

The Pre-Great-Recession Slowdown in U.S. Productivity Growth*

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* The views expressed here are my own and do not necessarily reflect the views of the Federal Reserve Bank of San Francisco or anyone else associated with the Federal Reserve.

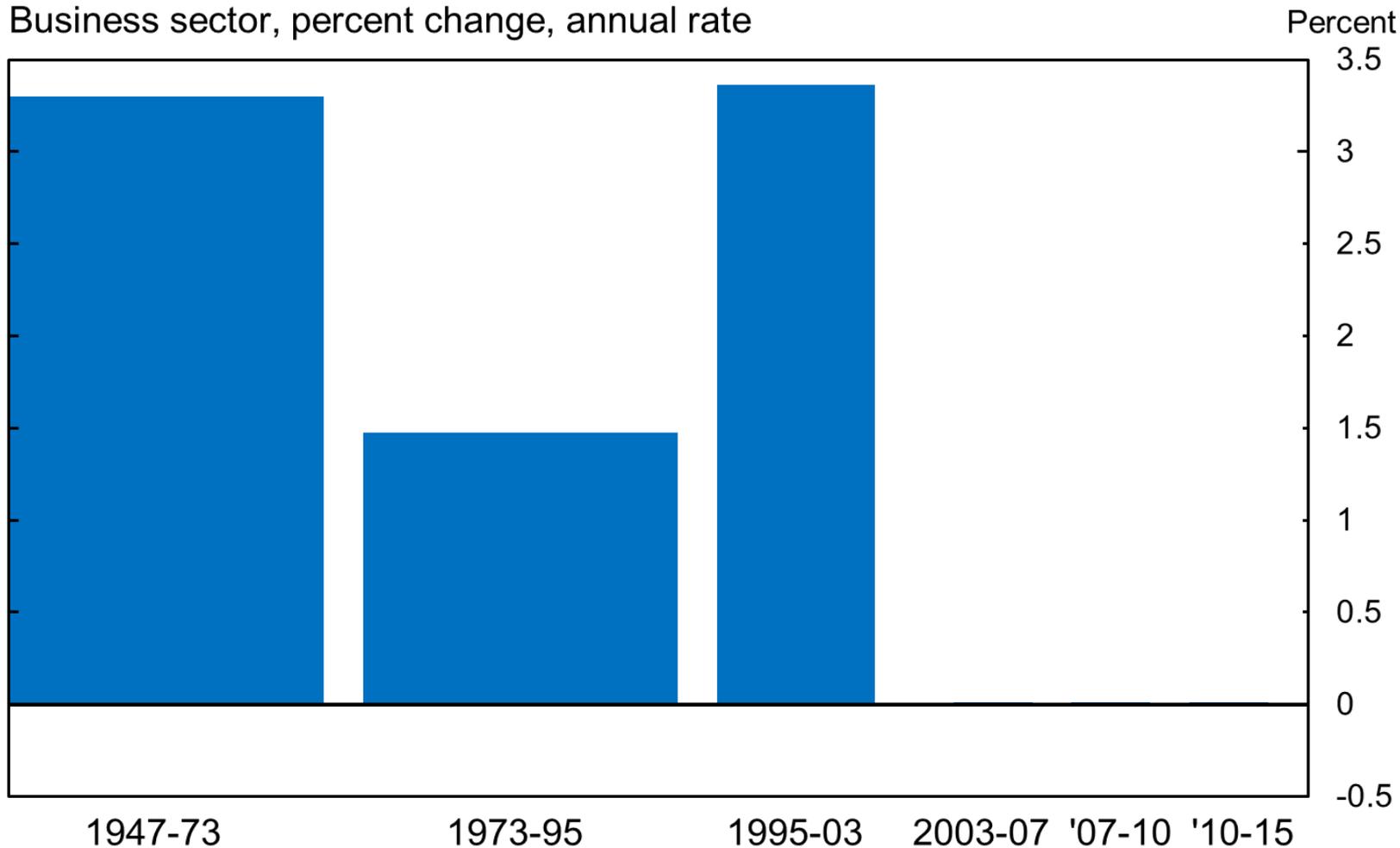
Overview

- Labor and total factor productivity slowed down prior to Great Recession
- TFP slowdown was broadbased across industries
- Probably not growing mismeasurement

Productivity growth: Varying rates of “normal”

Growth in U.S. output per hour

Business sector, percent change, annual rate

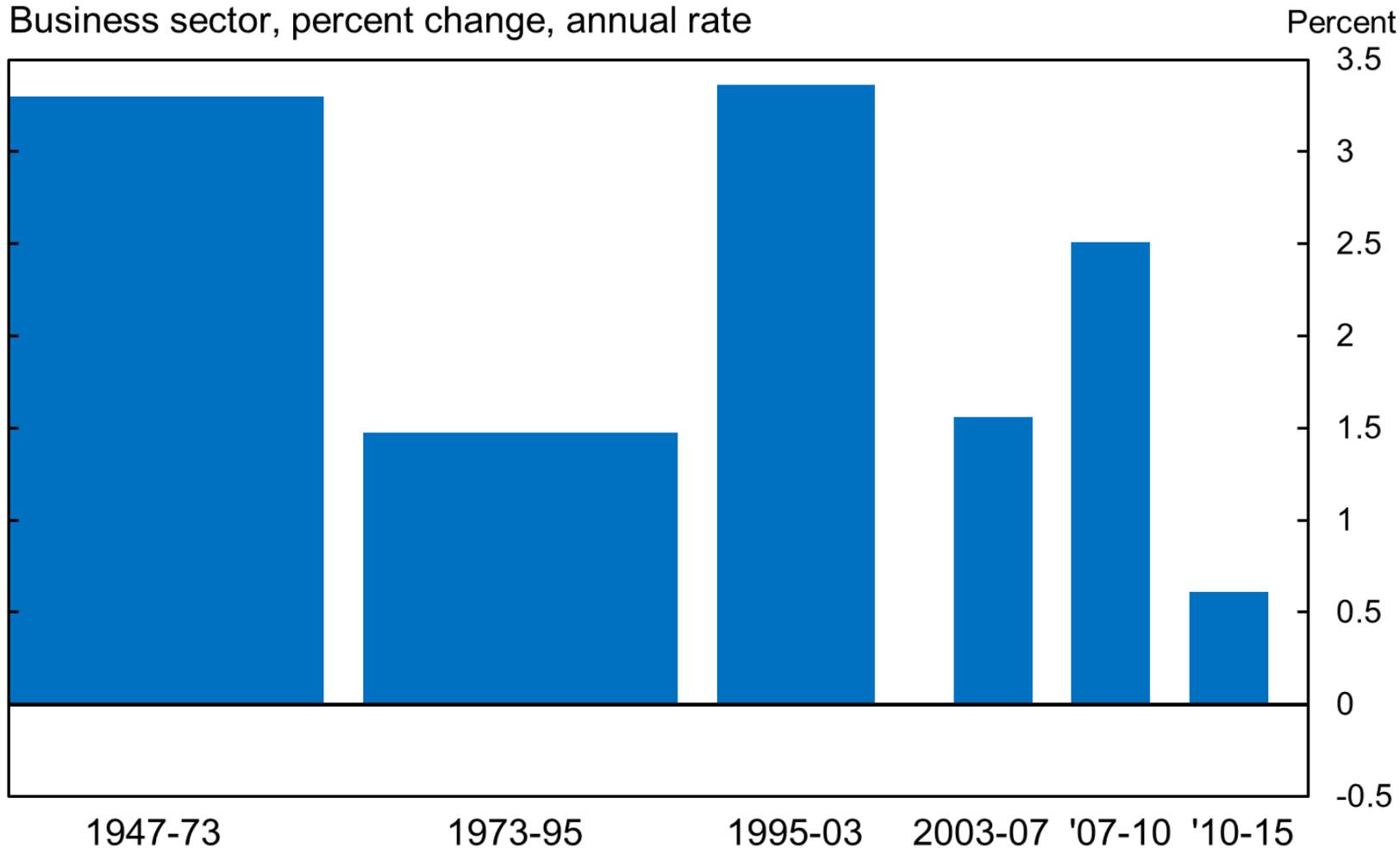


Source: Fernald (2014). Quarterly; samples end in Q4 of years shown except 1973 (ends Q1) and 2015 (ends Q3)

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Growth in U.S. output per hour

Business sector, percent change, annual rate

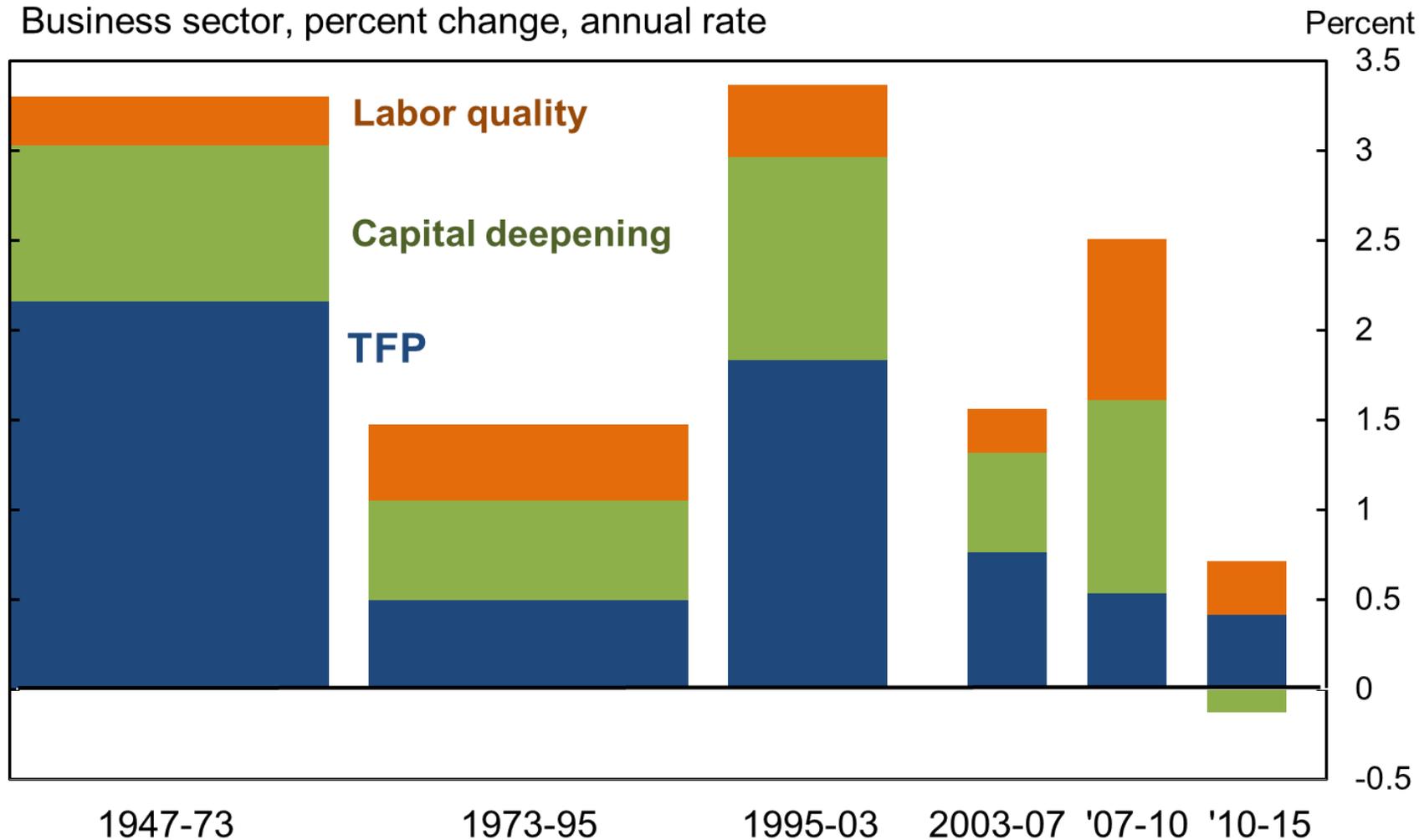


Source: Fernald (2014). Quarterly; samples end in Q4 of years shown except 1973 (ends Q1) and 2015 (ends Q3)

Accounting for U.S. growth: Varying rates of normal

Contributions to growth in U.S. output per hour

Business sector, percent change, annual rate

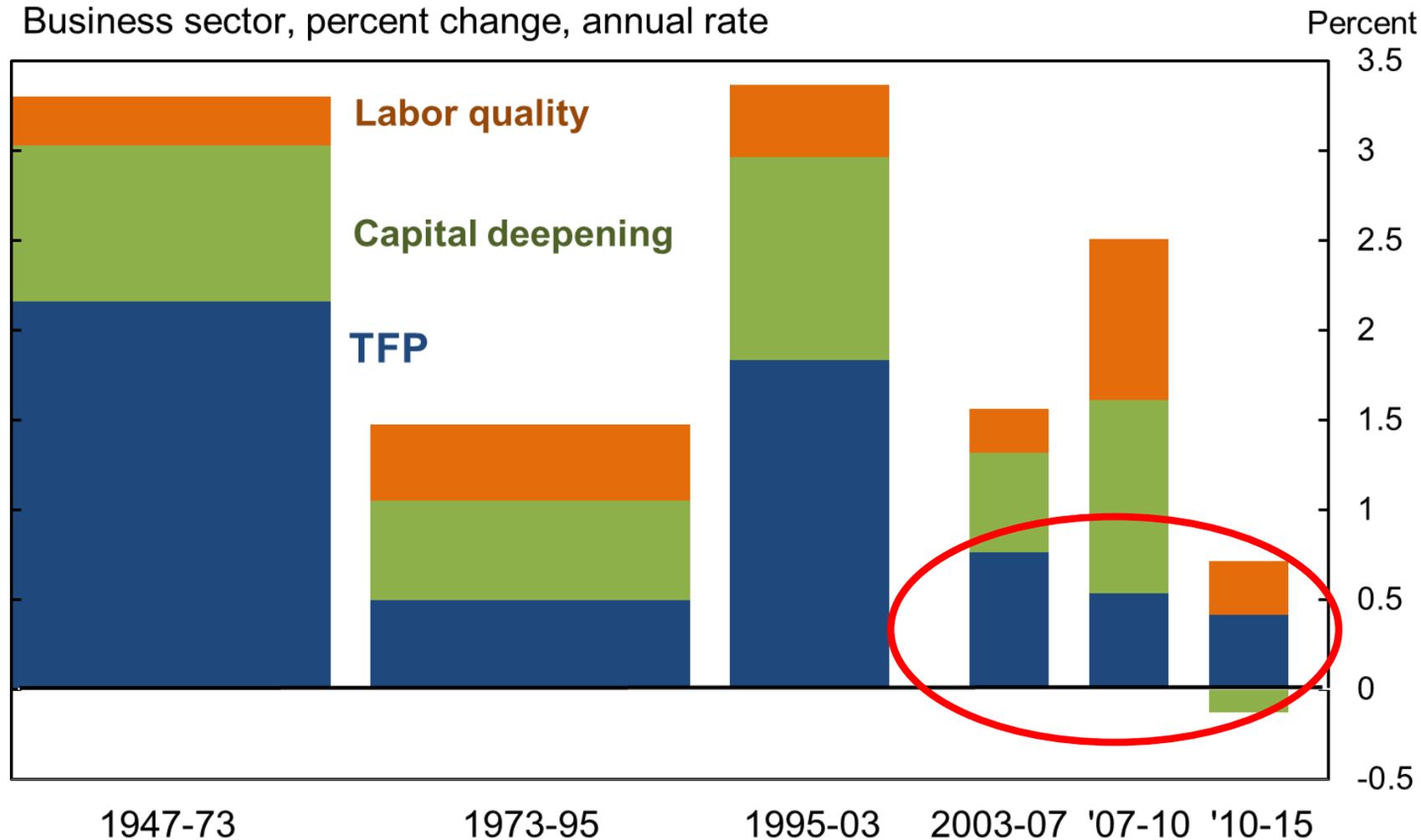


Source: Fernald (2014). Quarterly; samples end in Q4 of years shown except 1973 (ends Q1) and 2015 (ends Q3). Total factor productivity measured as a residual

Slow U.S. TFP growth since 2003

Contributions to growth in U.S. output per hour

Business sector, percent change, annual rate



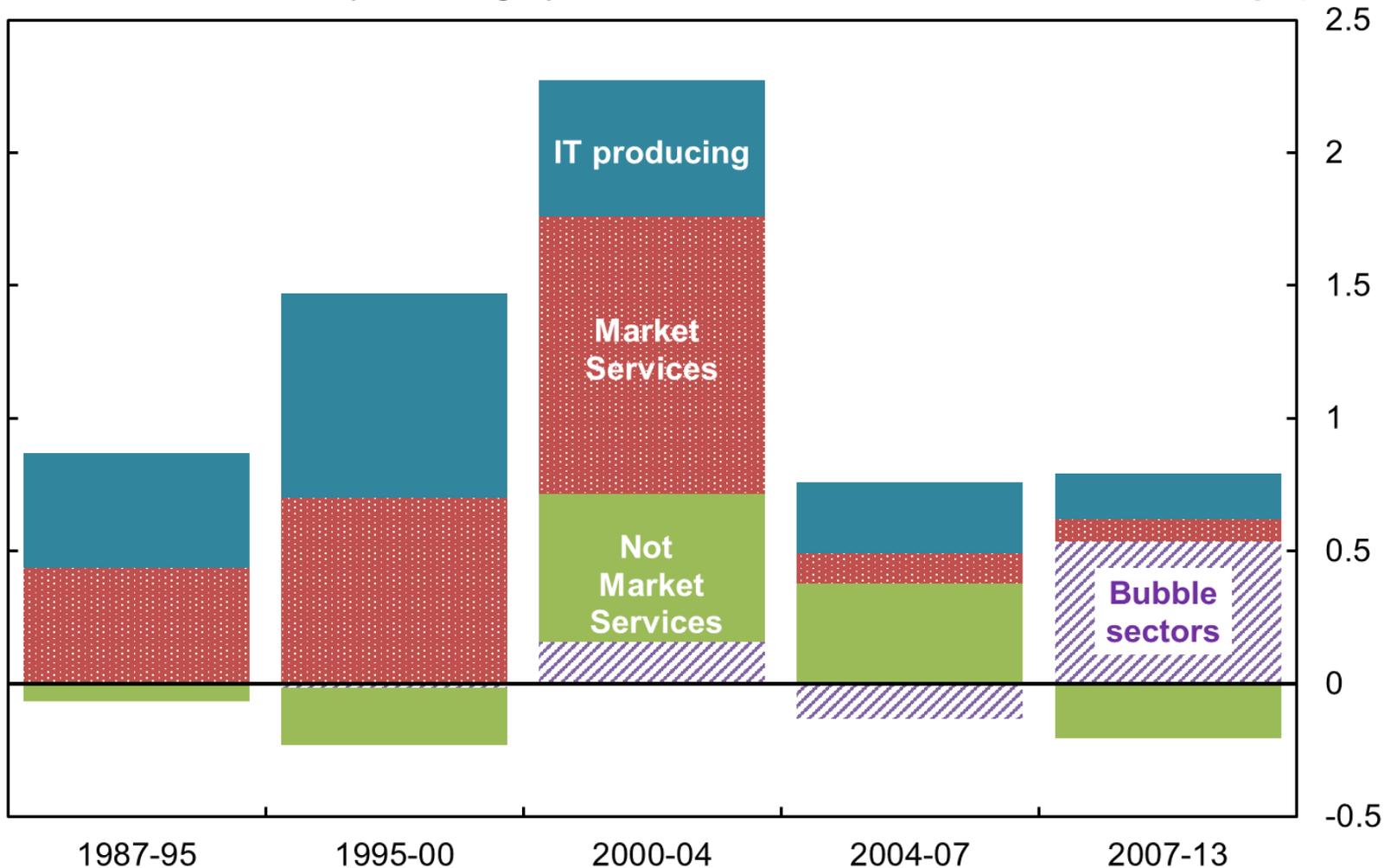
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Rise and fall of TFP growth in IT-intensive market services

U.S. total factor productivity by industry subgroup

Contribution, annual percentage points

Percentage points



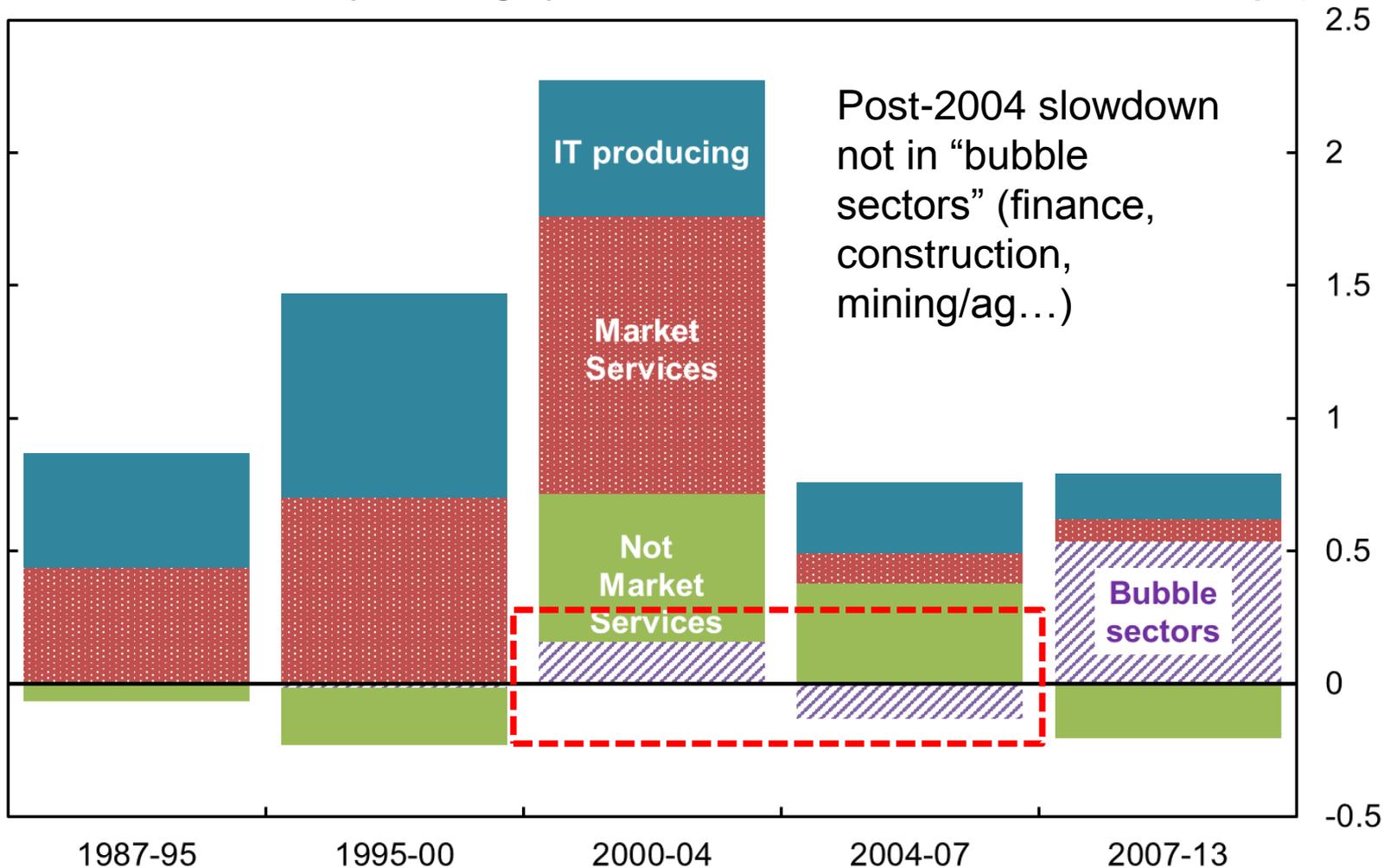
Source: Bureau of Labor Statistics, Fernald (2014a). Bubble sectors are construction, real estate, finance, mining, ag, petrol. ref.

Rise and fall of TFP growth in IT-intensive market services

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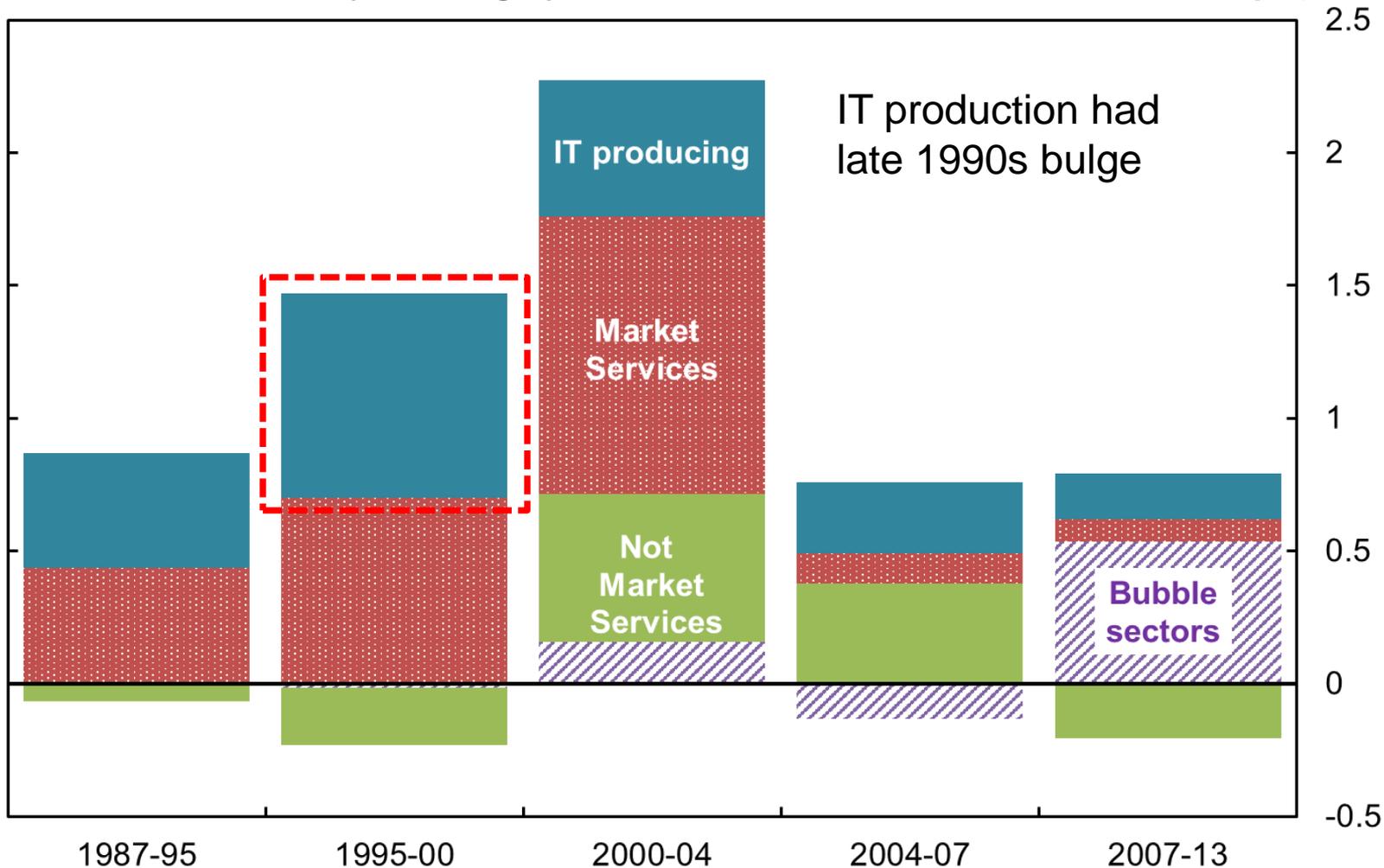
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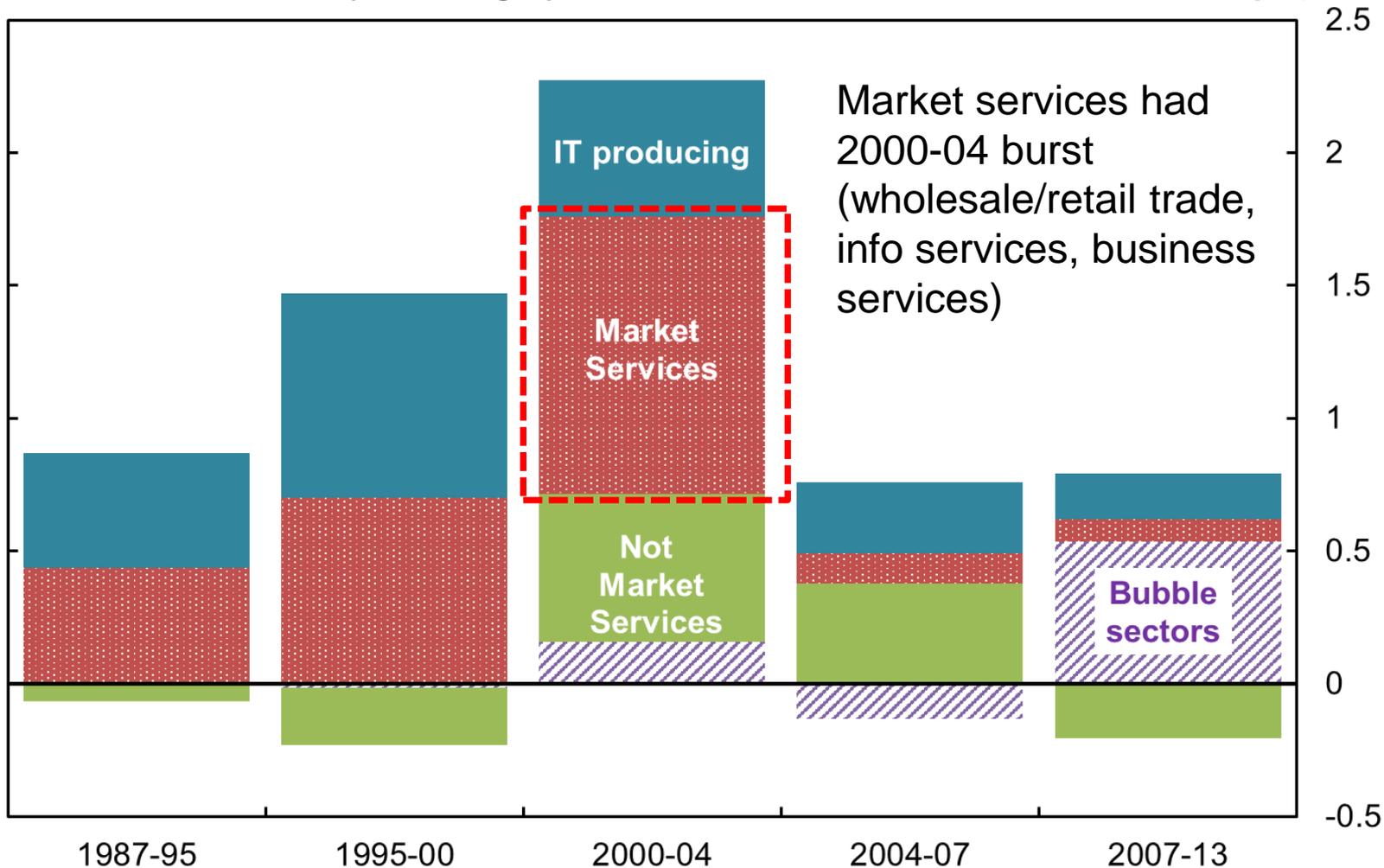
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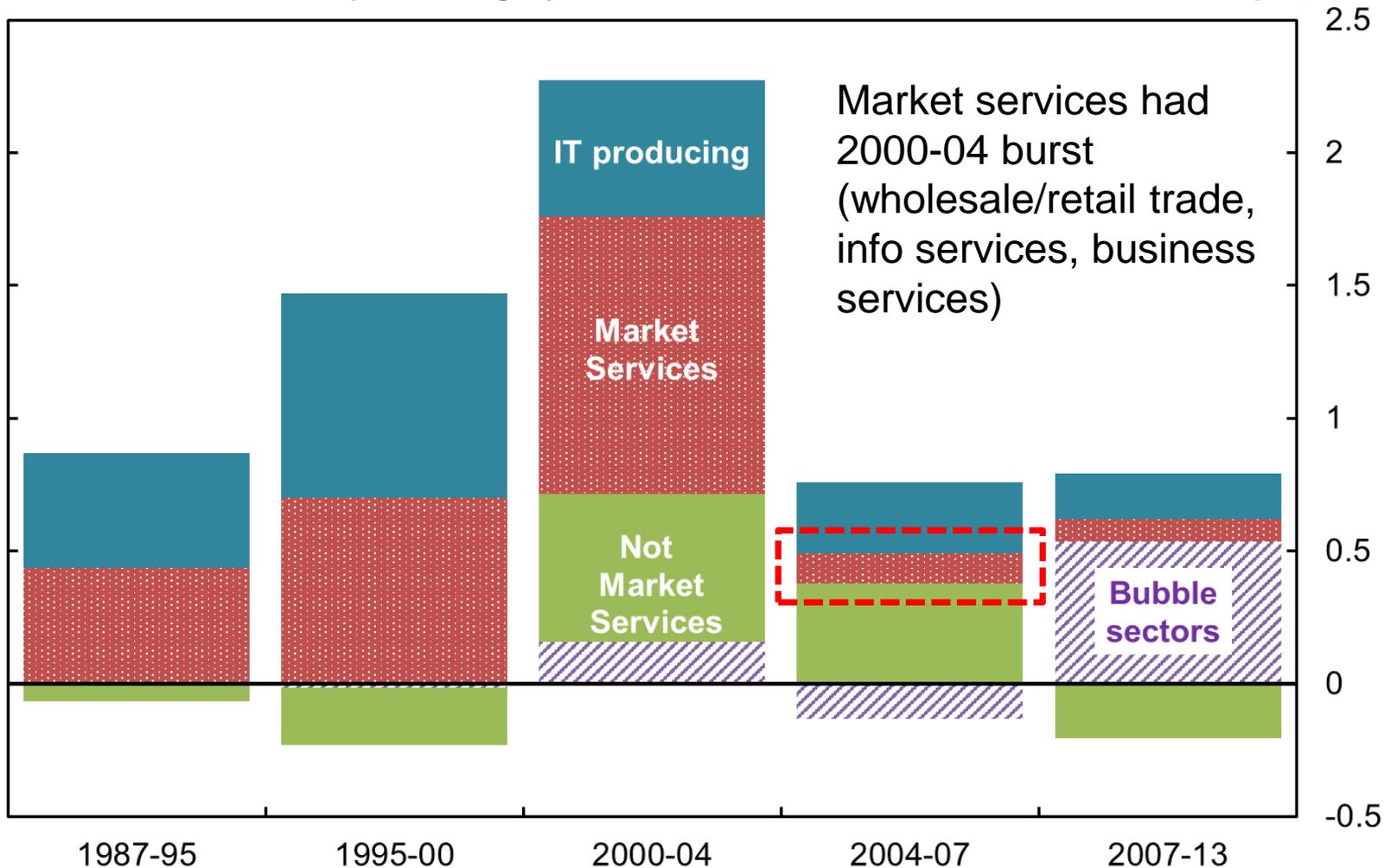
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Rise and fall of TFP growth in IT-intensive market services

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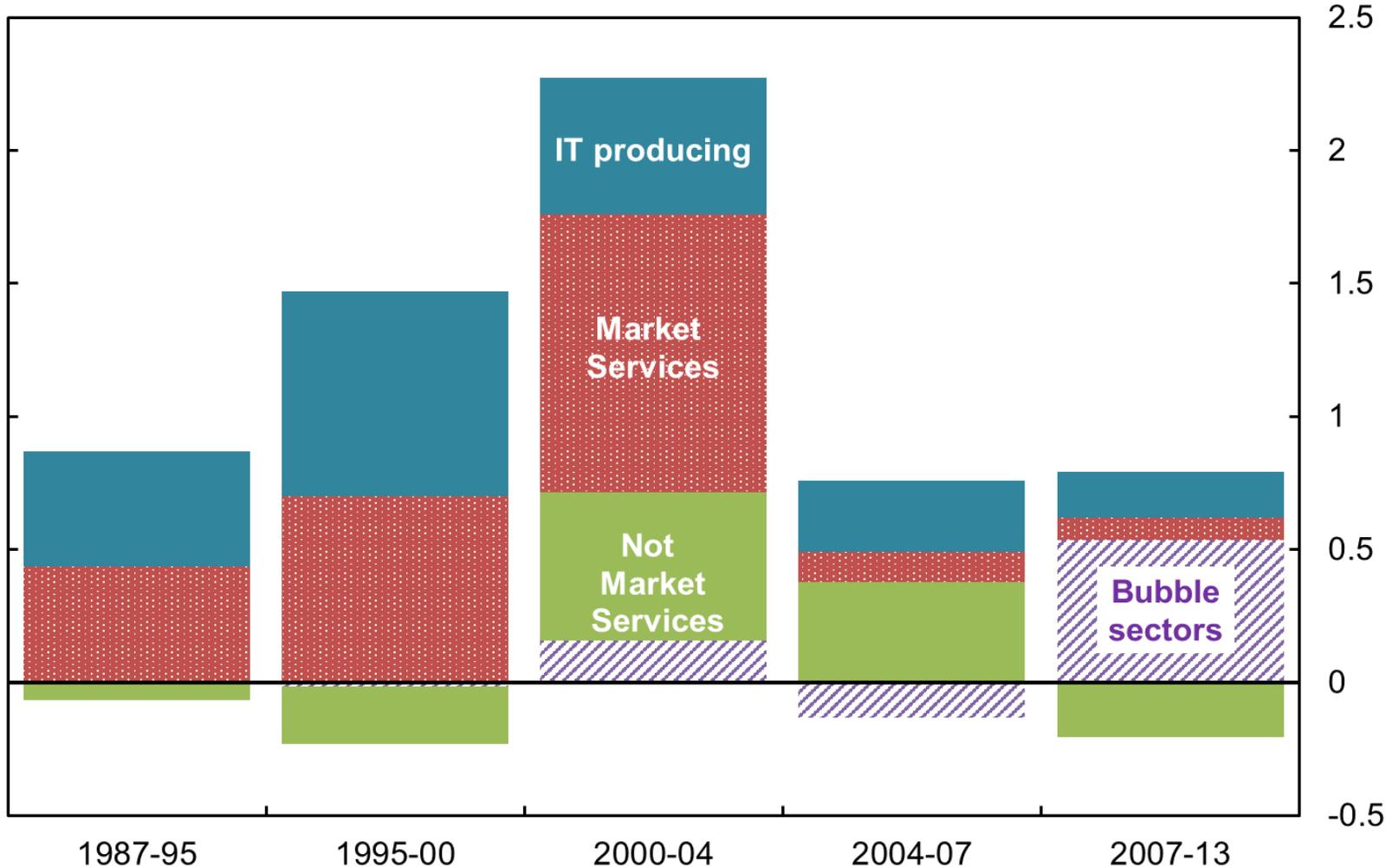
Source: Bureau of Labor Statistics, Fernald (2014a). Bubble sectors are construction, real estate, finance, mining, ag, petrol. ref.

Broadbased slowdown outside “bubble sectors”

U.S. total factor productivity by industry subgroup

Contribution, annual percentage points

Percentage points



Source: Bureau of Labor Statistics, Fernald (2014a). Bubble sectors are construction, real estate, finance, mining, ag, petrol. ref.

Productivity paradox 2.0

“The things at which Google and its peers excel, from Internet search to mobile software, are changing how we work, play and communicate, yet have had little discernible macroeconomic impact. ... **Transformative innovation really is happening on the Internet. It’s just not happening elsewhere.**”

Greg Ip, *Wall Street Journal*, August 12, 2015

Productivity paradox 2.0

“Today’s information age is full of sound and fury signifying little.”

Martin Wolf, *Financial Times*, Oct 2, 2012

A productivity problem or measurement problem?

- Specific recent measurement concerns
 - Deflators for capital goods (specialized equipment, software)
 - “Free” goods available on the Internet (Facebook, Google, etc.)

Capital goods mismeasurement: Perhaps broad TFP slowdown is even worse?

- Capital goods: Missing more of the quality change in specialized equipment and software (e.g., Byrne and Pinto)
 - GDP effects positive but limited
 - Small share of GDP
 - *Reduces* true TFP growth overall
 - Faster TFP growth in (domestically produced) equipment and software
 - Slower TFP growth in sectors that use (domestic and imported) capital goods

Counting “free” digital goods wouldn’t raise *market* productivity much

- Facebook, Google, Tripadvisor, etc. are free (to users)
 - “Free” (but advertising supported) digital goods
 - Like free radio and TV and advertising-supported print media
 - Nakamura and Sokoveichik estimate this adds....2 basis points/year to growth!
 - Benefits to consumers (based on value of time, e.g., Brynjolfsson and Oh 2012) are larger
 - Conceptually, this is home, not market, production (Becker, 1965)
 - Enormous benefits...but not a shift in the *market* production function

Best guess:

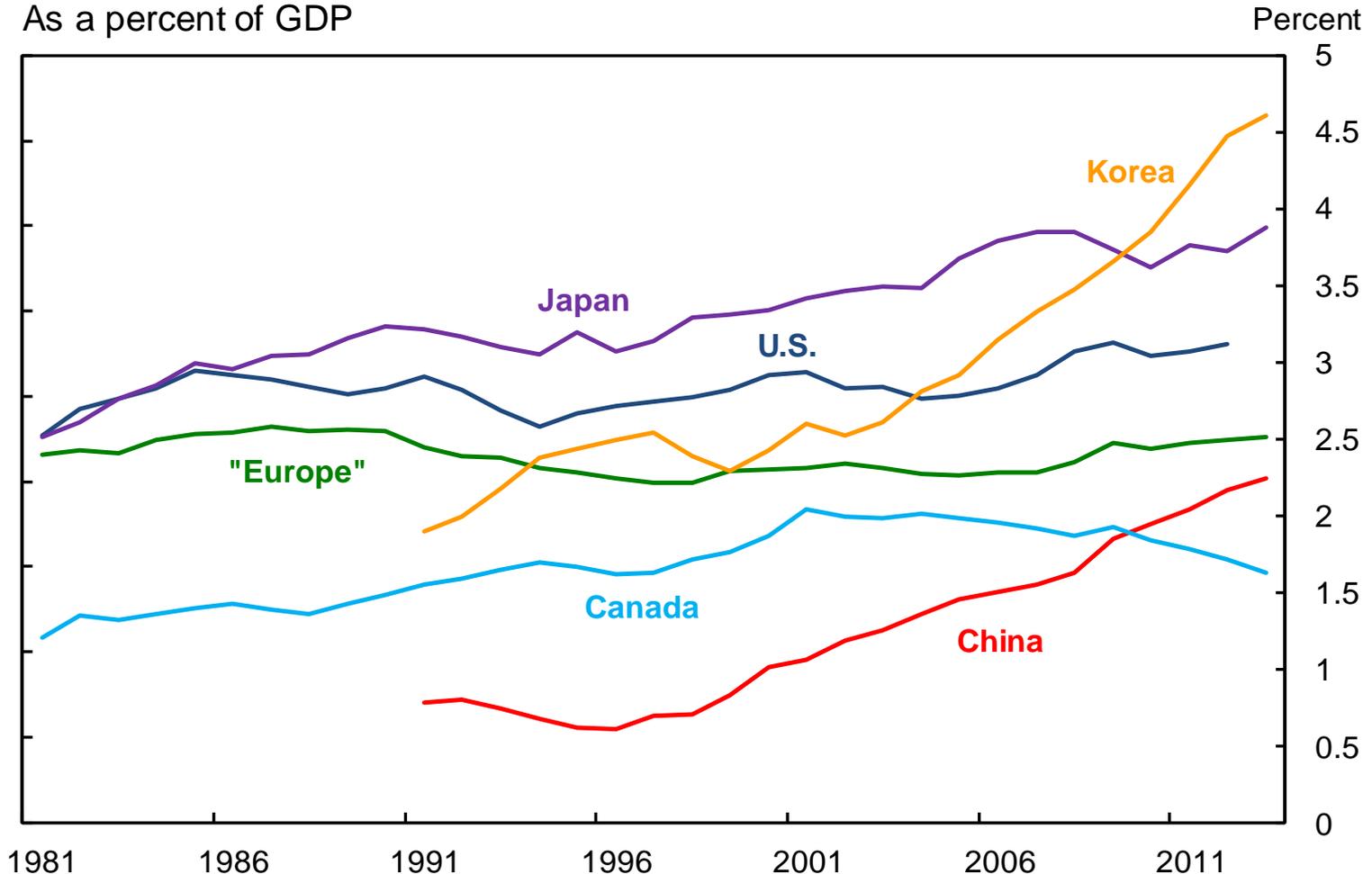
Modest productivity growth the “new normal”

- But lots of statistical and economic uncertainty

One upside risk: More R&D being done globally

R&D expenditures

As a percent of GDP



Source: OECD. "Europe" is an unweighted average of France, Germany, and U.K.

Takeaways:

Modest U.S. productivity growth as the “new normal”?

- Pre-Great-Recession slowdown was fairly broadbased
- Growing mismeasurement would make this broadbased TFP slowdown in market goods and services even *worse*
- Future is highly uncertain...

