THE ECONOMIC IMPACT OF INFORMATION TECHNOLOGIES AFTER THE FINANCIAL CRISIS

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http://economics.harvard.edu/faculty/jorgenson/

Keynote Lecture to the Annual Conference of the Association des Économistes Québécois

Hôtel Hilton du Casino du Lac-Leamy
Gatineau, Québec
May 19, 2011

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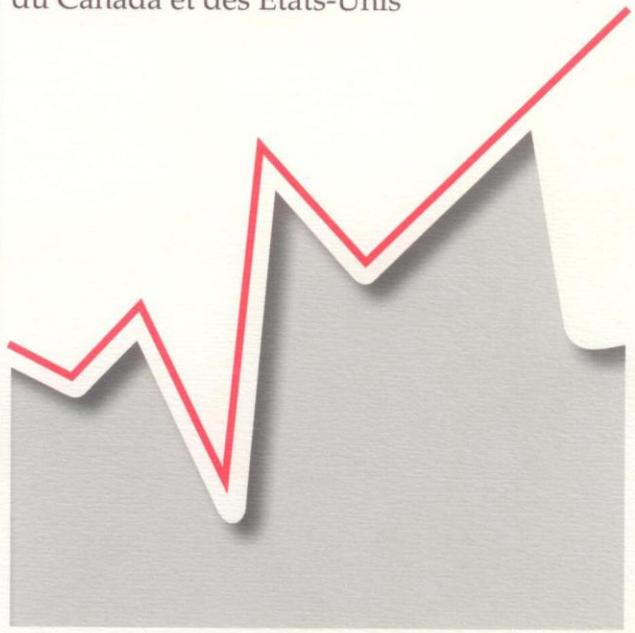

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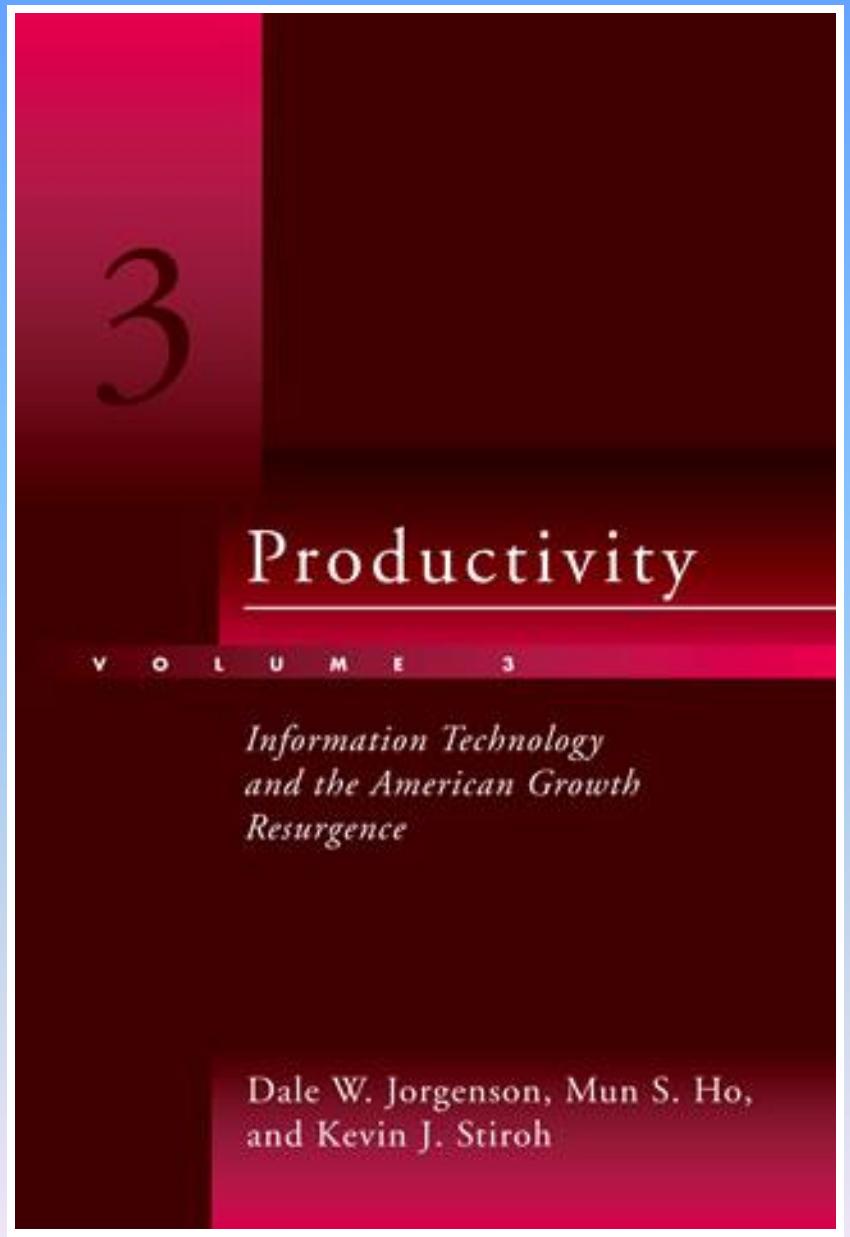

3
Productivity
VOLUME 3
Information Technology and the American Growth Resurgence
Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh

INTRODUCTION TO THE WORLD KLEMS CONSORTIUM

World KLEMS Consortium

Formed August 19-20, 2010

What's New?

70 NAICS Industries Covering 1960-2007

Before the Crisis

The IT Boom, the Dot-Com Crash, and the Jobless Recovery

After the Crisis

Continuing Economic Growth and Convergence

EU KLEMS PROJECT

Initial Release:

March 15, 2007

25 EU Economies:

U.S., Canada, Japan, and Korea

Data Sources:

Labor, Capital, and Intermediate Input

Completion Date:

June 30, 2008

IT-RELATED INDUSTRIES

IT-Producing Industries

Computer and peripheral equipment manufacturing
Communications equipment manufacturing
Semiconductor and other electronic component manufacturing
Software publishing
Information and data processing services
Computer systems design and related services

IT-Using Industries

Construction
Machinery
Motor vehicles bodies and trailers and parts
Other transportation equipment
Miscellaneous manufacturing
Printing and related support activities
Wholesale Trade
Retail Trade
Air transportation
Water transportation
Truck transportation
Transit and ground passenger transportation
Pipeline transportation
Other transportation and support activities
Broadcasting and telecommunications
Federal Reserve banks credit intermediation and related activities
Securities commodity contracts and investments
Insurance carriers and related activities
Rental and leasing services and lessors of intangible assets
Legal services
Miscellaneous professional scientific and technical services
Management of companies and enterprises
Administrative and support services
Waste management and remediation services
Educational services
Hospitals Nursing and residential care facilities
Social assistance
Performing arts spectator sports museums and related activities
Other electronic products
Newspaper; periodical; book publishers

NON-IT INDUSTRIES

Farms
Forestry fishing and related activities
Oil and gas extraction
Mining except oil and gas
Support activities for mining
Utilities
Wood products
Nonmetallic mineral products
Primary metals
Fabricated metal products
Electrical equipment appliances and components
Furniture and related products
Food and beverage and tobacco products
Textile mills and textile product mills
Apparel and leather and allied products
Paper products
Petroleum and coal products
Chemical products
Plastics and rubber products
Rail transportation
Warehousing and storage
Motion picture and sound recording industries
Funds trusts and other financial vehicles
Ambulatory health care services
Amusements gambling and recreation industries
Accommodation
Food services and drinking places
Other services except government
Federal General government
Federal Government enterprises
S&L General Government
S&L Government enterprises
Real estate
Household

ROLE OF INFORMATION TECHNOLOGY: Growth of Output

OUTPUT SHARES OF IT:

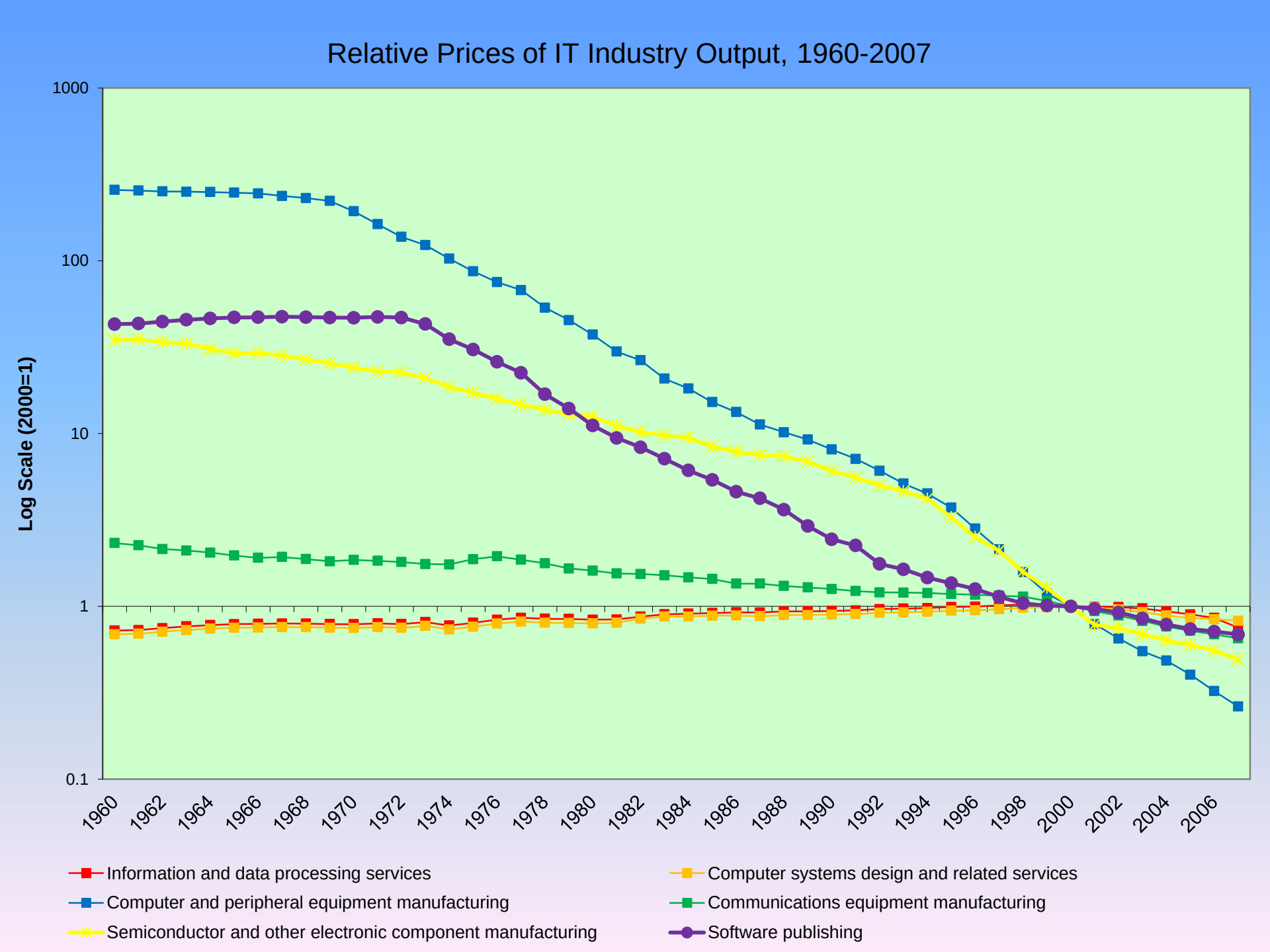
Computers, Communications Equipment, Semiconductors, Software, Information and Data Processing Services, Computer Systems Design and Related Services

OUTPUT CONTRIBUTION BY TYPE:

Computers, Communications Equipment, Semiconductors, Software, Information and Data Processing Services, Computer Systems Design and Related Services

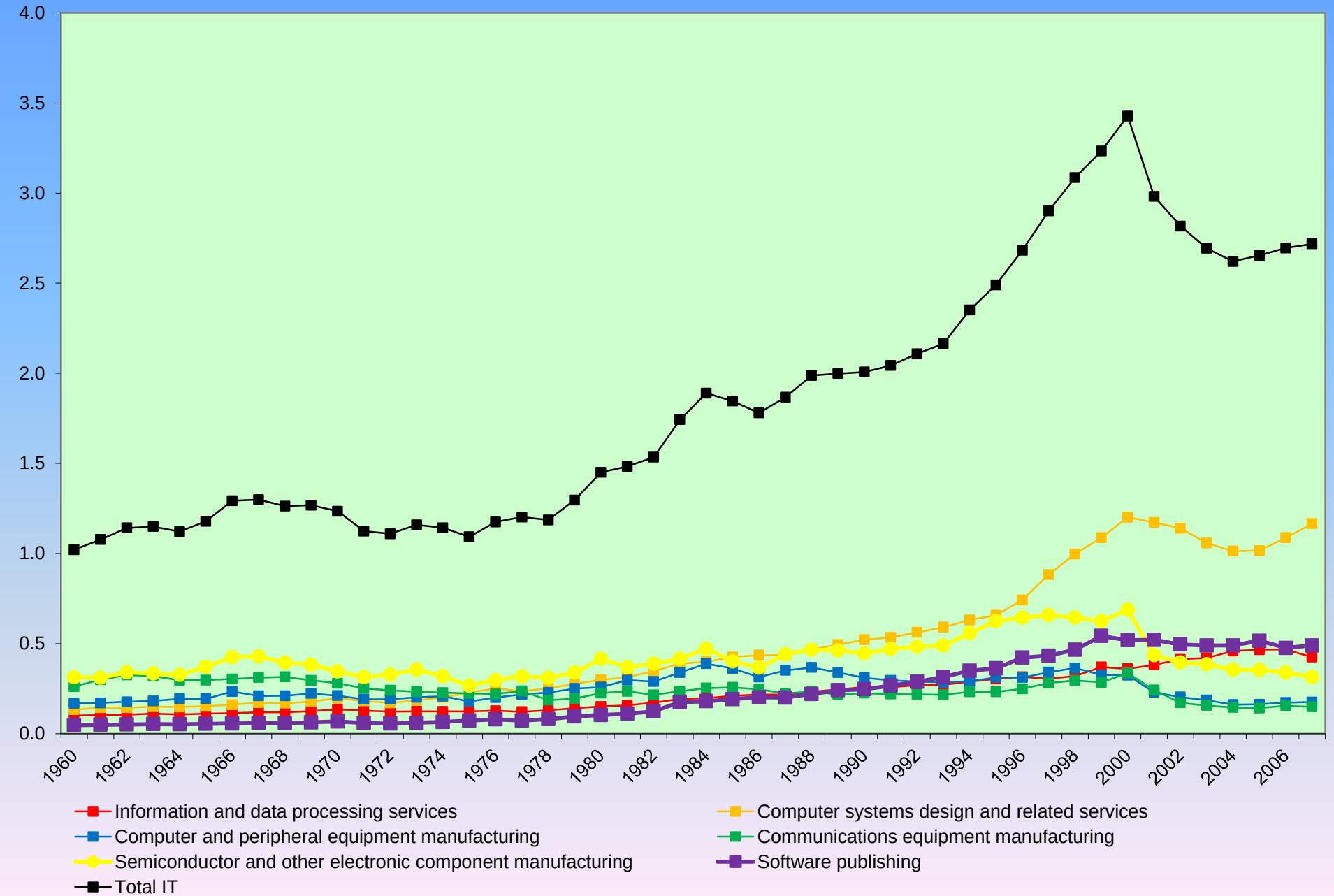
OUTPUT CONTRIBUTION OF IT:

IT-Producing, IT-Using, and Non-IT Value Added


Relative Prices of IT Industry Output, 1960-2007
Log Scale (2000=1)
1000
100
10
1
0.1
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
Information and data processing services
Computer systems design and related services
Computer and peripheral equipment manufacturing
Communications equipment manufacturing
Semiconductor and other electronic component manufacturing
Software publishing

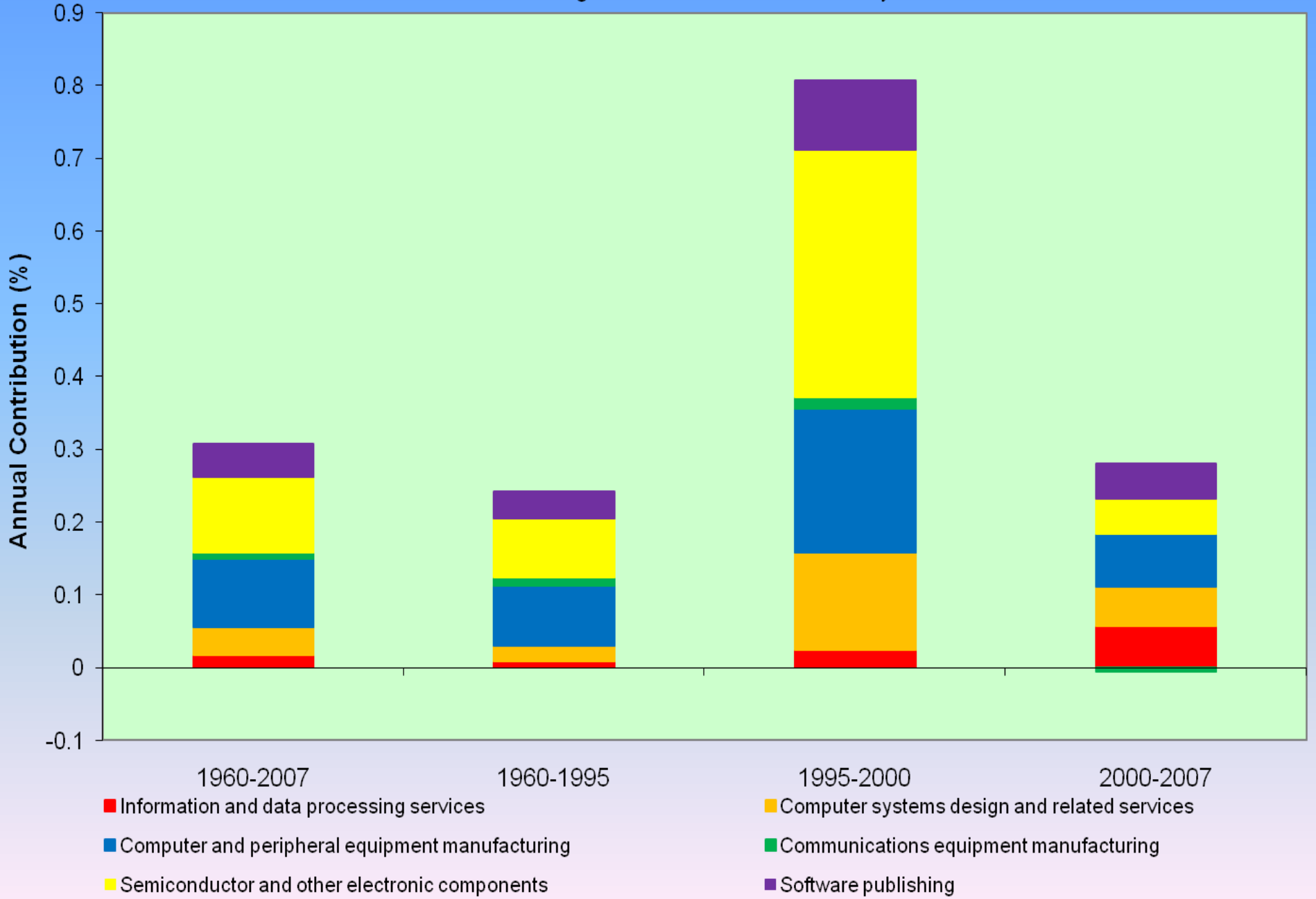
Value Added Shares of Information Technology by Type, 1960-2007

Share of Current Dollar Value Added.



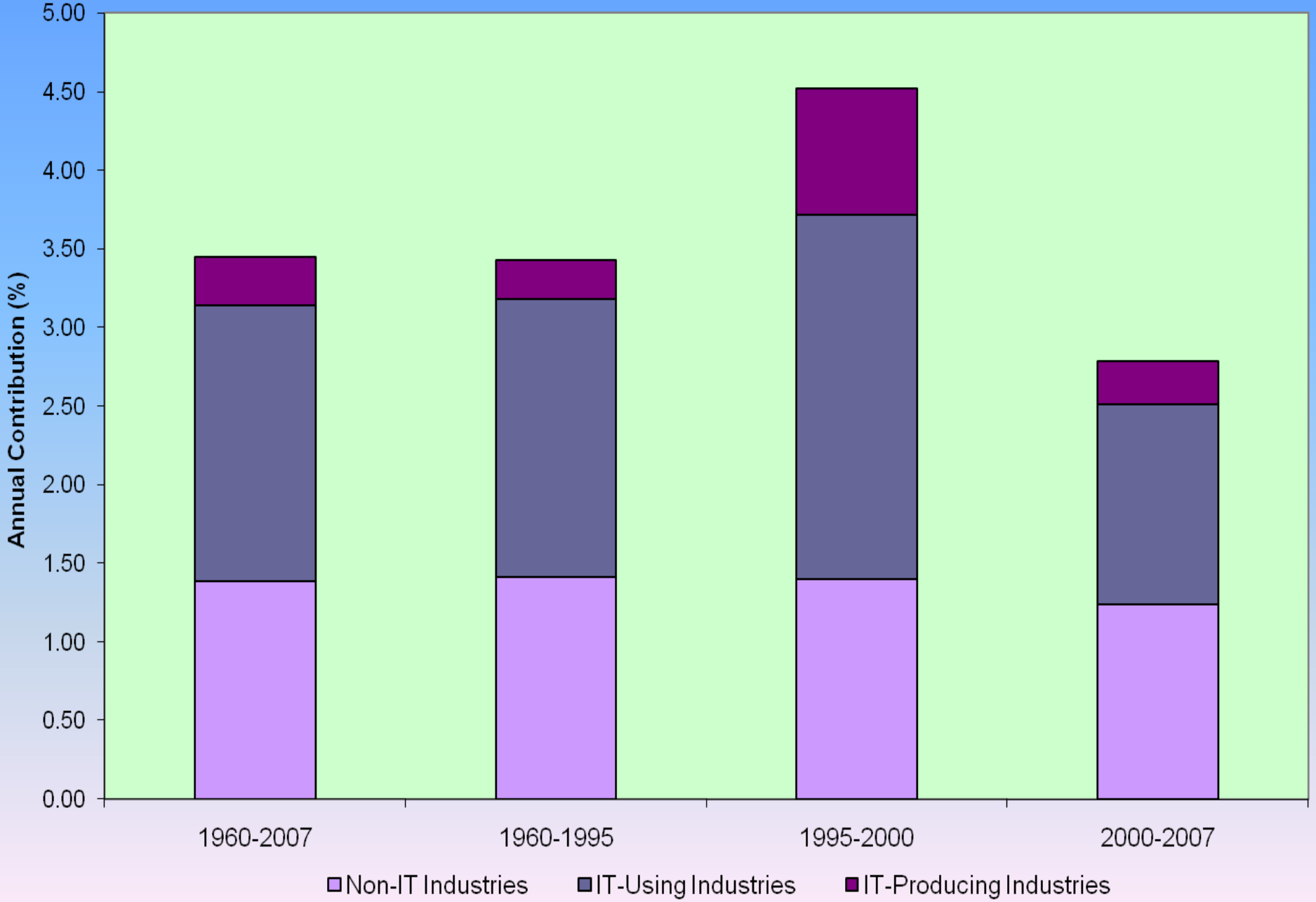
Industry Contributions to Value Added

Value added weighted contributions of industry value added.



Industry Contributions to Value Added Growth

Value added weighted contributions of industry value added.



GROWTH IN THE NEW MILLENNIUM: IT Investment and Productivity Growth

TOTAL FACTOR PRODUCTIVITY:

IT-Producing, IT-Using, and Non-IT Production

SOURCES OF U.S. ECONOMIC GROWTH:

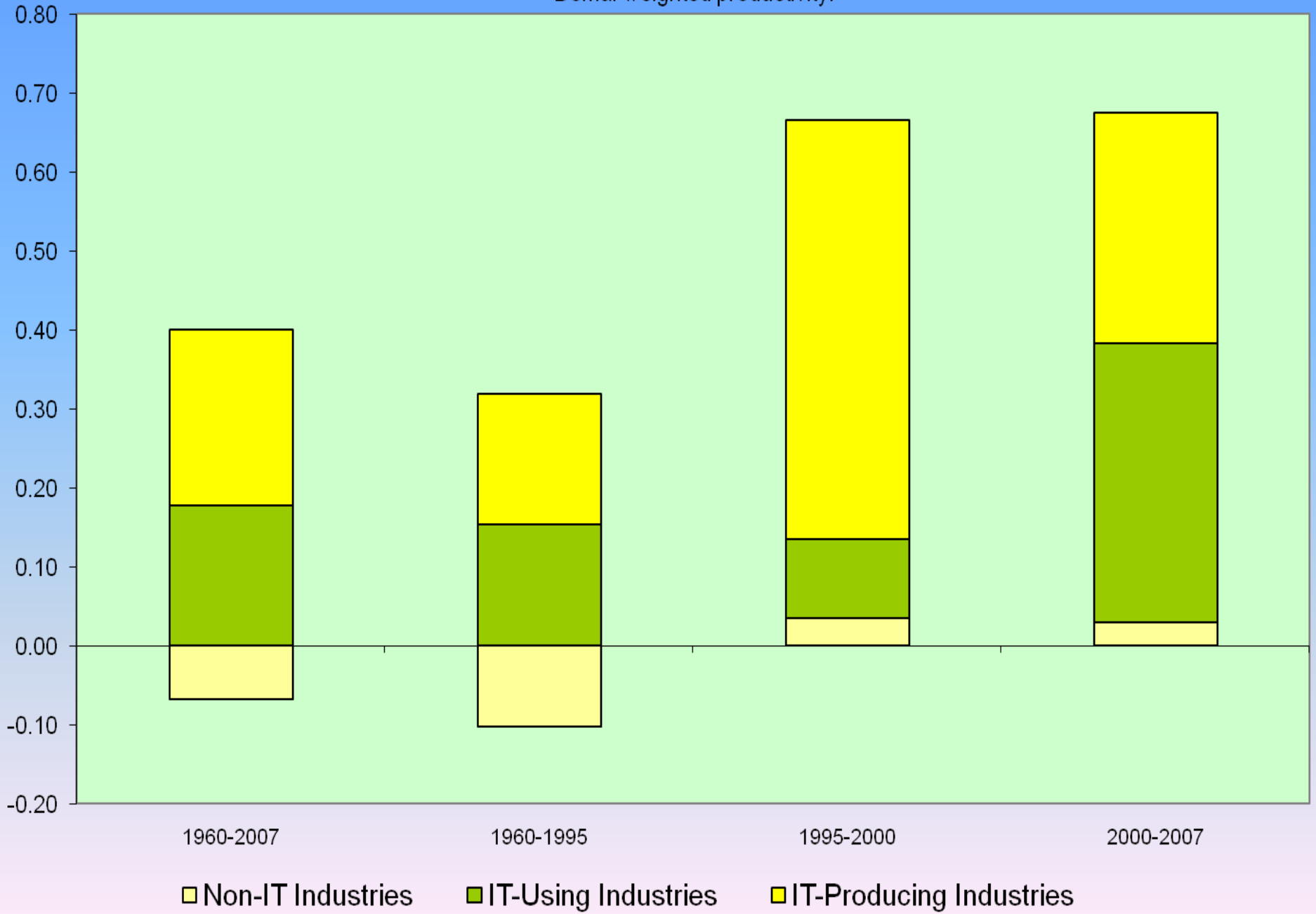
Capital Input, Labor Input, and TFP

AVERAGE LABOR PRODUCTIVITY GROWTH:

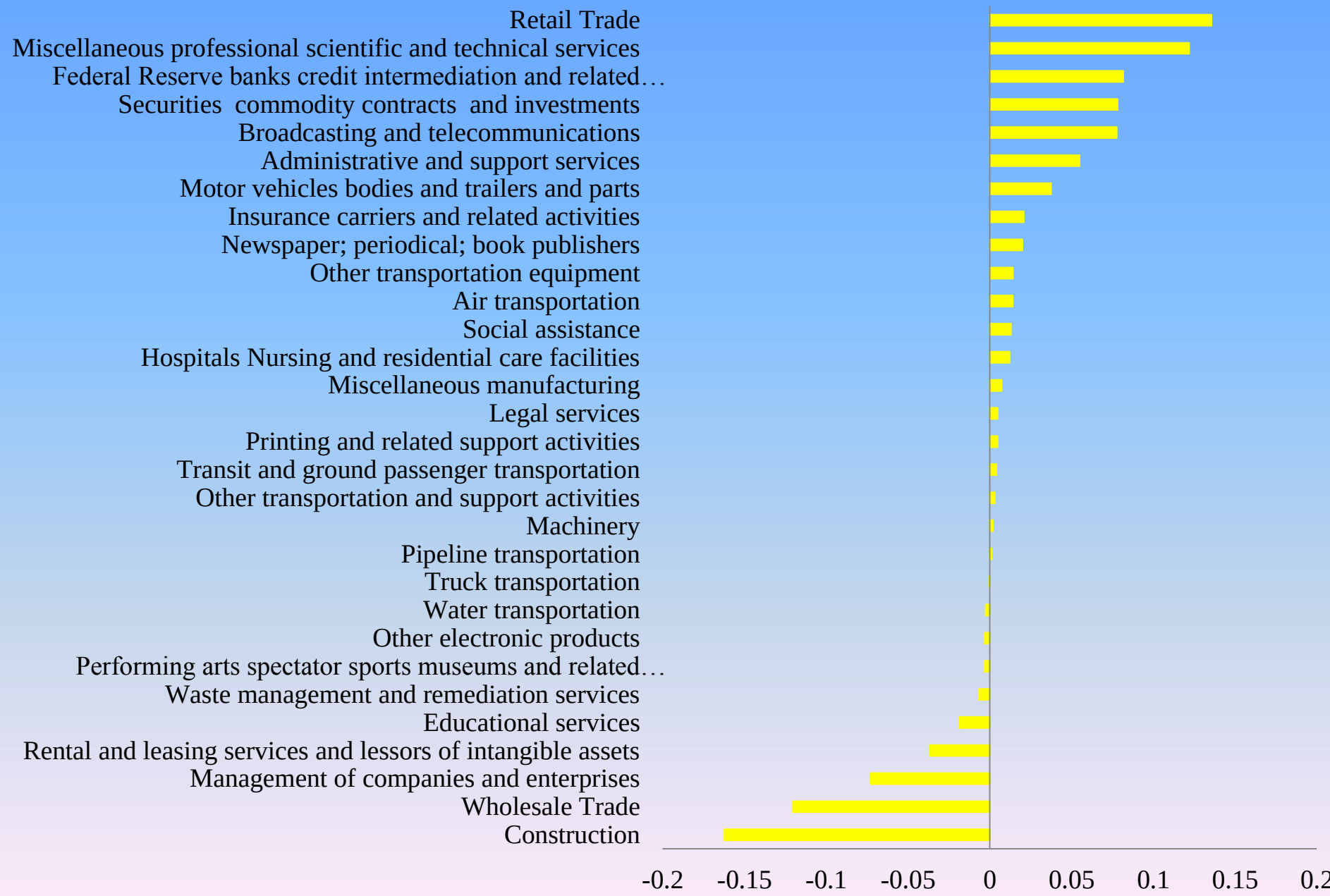
Capital Deepening, Labor Quality, TFP

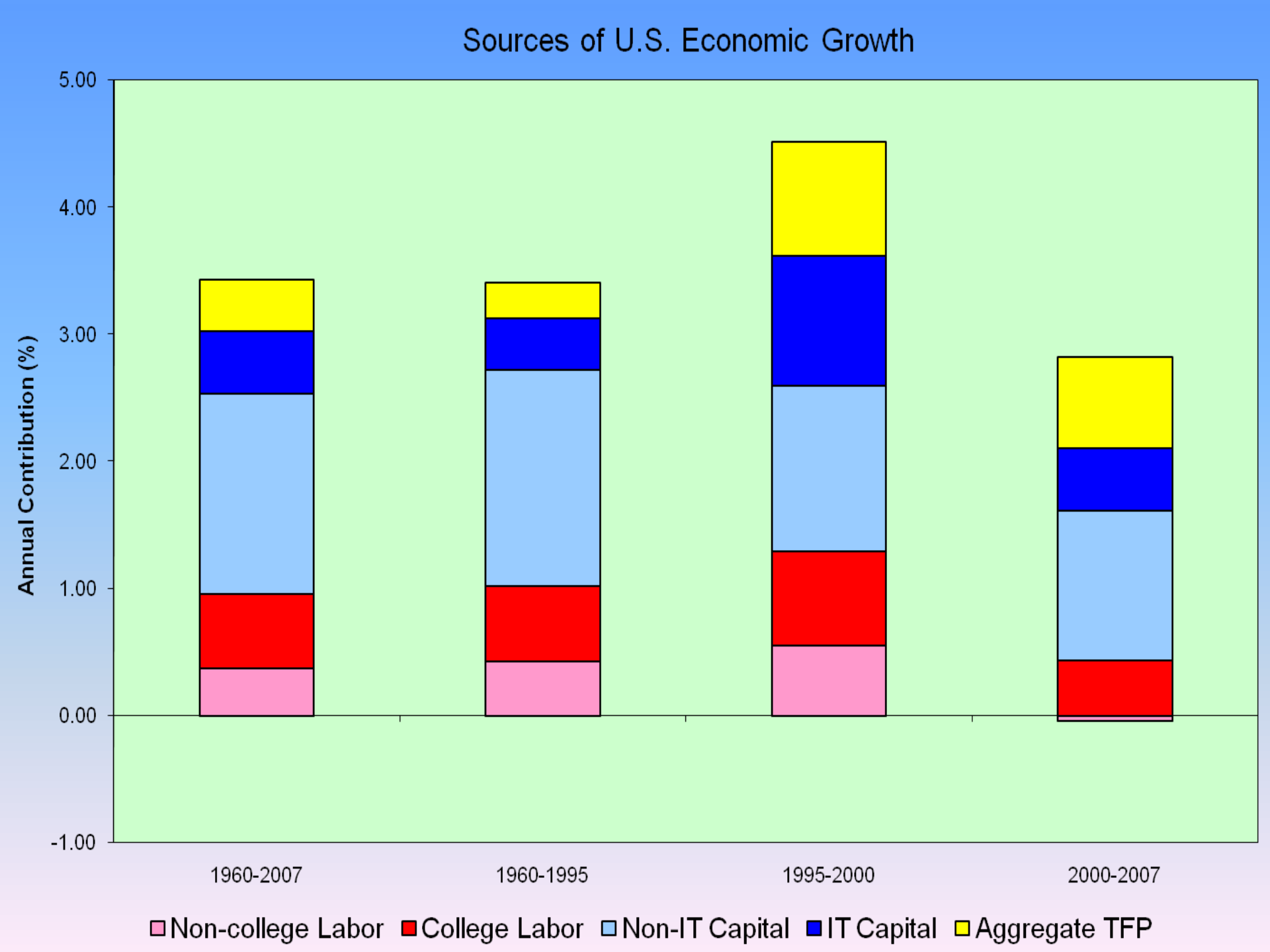
Industry Contributions to Productivity Growth

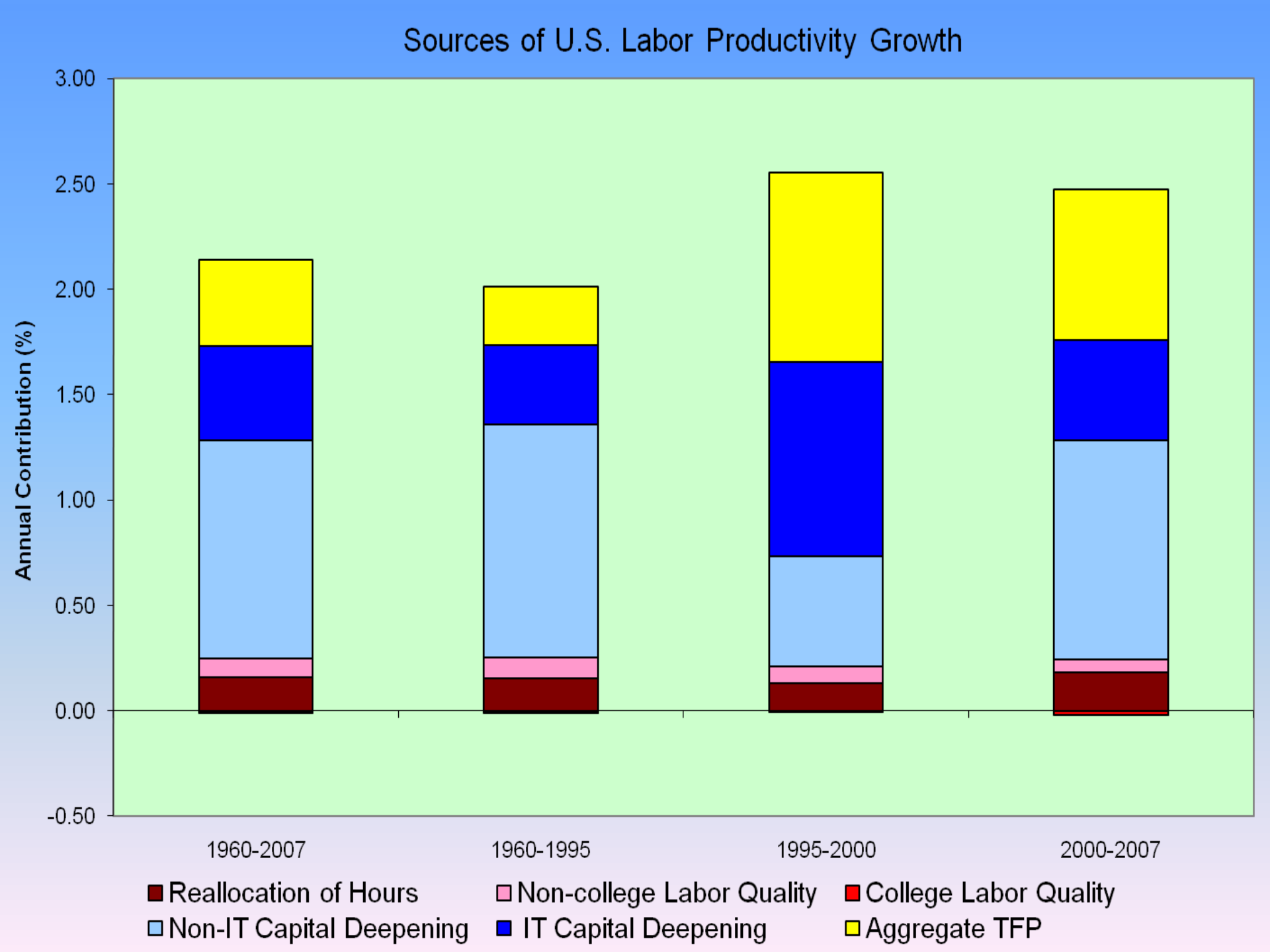
Domar weighted productivity.



Change in Contribution to Productivity: 2000-2007 less 1960-1995: IT Users




Sources of U.S. Economic Growth
Annual Contribution (%)
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
1960-2007
1960-1995
1995-2000
2000-2007
Non-college Labor
College Labor
Non-IT Capital
IT Capital
Aggregate TFP


Sources of U.S. Labor Productivity Growth
Annual Contribution (%)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
1960-2007
1960-1995
1995-2000
2000-2007
Reallocation of Hours
Non-college Labor Quality
College Labor Quality
Non-IT Capital Deepening
IT Capital Deepening
Aggregate TFP

GROWTH AT THE INDUSTRY LEVEL: Value Added and Productivity Growth

VALUE ADDED GROWTH:

IT-Producing Industries

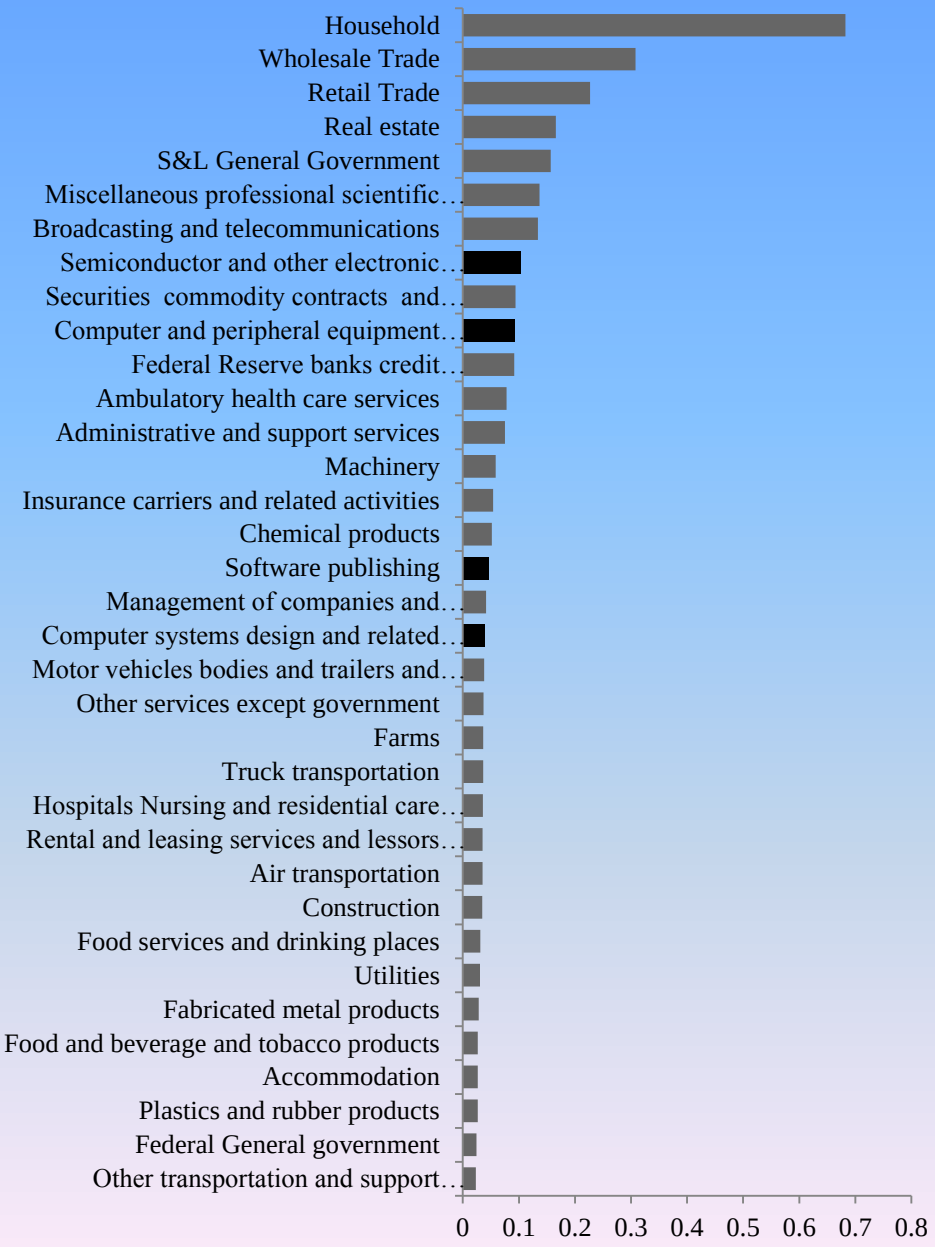
PRODUCTIVITY GROWTH:

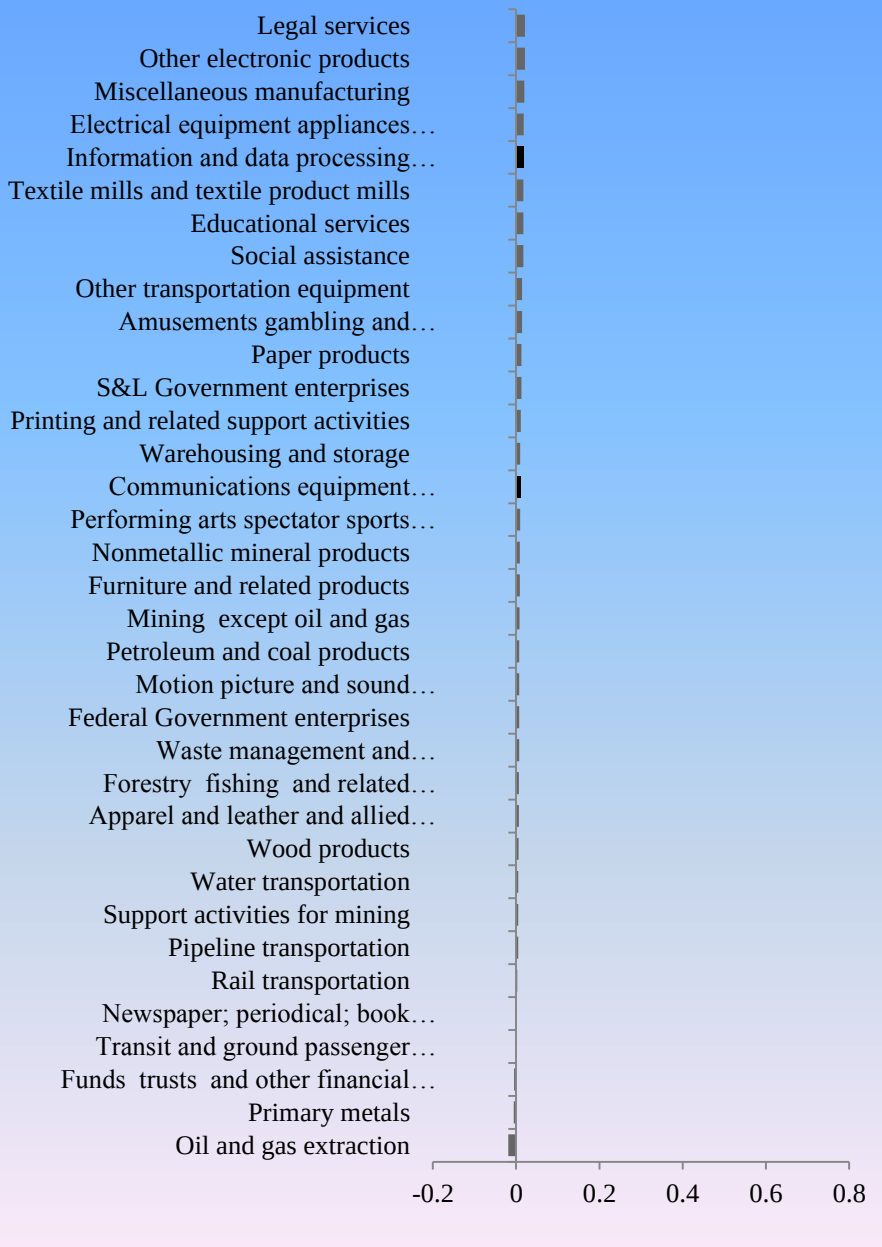
IT-Producing Industries

CHANGE IN PRODUCTIVITY GROWTH:

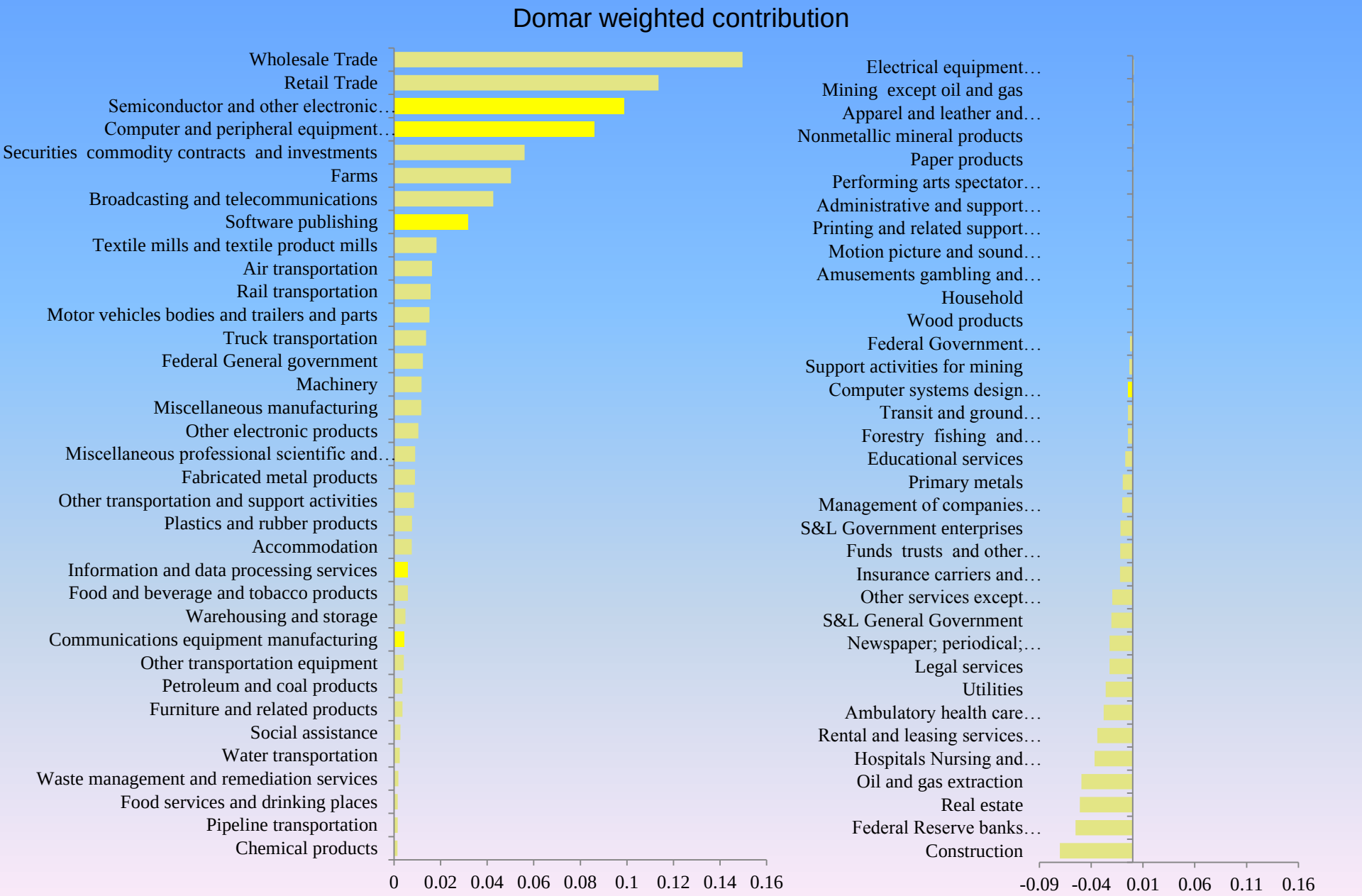
IT-Using Industries

Industry Contributions to Value Added Growth, 1960-2007





Industry Contributions to Productivity Growth, 1960-2007



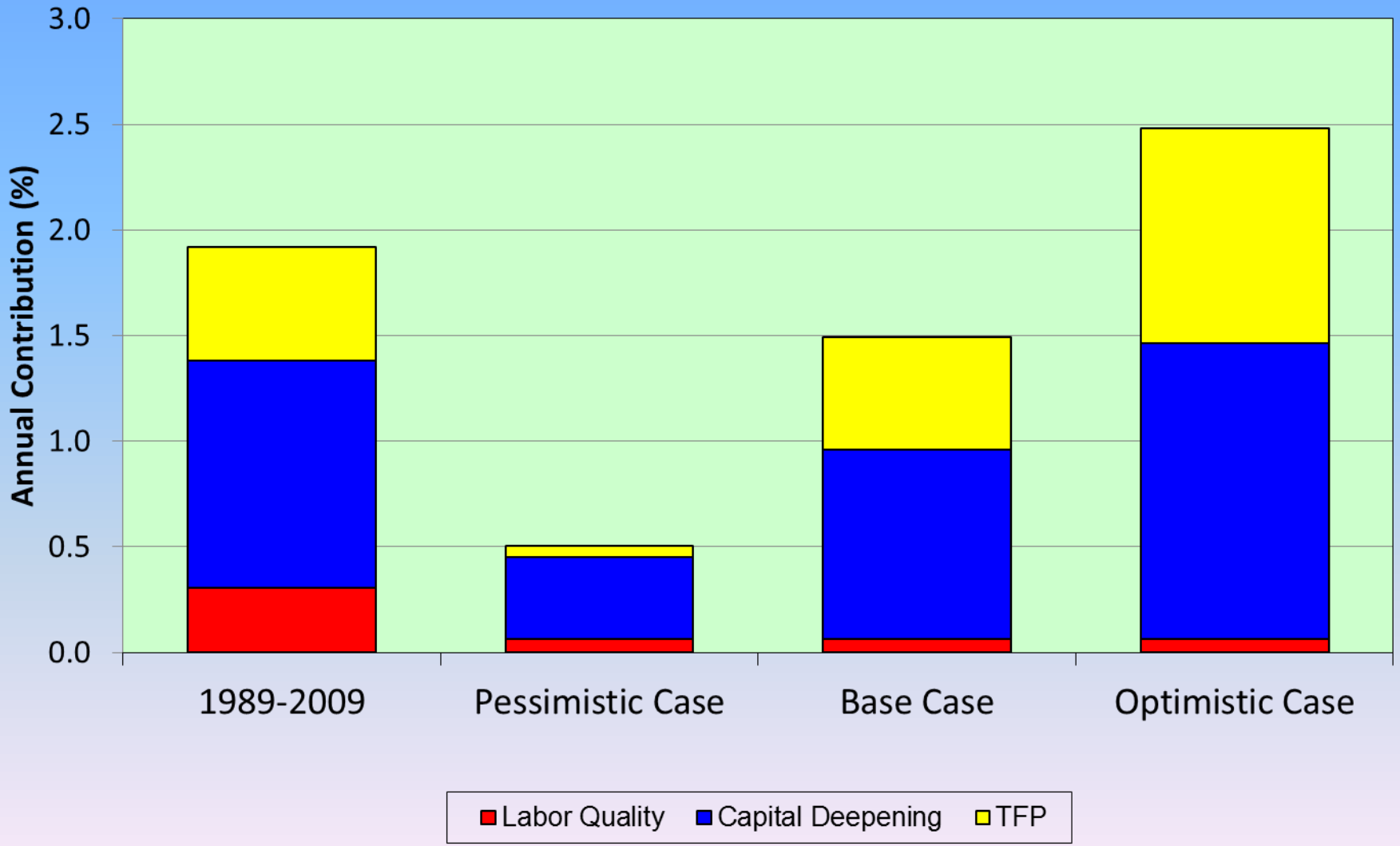
Projecting Growth of the U.S. and the World Economy

Hours Worked from Labor Force Projections;
Labor Quality from Projections of Educational Attainment

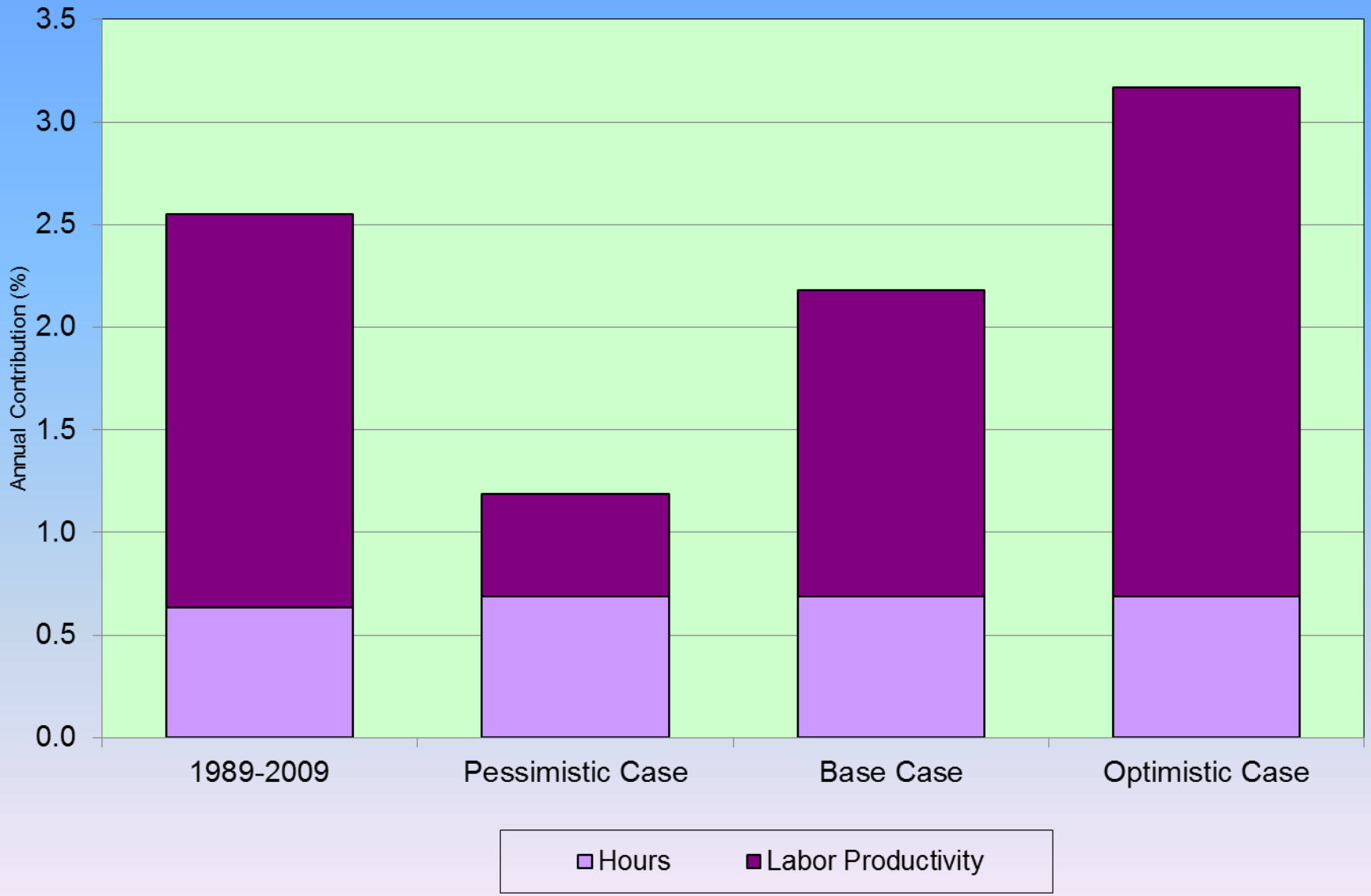
Productivity Growth from Production Possibility Frontier:
IT and Non-IT Productivity Growth, Capital Quality, and the Gap between Growth of Output and Capital

GDP Growth Is the Sum of Growth in
Hours Worked and Productivity Growth

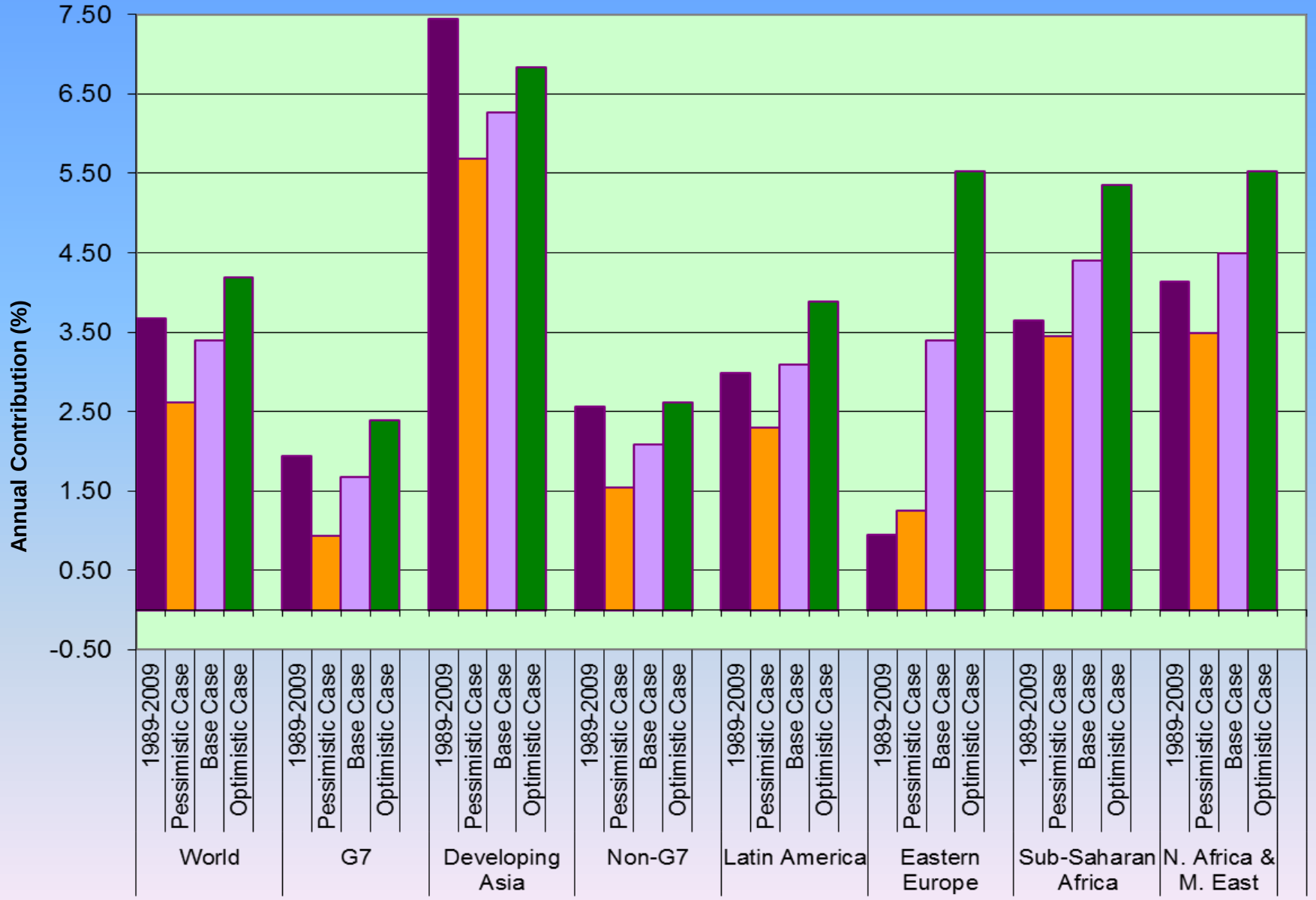
Range of U.S. Labor Productivity Projections



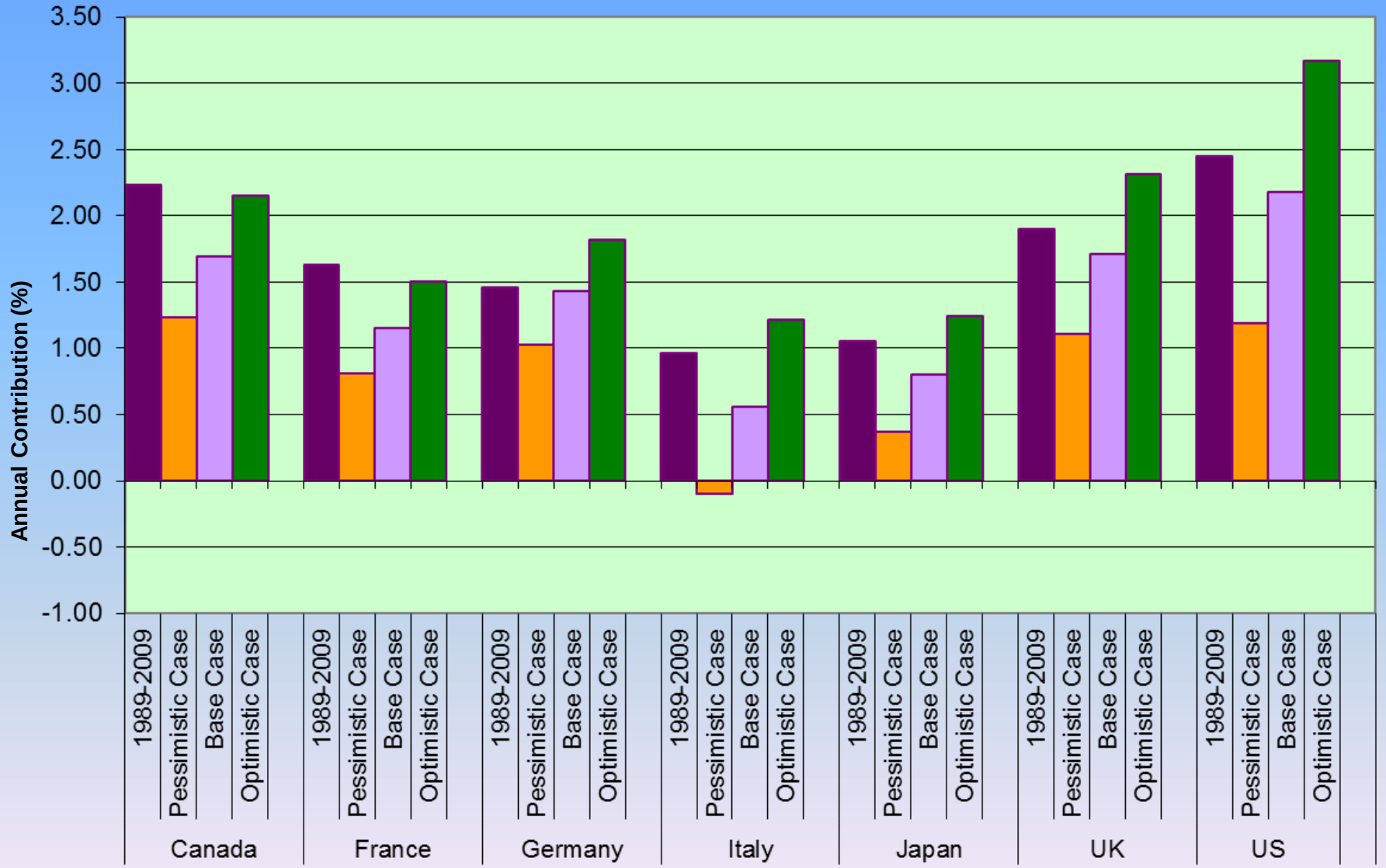
Range of U.S. Output Projections



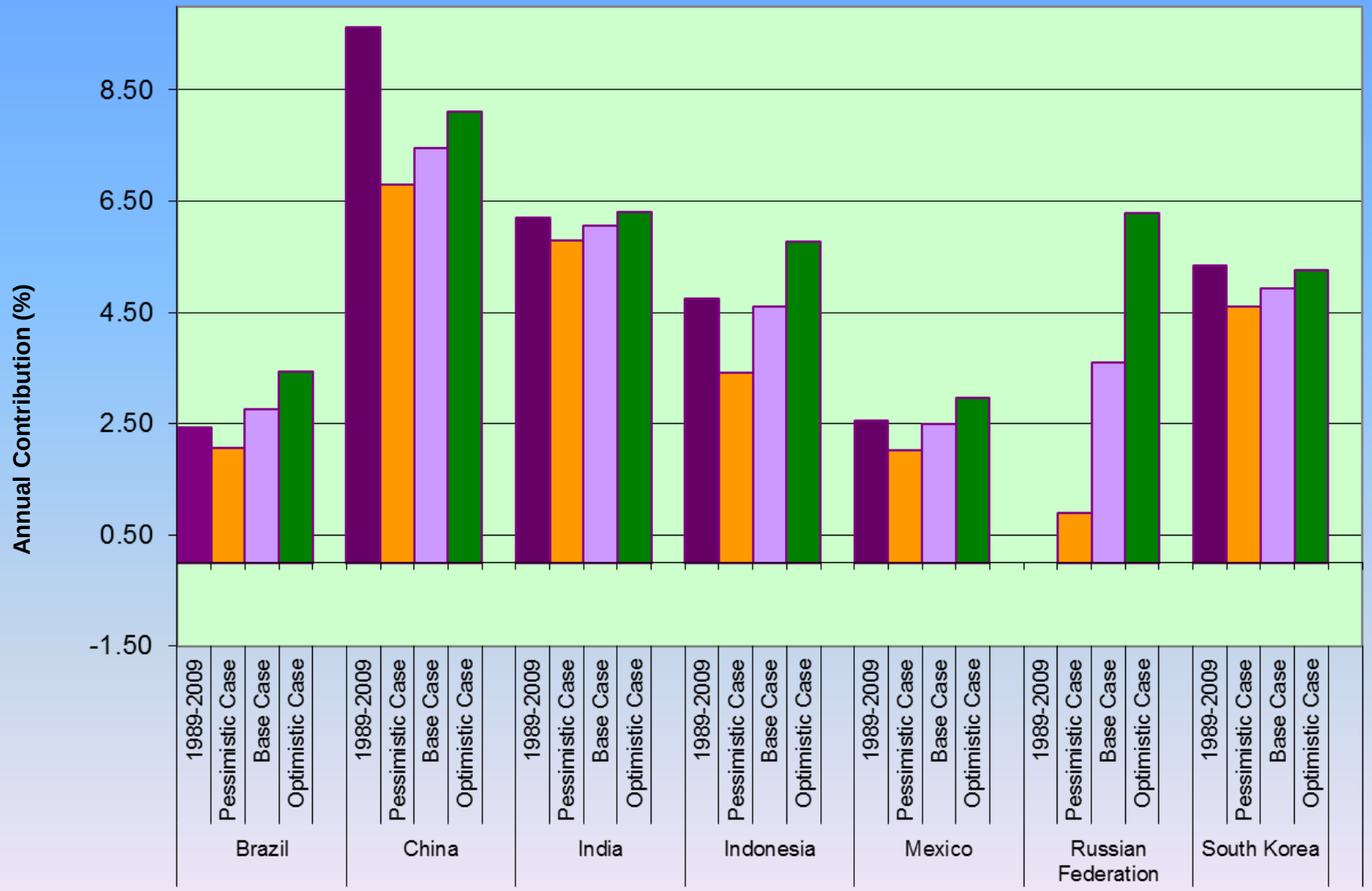
Range of World Output Projections



Range of G7 Output Projections



Range of Output Projections for Developing and Transition Economies



THE ECONOMIC IMPACT OF INFORMATION TECHNOLOGIES

FROM IT PRODUCTION TO UTILIZATION:

Trade and Services to the Forefront

THE WORLD ECONOMY:

Continuing Economic Growth

THE G7 ECONOMIES:

Slower Growth

CONVERGENCE:

The Rise of Asia