

RIETI
Research Institute of Economy, Trade & Industry, IAA



Japan's Potential Growth in a World Perspective

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Determinants of Total Factor Productivity and Japan's Potential Growth:

An International Perspective

Tokyo, Japan

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Economic Growth in the Information Age

INTRODUCTION:

Prices of Information Technology

THE INFORMATION AGE:

Faster, Better, Cheaper!

ROLE OF INFORMATION TECHNOLOGY:

IT Prices and the Cost of Capital

WORLD GROWTH RESURGENCE:

IT Investment and Productivity Growth

ECONOMICS ON INTERNET TIME:

The New Research Agenda

THE INFORMATION AGE: Faster, Better, Cheaper!

MOORE'S LAW: The number of transistors on a chip doubles every 12-24 months. (Itanium 2 Processor, released November 8, 2004, has 592 million transistors.)

INVENTION OF THE TRANSISTOR:

Development of Semiconductor Technology.

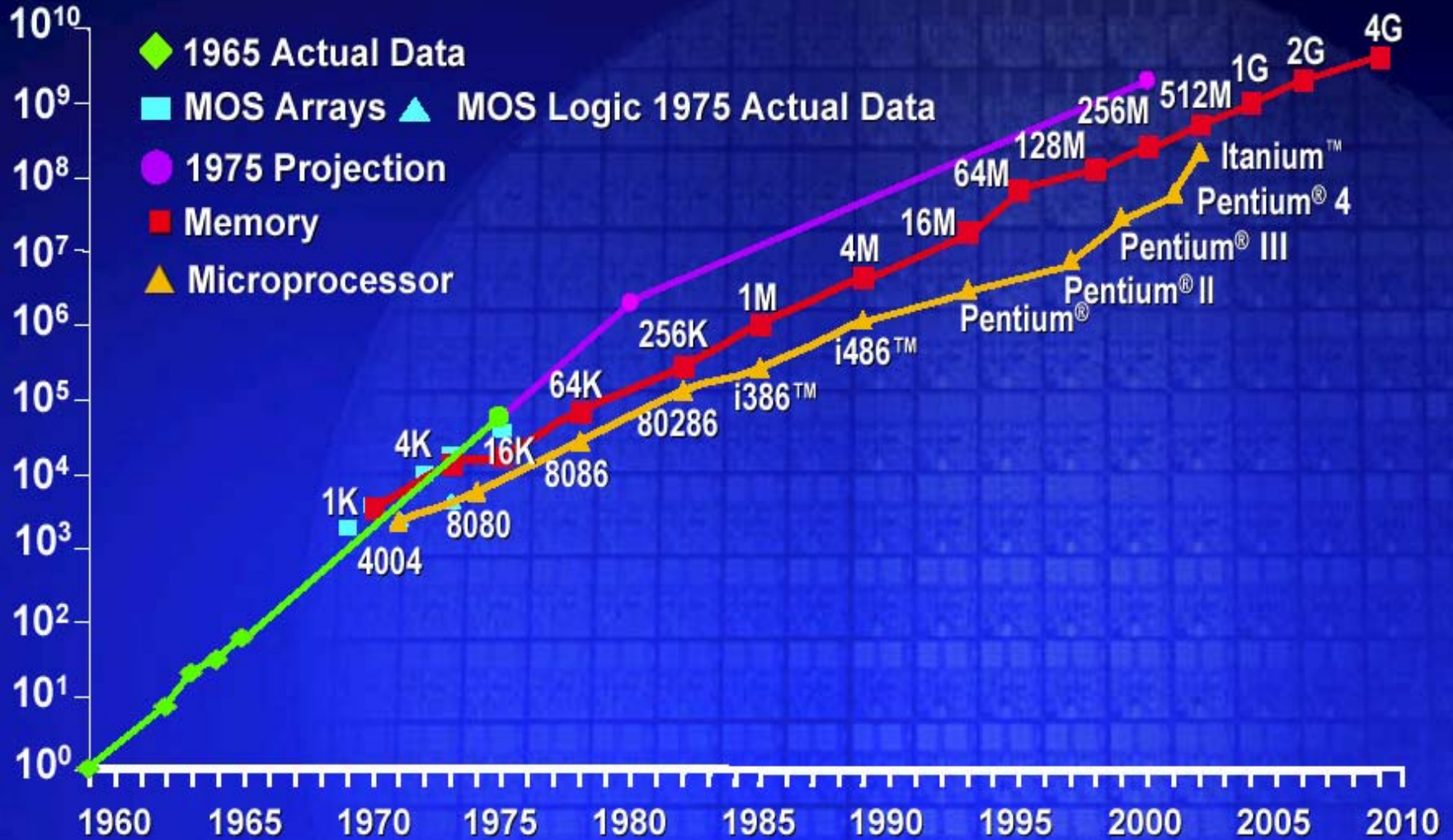
THE INTEGRATED CIRCUIT:

Memory Chips; Logic Chips.

SIA Annual Report 2005: In 1978, a commercial flight between New York and Paris cost \$900 and took seven hours. If the principles of Moore's Law were applied to the airline industry, that flight would now cost about a penny and take less than one second.

Integrated Circuit Complexity

Transistors
Per Die



HOLDING QUALITY CONSTANT

Matched Models and Hedonics

SEMICONDUCTOR PRICE INDEXES:

Memory and Logic Chips.

COMPUTER PRICE INDEXES:

The BEA-IBM Collaboration.

COMMUNICATIONS EQUIPMENT:

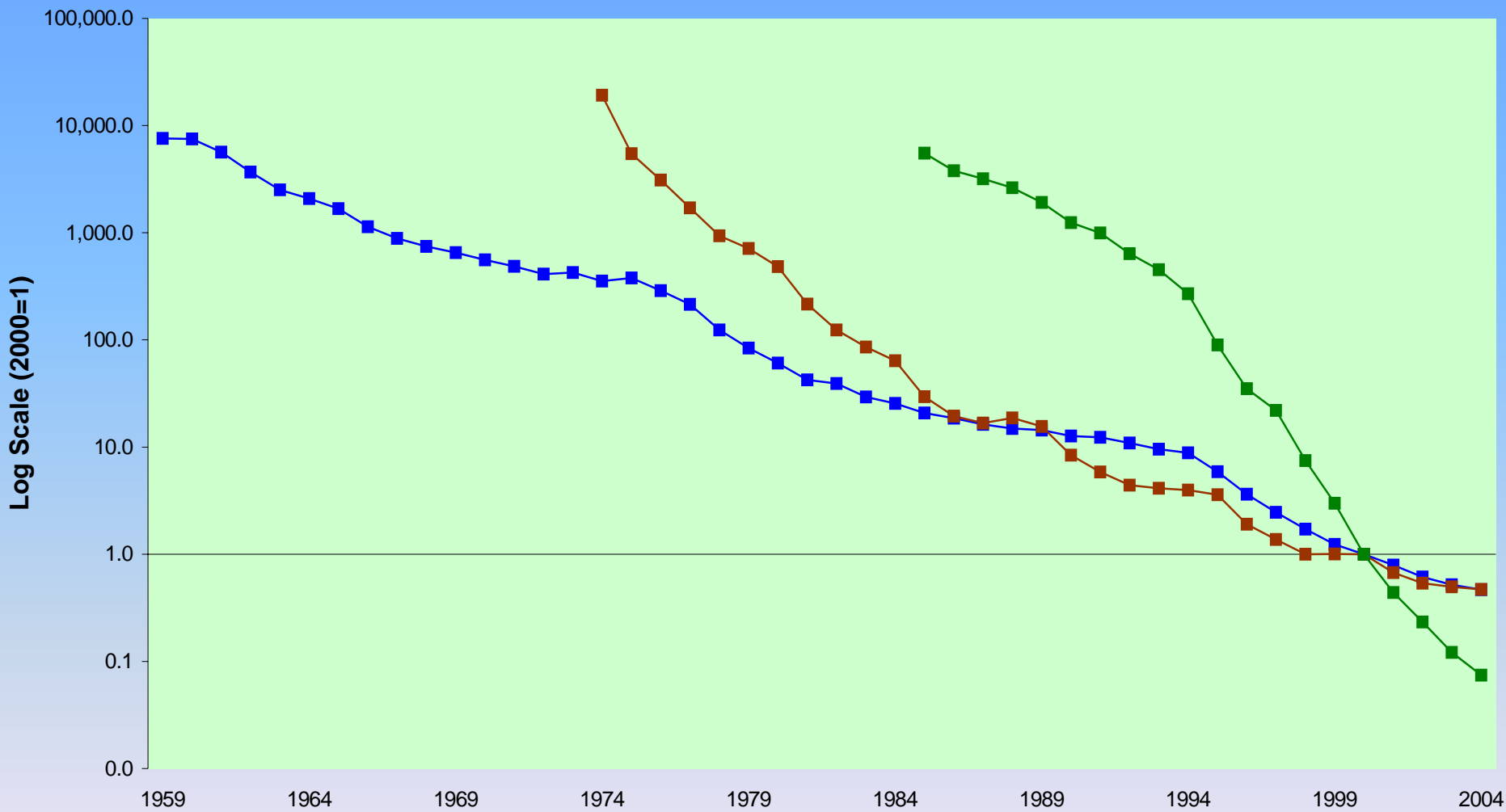
Terminal, Switching, and Transmission.

SOFTWARE:

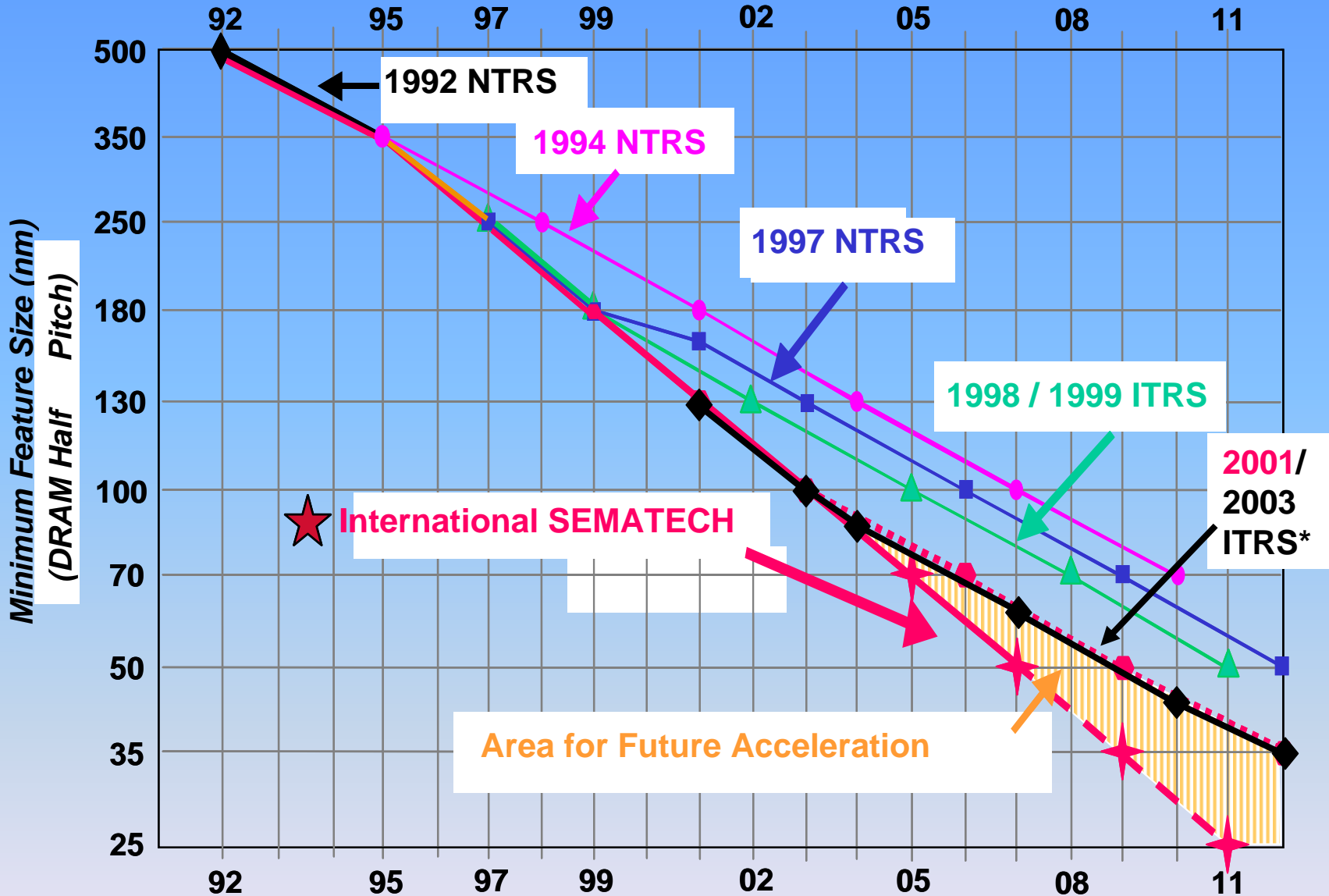
Prepackaged, Custom, and Own-Account.

Relative Prices of Computers and Semiconductors, 1959-2004

All price indexes are divided by the output price index



Computers Memory Logic



*Note the 2003 ITRS timing is unchanged from the 2001 ITRS

Semiconductor Roadmap Acceleration

ROLE OF INFORMATION TECHNOLOGY: IT Prices, Investment, and Productivity.

INPUT SHARES OF IT:

Computers, Communications Equipment, and Software.

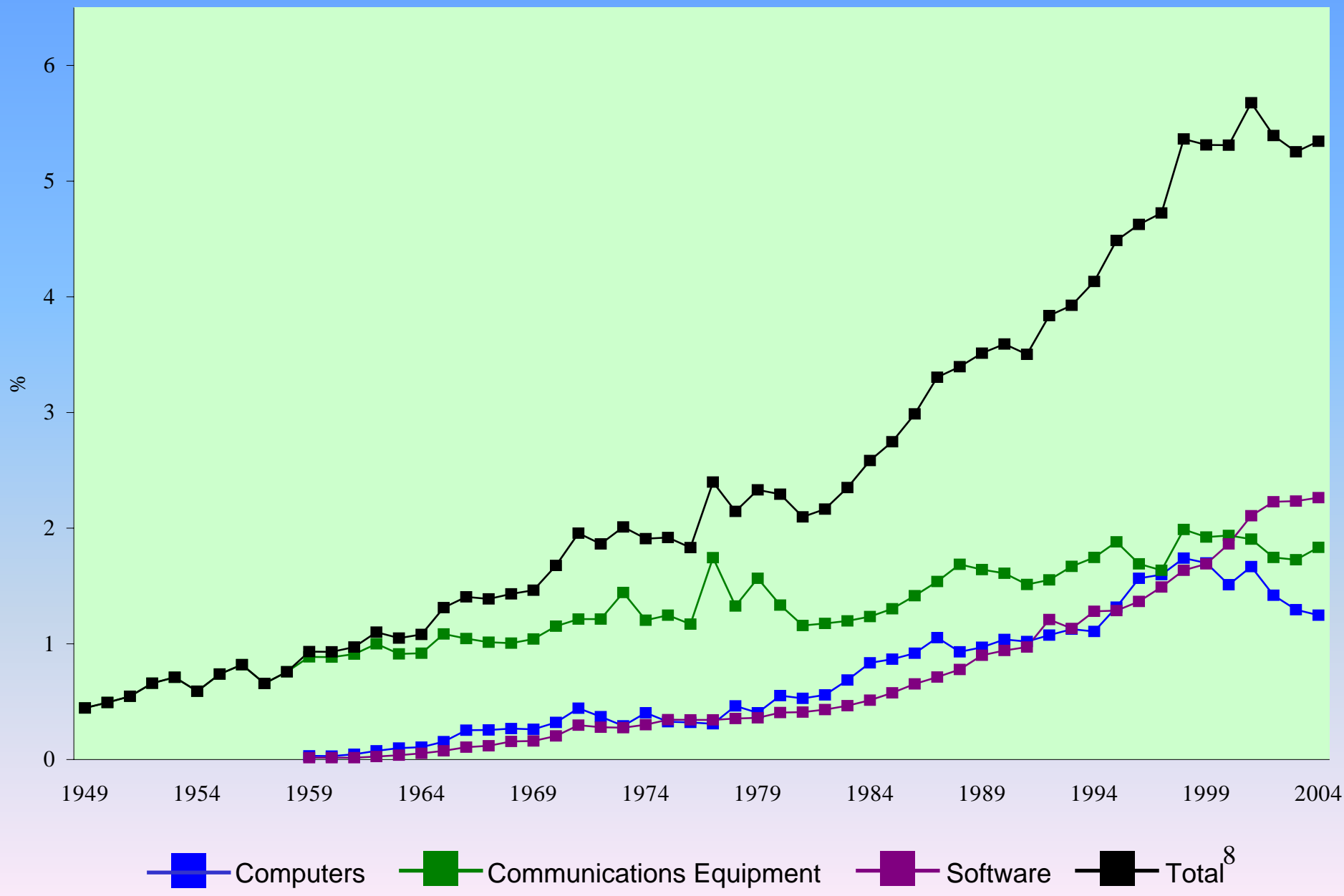
CAPITAL CONTRIBUTION:

IT versus Non-IT Capital Services.

CAPITAL CONTRIBUTION BY TYPE:

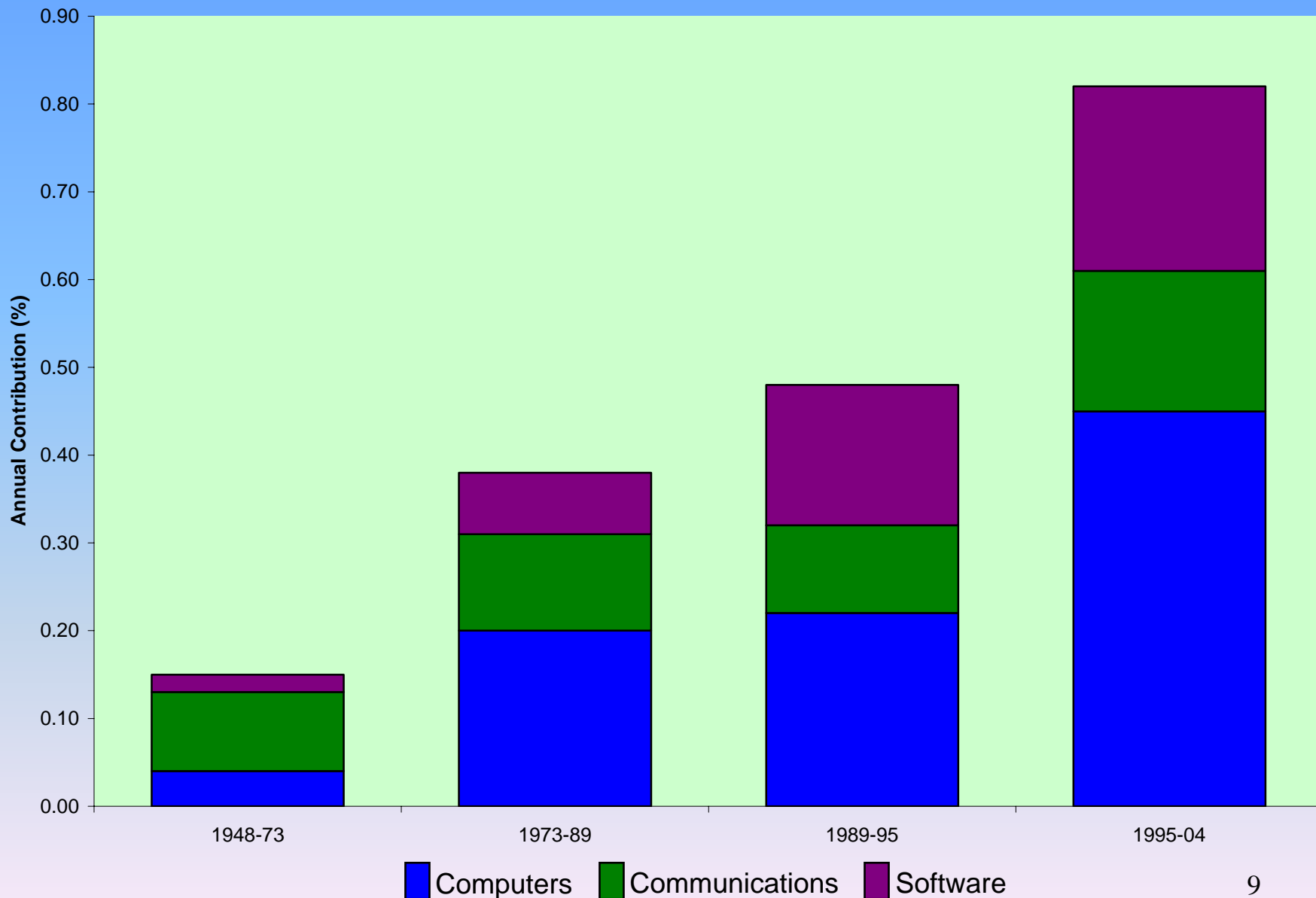
Computers, Communications Equipment, and Software.

Input Shares of Information Technology by Type, 1948-2004



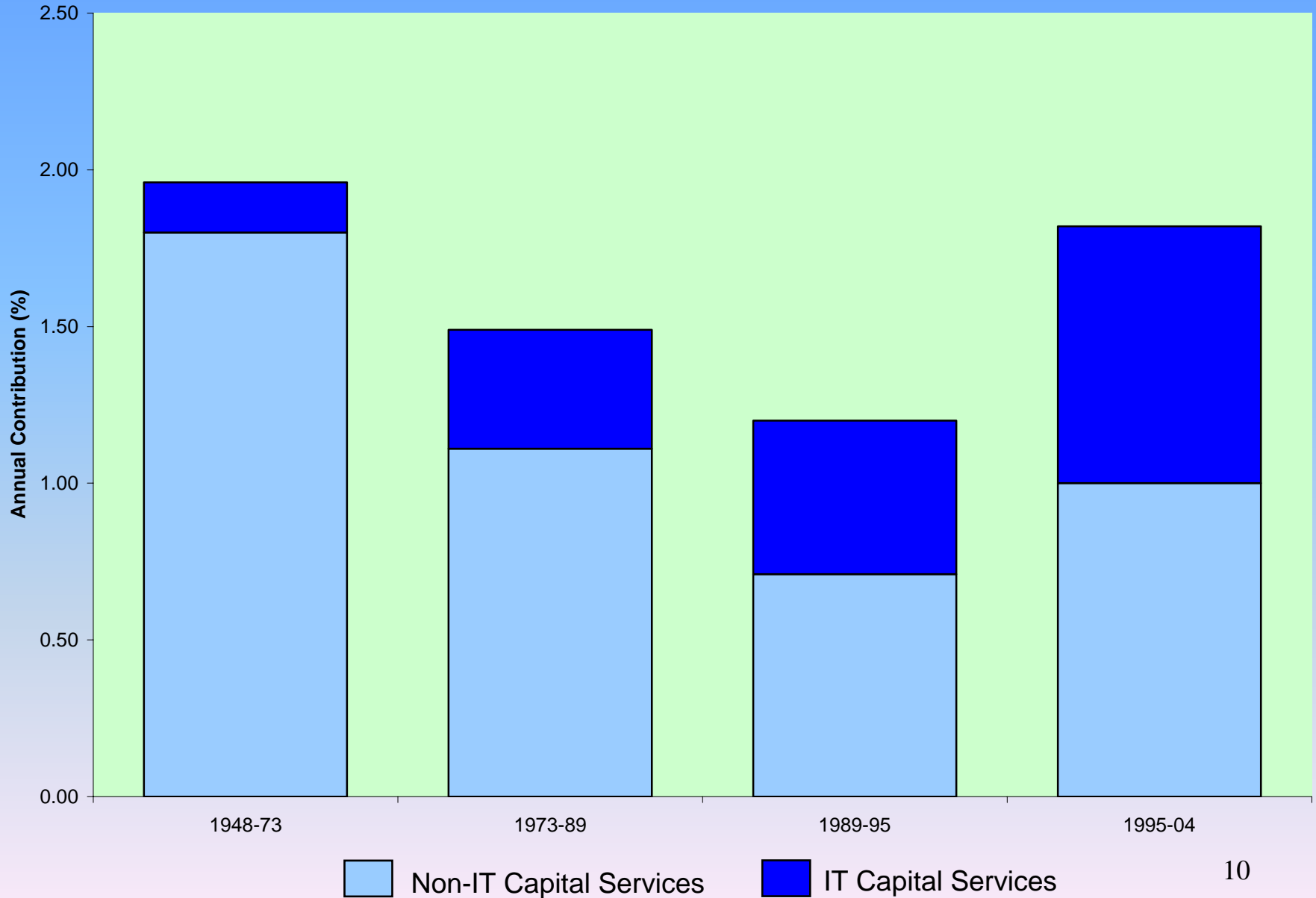
Capital Input Contribution of Information Technology by Type

Input contributions are the average annual growth rates, weighted by the income shares.

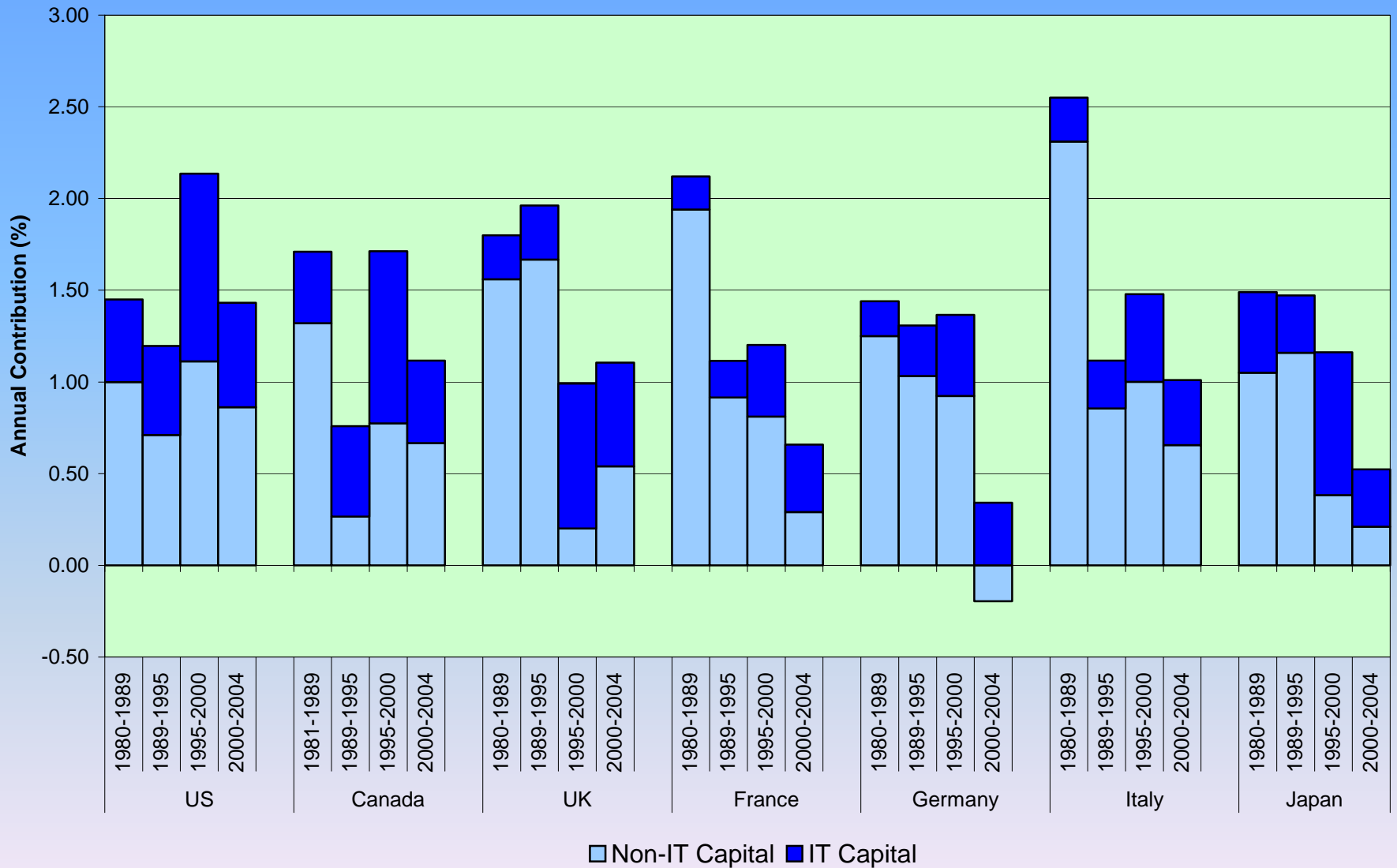


Capital Input Contribution of Information Technology

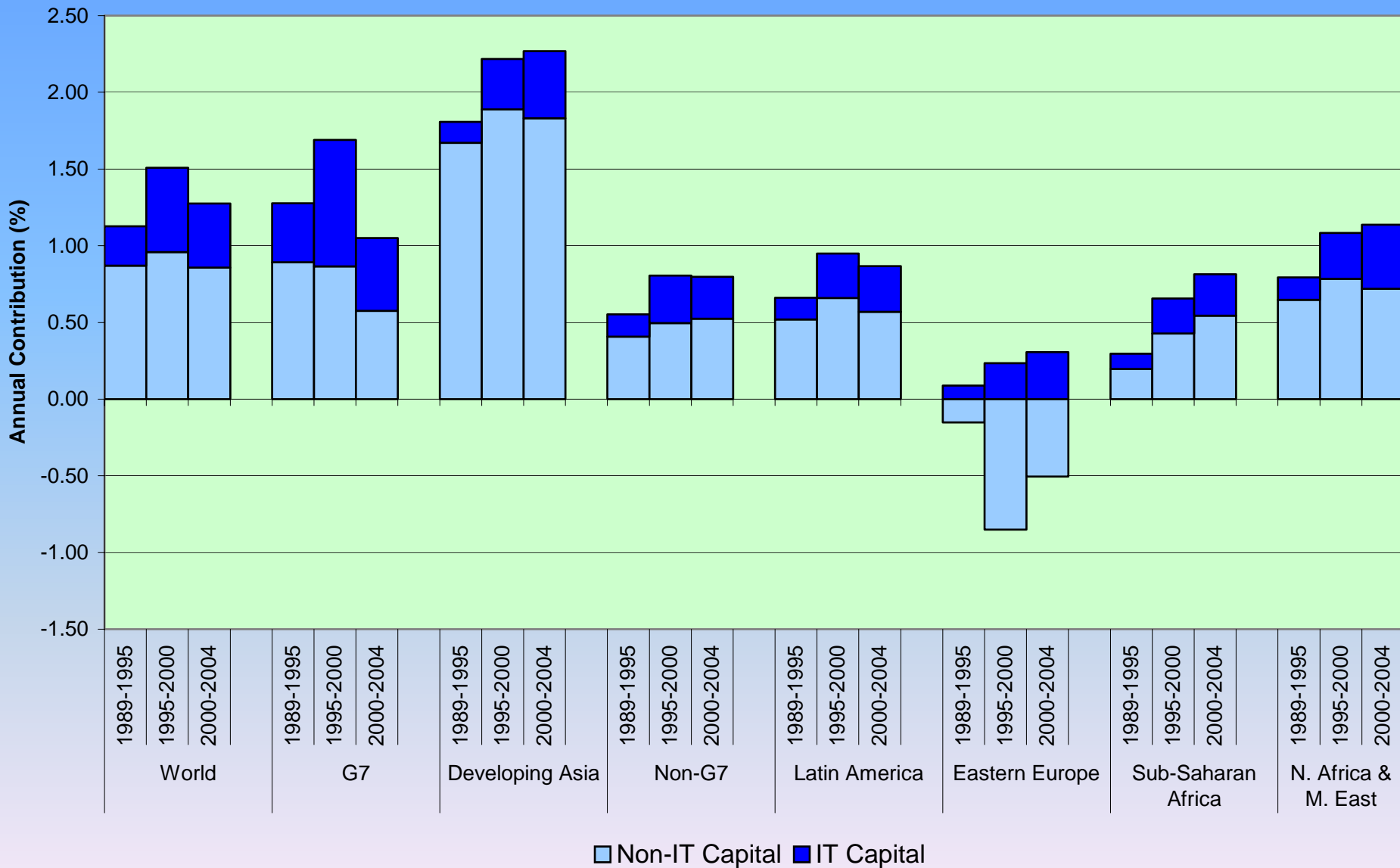
Input contributions are the average annual growth rates, weighted by the income shares.



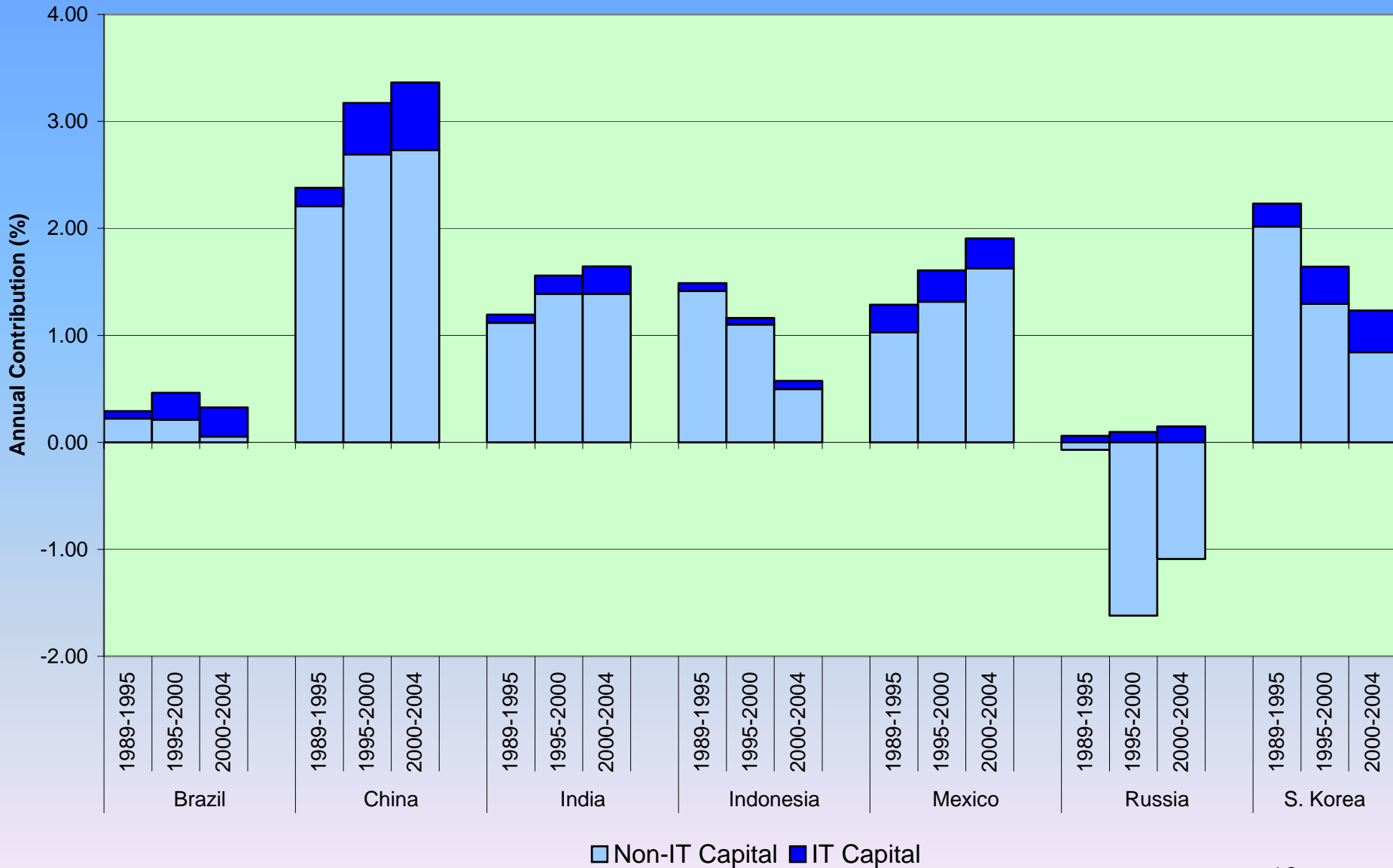
Capital Input Contribution: G7



Capital Input Contribution: World and Regions



Capital Input Contribution: Developing and Transition Economies



WORLD GROWTH RESURGENCE: IT Investment and Productivity Growth.

TOTAL FACTOR PRODUCTIVITY:

IT-Production versus Non-IT Production.

SOURCES OF ECONOMIC GROWTH:

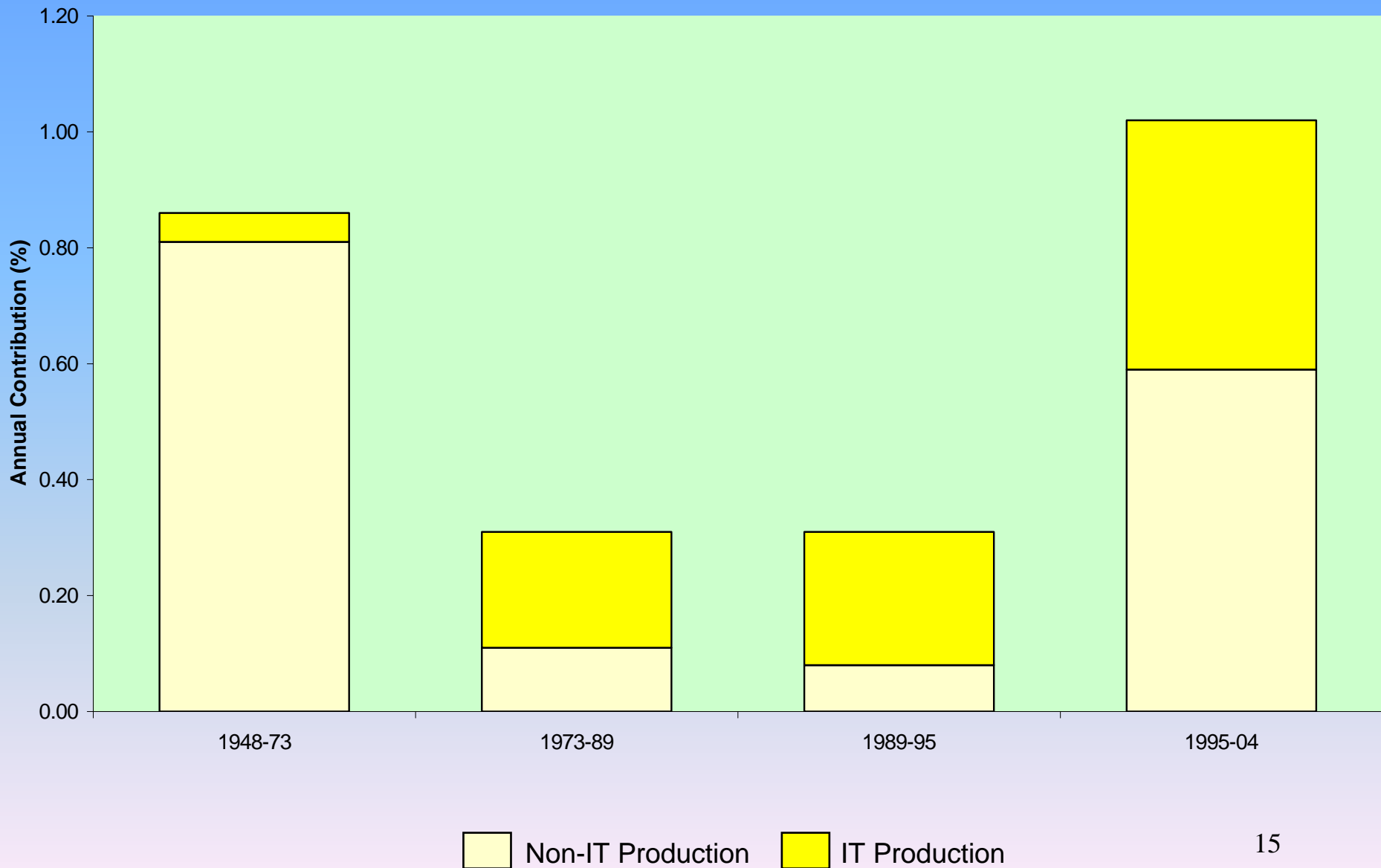
Capital Input, Labor Input, and TFP.

LABOR INPUT GROWTH:

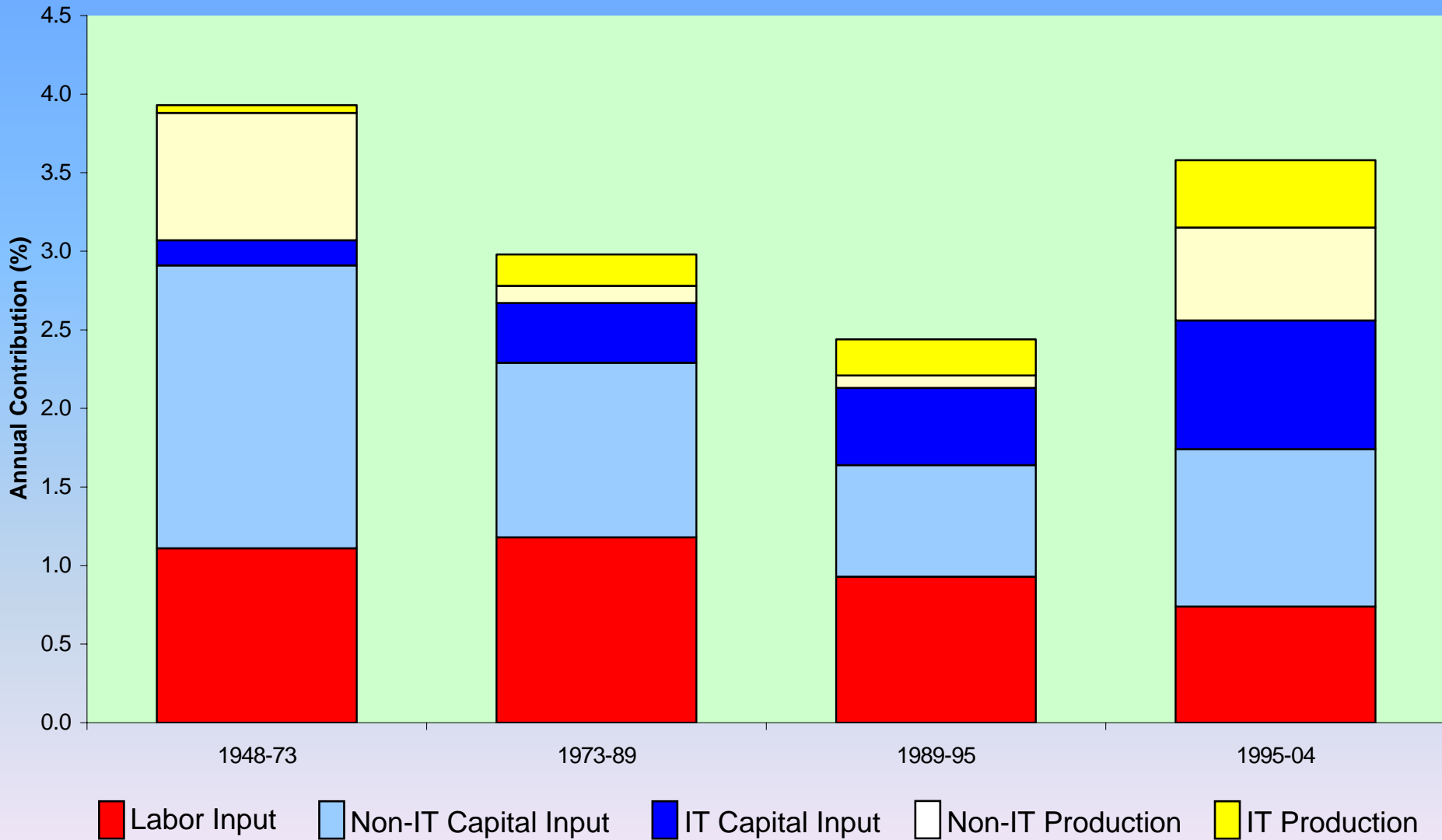
Hours Worked and Labor Quality.

Contributions of Information Technology to Total Factor Productivity Growth

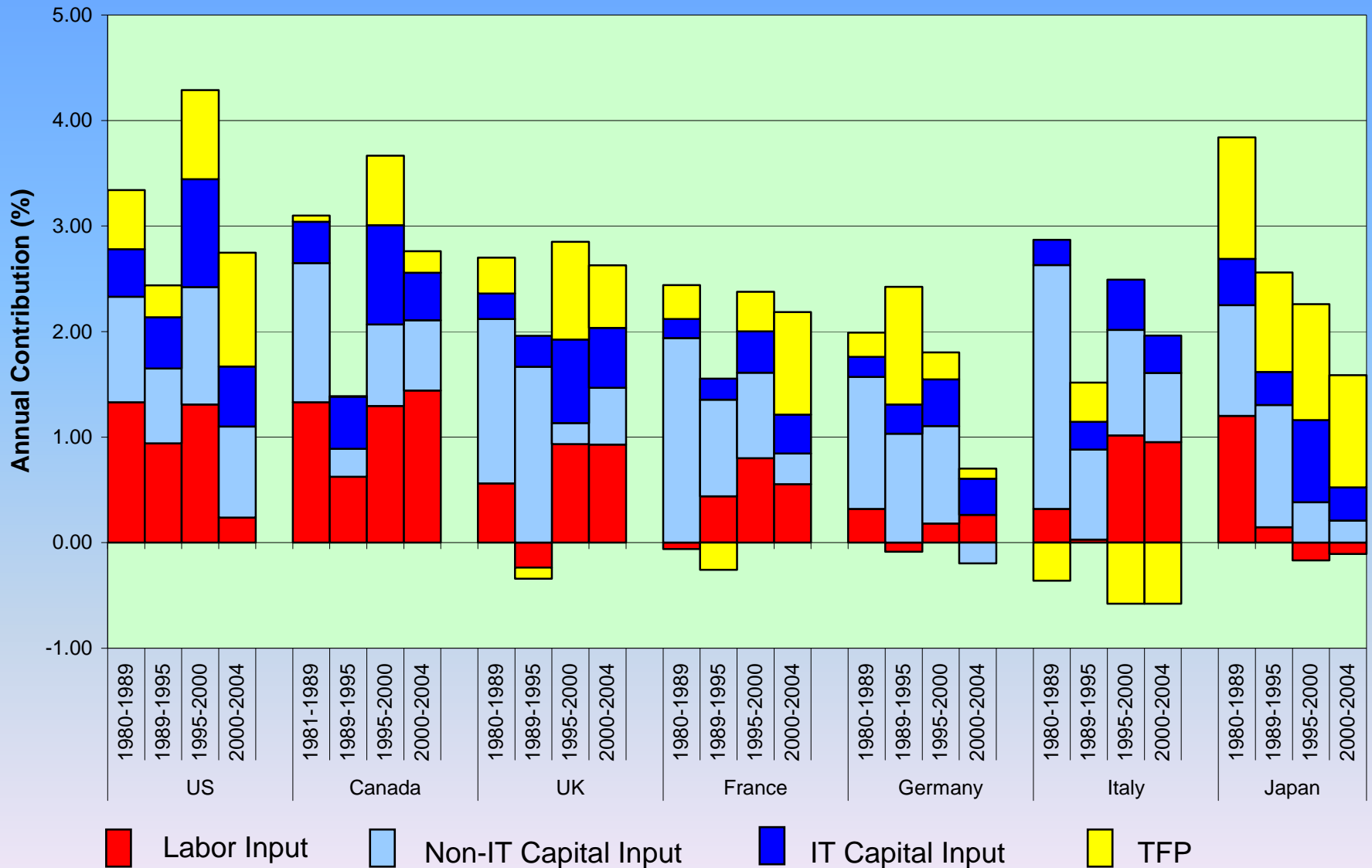
Contributions are average annual relative price changes, weighted by average nominal output shares.



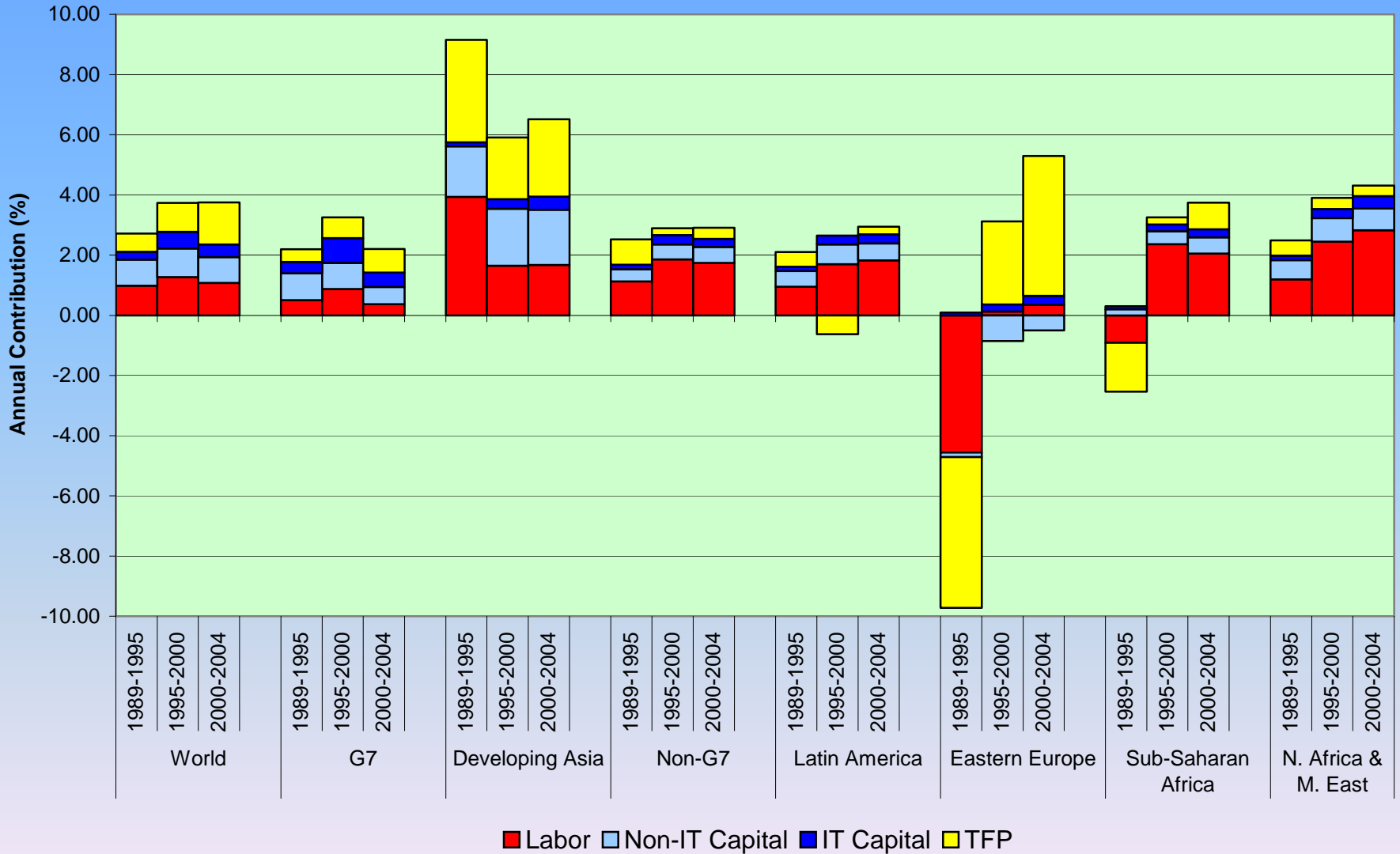
Sources of Gross Domestic Product Growth



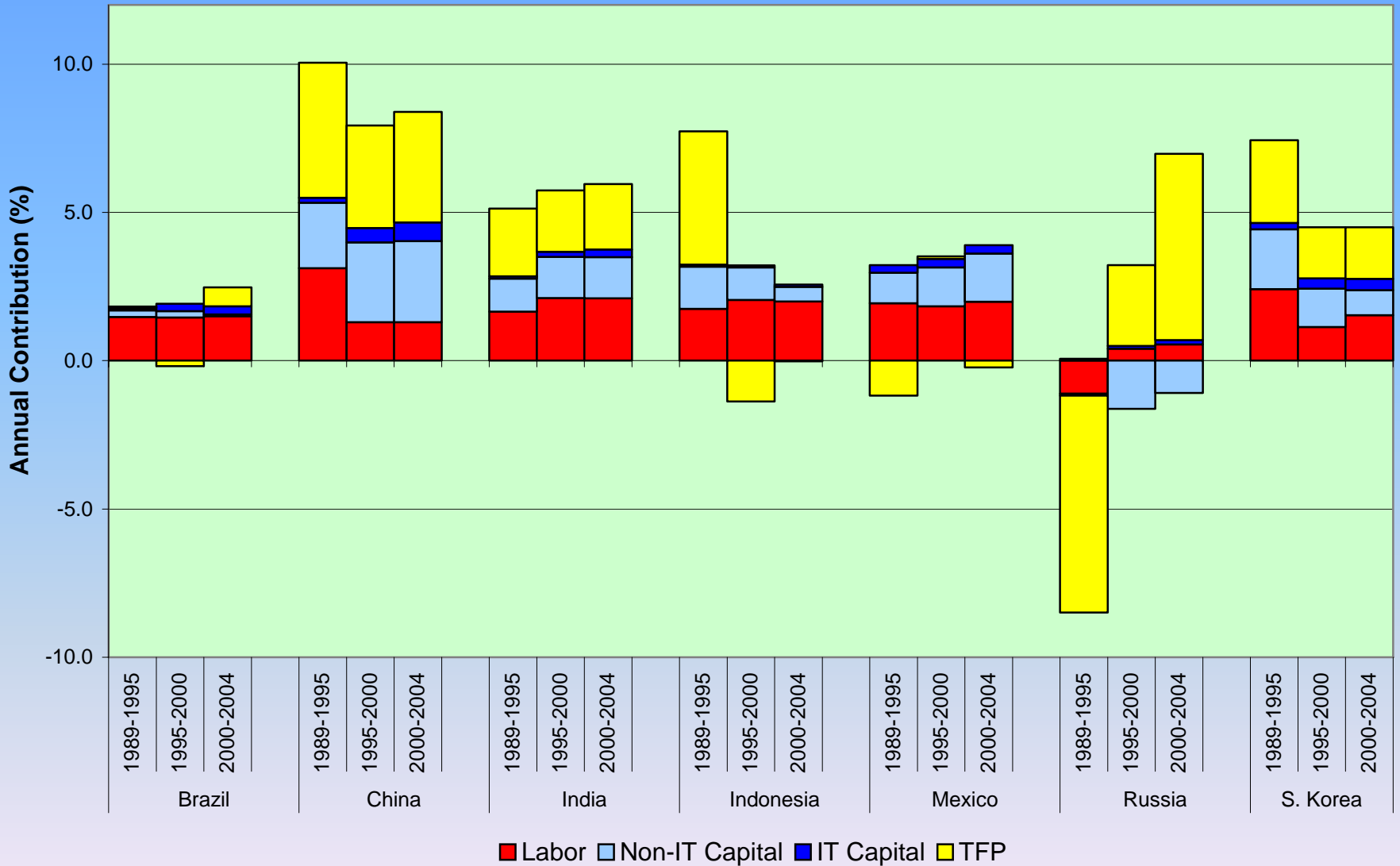
Sources of Gross Domestic Product Growth



Sources of Growth by Country: World and Regions



Sources of Economic Growth: Developing and Transition Economies



ECONOMICS ON INTERNET TIME: The New Research Agenda.

- The Solow Paradox -- we see computers everywhere but in the productivity statistics -- versus the Information Age.
- Equity Valuations and Growth Prospects: accumulation of intangible assets versus irrational exuberance.
- Widening Wage Inequality:capital-skill complementarity versus skill-biased technical change.
- Modeling IT and the semiconductor industry: permanent versus transitory contributions to economic growth.