

---

# Why is US Productivity Growth So Slow? Possible Explanations

## Possible Policy Responses

---

Presentation to Nomura Foundation  
Conference

Martin Neil Baily and Nicholas Montalbano

---

---

# What is productivity and why is it important?

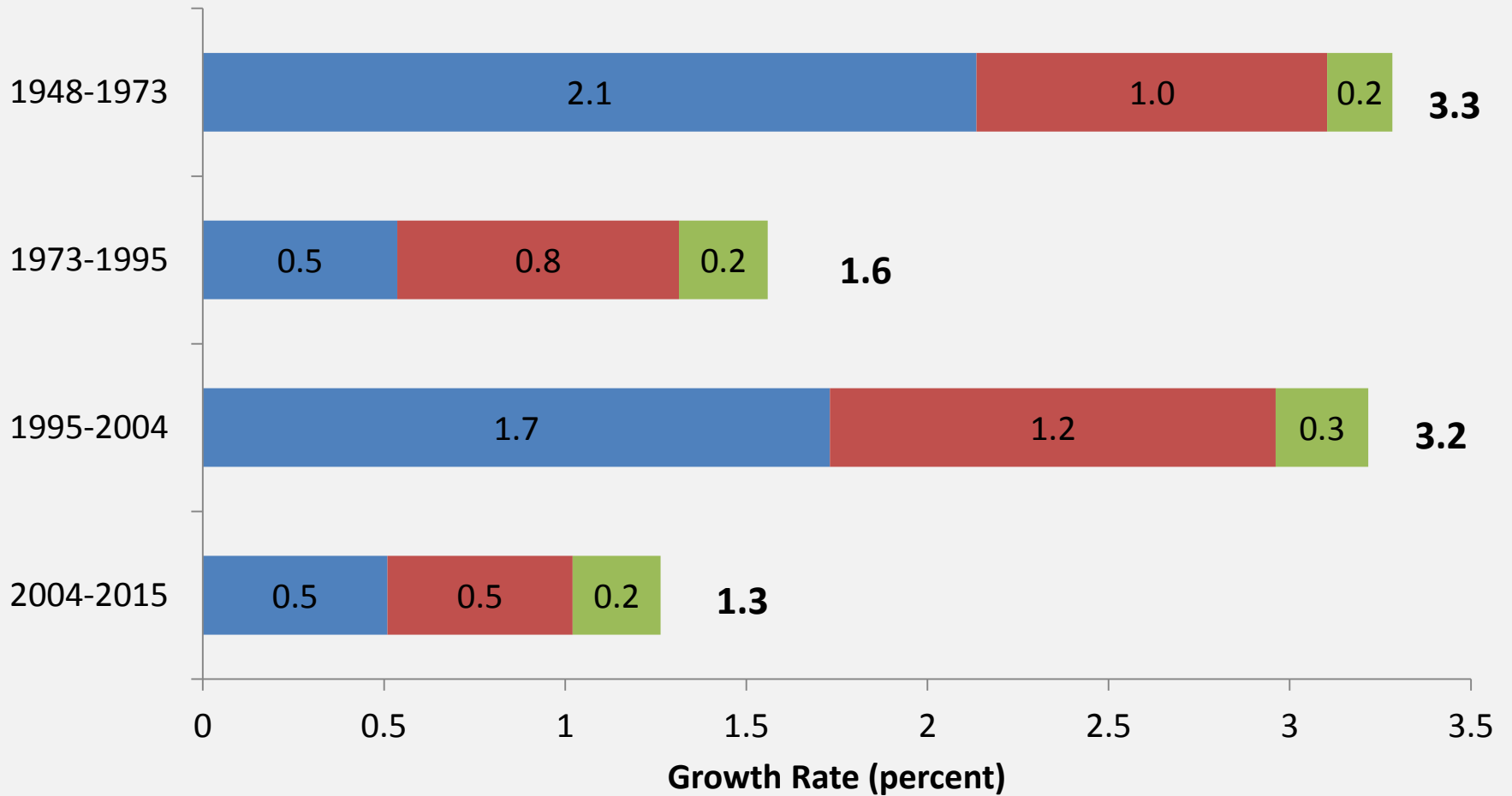
- Productivity growth is the most important determinant of the growth in wages and living standards over the long run
  - Labor Productivity: output per hour worked
    - Reflects combined contributions of capital per worker and MFP.
  - Multifactor Productivity (MFP): output per bundle of inputs (capital, labor, and intermediate inputs)
    - MFP growth occurs through improvements in technology, higher quality goods and services, and better organization of production
-

---

# Four Distinct Productivity Episodes

- **Post-WWII Boom (1948-72)**
    - Catchup from Great Depression and War
    - Introduction of major innovations in transportation, appliances, communications and computing
  - **Post-1972 Slowdown (1972-95)**
    - No real convincing explanation, but there was a large slowing of mfp growth
    - Turbulence for energy price shocks and inflation
  - **IT Boom (1995-2004)**
    - Primarily a reflection of digital revolution and economies of scale in retailing.
  - **Post-2004 Slowdown**
    - Appears to pre-date the financial crisis
    - Slowing of both MFP and capital accumulation
-

# Labor Productivity by Contribution

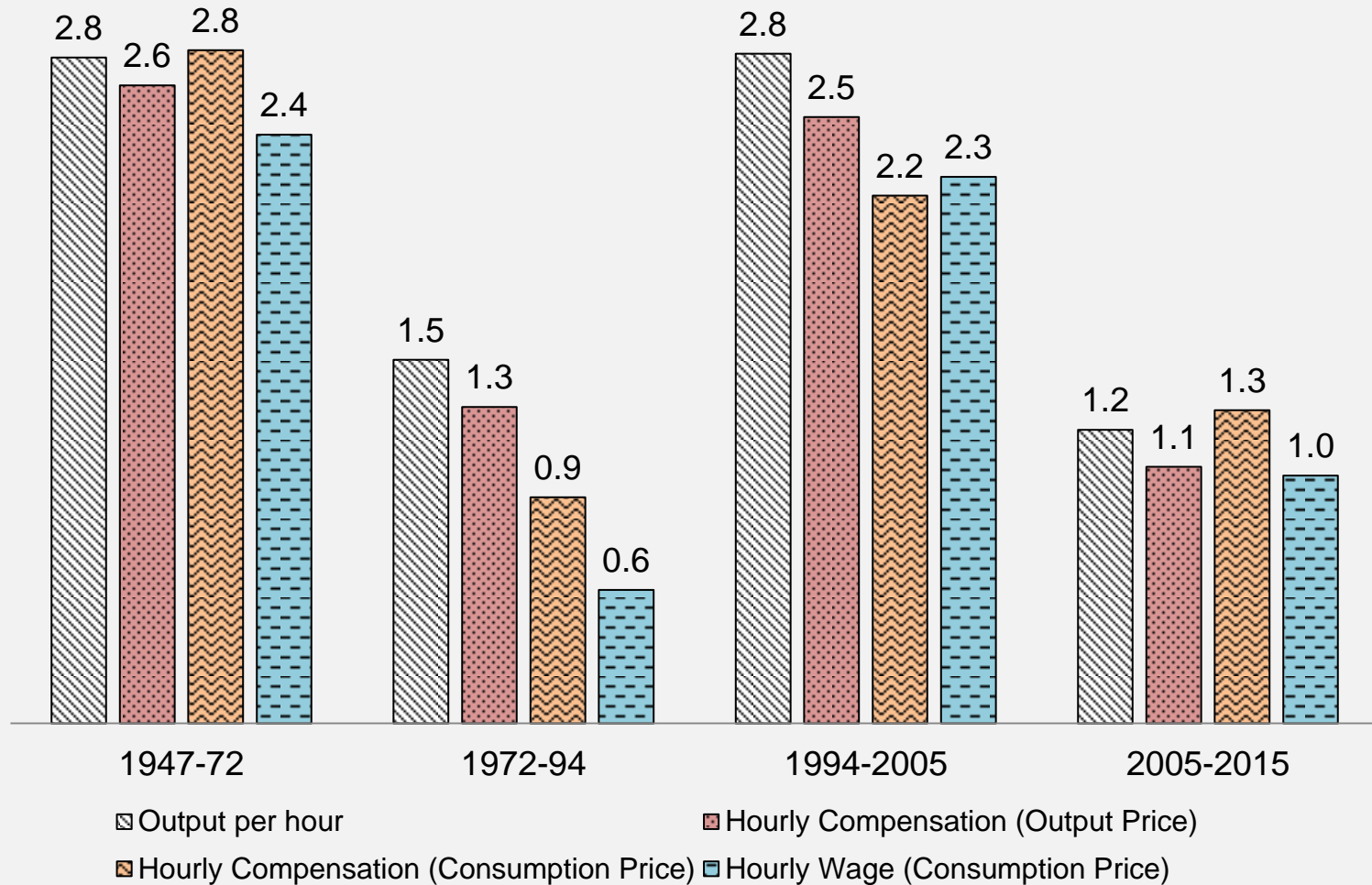


■ MFP ■ Capital Deepening ■ Labor Composition

# Productivity Growth Episodes

- Large swings in pace of MFP change consistent with emphasis on variations in technological change as the primary driver.
- Technological change has a reinforcing impact on capital accumulation.
- Productivity cycles are echoed in growth pattern for real wages.
  - Some of the variation can be trace to changes in labor's share and the cost of social welfare contributions, but
  - Predominant factor is changing pace of productivity change.
  - Recent real wage gains have been better than in 1972-94.

## Changes in Productivity and Real Wage, 1947-2015



---

# Global Dimensions

- The slowing pace of productivity change since 1972 has been a sustained phenomenon of all the major advance economies.
  - The temporary post-1994 ITC driven recovery in the United States is not evident elsewhere.
    - For a time the United States was both a producer and a user of the new technologies, whereas
    - most other advance economies were only users.
    - The production of ITC is now centered in Asia.
-

# GDP per Hour Worked

Annual Rate of change

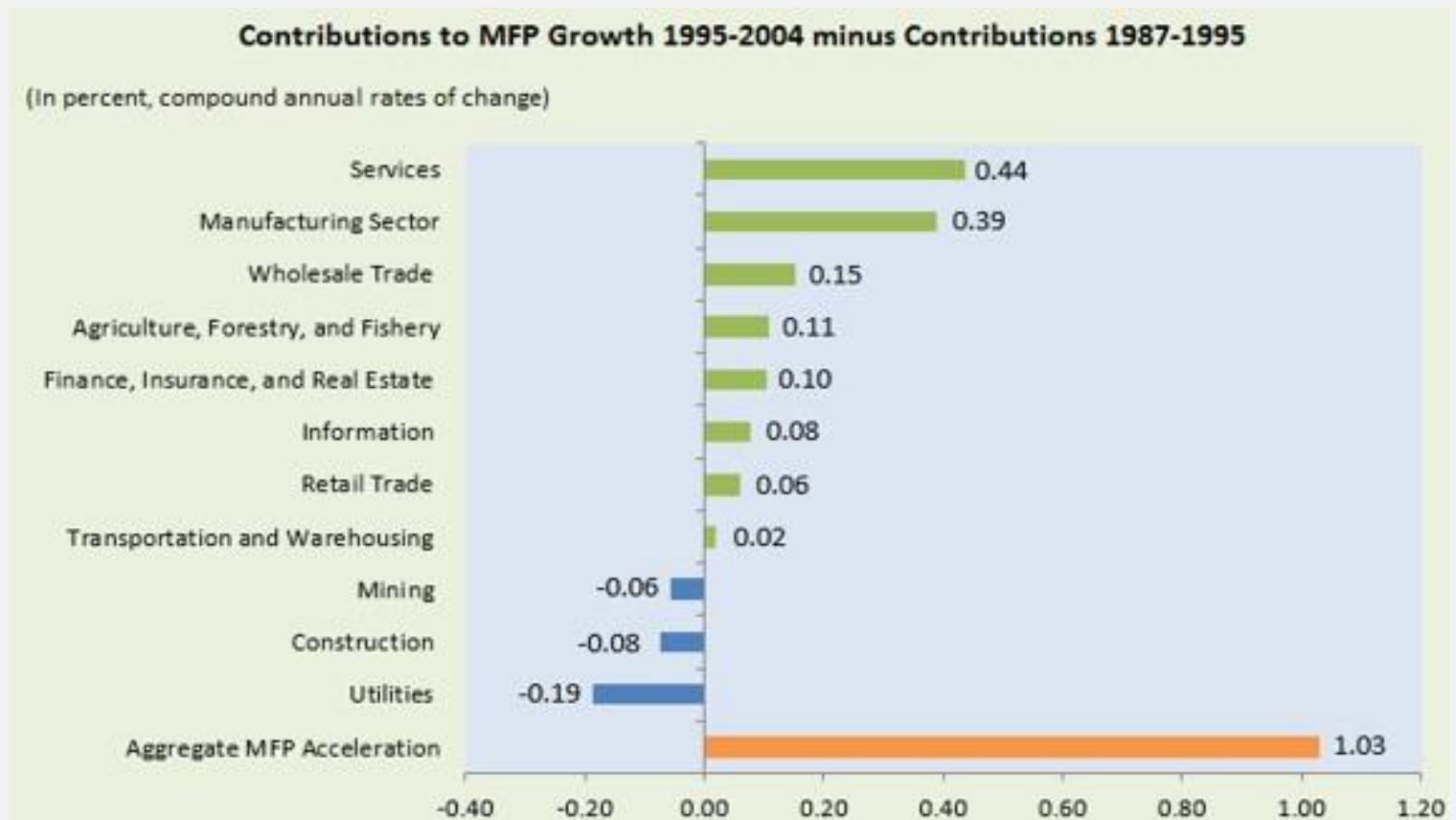
	<u>1970-94</u>	<u>1994-04</u>	<u>2004-14</u>	<u>Slowdown</u>
Australia	1.5	2.1	1.3	-0.8
Canada	1.4	1.4	1.0	-0.4
France	3.2	2.0	0.8	-1.2
Germany	3.0	1.7	0.9	-0.8
Italy	2.7	0.8	0.1	-0.7
Japan	3.8	2.0	0.9	-1.1
Sweden	1.9	2.7	0.7	-2.0
United Kingdom	2.7	2.2	0.4	-1.8
United States	1.5	2.3	1.1	-1.2



# What Drove Post-1995 Acceleration: Services & Manufacturing

In Services, Negative Growth Numbers were Eliminated

Semiconductors a big role in the manufacturing acceleration



Source: Authors' calculations of contributions to aggregate growth using Domar Weights, based on BLS MFP database

# Contributions to MFP Growth 2004-2014 Minus Contributions 1995-2004

In percent, compound annual rate of change



# Role of Computers in Manufacturing 1987-2014

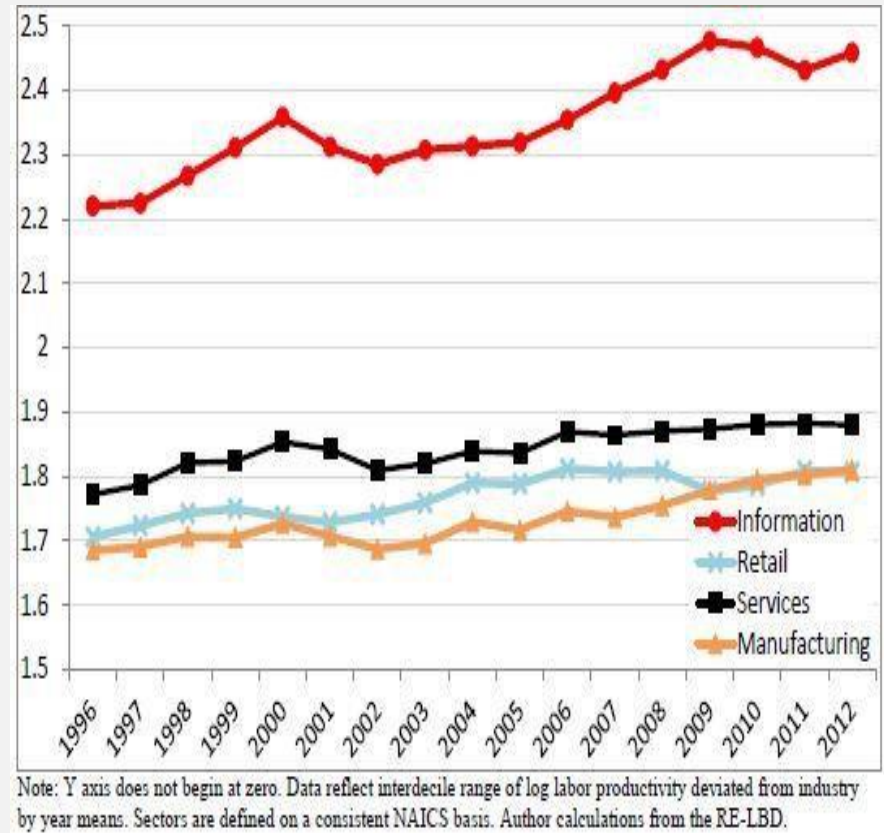
Total Manufacturing	Computer & Electronics	Other Manufacturing
Output		
2.7	10.5	1.6
2.3	10.9	0.8
1.6	1.3	1.6
Multifactor Productivity		
0.8	8.3	-0.3
2.0	11.3	0.5
0.0	3.8	-0.4

---

# Summary on the US Productivity Growth Surge 1995-2004.

- Accelerated decline in ICT prices, for a period.
  - Strong demand growth, high investment.
  - Strong productivity growth in wholesale and retail trade started pre-95, ended in the 2000s. The “Wal-Mart effect”.
  - Services productivity flipped from large negatives to small positives in mid-90s. A Greenspan effect? He questioned the validity of negative productivity numbers.
  - Three real effects, one measurement issue.
-

# Important Research from Micro Data: A widening productivity gap between the most productive and the less productive firms



---

# Explanations of Chronically Slow Productivity Growth

- With the 1995-2004 surge roughly understood, the question becomes why has growth been chronically slow and what can be done about it.
  - Three perspectives:
    - Chronic measurement problem. Productivity actually doing better than is believed
    - The productivity frontier is now moving out slowly because of an exhaustion of important innovations.
    - The frontier is moving out, but many or most firms are not keeping pace with the frontier
-

---

# The Mismeasurement Issue and Long Run Growth

- The Poorly Measured Part of the Economy is Large
    - Health care. Innovations in surgical procedures, scanning, pharmaceuticals, medical devices.
    - Education. Technology has changed very little
    - Financial services, legal services, professional services.
    - CPU price declines have slowed, but other ICT prices are still falling rapidly (Byrne and Corrado).
  - But, for mismeasurement to account for the slowdown, we need either a big jump in the magnitude of mismeasurement or a large increase in the size of the mismeasured sector.
-

---

## Are there are no more major innovations to be found?

- Robert J. Gordon lays out the case that no more major innovations are forthcoming. He reviews and dismisses the range of innovations described by the technology optimists.
  - Mokyr argues that technology has provided much better tools with which to make future advances in technology.
  - Firm level data suggest the problem is that many or most firms cannot keep up with the frontier.
  - Agree with Gordon that the period after the war was unusual, but disagree with extent of his pessimism.
-



---

# Barriers that Prevent Diffusion and Policies to Overcome the Problem

- Competition should drive out the least productive companies and force the laggards to catch up.
    - Regulation may be limiting competitive intensity
    - Patents are providing too much rent seeking and not enough competition
    - Too much licensing restricts entry
    - Lack of effective competition in health care
    - Must maintain global competition and expand trade
  - Neither managerial capability nor worker skills are at the level to adopt best practices
    - May be a question of time before innovation diffuses, becomes more user-friendly
  - Invest in worker skills
-

---

## Other Policies to Increase Productivity Growth

- Stimulate aggregate demand with infrastructure investment
    - We need to fix the roads. Stronger demand should boost investment
  - Enhance US manufacturing. A big share of productivity growth. Important innovations are available.
    - Tax reform to level the playing field
    - Federal support for R&D has lagged
-

---

# Conclusion

- Access to firm level data has revealed the widening of the productivity distribution and, together with industry data, provided insight into the causes of slow growth
  - It has also given hope that there might be ways to reverse or partially reverse the slowing of growth, either through policy actions to encourage competition, or through the natural forces of time in a market economy.
-