China Industrial Productivity (CIP) Database

Set up, progress, challenges, and relations with the world KLEMS

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In this presentation…

- About the CIP project
- Relations with the World KLEMS
- Connections with the previous work
- Progress so far
- Challenges ahead

The CIP Plan

- An IER/Hitotsubashi-RIETI joint research project.
- The current round of the project is for the period 2010-12.
- It aims to construct conceptually standard and methodologically KLEMS-compatible database that is eventually open to the public.
- At the same time, it engages world-wide researchers in policy-oriented, production function analysis on the post-reform Chinese economy at industry level, as well as international comparisons. In particular:
  - The role of government in resource reallocation compared with the market from a productivity perspective
  - The productivity effect of different reform models, shock therapy versus gradualist
  - Dynamic comparative advantage from a productivity perspective

The CIP Plan…

- Features of the CIP database

  - Period covered: 1980/85-2010
  - Industry classification: Based on CSIC2002 (ISIC v3, compatible), linked back to CSIC1972, CSIC1985 and CSIC1994, fully reconcilable with the Chinese I/O tables
  - Regional break down: rural vs urban (for the recent decade only)
  - Legal form (ownership type) break down: state, domestic non-state and foreign-invested enterprises (for the recent decade only)

The CIP Plan…

- Features of the CIP database
  - Labor data: numbers employed; adjusted for national totals; converted for hours worked; and adjusted for quality change by labor compensation
  - Capital data: alternative investment flows to official statistics; breakdown by structures (residential to be removed) and equipment; deflated by re-constructed industry-specific deflators; depreciated by alternative rates; adjusted for quality change by user costs
  - Output data: GVO and GVA based on available national accounts and input-output tables; adjusted for inconsistency with industry accounts; deflated by industry-specific output and input (if possible) deflators

The CIP and the World KLEMS

- The CIP project is conceptually and methodologically in line with the system of the world KLEMS
- The results of the CIP are aimed to be a coherent part of the KLEMS
- International collaborations
  - GGDC, aiming at setting up some regular joint program on both data and analytical studies
  - The productivity program of TCB China Center
  - The NBS-TCB joint productivity program
  - Together with JIP and KIP to develop links with other major Asian economies to enhance the work towards Asian KLEMS

Links to my previous work featured by …

- 39 (grouped to 24) industries of the industrial sector (mining, manufacturing and utilities as the sub-sectors) for the period 1949/52-2000/05
- Covering only enterprises at/above the “designated size” (previously “township level),
- Leaving those below the “size” and outside the regular “reporting-registration system” as a residual
- Adjusted for CSIC1994-CSIC2002 (no change for the industrial sector) (Chart)

EXAMPLES ON RECONCILIATION OF DIFFERENT CHINESE STANDARDS OF INDUSTRIAL CLASSIFICATION

Wu-Yue	1994 CISC		1985 CSIC		1972 CSIC	
Code[a]	Code	Industry	Code	Industry	Code	Industry
02	⇦07	Oil and natural gas extraction	⇦0900	Oil and natural gas extraction	⇦0401 ⇦0402	Oil extraction Gas extraction
12	⇦25	Petroleum refinery and coking	⇦3400	Petroleum refinery	⇦0403	Petroleum refinery
			⇦3510 ⇦3520	Coking Coal gas	⇦0321 ⇦0322	Coking Coal gas
24[b]	⇦45	Coal gas			⇦0310	Coal mining
01	⇦06	Coal mining	⇦0800	Coal mining		
…	…	…	…	…	…	
03	⇦08	Ferrous metal ore mining	⇦1000	Ferrous metal ore mining	⇦0111	Ferrous metal ore mining
	⇦09	Non-ferrous metal ore mining	⇦1100	Non-ferrous metal ore mining	⇦0121	Non-ferrous metal ore mining
16	⇦32	Ferrous metal smelting and pressing	⇦4800	Ferrous metal smelting and pressing	⇦0112	Ferrous metal smelting and pressing
	⇦33	Non-ferrous metal smelting and pressing	⇦4900	Non-ferrous metal smelting and pressing	⇦0122	Non-ferrous metal smelting and pressing

Links to my previous work…

- Employment series, reconstructed and conceptually adjusted to international standards in numbers, hours, compensation, and quality (see the following table)
- Adjusted for structural breaks (see the following chart)
- … in parallel to a “tidy version” of the NBS series on numbers employed

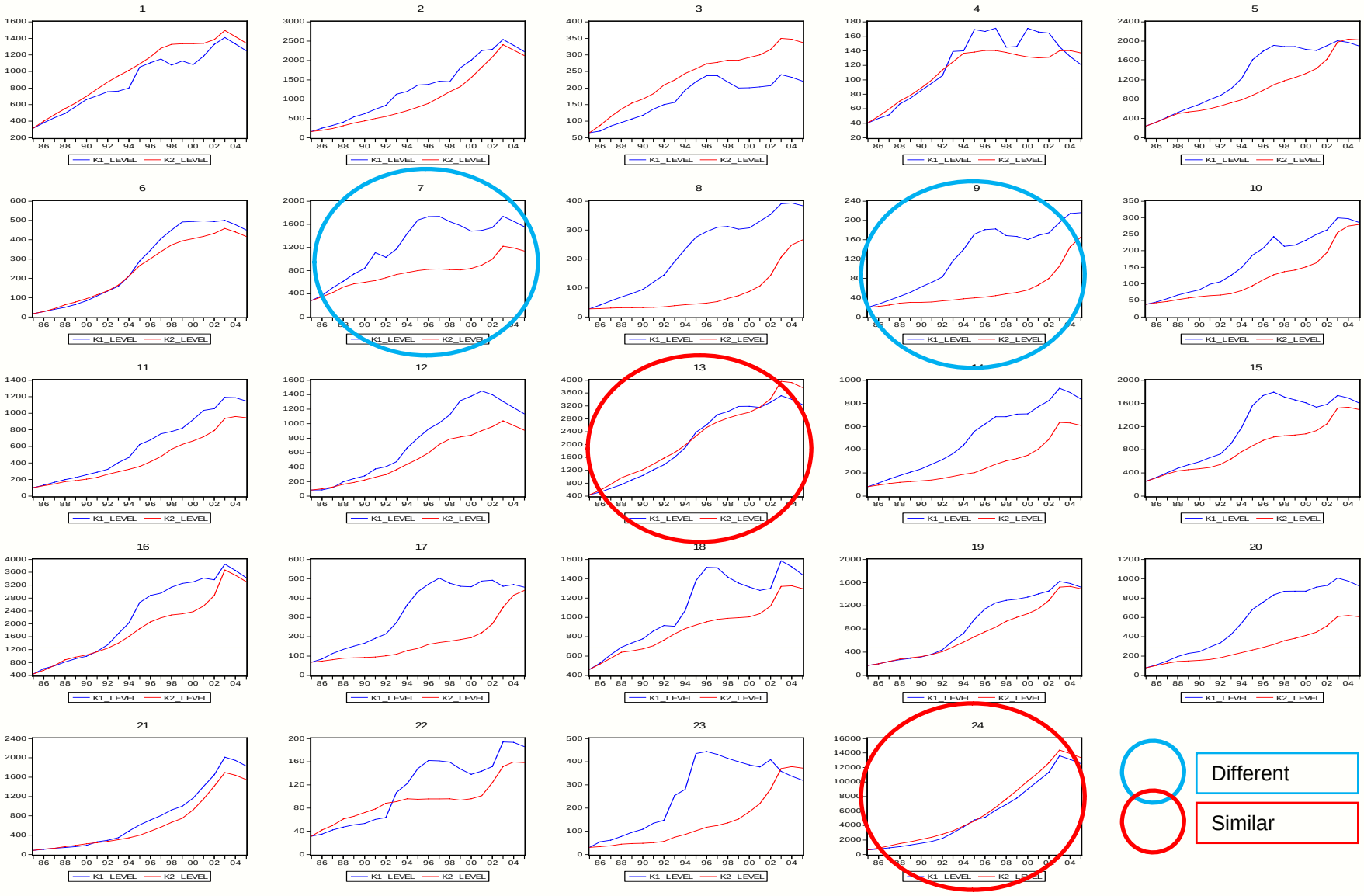
TABLE 1
CLASSIFICATION FOR SECTORAL AND HUMAN CAPITAL ATTRIBUTES OF LABOUR INPUTS

Industrial Sector (s)	Human Capital Attribute
1. Coal mining	Gender: (g)
2. Oil and gas extraction	1. Male
3. Metallic mineral mining	2. Female
4. Non-metallic minerals mining	Age Group: (a)
5. Food & kindred products	1. 15-19
6. Tobacco products	2. 20-24
7. Textiles	3. 25-29
8. Apparel	4. 30-39
9. Leather & leather products	5. 40-49
10. Saw mill products & furniture	6. 50-54
11. Paper products, printing & publishing	7. >54
12. Petroleum & coal products	Education Attainment: (e)
13. Chemicals & allied products	1. Illiteracy or semi-illiteracy
14. Rubber & plastics products	2. Primary school
15. Stone, clay & glass products	3. Junior high school
16. Metals smelting, pressing & rolling	4. Senior high school
17. Metal products	5. Tertiary education
18. Industrial machinery & equipment	Occupation: (j)
19. Transportation equipment	1. Managerial & administrative staff
20. Electrical equipment	2. Technicians & engineers
21. Electronic & telecommunication equip.	3. Production workers
22. Instruments and office equipment	Ownership Type: (o)
23. Miscellaneous manufacturing	1. State-owned enterprises (SOEs)
24. Power, steam, gas and tap water supply	2. Non-SOEs at/above township level
	3. Other status below township (village level and household/self-employed)

Links to my previous work…

- Industry capital stock is estimated with a novel approach that derives flows from the official stock data at historical costs, breaks down structures and equipment, constructs the initial stock, measures price change and depreciation
- The new investment flow-based stock estimates are made in parallel to those using the official investment statistics for comparison (see the following chart)
- However, official investment indicator is not based on the national accounts concept of fixed capital formation, FCF

Estimated Net Capital Stock by Industry: Wu (K1/Blue) vs Official (K2/Red) (1985=100)



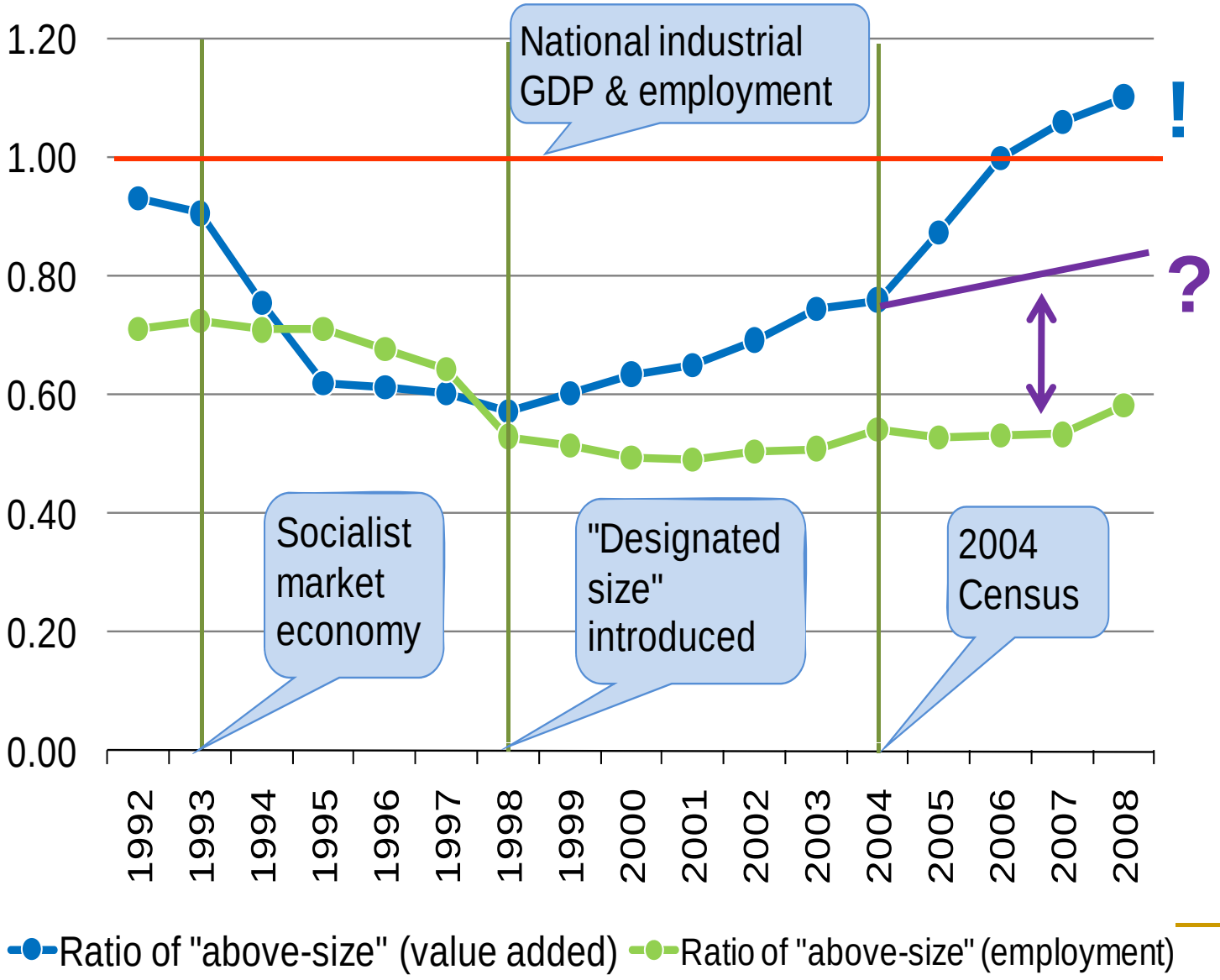
Progress so far…

- Have revisited all conceptual and classification problems in employment and investment in Chinese statistics
- Investigated all sources of annual series and now moving to all census-based data aiming to use all available information to fill data gaps and make the constructed data consistent
- Services have been the focus of the CIP so far in basic data construction
- A significant progress has been made in estimating industries of below size and outside the system (self employed) for the industrial sector
- A significant progress has been made in constructing national accounts-consistent GVO and GVA at nominal prices using the GGDC SUTRAS program

Challenges in the CIP…

- How to deal with the industry level data inconsistency with the national accounts? (see the following chart)
  - Assuming a growth along the past trend?
  - Imposing fixed ratios from the most recent census?
  - Or something else that is more coherent with the I/O tables?

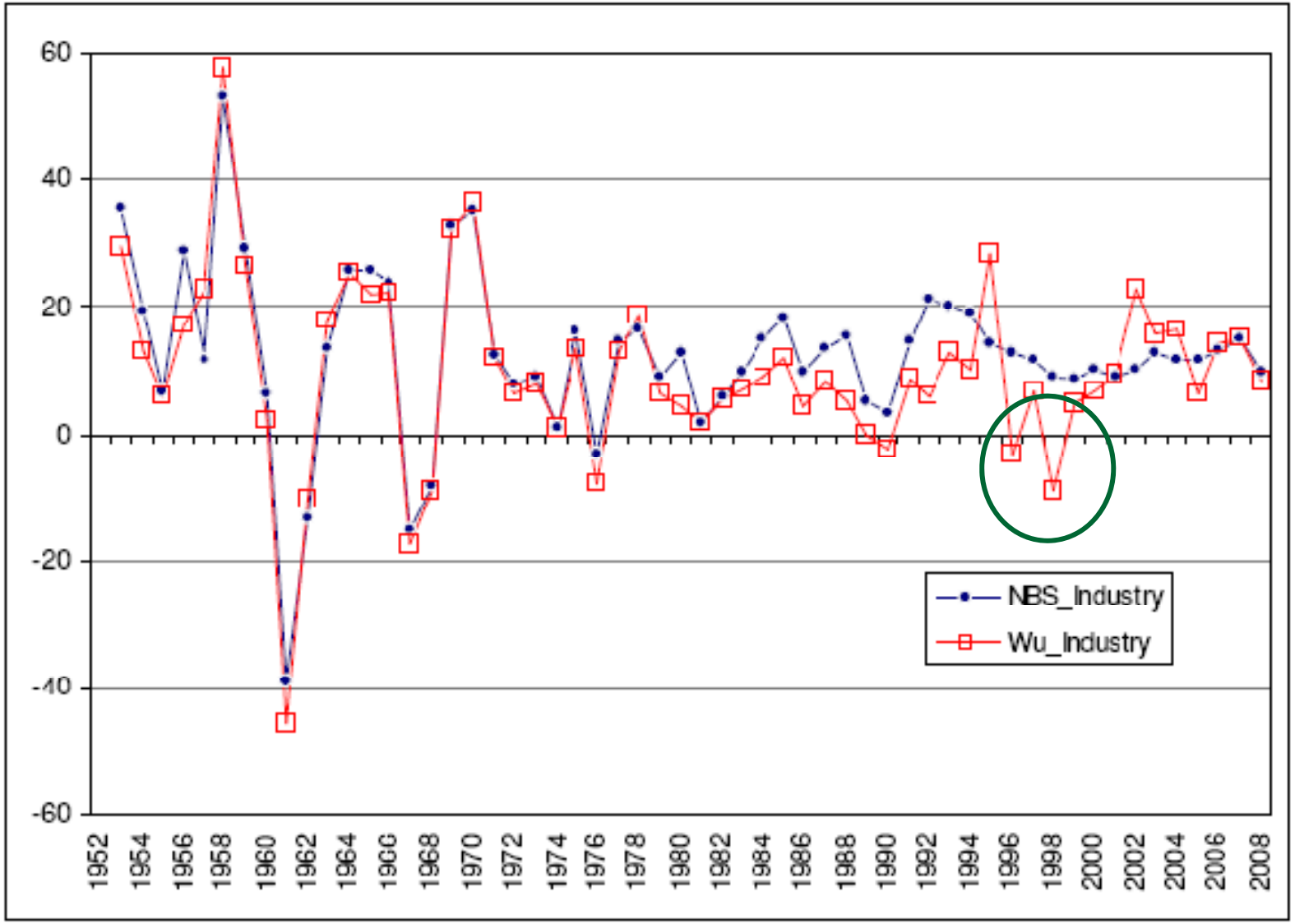
The national accounts are blown up…



Challenges in the CIP…

- On the other hand, how to deal with the likely exaggeration of the national accounts in output?
- Stick to the national accounts or produce two alternative databases in parallel?
- See the following chart…

Industrial output has been exaggerated?



Challenges in the CIP…

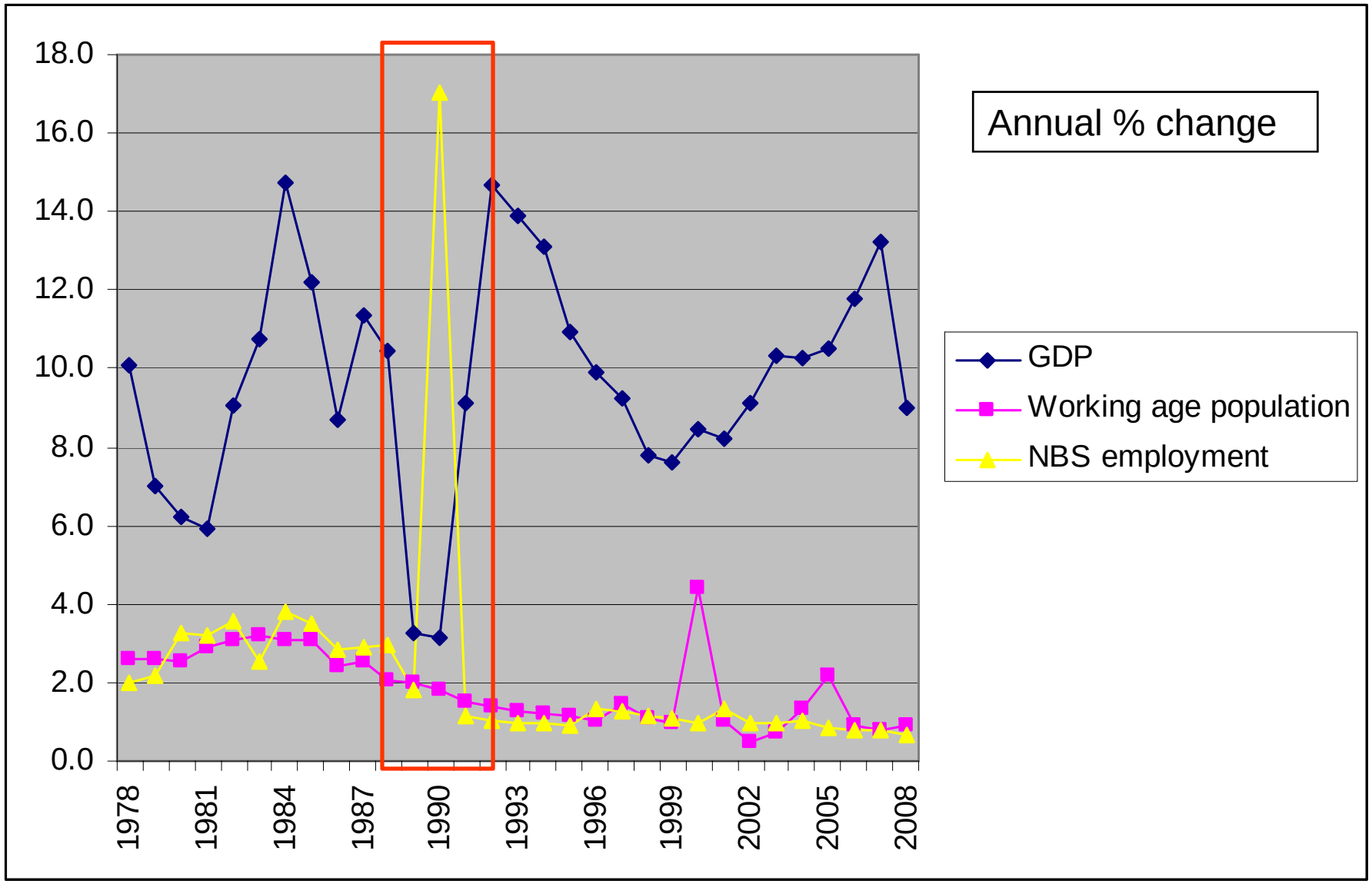
- Capital: serious inconsistencies between
  - fixed asset investment (FAI) collected and reported by NDRC (the modern form of the old planning commission) that includes land transaction fees (the total FAI is about 20-30% higher than FCF, apparently adjusted by NBS)
  - fixed capital formation (FCF) – national accounts concept, but there is still substantial mis-categorization of inventory as fixed capital formation as admitted by NBS
  - (implicit) actual increase in the capital stock at the industry level (production accounts as in accounting book)

- Currently, for the industrial sector investment flows are derived from the production accounts. If this is acceptable, how about services?

Challenges in the CIP…

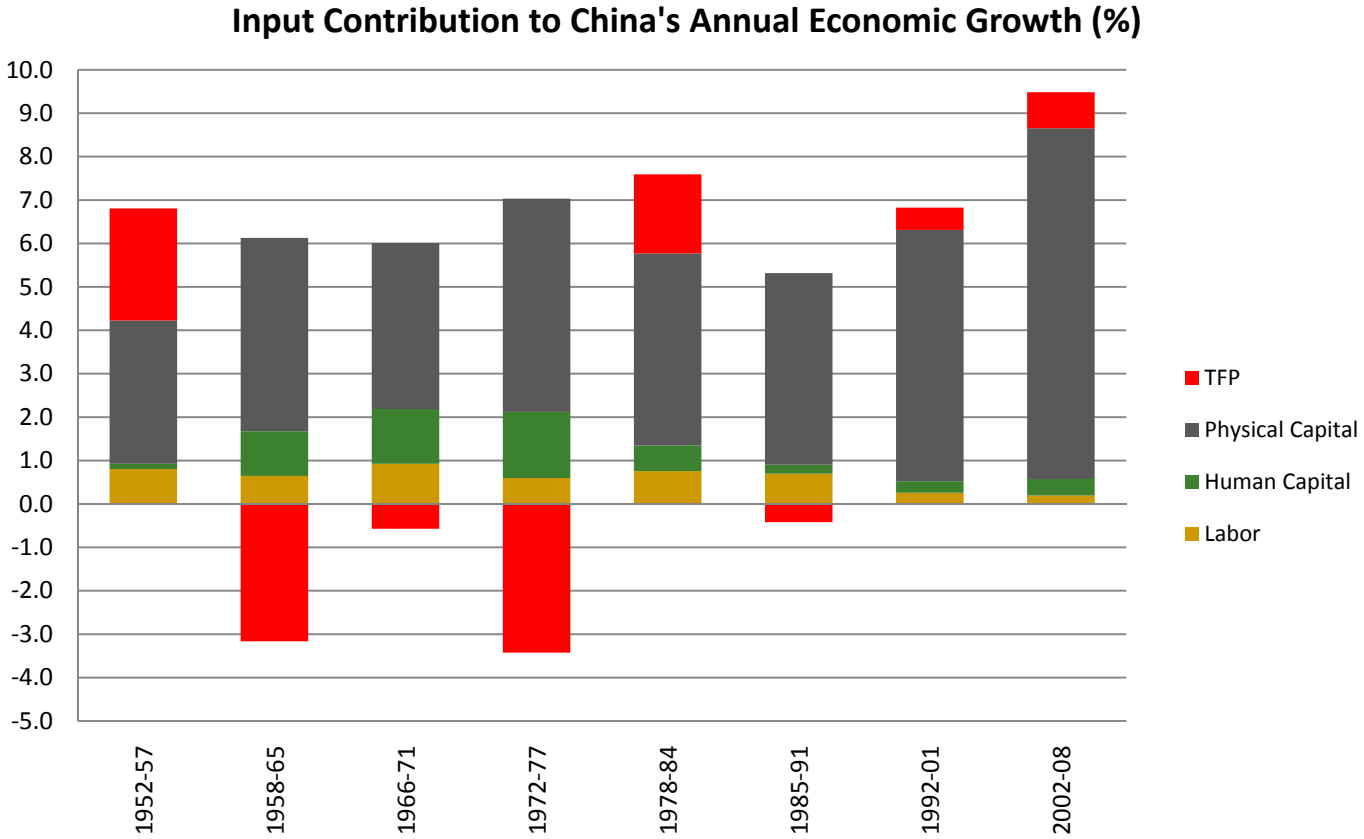
- Employment: serious inconsistency between annual statistics collected through the regular reporting system and by the population census (and population annual sample surveys), which use different concepts of employment
- The regular system collects data mainly from the formal sector with stable employment that is monitored by the authorities,
- whereas the census and population sample surveys also cover employment from informal sectors, temporary workers, non-registered self-employed
- An astonishing structural break in employment appeared in 1990 (see the growth rate in the chart) that could not be justifiable by fundamental forces in the economy

The structural break in employment series



A preliminary result for the aggregate economy after all adjustments.

Implications? TFP gain or lost is likely due to policy regime shift shocks and growth in general is investment driven



Comments or ideas?
Thank You!