

# Measuring Quarterly Labor Productivity by Industry

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# What is Productivity?

Measure of economic performance that indicates how effectively inputs are converted into output



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# Why is Productivity Important?

Productivity growth allows us to produce more with the same or less input → increases in living standards.



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# Productivity Measures

- Labor Productivity – Output per hour worked
- Multifactor Productivity – Output per unit of combined inputs (Labor, Capital, Energy, Materials, Purchased Services)



# New Quarterly GDP-by-Industry Data

- Published by BEA, April 25, 2014
- Begins in 2005 and extends forward
- Available 120 days after the end of the reference quarter



# Quarterly Labor Productivity by Industry

- Quarter to quarter growth in output less the quarter to quarter growth in hours worked
- Expressed as an annual rate to facilitate comparisons to the annual growth rates



# Quarterly Hours Worked by Industry

- BLS Current Employment Statistics program (CES)
- BLS National Compensation Survey (NCS)
- BLS Current Population Survey (CPS)



# Output Measurement Concepts

## Value-added

- ▶ value of goods and services produced by an industry or sector less all purchased intermediate inputs

## Sectoral output

- ▶ gross output less only those intermediate inputs that are produced within that industry or sector.

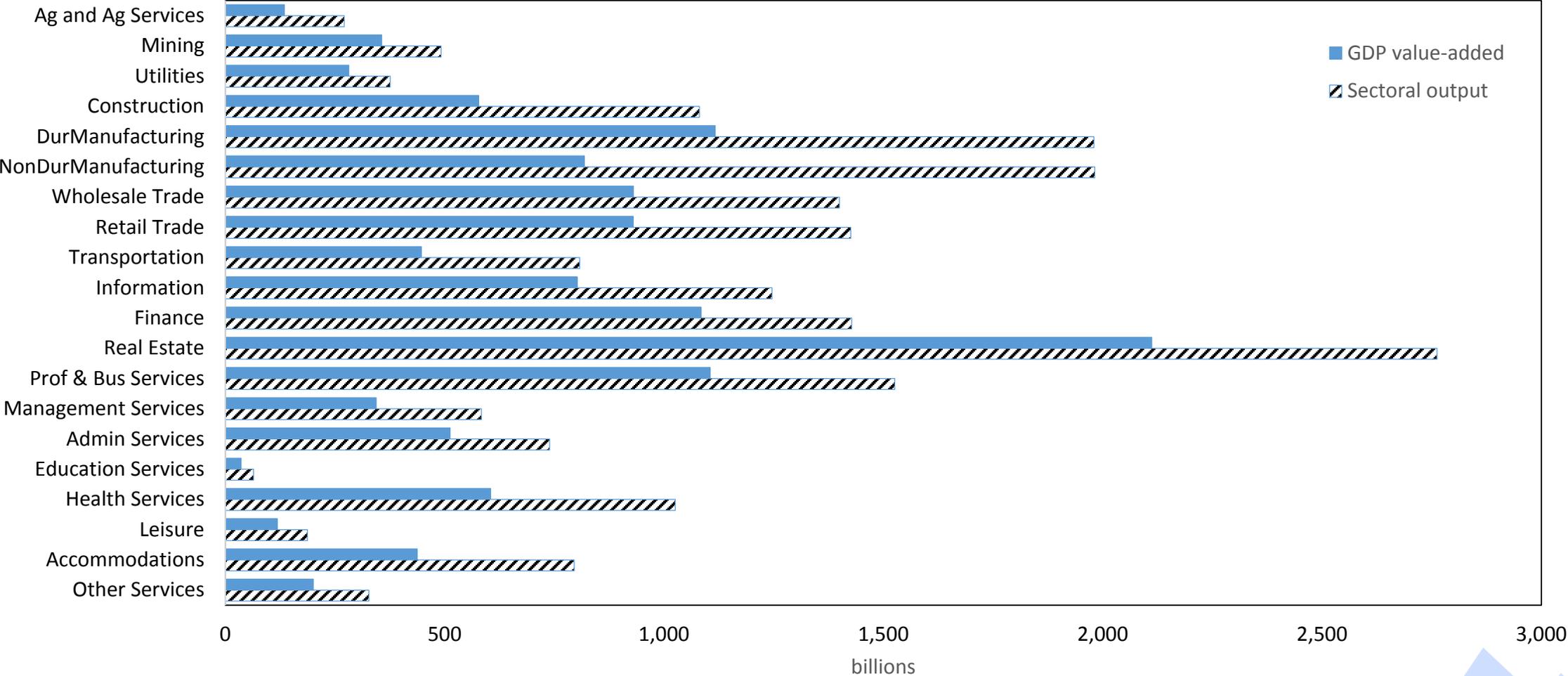


# Which Output Concept Should be Used?

- Depends on the question you are interested in answering
- Important to be aware of which method is used when interpreting labor productivity data
- Different accelerations and decelerations in measured labor productivity



# GDP and Sectoral Output by Industry, 2014



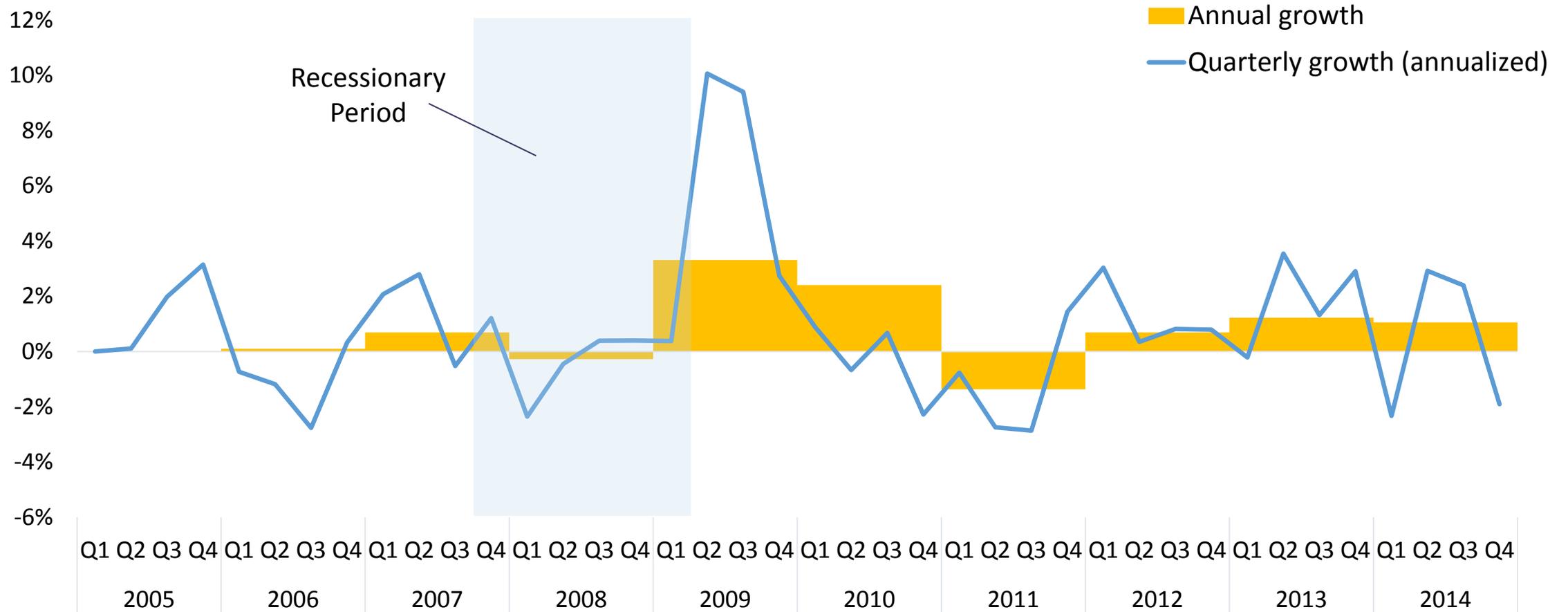
# Quarterly Labor Productivity Growth

- Quarterly growth rates provide additional information that is not apparent in the annual trends
- Initial quarters of recovery showing significantly faster growth than annual



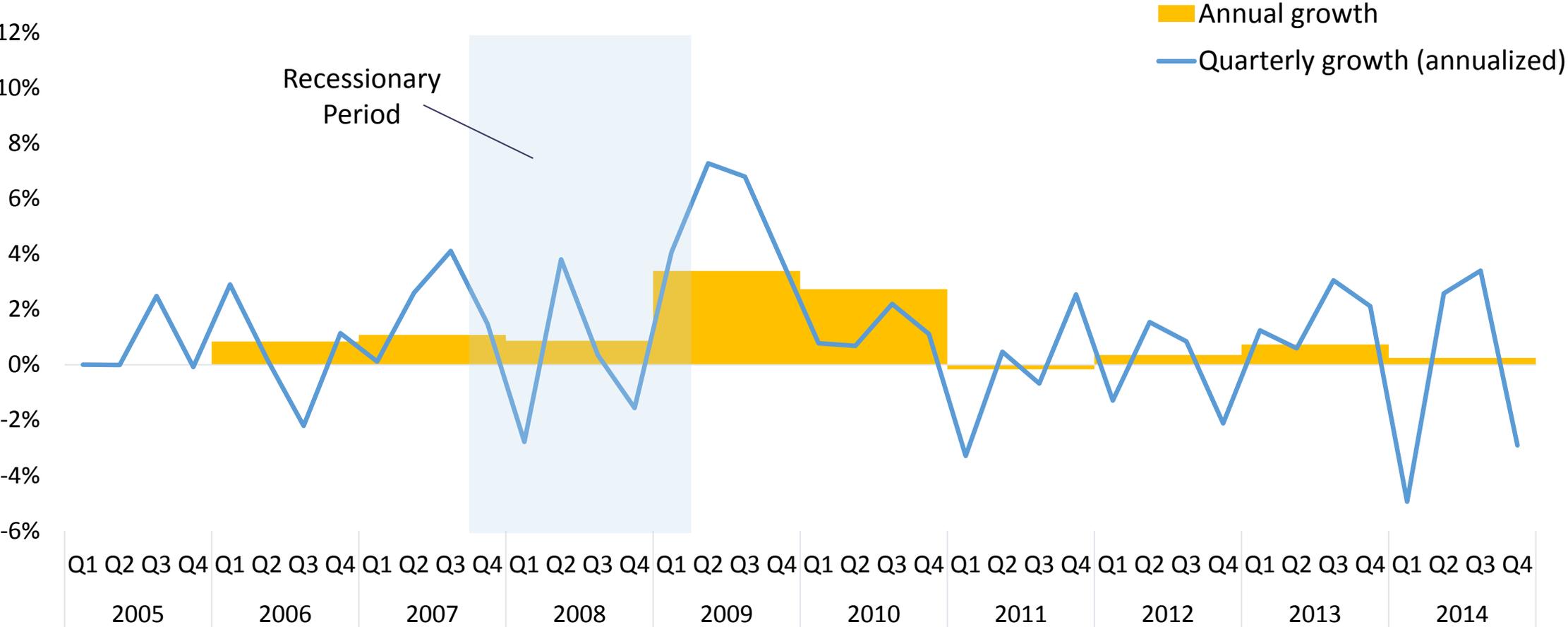
# Labor Productivity Growth in the Private Sector, Sectoral Output

(Percent Change from Previous Period)



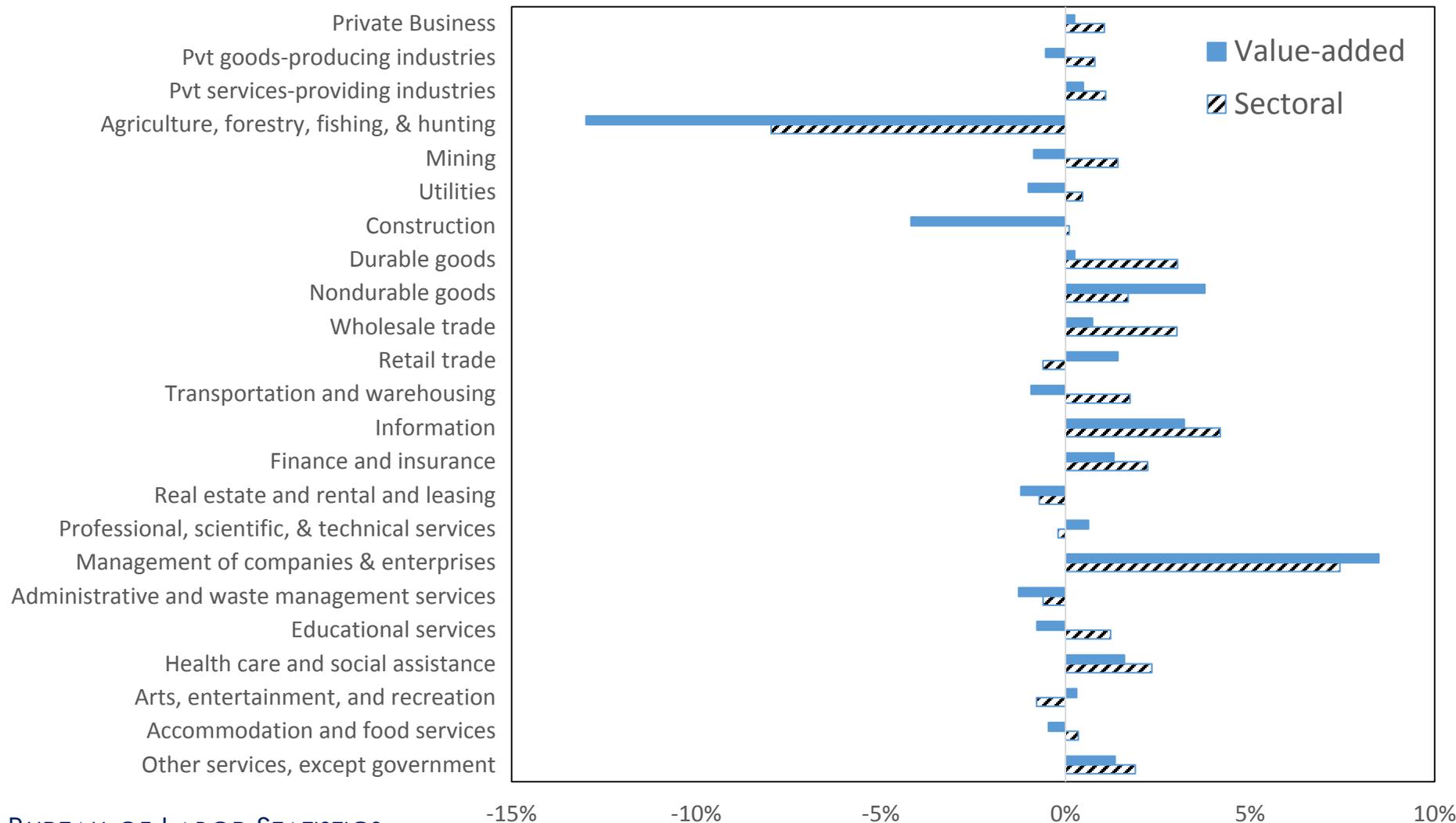
# Labor Productivity Growth in the Private Sector, Value-Added

(Percent Change from Previous Period)



# Differences Across Industries

## Labor Productivity Growth 2013 - 2014



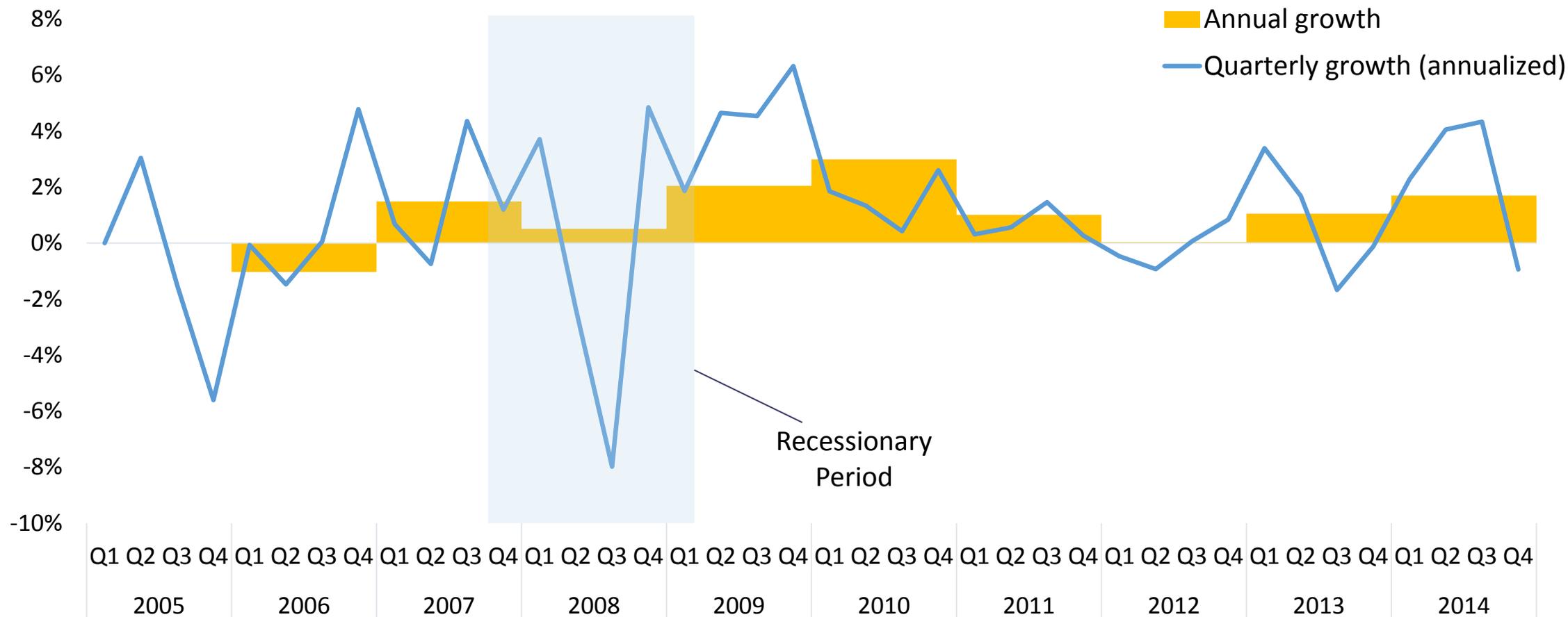
# Industry Labor Productivity Growth

- Heterogeneity among industries is not observed at the aggregate level.
- Heterogeneity in labor productivity growth among industries is more pronounced in the quarterly data.
- Volatility within each of the 20 industries is lost when only examining annual trends.



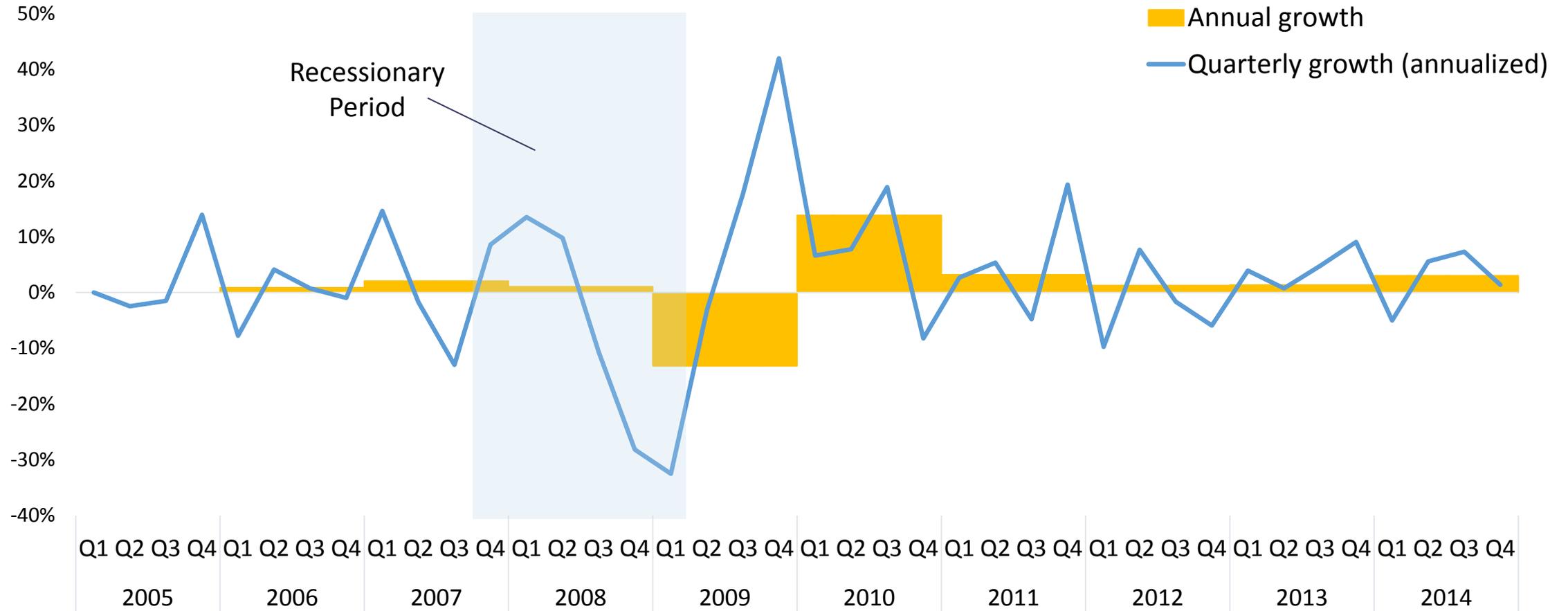
# Volatility of Productivity Growth, Nondurable Goods Manufacturing

(Percent Change from Previous Period)



# Volatility of Productivity Growth, Wholesale Trade

(Percent Change from Previous Period)



# Independence of Output and Hours Measures

If inputs and outputs are measured using similar source data, labor productivity will be biased toward zero by definition



# BEA Source Data for Quarterly GDP-by-Industry

- U.S. Census Bureau
  - ▶ Quarterly Services Survey (QSS)
  - ▶ Service Annual Survey (SAS)
- Industry coverage within the QSS and SAS has significantly expanded over the past ten years, resulting in decreased dependence on input-based data

# Use of Input-based Data

- Found in 11 service-providing industries, either directly or indirectly
- Direct use occurs within portions of seven industries
- Input-based methods impact roughly 5% of measured GDP



# Negative Long-run Growth

- Occurs when labor is growing at a faster rate than output
- 2007-2009 recessionary period produced most of the negative long-run trends
- Longer time series would be more informative



# Negative Long-run Growth

## Value-added:

- Construction
- Management services
- Educational services
- Accommodations
- Other Services

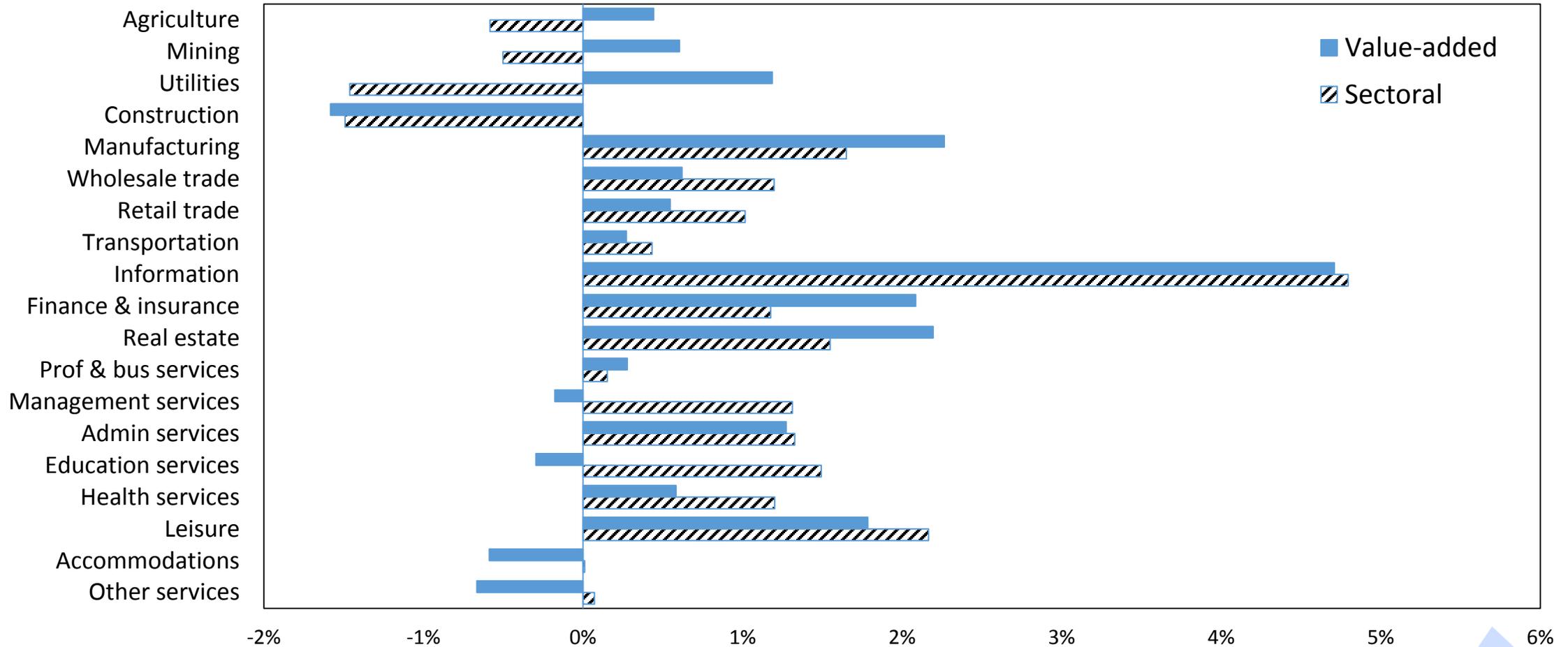
## Sectoral:

- Construction
- Agriculture
- Mining
- Utilities



# Labor Productivity Growth by Industry, 2005-2014

## Average Annual Growth



# Concluding Remarks

- Provide new insights into economic activity
- Highlight the heterogeneity among industries
- Complement the existing measures
- Greatest concern where there is a heavy concentration of nonprofit institutions
- More detailed information needed



# Questions

- How would customers use quarterly industry-level productivity data?
- To what extent does the volatility of the quarterly industry-level productivity data diminish their usefulness?
- Given that it is unlikely that OPT will have the resources to publish quarterly estimates, would it be valuable to publish the quarterly movements of industry productivity retrospectively with the final annual data?



# Contact Information

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