Productivity in the U.S. Services Sector

New Sources of Economic Growth

Jack E. Triplett

Barry P. Bosworth

Brookings Institution Press
Washington, D.C.

Contents

CHAPTER ONE

Introduction

The United States has a services-based economy. Over the past half-century, the share of the nation's output accounted for by goods-producing industries has fallen by nearly half, and the services-producing industries now account for more than three-quarters of GDP and a comparable proportion of total employment.

Yet services industries have long been disparaged as sources of low-skill, low-wage jobs, and they often are characterized as part of a stagnant sector marked by low productivity growth and only limited opportunities for innovation. Some economists have contended that, over the long term, the need to devote an ever-increasing share of employment to services would drag down the rate of aggregate economic growth (Baumol 1967).

Our fundamental motivation for writing this book was the growing realization of how much things have changed. The services-producing industries have emerged as the dominant engines of U.S. economic growth. During the 1990s, services were responsible for 19 million additional jobs, while employment in the goods-producing sector stagnated.

Even more striking, productivity growth in the services industries, as we show, has fueled the post-1995 expansion of labor productivity in the United States. Labor productivity in services-producing industries advanced 2.6 percent a year between 1995 and 2001, exceeding the 2.3 percent growth in productivity in goods-producing industries (see chapter 2). Though the margin for services industries might appear small, it represents a tremendous contrast from

earlier years, when labor productivity growth in services industries lagged far behind that in the goods-producing sector.

Services now lead the way, indicating how much things have changed. We estimate that services industries accounted for 73 percent of post-1995 labor productivity growth in the United States and 76 percent of aggregate U.S. multifactor productivity growth. This is not a portrait of a stagnant sector.

Moreover, the services industries are the primary consumers of information technology (IT) capital. It has been widely reported by others (Jorgenson and Stiroh 2000; Oliner and Sichel 2000) that IT has been a major contributor to recent U.S. productivity growth. We confirm this at the industry level and show in addition that the productivity-enhancing contributions of IT took place in the services industries. IT in services industries accounted for 80 percent of the total IT contribution to U.S. labor productivity growth between 1995 and 2001. As with labor productivity growth and multifactor productivity growth, the IT revolution in the United States is a services industry story.

Services industries have emerged as one of the most dynamic and innovative sectors of the U.S. economy. That was the basis of one of our previous studies (Triplett and Bosworth 2002), which proclaimed that "Baumol's Disease has been cured." The characterization of services as a drag on aggregate growth is no longer valid.

The U.S. statistical system also has changed. The trend toward services claiming a growing share of the economy was long ignored by a statistical system originally structured to report the production and consumption of goods. For many years the outputs of major services-producing industries were estimated by making simple extrapolations of their past relationships to employment or some similar partial indicator. The research reported in this book highlights the progress that has been made in the U.S. statistical system in expanding the range of surveys of the services-producing industries and in developing an improved methodology for measuring both the output of services and the contribution of critical new high-technology products. We have benefited from the emergence of new government data sets that have enabled us to measure labor productivity and the growth in multifactor productivity (MFP) at the level of individual industries. Labor productivity is simply the ratio of output per unit of labor input, which is defined as persons or hours. However, with the new data, we can measure the growth in MFP, defined as output per unit of input when input is expanded to include labor, purchased inputs, and different forms of capital. Multifactor productivity is a far more comprehensive measure of the efficiency of resource use.

Our research employs data for twenty-nine services sector industries—at approximately the two-digit level of the old U.S. SIC (Standard Industrial Classification) system—and for fifty-four industries overall. The United States now has a comprehensive set of data on the output, value added, purchased inputs, capital services, and employment of all fifty-four industries. Our conclusion that accelerating labor productivity and MFP in services industries played a crucial part in the post-1995 growth in U.S. productivity would not have been possible without the improvements in the U.S. industry database. We know of no other country that has a comparable database.[1]

Our broad conclusions about the improved productivity of the services-producing industries are developed in chapter 2. We find that the bulk of the post-1995 acceleration of productivity growth was within the services-producing industries. In the period after 1995, labor productivity in the goods-producing industries improved, but not nearly so much as it did in the services-producing industries. Multifactor productivity, moreover, accelerated strongly in services-producing industries (we measured it at 0.3 percent a year before 1995 and at 1.5 percent a year for the 1995–2001 period) but hardly at all in the goods-producing sector.

However, the services sector encompasses a diverse range of industries, including various forms of transportation and communications, wholesale and retail trade, financial services, and business, personal, and professional services. The patterns of productivity change are equally diverse—seventeen of the twenty-nine services industries in our database showed an acceleration of multifactor productivity growth after 1995. Though large industries (retail trade, wholesale trade, finance) accounted for much of the contribution to aggregate growth after 1995 (because they advanced and they are large), the improvement in services productivity growth was broad based: twenty-four of the twenty-nine services industries in our analysis had positive growth in labor productivity after 1995.

The growing awareness of the importance of services in creating job opportunities and raising productivity and real income has arisen from the improvements that have been made in the statistical reporting system. Some economists still believe that government statistics on services are too poor to be used or believed—but that belief, like the belief that services inherently are not susceptible to productivity improvements, is outdated.

This is a book on developments in the productivity of the services sector, but it is also a book on measurement. Measuring economic variables has long been a

1. The closest examples would be O'Mahony and Van Ark (2003) and Jorgenson and Lee (2001).

major part of productivity research in the United States because accurate and relevant measurements are so important in forming conclusions about productivity growth.

In subsequent chapters we examine the behavior of measured productivity for individual industries, with a particular focus on issues of measurement. We also report and incorporate the results of a Brookings Institution research program on measuring output and productivity in the services sector. Many of the twenty-nine services industries for which we compute labor and multifactor productivity growth in chapter 2 were subjects of a series of fifteen Brookings economic measurement workshops. The workshops and presentations are listed in appendix B of this volume.[2]

Our examination of individual industries allows us to identify some of the factors that lie behind the acceleration of U.S. aggregate productivity growth. In transportation, for example, we can readily observe the impacts of deregulation, which led to major internal reorganization in railroads and in trucking. The surge of output and labor productivity in communications and finance can be traced directly to the rapid adoption of new information and communications technologies. A combination of changes in information technology (scanners and computers) and organizational changes led to substantial efficiency improvements in retailing. What emerges is a picture of services that is at sharp variance with the old picture.

In several cases, the changed perspective can be traced to new and improved ways of measuring output in services. In particular, the shift away from a focus on value added to gross output (sales or revenues) in Bureau of Economic Analysis (BEA) industry accounts has led to measures of output that better reflect what is actually produced. In banking, for example, the measurement of output now includes use of more convenient automated teller machines and the provision of services over the Internet. The Bureau of Labor Statistics (BLS) also has greatly expanded the coverage of the producer price index (PPI) program to cover a large proportion of services. It was not so long ago that the PPI was restricted to goods alone. The Census Bureau now produces annual surveys of most services-producing industries.

However, our examination of individual industries also provides an opportunity to point out some of the areas where the concepts and data are still inadequate or anomalies need to be resolved. Despite the surge in productivity in services as a whole, in some industries measured growth in labor and multifactor

2. A list also is available at the Brookings website (www.brookings.edu/es/research/projects/productivity/productivity.htm [March 25, 2004]).

productivity has been negative over sustained periods of time. Those results suggest that there are still significant measurement problems. We spend a fair amount of our space and an entire chapter (chapter 11) on improvements that we think are still needed in services statistics.

Zvi Griliches (1992, 1994) suggested that even in the "old days" before the IT and managerial revolutions, productivity in services industries might not have been as bad as it appeared because the statistics that existed at the time were so inadequate.[3] Innovations in services—changes in organization, delivery, and variety—often are more difficult to identify than the new products offered in the goods-producing sector, and too few resources were put into measuring services industries. Only recently have statistics emerged that allow us to identify and track the changes in these industries. Economists, including us, owe Griliches a great debt for calling attention to the need for services sector data and the implications for productivity analysis. In many ways, this book commemorates Griliches' foresight.

3. Marimont (1969) indicates that there were "old, old" days when nearly the only information on services concerned employment; at that time BEA estimated services industry output in part by labor extrapolation with a labor productivity adjustment based on manufacturing productivity. When direct information on services output became available for some industries, the methodology changed to combining the direct measures with labor extrapolation in the other industries, but without any productivity adjustment. It is significant that implied productivity in services from the "old, old" BEA data, before the 1970s, exceeded the implied productivity for the following period.