THE WORLD KLEMS INITIATIVE

by

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RIETI WORLD KLEMS SYMPOSIUM:
Growth Strategy after the World Financial Crisis.

Tokyo, Japan
May 20, 2014

THE WORLD KLEMS INITIATIVE: OUTLINE OF THE PRESENTATION

The Objective of the World KLEMS Initiative Is to Incorporate KLEMS-Type Data Sets into Official Systems of National Accounts.

The Growth of Outputs, Inputs, and Productivity at the Industry Level Is Crucial for Understanding the Sources of Economic Growth and the Nature of Structural Change.

Level Comparisons among Countries Are Essential for Assessing Competitive Advantage.

KLEMS-Type Data Can Be Combined with Demographic Projections to Project Productivity and Economic Growth:

MILESTONES IN THE WORLD KLEMS INITIATIVE

EU KLEMS: Completed June 2008. KLEMS Data Sets for 25 or 27 European Union (EU) Members Plus Australia, Canada, Japan, Korea, and the United States. **See:http://www.euklems.net/**

LA KLEMS: Established December 2009 at ECLAC/CEPAL, the Economic Commission for Latin America and the Caribbean, Santiago, Chile. **See:http://www.cepal.org/cgi-bin/getprod.asp?xml=/la-klems/noticias/paginas/4/40294/P40294.xml&xsl=/la-klems/tpl-i/p18f-st.xsl&base=/la-klems/tpl-i/top-bottom.xsl**

World KLEMS Initiative: Established First World KLEMS Conference, Harvard University, August 2010. **See: http://www.csls.ca/ipm/24/IPM-24-Jorgenson.pdf**

Asia KLEMS: Established July 2011, First Asia KLEMS Conference, Asian Development Bank Institute, Tokyo, Japan. **See: http://www.asiaklems.net/**

Second World KLEMS Conference: Harvard University, August 9-10, 2012. **See**: **http://www.economics.harvard.edu/faculty/jorgenson/files/0809_0900_TIMMER_9AM_worldklems2012_timmer_intro.pdf**

EUROPEAN UNION (EU) KLEMS

Two Volumes Reporting Results of EU KLEMS:

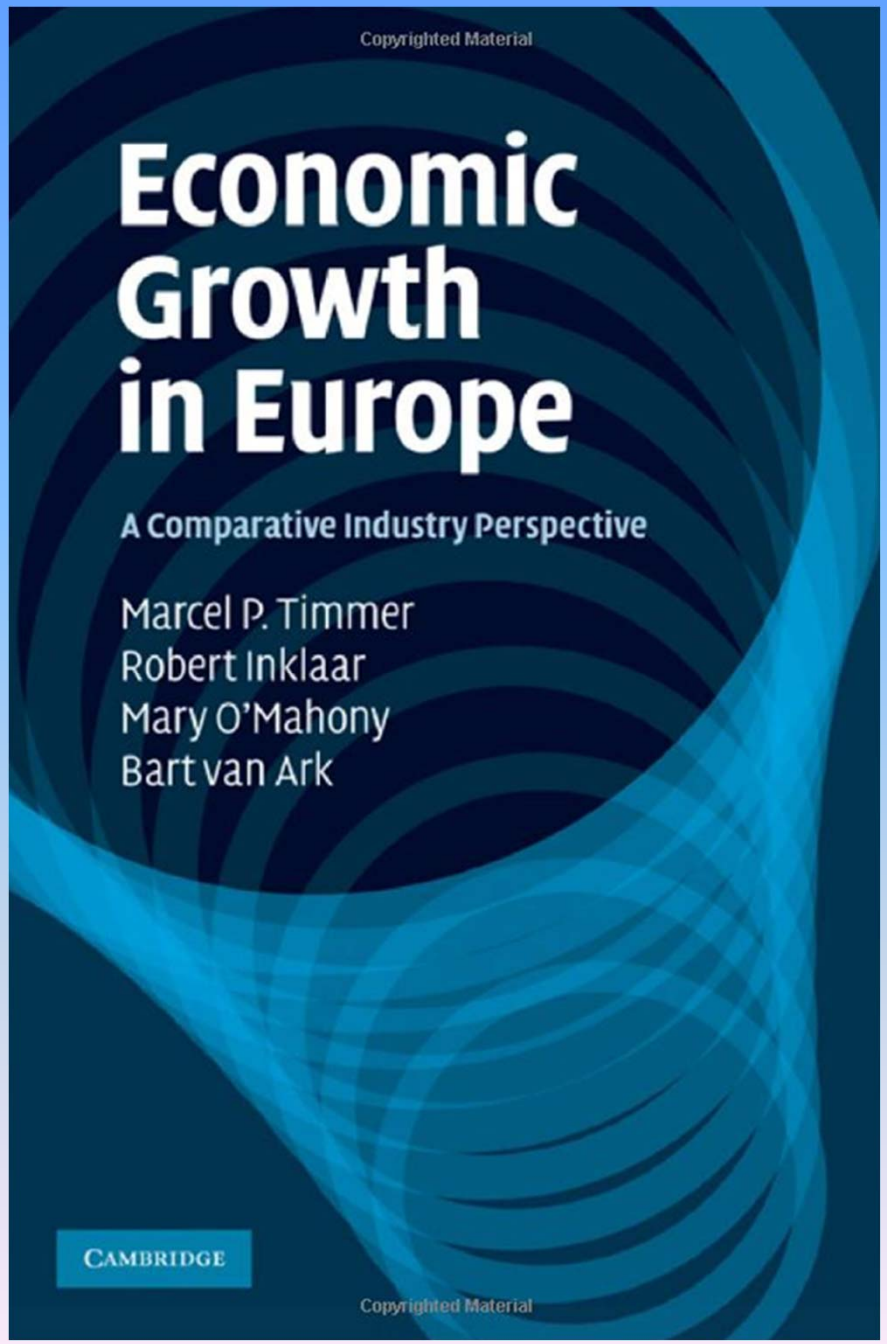
Marcel P. Timmer, Robert Inklaar, Mary O'Mahony, and Bart van Ark, ECONOMIC GROWTH IN EUROPE: A Comparative Industry Perspective, Cambridge, Cambridge University Press, 2010.

Matilde Mas and Robert Stehrer, eds., INDUSTRIAL PRODUCTIVITY IN EUROPE: Growth and Crisis, Cheltenham, UK, Edward Elgar Publishing, 2012.

Important Findings: The EU KLEMS Project Identified Weaknesses in the Knowledge Economy – Investment in Human Capital, Investment in Information Technology, and Innovation – As Main Sources of Economic Growth Slowdown that Preceded the Current Economic and Fiscal Crisis in Europe.

Policy Implications: Establishment of a Single Market for Services in Europe Is Critical in Removal of Barriers to the Knowledge Economy and Revival of Economic Growth in Europe as the Crisis Winds Down.

Updated Data: See: http://www.euklems.net/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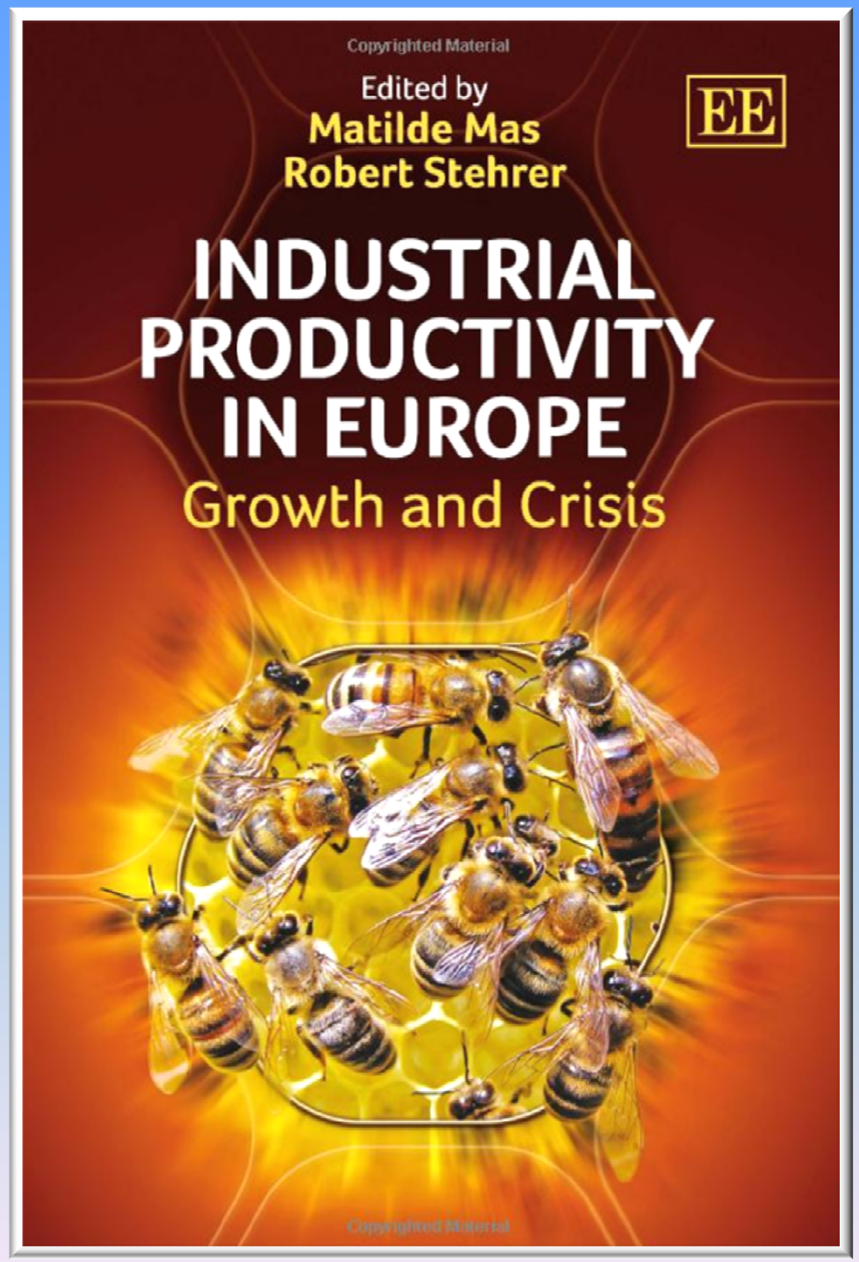
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Growth and Crisis
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LATIN AMERICAN (LA) KLEMS

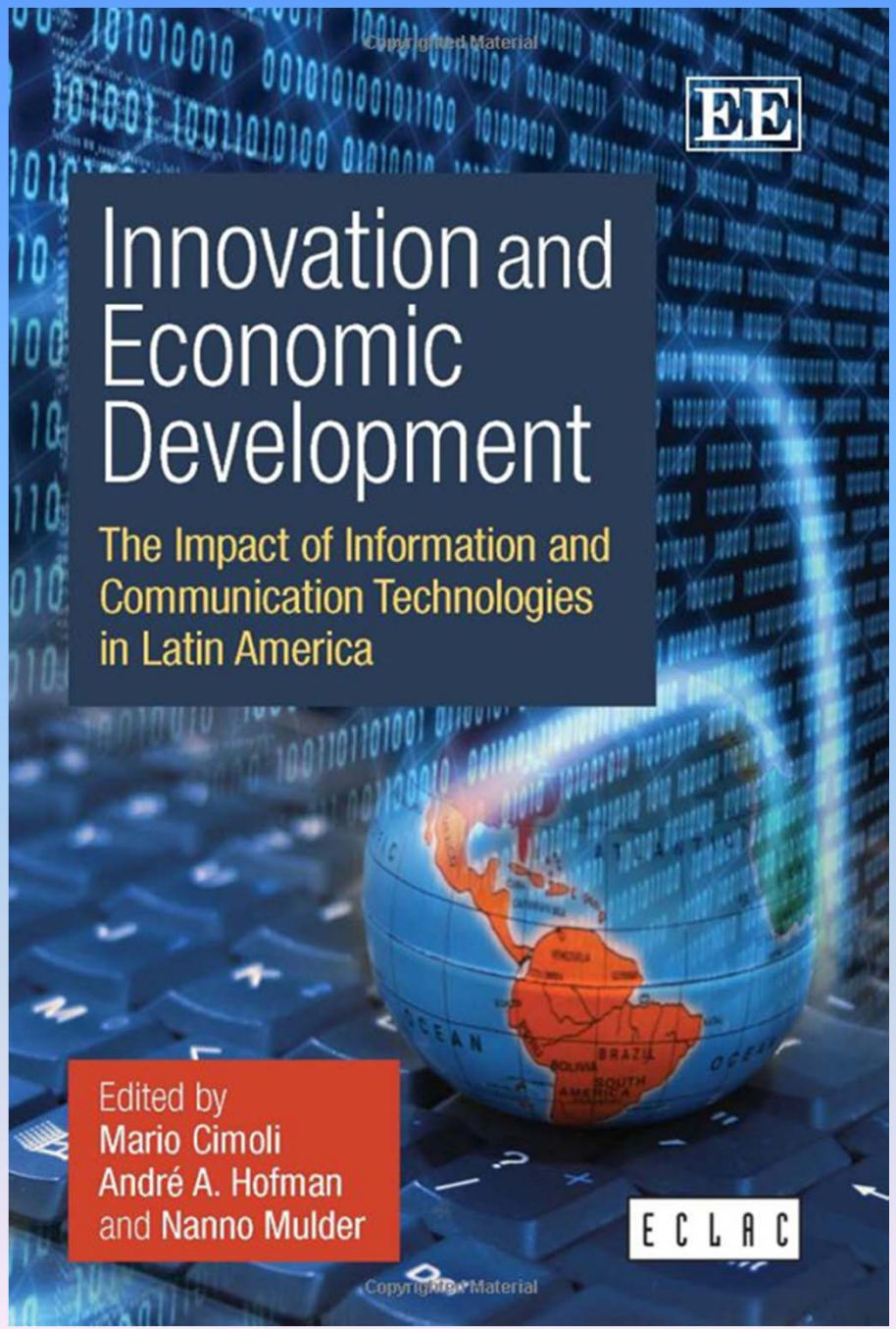
Results of Initial Conference Reported in:

Mario Cimoli, Andre A. Hofman, and Nanno Mulder (2010), eds., INNOVATION AND ECONOMIC DEVELOPMENT: The Impact of Information and Communication Technologies in Latin America, Northampton, MA, Edward Elgar.

Detailed Report on Mexico KLEMS:

INEGI (2013), SISTEMA DE CUENTAS NACIONALES DE MEXICO: Productividad Total de los Factores, 1990-2011,
Aguascalientes, Mexico, INEGI.

Presents a Complete Mexico KLEMS Data Set, Integrated with Mexican National Accounts. A Very Important Empirical Finding: Mexican Total Factor Productivity Has Not Grown since 1990. Positive Growth Offset by Negative Growth in Mexican Sovereign Debt Crisis of 1995, U.S. Dot-Com Crash of 2001, and U.S. Financial and Economic Crisis of 2007-2009. Other Important Findings Discussed at this Conference.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André A. Hofman
and Nanno Mulder
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Instituto Nacional de Estadística y Geografía
SCNM
Sistema de Cuentas Nacionales de México
Productividad total de los factores 1990-2011
INEGI
INSTITUTO NACIONAL DE ESTADÍSTICA Y GEOGRAFÍA

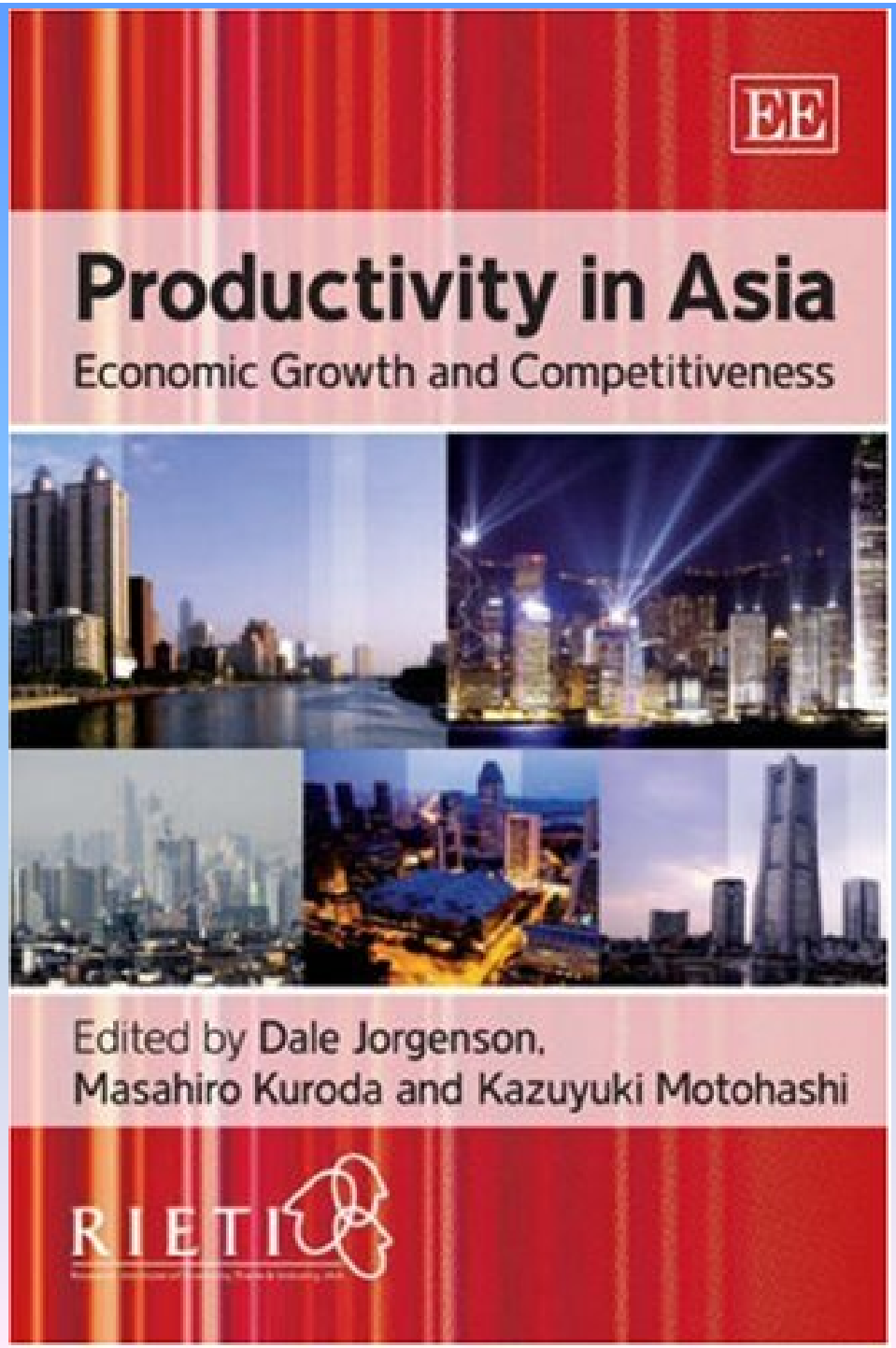
ASIA KLEMS

Asia KLEMS Was Preceded by International Comparison of Productivity among Asian Countries (IPAC) Project, Research Institute of Economy Trade and Industry (RIETI), Tokyo, Japan. Results Reported in:

Dale W. Jorgenson, Masahiro Kuroda, and Kazuyuki Motohashi (2007), eds., PRODUCTIVITY IN ASIA: Economic Growth and Competitiveness, Edward Elgar, Northampton, MA.

KLEMS-Type Data Sets for Japan and Korea: Japan Industrial Database (JIP); Korea Industrial Data Base (KIP). Updated Data Available EU KLEMS website. These Data Sets and Others Discussed at First Asia KLEMS Conference in Tokyo, 2011, and Second Asia KLEMS Conference in Seoul, 2013. KLEMS-Type Data Sets Have Completed for India and Taiwan and Are Under Construction for China and Malaysia.

Third World KLEMS Conference, Tokyo, May 19-20, 2014, RIETI. See:http://www.rieti.go.jp/en/events/14051901/info.html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Productivity in Asia
Economic Growth and Competitiveness
Edited by Dale Jorgenson,
Masahiro Kuroda and Kazuyuki Motohashi
RIETI

AGENDA FOR WORLD KLEMS: GROWTH AND STRUCTURAL CHANGE

National Accounts. The First Objective for the World KLEMS Initiative is to Incorporate Data on Growth and Productivity into the National Accounts. Nine Countries Provide KLEMS Data within National Accounts: Australia, Canada, Denmark, Finland, Italy, Mexico, The Netherlands, Sweden, and the United States.

Japan in World KLEMS. The RIETI Japan Industrial Productivity (JIP) Database Provides KLEMS-Type Data on Growth and Productivity for Japan, Covering the Period 1970-2009:
http://www.rieti.go.jp/en/database/JIP2012/index.html#04-4
This Database Is Consistent with the Japan System of National Accounts (JSNA) and Could Be Made Part of the National Accounts.

Applications. The JIP Database Has Been Used to Analyze "The Structural Causes of Japan's Two Lost Decades" by Kyoji Fukao, et al. According to Fukao: "Japan needs to make changes that would allow productive companies to expand their market share, and small and medium enterprises (SMEs) to increase productivity."
See: http://www.rieti.go.jp/en/publications/rd/003.html

THE AGENDA FOR WORLD KLEMS: INTERNATIONAL COMPETITIVENESS

Second Priority Is the Analysis of International Competitiveness. The Natural Framework for this is the World Input-Output Study (WIOD), Revised and Extended by OECD and World Trade Organization: http://www.wiod.org/index.htm.

KLEMS-Type Data Sets Can Be Linked by Industry-Level Purchasing Power Parities and Trade Data as Shown by Inklaar and Timmer (2014): http://onlinelibrary.wiley.com/doi/10.1111/roiw.12012/abstract. These Data Can Be Used to Implement the Value Added Approach to Trade: Marcel P. Timmer, Bart Los, Robert Stehrer, and Gaaitzen de Vries (2012), "Fragmentation, Incomes, and Jobs. An Analysis of European Competitiveness," Working Paper No. 9, Groningen Growth and Development Centre. See: http://www.wiod.org/publications/papers/wiod9.pdf

Challenge Remaining Is to Link Data Sets for Capital and Labor Inputs, Using the Methodology of Jorgenson and Nomura: Dale W. Jorgenson and Koji Nomura (2007), **"The Industry Origins of the U.S.-Japan Productivity Gap"**. Economic Systems Research 19, no. 3 (2007): 315-412.

THE AGENDA FOR THE WORLD KLEMS INITIATIVE: SUMMARY

Original Vision: The World KLEMS Initiative Involves KLEMS-Type Data Sets for More Than 40 Countries. These Will Include Data for the Countries that Are Participating in EU KLEMS, LA KLEMS, and Asia KLEMS, the Regional Organizations that Comprise World KLEMS.

Linking the Data: Data on Growth and Productivity Can Be Linked through Purchasing Power Parities for Industry Outputs, Intermediate Inputs and Inputs of Capital and Labor Services to Make International Comparisons of Outputs, Inputs, and Productivity Levels.

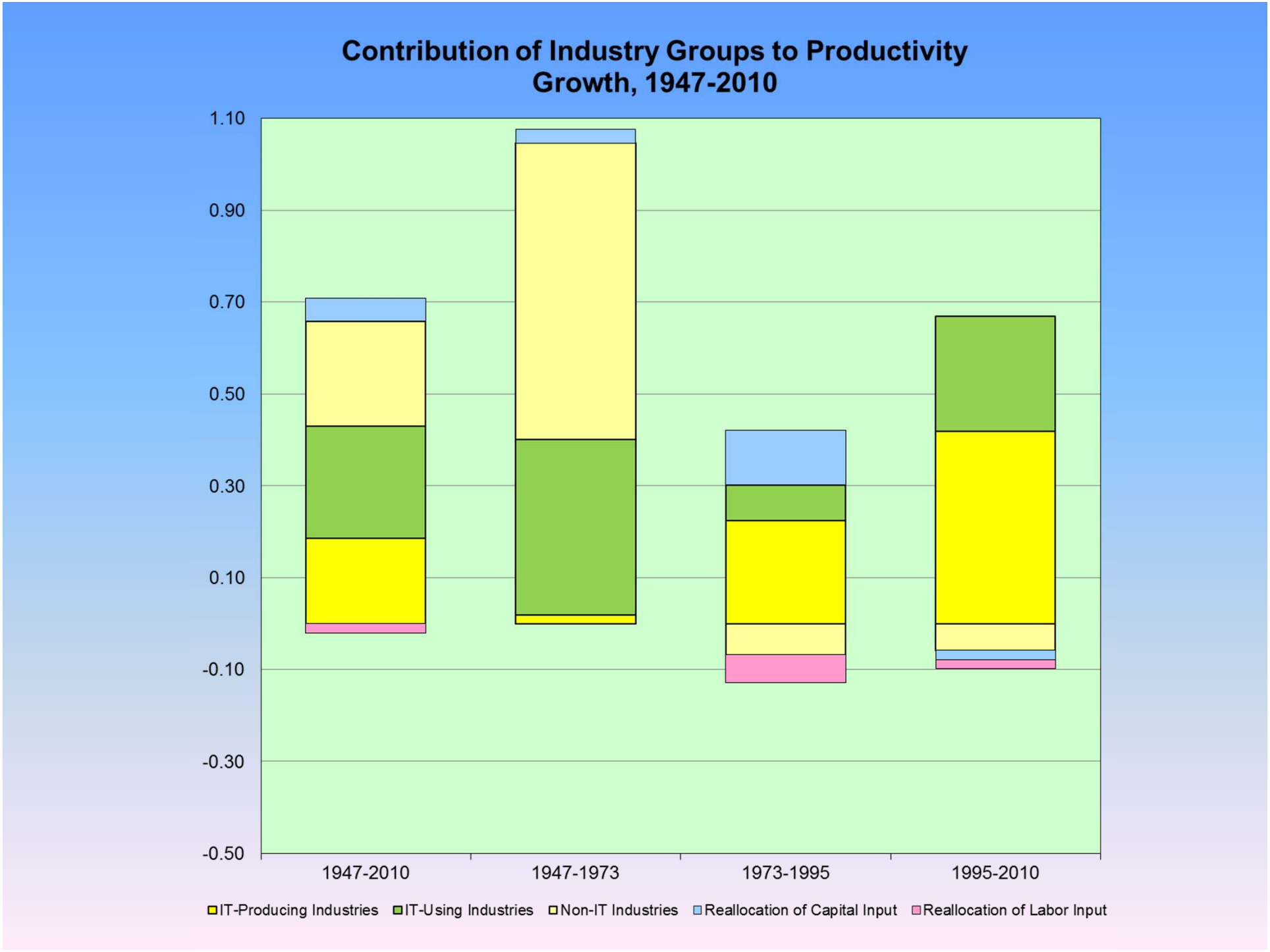
Applications: Growth and Productivity Data Are Used to Analyze the Sources of Economic Growth and Changes in Economic Structure. KLEMS-Type Data Can Be Combined with Demographic Projections to Project Growth and Productivity.

INDUSTRY CONTRIBUTIONS TO PRODUCTIVITY GROWTH

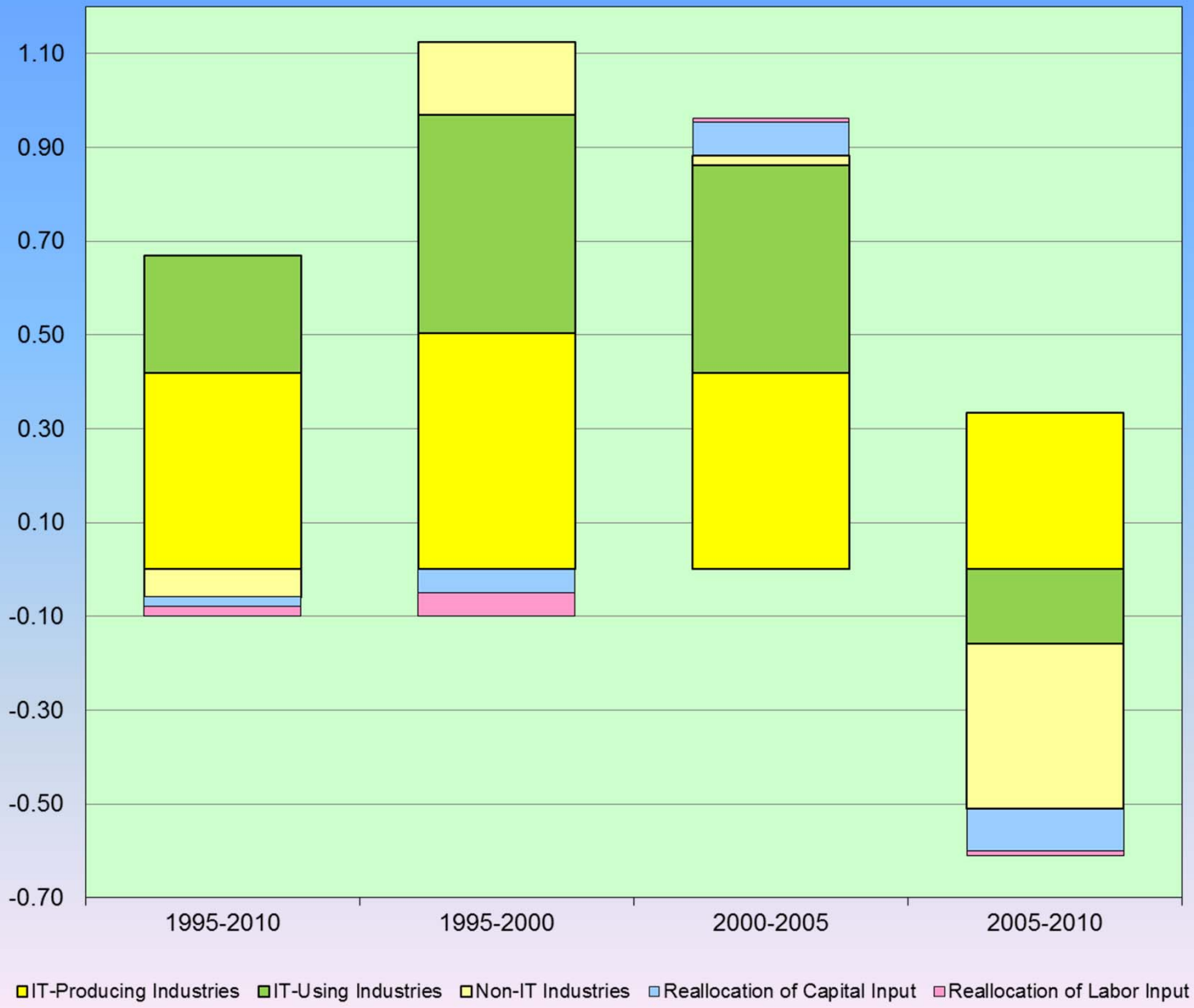
Industry-Level Productivity Growth:
IT-Producing, IT-Using and Non-IT Industries

Reallocation of Factor Inputs:
Capital Input and Labor Input

Aggregate Productivity Growth:
Industry Productivity and Factor Reallocations


Contribution of Industry Groups to Productivity Growth, 1947-2010
1.10
0.90
0.70
0.50
0.30
0.10
-0.10
-0.30
-0.50
1947-2010
1947-1973
1973-1995
1995-2010
IT-Producing Industries
IT-Using Industries
Non-IT Industries
Reallocation of Capital Input
Reallocation of Labor Input

Contribution of Industry Groups to Productivity Growth, 1995-2010



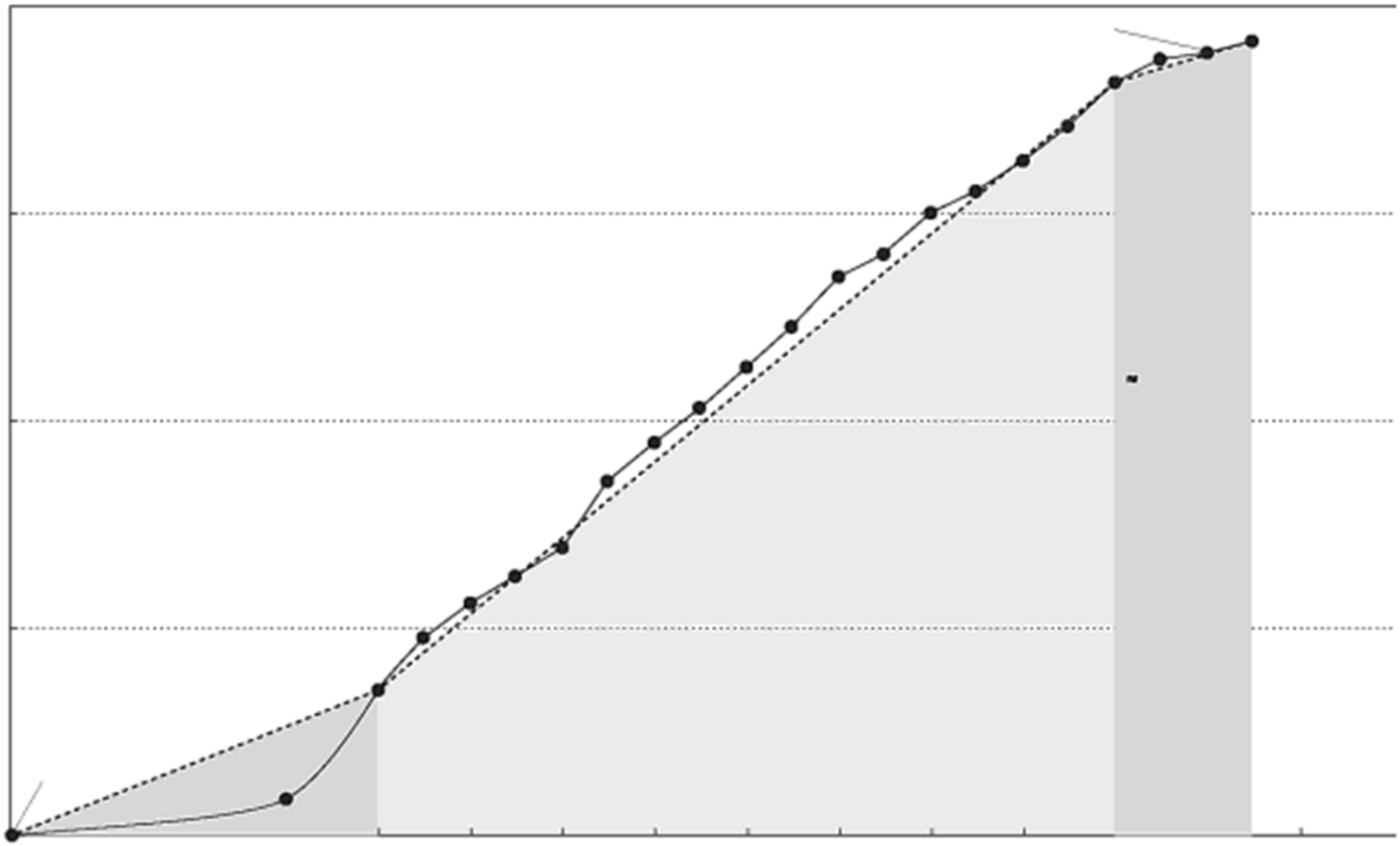


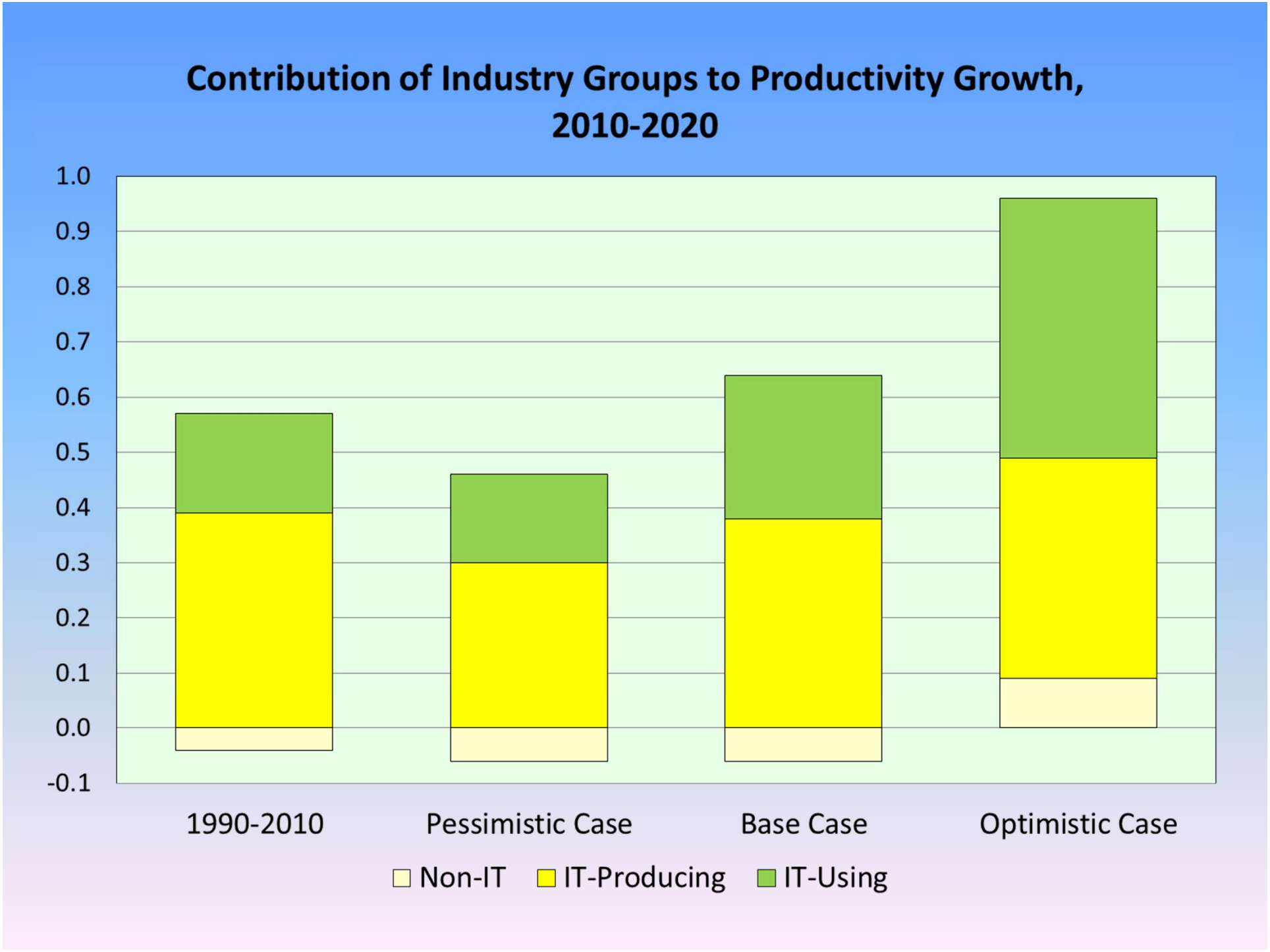
Figure 1.1 Growth in processor performance since the mid-1980s. This chart plots performance relative to the VAX 11/780 as measured by the SPECint benchmarks (see Section 1.8). Prior to the mid-1980s, processor performance growth was largely technology driven and averaged about 25% per year. The increase in growth to about 52% since then is attributable to more advanced architectural and organizational ideas. By 2002, this growth led to a difference in performance of about a factor of seven. Performance for floating-point-oriented calculations has increased even faster. Since 2002, the limits of power, available instruction-level parallelism, and long memory latency have slowed uniprocessor performance recently, to about 20% per year. Since SPEC has changed over the years, performance of newer machines is estimated by a scaling factor that relates the performance for two different versions of SPEC (e.g., SPEC92, SPEC95, and SPEC2000).

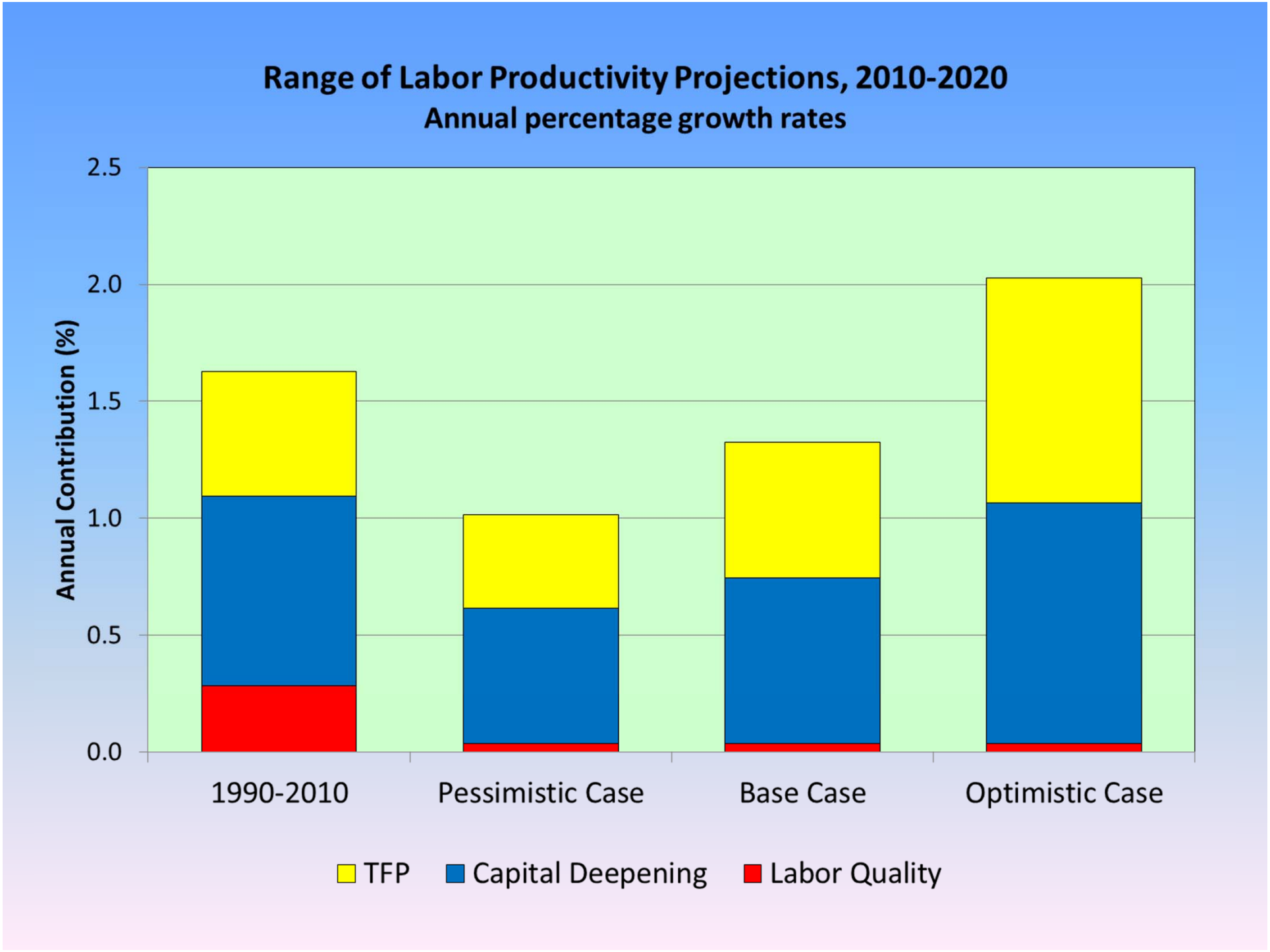
PROJECTING U.S. PRODUCTIVITY AND ECONOMIC GROWTH

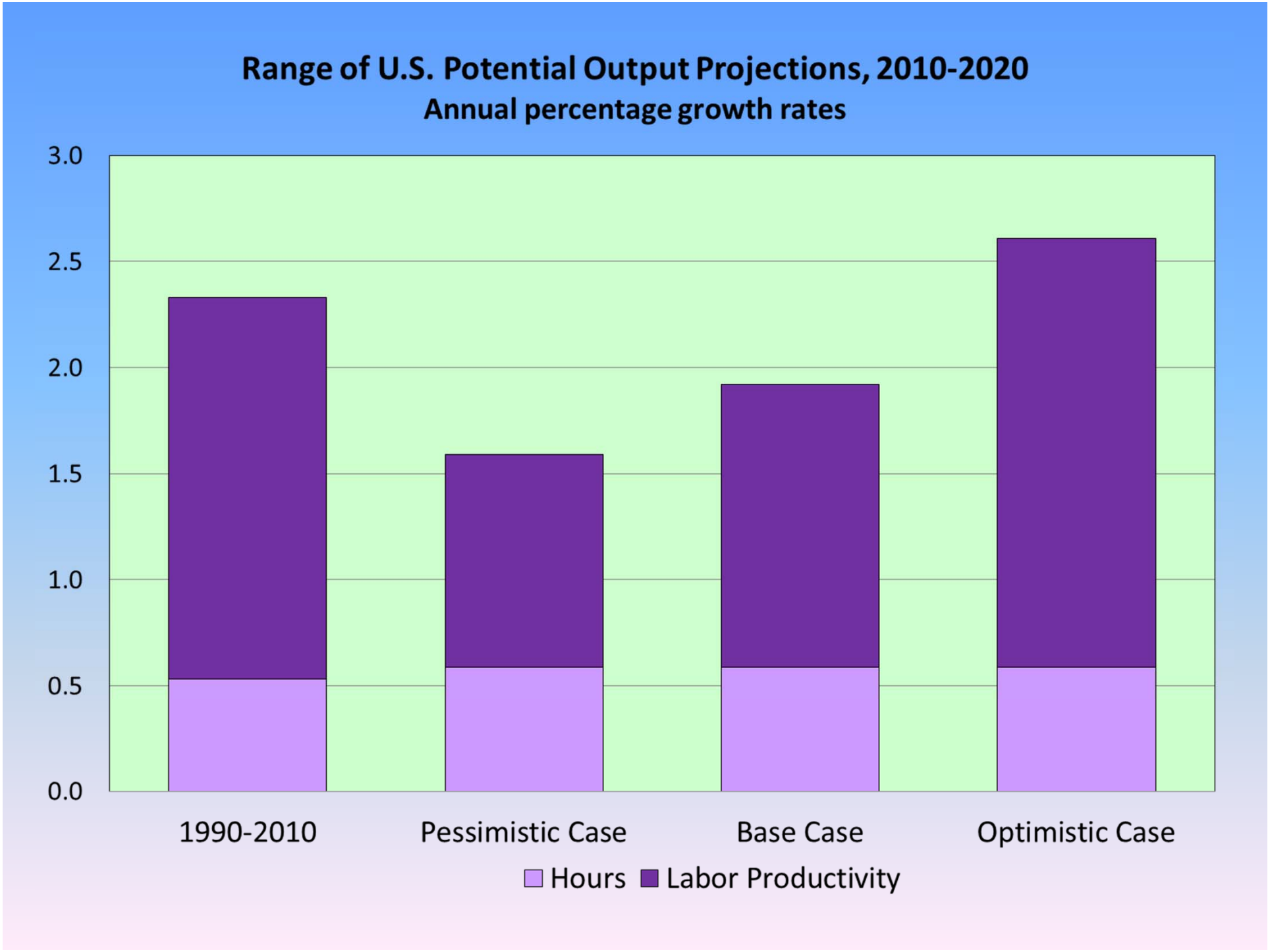
Industry Contributions to Productivity Growth

Range of Labor Productivity Growth Projections

Range of Potential Output Growth Projections


Contribution of Industry Groups to Productivity Growth, 2010-2020
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
1990-2010
Pessimistic Case
Base Case
Optimistic Case
Non-IT
IT-Producing
IT-Using


Range of Labor Productivity Projections, 2010-2020
Annual percentage growth rates
Annual Contribution (%)
2.5
2.0
1.5
1.0
0.5
0.0
1990-2010
Pessimistic Case
Base Case
Optimistic Case
TFP
Capital Deepening
Labor Quality


Range of U.S. Potential Output Projections, 2010-2020
Annual percentage growth rates
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1990-2010
Pessimistic Case
Base Case
Optimistic Case
Hours
Labor Productivity

WHAT WILL END THE LONG SLUMP?
Summary and Conclusions

Innovation and Total Factor Productivity
IT-Using, IT-Producing and Non-IT Industries

Postwar U.S. Economic History
The Postwar Recovery, the Big Slump, the IT Boom and the Great Recession

Projecting Productivity and Economic Growth
Demography and Technology