications of the EU/KLEMS implemented by the Groningen Growth and Development Center, University of Groningen (GGDC). The industrial classification of the raw data conforms to the 2002 version of the China Standard of Industrial Classification (CSIC). The available data are in 32 industries of the (regrouped) 33 EU/KLEMS industries (Timmer, *et al*, 2007).

Industrial Classification of CIP Database

TT	Total Economy (1000 persons, mid-year)
AtB	Agriculture, Hunting, Forestry and Fishing
C	Mining and Quarrying
15t16	Food, Beverages and Tobacco
17t18	Textiles and Textile Products
19	Leather, Leather and Footwear
20	Wood and Products of Wood and Cork
21t22	Pulp, Paper, Paper , Printing and Publishing
23	Coke, Refined Petroleum and Nuclear Fuel
24	Chemicals and Chemical Products
25	Rubber and Plastics
26	Other Non-Metallic Mineral
27t28	Basic Metals and Fabricated Metal
29	Machinery, Nec (not elsewhere classified)
30t33	Electrical and Optical Equipment

* Keiko Ito and G.J. de Vries helped prepare for notes on the SUTRAS-based reconstruction of Chinese IOT.

34t35	Transport Equipment
36t37	Manufacturing, Nec; Recycling
E	Electricity, Gas and Water Supply
F	Construction
50t52	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel
H	Hotels and Restaurants
60	Inland Transport
61	Water Transport
62	Air Transport
63	Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies
64	Post and Telecommunications
J	Financial Intermediation
70	Real Estate Activities
71t74	Renting of machinery & equipment and Other Business Activities
L	Public Admin and Defense; Compulsory Social Security
M	Education
N	Health and Social Work
O	Other Community, Social and Personal Services
P	Private Households with Employed Persons

It should be noted that in our SUTRAS-based reconstruction of the CIOT (see below) (Temurshoev and Timmer, 2010), we adopt a slightly different classification from the above. That is, 50t52 is split into 51 (Wholesale trade and commission trade services, except motor vehicles and motorcycles) and 52 (Retail trade services, except motor vehicles and motorcycles; repair services of personal and household goods), utilizing the information taken from the China Economic Census 2004. 67 (Services auxiliary to financial intermediation) is included in 65 (Financial intermediation services, except insurance and pension funding services). 71 (Renting services of machinery and equipment without operator and of personal and household goods; for 1997 only) and 72 (Computer and related services) are included in 73 (Research and development services).

List of Main Indicators

EMP1:	Persons employed in thousands
EMP2:	Hours worked in millions
ALH:	Average hours worked per person per year
DEF:	Producer Price Index (PPI) with 2005=100 for industrial sectors and national accounts implicit price index (IPI) for non-industrial sectors
GVO:	Gross value of output at current price in millions of RMB
GVA1:	Gross value added at current price in millions of RMB
GVA2:	Gross value added at 2005 price in millions of RMB (single deflation approach)

GVA2P: GVA per person at 2005 price

GVA2H: GVA per hour at 2005 price

CIP Reconstructed Chinese Input-Output Tables

The CIP 1.0 reconstructed CIOTs are generated by the SUTRAS program of the WIOD-EU/KLEMS with control totals given by the data of CSNA. The CIOTs are at producer prices; no margins and net taxes on products are available.

It is available for five benchmark years:

CIOT 1987

CIOT 1992

CIOT 1997

CIOT 2002

CIOT 2007

Main Procedures in Data Construction

1. GVO and GVA in Nominal Terms: The indicators of GVO and GVA in CIP 1.0 are reconstructed based on two major sources of data: a) China's annual national accounts that give the "control totals" for the aggregate economy and its broad sectors and b) 2-digit level industries of the industrial sector at the "designated size." The national totals are based on the 2008 National Economic Census results-adjusted data. Inconsistent classifications of national accounts are adjusted to conform to CSIC 2002 and regrouped in line with the EU/KLEMS (Timmer, *et al*, 2007). Finally, they are reproduced by the EU/KLEMS SUTRAS program (Temurshoev and Timmer, 2010).
2. GVA at 2005 Prices: To deflate GVA, CIP 1.0 employs price data from three sources: a) implicit national accounts price data for value added by sectors which can be derived from reported GVA in nominal terms and GVA annual growth rate index in real terms; b) NBS reported PPIs for 2-digit industries of mining, manufacturing, and utilities (e.g. see NBS, CSY, 2010, Tables 9-11 and 9-12) and c) PPIs at commodity level are obtained from NBS (internal). With little producer price information for services, CIP 1.0 does not intend to estimate PPIs for all sectors and adopts the single deflation approach.
3. Numbers Employed: To construct employment accounts that exactly match the national output accounts, CIP 1.0 utilizes three steps: a) following Wu (2011) and Wu and Yue (2010), it adjusts the serious structural break in the official data, presenting a huge gap (80 to 100 million) between the population census-recorded employment and annual estimates since 1990 and allocates the additional employment to industries; b) following Wu and Yue (2010), the employment of the industrial sector is first reconstructed with detailed industrial statistics of annual reports and censuses, which serves as the hard core of the whole reconstruction and adjustment, and c) the rest of the employment is then reconciled with all information available for the non-industrial sectors, i.e., agriculture and services. However, the employment data are not yet quality adjusted.
4. Hours Worked: There have been no systematic official estimates on hours worked. Hours worked based on censuses and occasional surveys are still under construction. Thus, the CIP 1.0 number-hour conversion is inevitably mechanical. The approach used

here is to make the institutional working hours of the official calendar as the baseline, and then use anecdotal information-based assumptions to adjust non-baseline industries, in which the state sectors are assumed to follow the baseline, whereas non-state industries, especially labor-intensive ones, practice longer working hours per week (for details see Wu and Yue, 2010).

5. Chinese Input-Output Tables (CIOT): The industry-level GVA and GVO data are taken from the time-series Supply and Use Tables (SUTs) estimated using the WIOD SUTRAS program (Temurshoev and Timmer, 2010). The data sources and our approach for the estimation of the time-series SUTs are described as follows.
 - a. From the published supply tables, we use the secondary production information (only available for industry: mining, manufacturing, and public utilities) in constructing the supply block. Row and column totals in the supply block are from the CIOTs, but the distribution is obtained from the official supply table from the NBS (NBS, CIOT, various volumes). The procedure to obtain consistency with the row and column totals is the so-called RAS-procedure (Temurshoev and Timmer, 2010).
 - b. In the SUTs and IOTs, the tables are balanced using a variable called “Others” or Error. That is: Intermediate Inputs + Final Demand + Error = Gross Output + Import. We distributed the error in each variable in the Final Demand Section using the share of each variable in the Final Demand. (Note: In some cases, the total Final Use (Final Demand) is zero or negative. For example, for the product “37” (secondary raw materials) for 1997, the Final Demand is zero. In such cases, we put the error in the variable “Changes in Inventory”.)
 - c. No adjustment of Imports CIF to Imports Free on Board (FOB) is provided. Exports are valued at FOB.
 - d. Financial Intermediation Services Indirectly Measured (FISIM) is not reported. Presumably, they are included in the intermediate use table.
 - e. Direct purchases abroad by residents and purchases on the domestic territory by non-residents are not reported.
 - f. Exports and imports for processing and assembling with materials provided abroad are not recorded in the exports and imports sections in the 2007 CIOT. However, NBS provides the estimated values for exports and imports including this type of processing trade in the Appendix of the 2007 CIOT. We use these estimated values for the compilation of the CIP Input-Output Tables. Moreover, the original 2007 CIOT do not include such imported materials and processed goods for exports in the input-output matrix. Only the value added accrued from such activities is counted in the CIOT. Although it is necessary to make adjustments for the input-output matrix per se, we did not do so. At this stage, we adjusted only export and import values and keep the original gross output values using the “error” (others) column as a balancing term.

*References**

A. Raw Data

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- 3) NBS, *China Statistical Yearbook* (CSY), various issues
- 4) NBS, *China Input-Output Table* (CIOT), 1987, 1992, 1997, 2002 and 2007
- 5) NBS, *Historical Data of Gross Domestic Product of China, 1952-1995*
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B. Papers

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