

Productivity In Services: New Sources of Growth

by

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Objectives

- Use new BEA/BLS industry data set to explore sources of post-1995 productivity resurgence
- Highlight expanded role of service-producing industries

Basic Summary(1)

- Post-1995 labor productivity growth of service-producing industries exceeded that of goods-producing industries.

	Trend Growth Rates		
	1987-95	1995-2001	Change
Labor Productivity			
Private Nonfarm Business	1.0	2.5	1.5
Goods-Producing Industries	1.8	2.3	0.5
Service Producing Industries	0.7	2.6	1.8

Summary (2)

- Similarly, growth of MFP in service-producing industries exceeds that of goods-producing after 1995

	trend growth rates		
	1987-95	1995-2001	Change
Multi-factor Productivity			
Private Nonfarm Business	0.6	1.4	0.9
Goods-Producing Industries	1.2	1.3	0.1
Service Producing Industries	0.3	1.5	1.1

Summary (3)

- Strong MFP gains in IT-producing industries are offset by weak performance in other goods-producing industries.
- Results for service-producing industries are very diverse.
 - Five industries (wholesale, retail, finance, real estate, and health) represent 130 percent of the increase in aggregate MFP.
 - Twelve of twenty-nine industries have negative MFP changes after 1995.

Summary (4)

- Our finding of large and widespread increases in MFP contrasts with earlier conclusions that the post-1995 acceleration is due to MFP gains in the IT industry.
 - There was a large increase of MFP in the IT-producing industries,
 - Increased IT capital per worker; **and also**
 - A large increase of MFP in IT-using industries.

Industry Data Set

- BEA industry accounts combined with capital services of BLS.
 - Designed to be fully consistent with national accounts.
 - Gross output, value added, and intermediate purchased inputs.
 - Capital services divided between IT and non-IT capital.

Industry data set (2)

- We constructed a nonfarm business sector consistent with definition of the BLS aggregate.
 - 54 industries (25 goods-producing, 29 service-producing)

Industry data set (3)

- The value-added aggregate differs from BLS published numbers because of
 - income-side estimate (excludes statistical discrepancy)
 - Differences between industry and expenditure price deflators
 - Persons engaged in production versus hours
 - No adjustment for labor quality (affects MFP)

Nonfarm Aggregate

Period	Value Added	Labor	Value Added per Worker	Multi-factor Productivity
Bureau of Labor Statistics				
1987-1995	2.9	1.5	1.4	0.9
1995-2001	3.8	1.5	2.3	1.1
Change	0.9	0.0	0.9	0.2
Industry Aggregate (BEA/BLS Data)				
1987-1995	2.9	1.7	1.1	0.7
1995-2001	4.3	1.9	2.3	1.3
Change	1.4	0.2	1.2	0.5

Nonfarm Aggregate (2)

- Significantly greater post-1995 acceleration
 - Labor Productivity
 - 1.2 vs 0.9
 - MFP
 - 0.5 vs 0.2
 - Larger acceleration reflects lower productivity growth in 1987-95
 - Same growth in 1995-2001.

Industry Results

- Gross Output
- Inputs: labor, capital, intermediate inputs
- Includes self-employed (BLS factor shares)
- Capital services: IT and non-IT
- Tornquist indexes.
- Least-squares trends for sub-periods
- Detailed Results in handouts

Contribution to the Aggregate

Convert industry data based on gross output to aggregate value added (tables 3 and 4)

- Labor productivity aggregated with value-added weights.
- Large reallocation terms among industries with different levels of labor productivity and intermediate input intensities.
- Reallocation terms make a negative contribution, but they are much less negative after 1995.

Contribution to Aggregate (2)

- MFP aggregated with Domar weights
- take effect of indirect contribution to lower intermediate input costs in other industries.
 - Inclusion of intermediate inputs scales down MFP relative to value-added concept.
 - weights exceed 100 percent (187%)
- Reallocation terms are small

Table 4

- Service-producing industries account for
 - three-fourths of post-1995 growth in aggregate labor productivity. and
 - all of the acceleration in labor productivity and MFP relative to 1987-95.
 - Cross-industry correlation of post-1995 acceleration of Q/L and MFP is only 0.33.
- Large contribution of IT-producing sectors to MFP is offset by declines in other goods-producing industries

Contribution of IT Capital

- Increased IT capital per worker was a large contributor to post-1995 resurgence of labor productivity
 - 80 percent of the increased contribution was in services (table 5).
- 1995 stock of IT capital is correlated with cross-industry changes in labor productivity
 - No correlation with distribution of MFP gains

Measurement Issues

- Inconsistent data sources
 - National accounts versus I-O accounts
 - $GO = VA + II$
 - GO and VA are derived from separate sources
 - Intermediate inputs obtained as a residual

Measurement Issues

- Negative productivity growth industries
 - Education, recreation, hotels insurance, local transit, and construction.
 - Problem most severe in services
 - Indicator of measurement problems
- Inadequate measures of inputs
 - lack of industry data on hours
 - Details on purchased inputs

Conclusion

- The productivity resurgence has been large and extends far beyond IT-producing sectors.
- The service-producing sectors account for a dominant portion of the improvements in:
 - labor productivity,
 - MFP, and
 - the contribution of IT capital.