Structural Change and Economic Growth in Japan: Interindustry Effects of Productivity Growth

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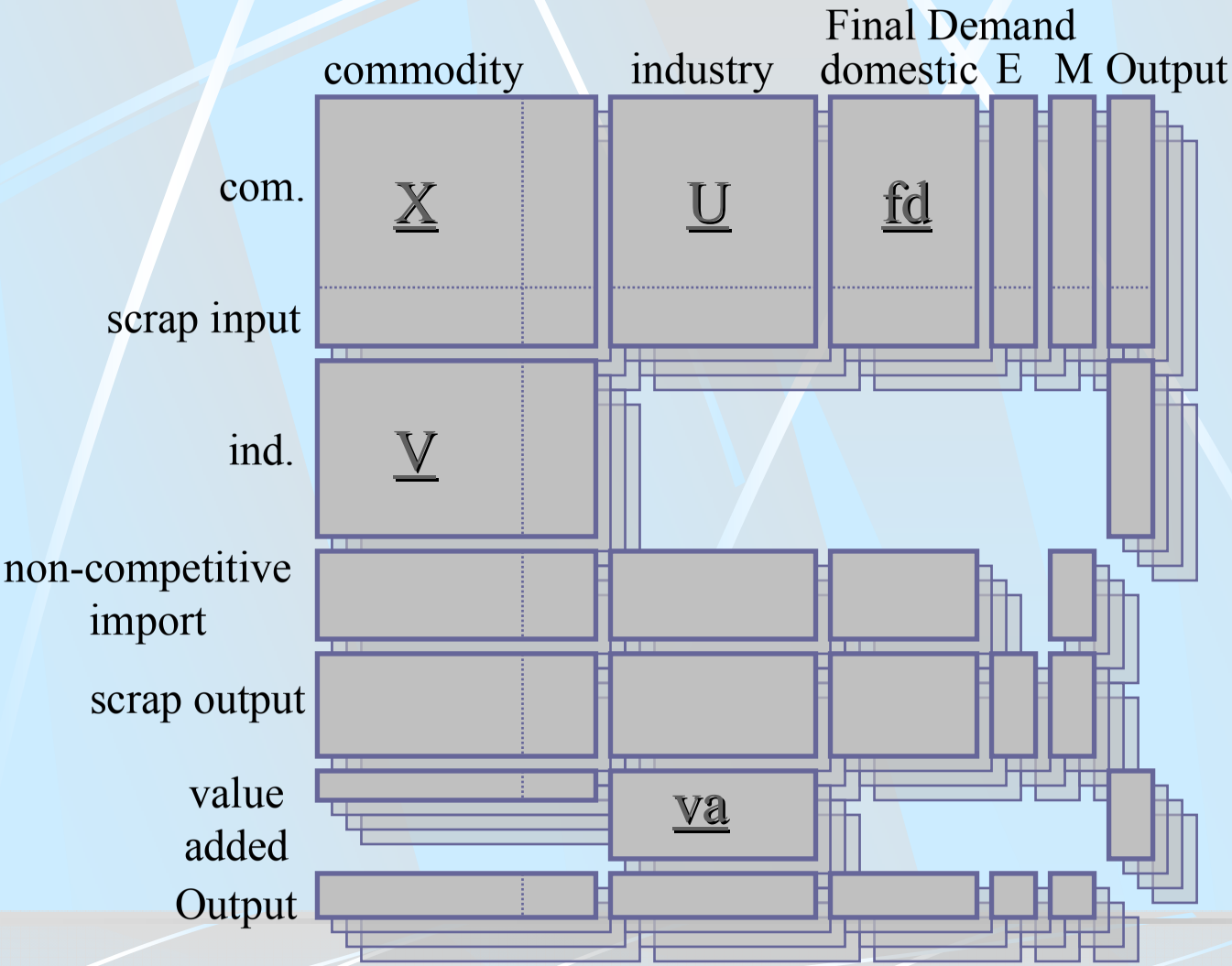
The 17-th TRIO conference @Keio University

Today's Topics

- Outlines of KDB(Keio Economic Observatory Database)
- Structural Change in Japan(Skyline Analysis)
- Sources of Aggregate Productivity Growth and Industry Contributions
- Interindustry Effects of Productivity Growth on Commodity Prices

KEO Data Base (KDB) Input-Output Table



Sector Classification

1. Agriculture.Forestry & Fishery	23. Motor Vehicle
2. Coal Mining	24. Other Trasp. Machinery
3. Other Mining	25. Precision Instruments
4. Building & Construction	26. Other Manufacturing
5. Food Manufacturing	27. Railway Transportation
6. Textile	28. Road Transportation
7. Apparel	29. Water Transportation
8. Woods & Related Products	30. Air Transportation
9. Furniture & Fixture	31. Storage Facility Service
10. Paper & Pulp	32. Communication
11. Publishing & Printing	33. Electricity
12. Chemical Products	34. Gas Supply
13. Petroleum Refinery	35. Water Supply
14. Coal Products	36. Wholesale & Retail
15. Rubber Products	37. Finance & Insurance
16. Leather Products	38. Real Estate
17. Stone & Clay	39. Education
18. Iron & Steel	40. Research
19. Non-ferrous Metal	41. Medical Care
20. Metal Products	42. Other Service
21. General Machinery	43. Public Services
22. Electric Machinery	

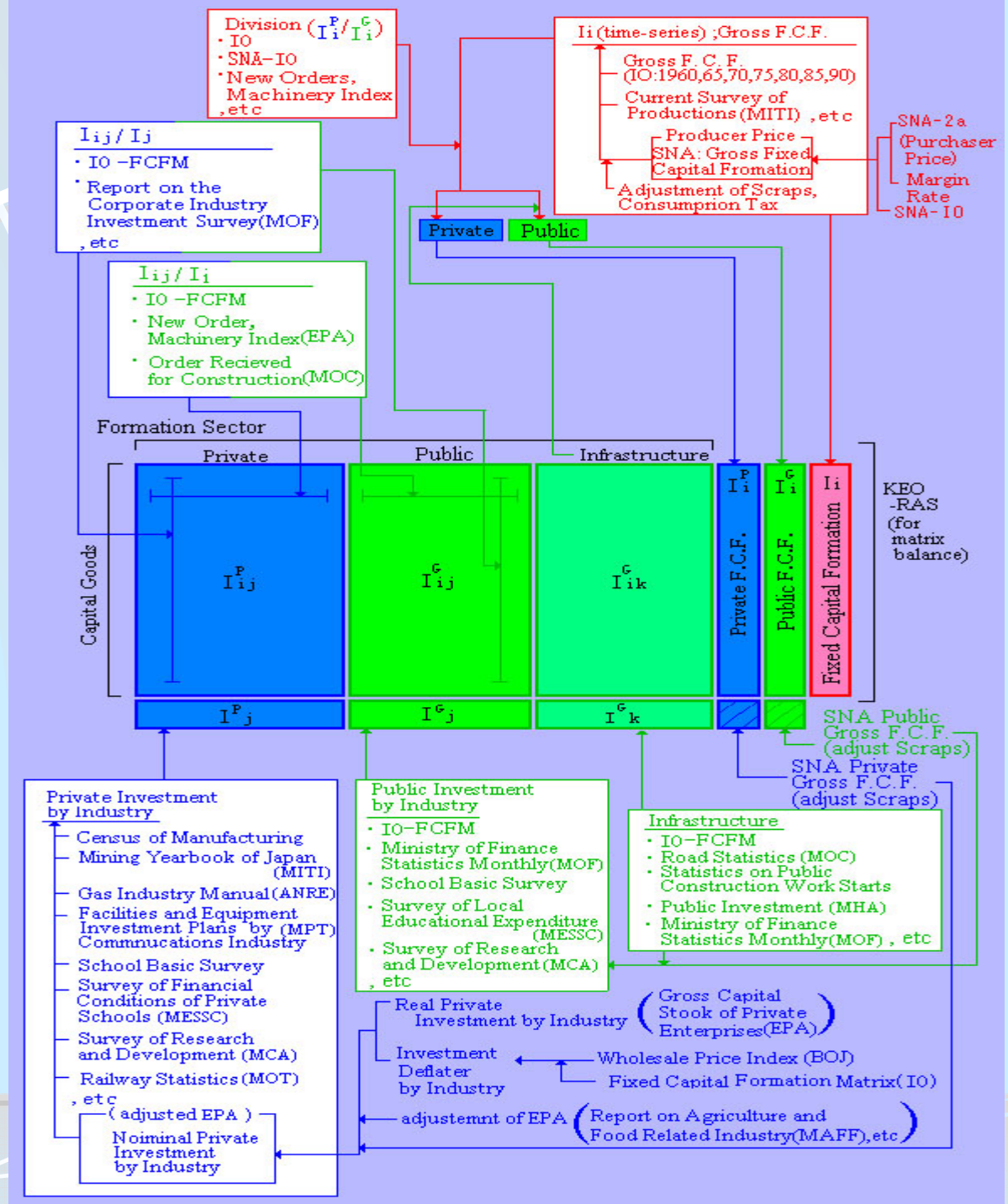
Labor Input

Industry(43)	KDB industry classification
Gender(2)	male,female
Age(11)	15-19,20-24,25-29,30-34,35-39, 40-44,45-49,50-54,55-59,60-64,over 65
Education(4)	under 9, 10-12, 13-14, over 15
Employment Status(3)	employee, self-emp., unpaid family worker

Capital Input

Industry
- KDB 43 Industry Classification, Private, Public, Infrastructure

Assets
- 78 tangible assets,
- 3 intangible assets,
- 3 inventory,
- 3 land



Skyline Analysis

$$X = (I - A)^{-1}(D + E - M)$$
$$= (I - A)^{-1}D + (I - A)^{-1}E - (I - A)^{-1}M$$

Consider the i-th commodity (ex. Iron and steel):

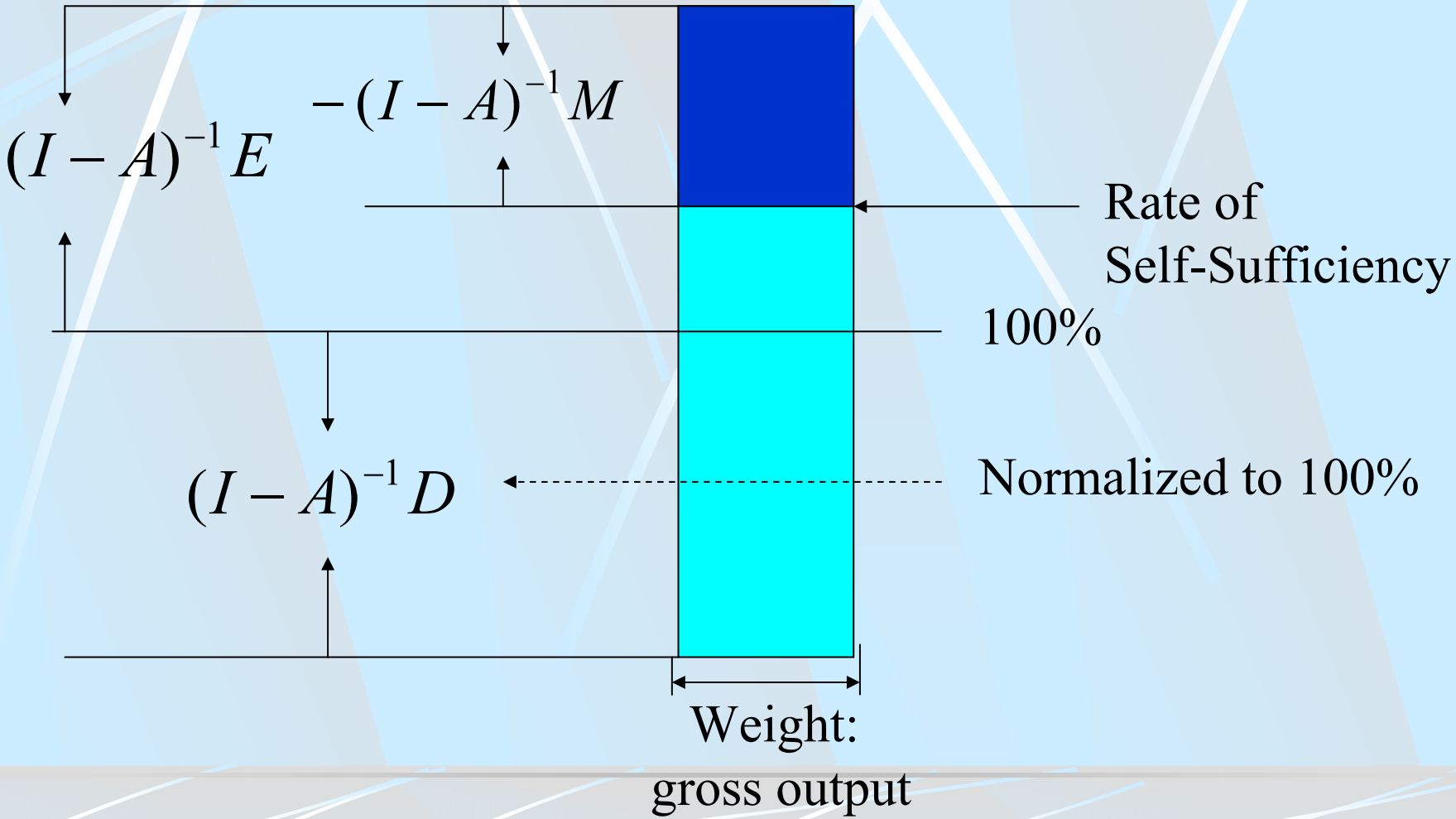
$(I - A)^{-1}D$: the amount of production to satisfy the domestic final demand

$(I - A)^{-1}E$: the amount of production to satisfy the export demand. The iron and steel embodied in the exported car is counted here.

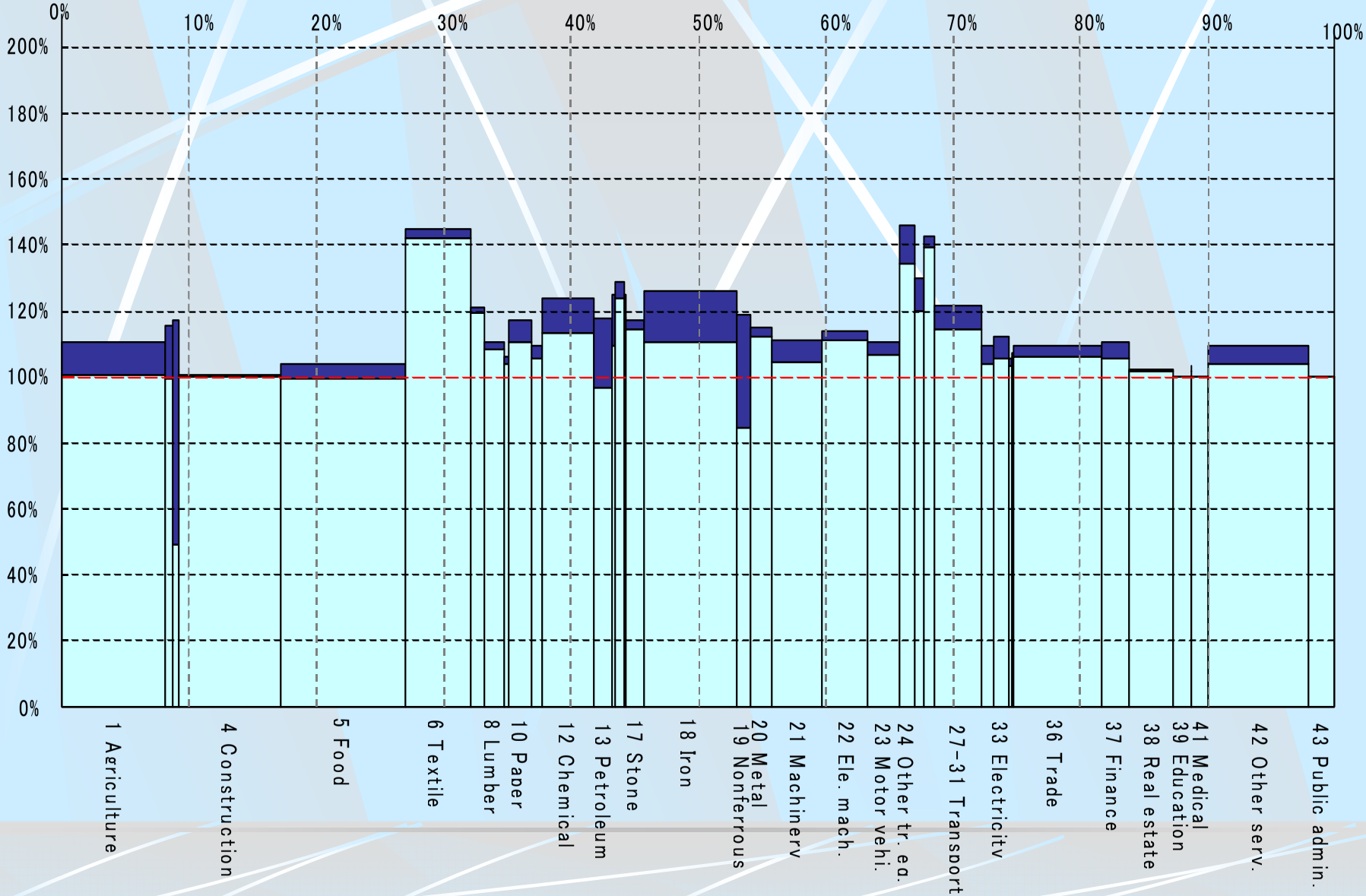
$(I - A)^{-1}M$: the amount of production substituted by the imported goods. The iron and steel embodied in the imported car is counted here.

Skyline Analysis

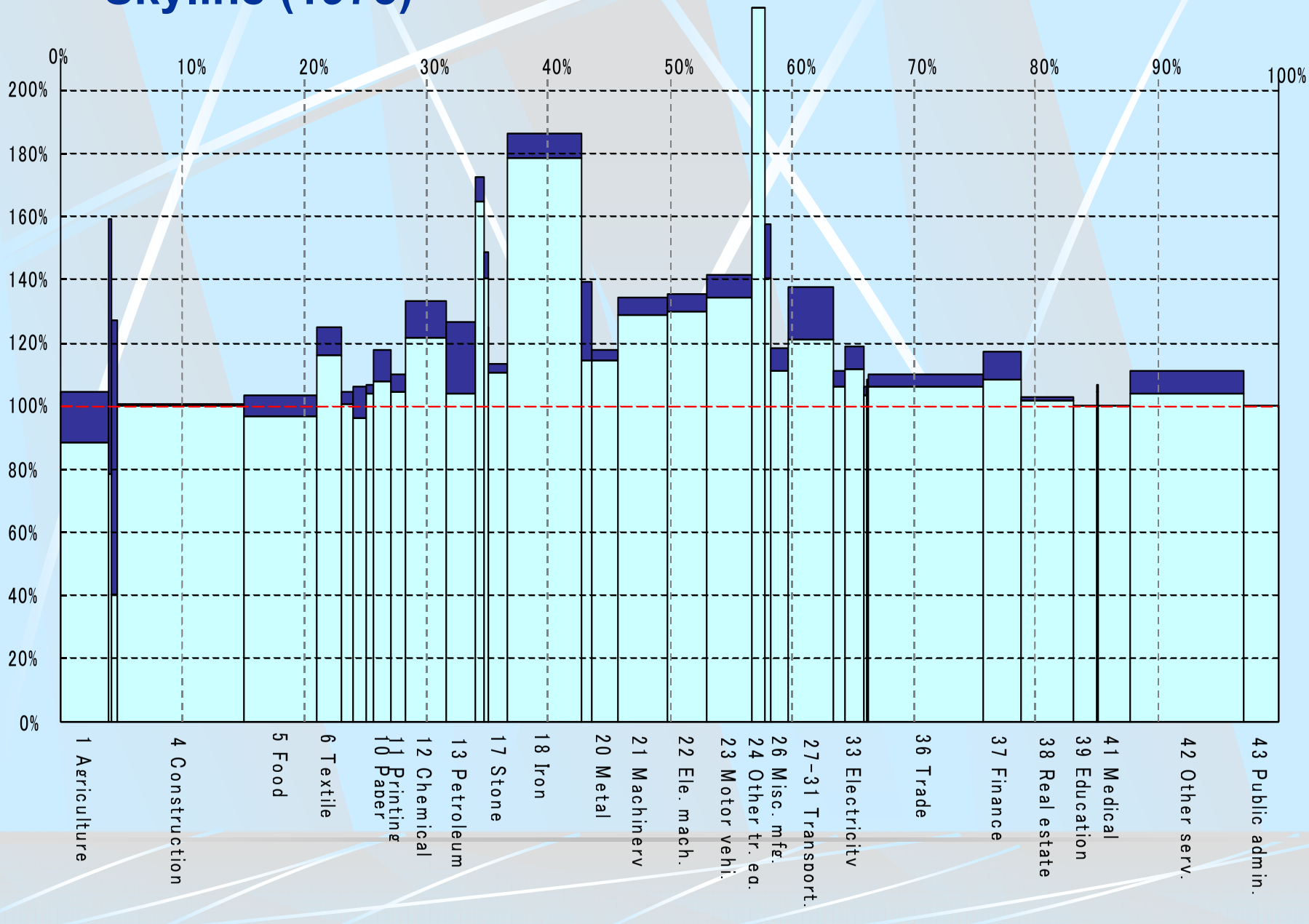
$$X = (I - A)^{-1}(D + E - M)$$



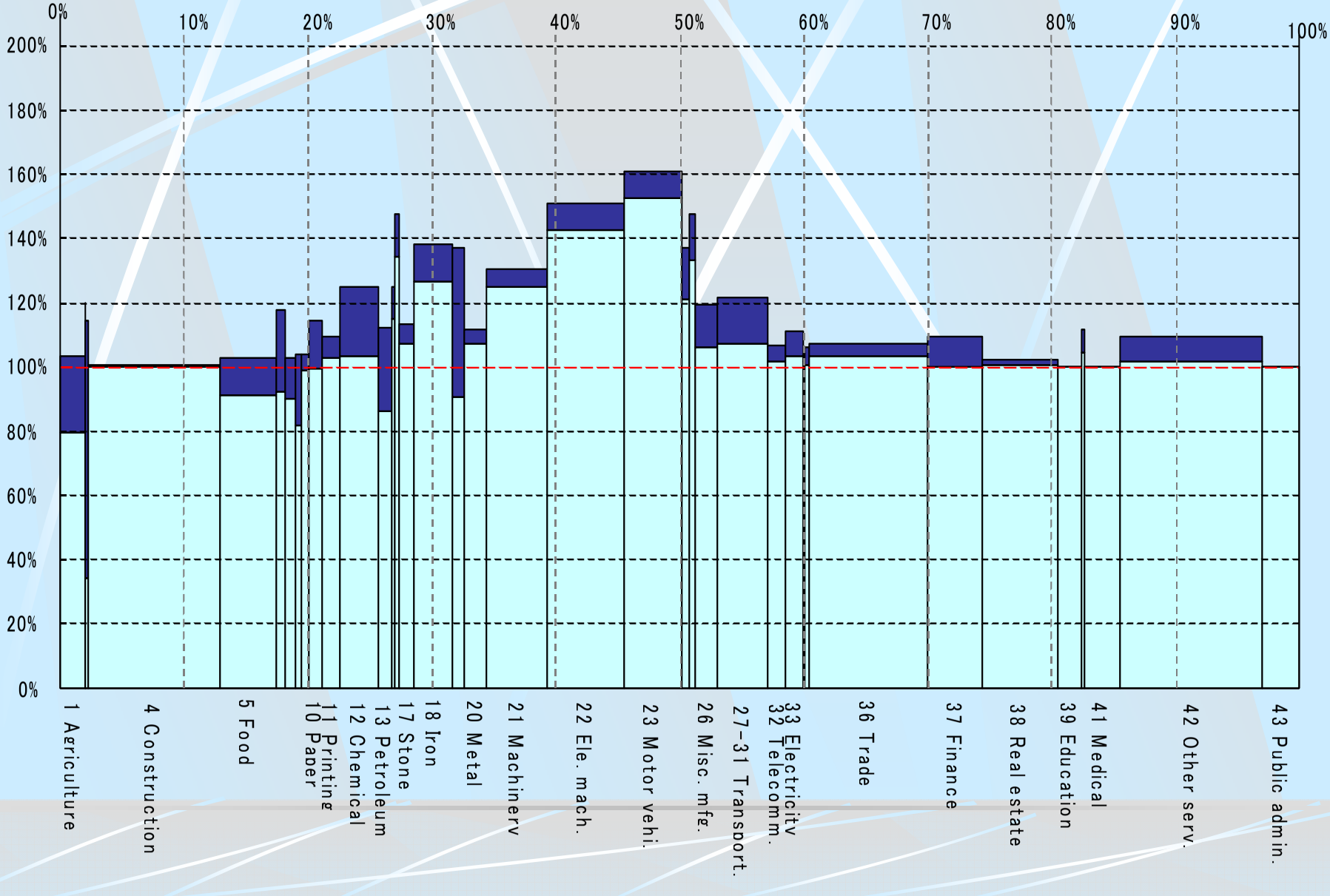
Skyline (1960)



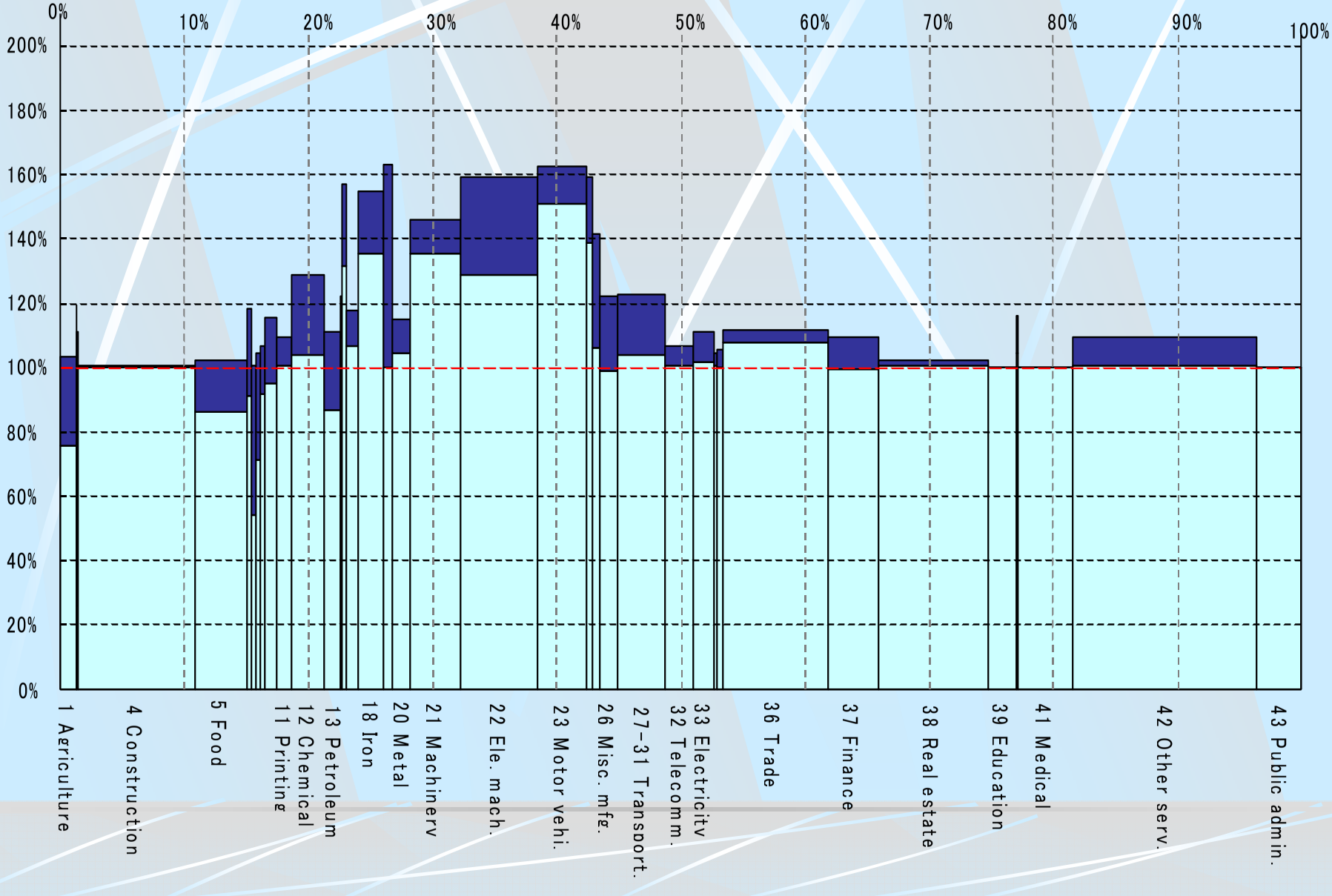
Skyline (1975)



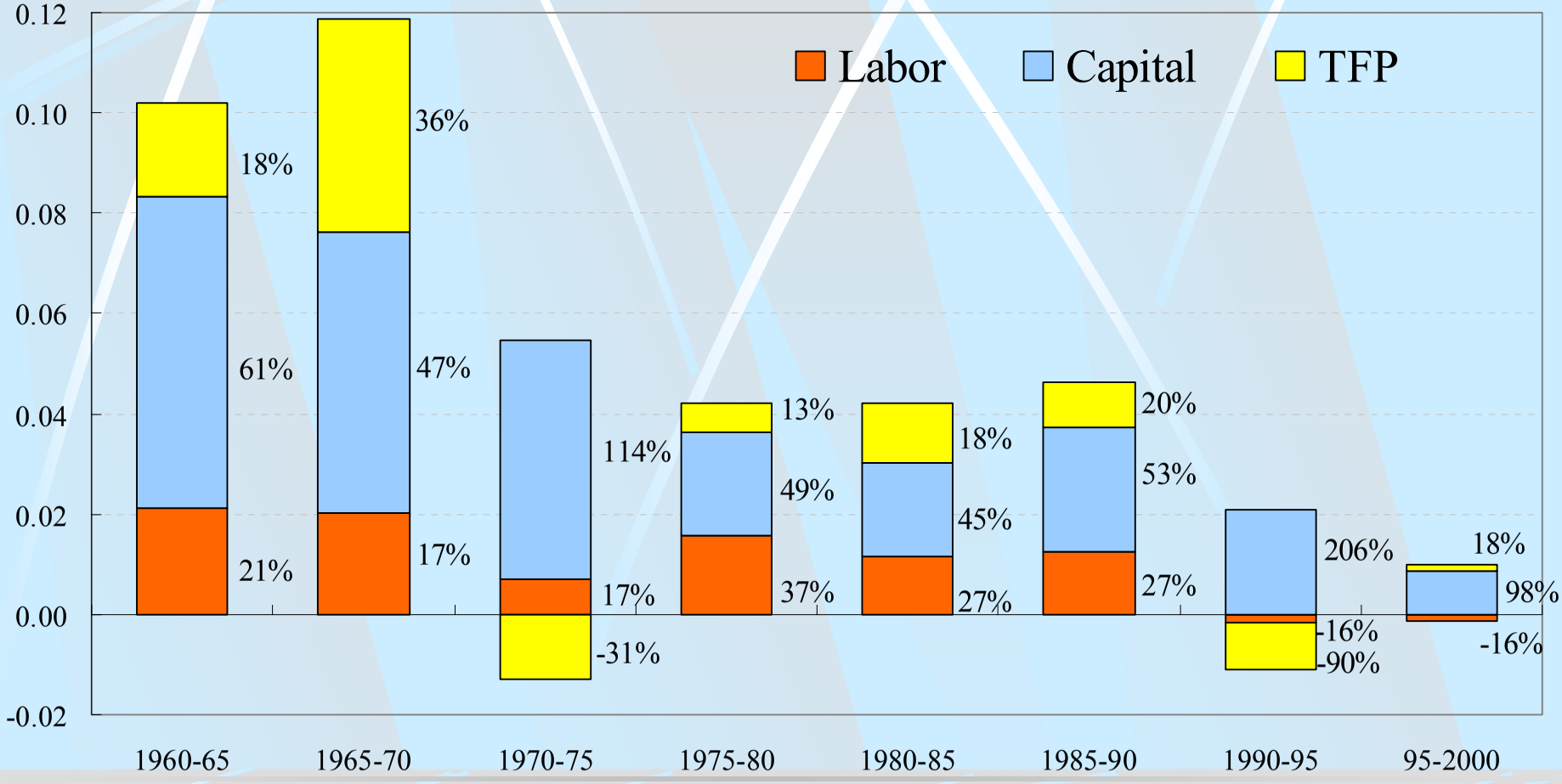
Skyline (1990)



Skyline (2000)



Sources of Economic Growth



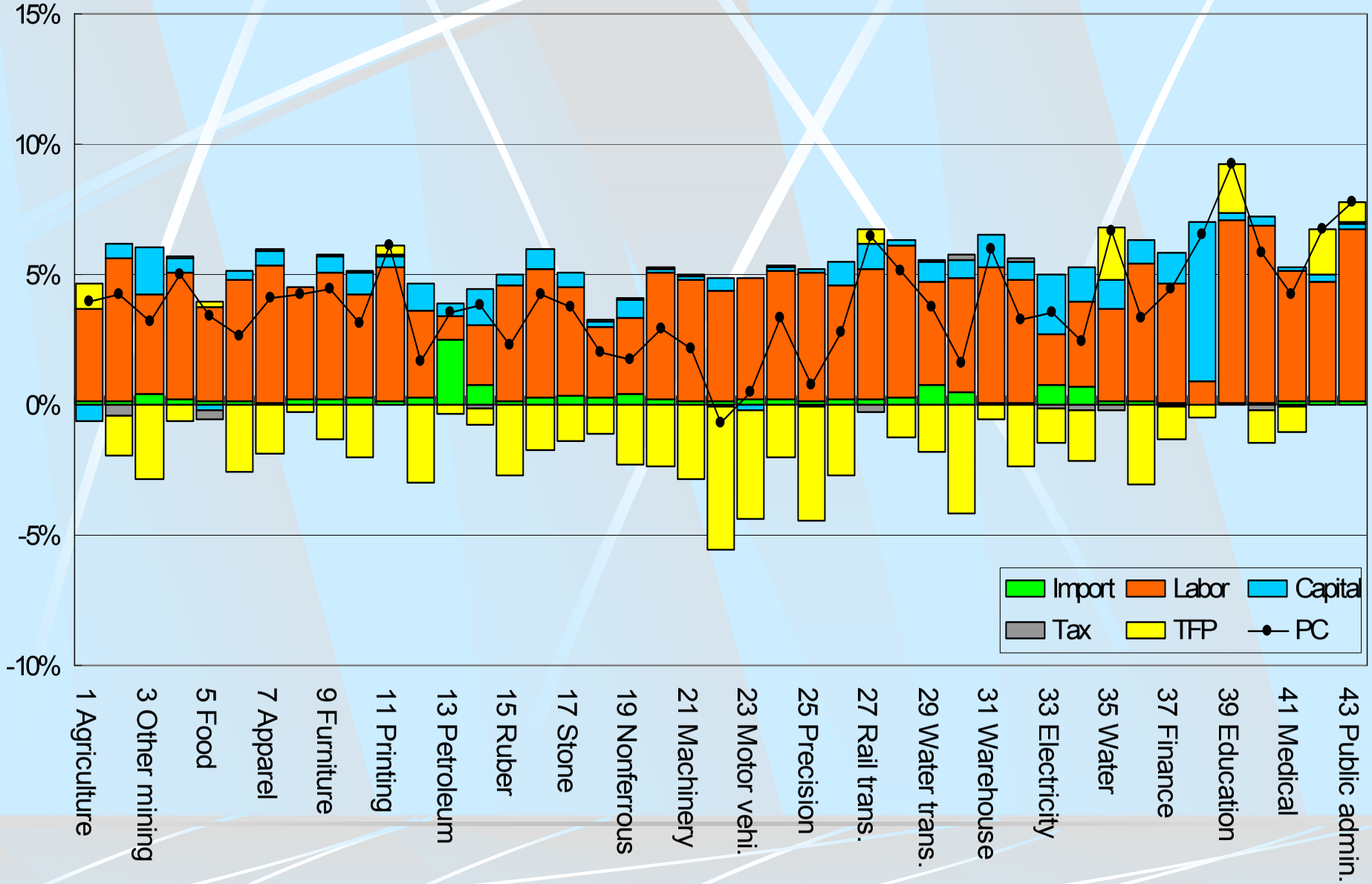
Interindustry Effects of Productivity Growth

- Using input-output frame work,
- Contributions of the intermediate inputs are decomposed into the ones of domestic goods and imported goods
- Contributions of the domestic goods are decomposed into the ones of labor, capital, and productivity of the other sectors.
- Next four slides shows the direct and indirect contributions of labor, capital, import, and productivity on changes in commodity output prices (the bars show the contributions, and the doted lines show the actual changes in output prices) .

Inter-Industry (1960-1970)

Inter-Industry (1973-1985)
Capital
Labor
Import
TFP
Tax
PC
43 Public admin.
41 Medical
39 Education
37 Finance
35 Water
33 Electricity
31 Warehouse
29 Water trans.
27 Rail trans.
25 Precision
23 Motor vehi.
21 Machinery
19 Nonferrous
17 Stone
15 Ruber
13 Petroleum
11 Printing
9 Furniture
7 Apparel
5 Food
3 Other mining
1 Agriculture
15%
10%
5%
0%
-5%
-10%

Inter-Industry (1985-1991)



Inter-Industry (1991-2000)