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PRODUCTIVITY GROWTH IN SERVICE INDUSTRIES: ARE THE TRANSATLANTIC DIFFERENCES MEASUREMENT-DRIVEN?

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Since the mid-nineties, U.S. labor productivity outgrows its European counterpart by a wide margin. van Ark *et al.* (2003) have found three service industries where productivity growth has accelerated in the U.S., but not in Europe, to account for most of the difference. These three industries are wholesale and retail trade, and trade in financial securities. However, since measurement methods differ on both sides of the Atlantic, Europe's shortfall in productivity growth could be a statistical artifact. This paper tries to answer the question whether this is indeed the case by quantifying the extent to which the U.S. growth rates in trade and banking are pulled upward by measurement methods that are unusual in Europe. In addition, some observations are offered on whether the recent upswing in productivity growth in the U.S. services sector has cured "Baumol's Cost Disease."

1. Introduction

According to official statistics, productivity growth in the United States has uncoupled from its European counterpart since the mid-nineties. Table 1 shows that both labor and multi-factor productivity grow faster in the U.S. than in the European Union. Moreover, while productivity growth rates have increased in the U.S. after the turn of the century, European rates are on the decline.

Many economists have been looking for the reasons behind this divergent development. Since the works of Oliner and Sichel (2000), Jorgenson (2001), Stiroh (2002) and others, economists have attributed most of the acceleration in productivity growth in the U.S. to the surge in investment in information and communication technologies (ICT) that started around 1995. Although ICT investment also accelerated in Europe over the last decade, a couple of studies found that Europe's lagging behind is mainly due to lower *levels* of ICT investment (cf. Colecchia and Schreyer, 2002; Vijselaar and Albers, 2004; Timmer and van Ark, 2005). Inklaar *et al.* (2005) show, however, that the labor productivity growth advantage of the U.S. in market services is not due to higher levels of ICT investment, but mainly due to superior multi-factor productivity performance. This point has also been made repeatedly by Jack Triplett and Barry Bosworth in a series of papers to be introduced later.

Another line of research has scrutinized measurement issues. As a response to the Boskin report (Boskin *et al.*, 1996), which stated that the rate of consumer price inflation in the U.S. was upward-biased by 1.1 percentage points per year, statistical offices in the United States have introduced reforms to deflation

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TABLE 1

PRODUCTIVITY GROWTH IN THE UNITED STATES AND IN THE EUROPEAN UNION, TOTAL ECONOMY (PERCENTAGES)

	Labor Productivity Growth			Multi-Factor Productivity Growth		
	1995–2005	1995–2000	2000–2005	1995–2005	1995–2000	2000–2005
United States	+2.3	+2.1	+2.4	+0.8	+0.4	+1.2
EU15	+1.4	+1.6	+1.1	+0.2	+0.4	+0.1

Notes: Data on multi-factor productivity growth are not available for Greece, Ireland, Luxembourg, Portugal and Sweden. The table lists the average multi-factor productivity growth rates (geometric mean) for the aggregate of the remaining ten EU15 countries.

Source: EU KLEMS Growth and Productivity Accounts: November 2007 Intermediate Release (www.euklems.org).

methods that have contributed to lowering inflation. Of course, lower price increases translate into higher "real" productivity growth (cf. Eldridge, 1999). Hartwig (2006a, 2006b) estimates that statistical revisions since the mid-nineties have pulled U.S. GDP—and hence *ceteris paribus* also productivity—growth upwards by 0.5–0.6 percentage points per year. This is not to say that the increase in labor productivity growth in the U.S. since the mid-nineties is a statistical illusion. The Bureau of Economic Analysis (BEA), which is in charge with preparing the National Accounts for the U.S., calculates most revisions to the National Income and Product Accounts backwards to 1959 (or even to 1929) so that new methods do not bias the time series. However, the apparently growing gap in productivity growth between the U.S. and most European countries is partly a statistical illusion since European countries have not—or only recently and without calculating their time series far backward—introduced comparable revisions. For example, the use of so-called hedonic deflation methods, which Hartwig (2006a, 2006b) identifies as being responsible for around half of the statistically induced upswing in U.S. productivity growth after 1995, has until recently been quite uncommon in Europe (cf. Ahnert and Kenny, 2004).[1]

Yet hedonics cannot be the whole story since, as van Ark *et al.* (2003) point out, most of the U.S. lead in productivity growth stems from services—and expenditures on services are *not* deflated using hedonic techniques in the U.S.[2] Still, there are other transatlantic differences in measurement methods with obvious consequences for comparative work on (market) services such as, for instance, the work being done in the EU KLEMS project that provided the data for Table 1. This paper's aim it is to answer the question whether measurement differences can account for the U.S. lead in the services sector's productivity growth. If so, then Europe's lagging behind would have to be regarded as a statistical artifact. In answering the research question, I will concentrate on the services industries that

[1]The part of the upswing that was "statistically induced" would not have become apparent without the change in the output measurement methodology.

[2]Housing rents are an exception. The Bureau of Labor Statistics (BLS) has used the hedonic method since 1988 to eliminate a downward bias from the Consumer Price Index (CPI) component for housing services. This bias stems from the fact that the creeping deterioration of housing services quality does not lead to lower housing rents. Quality-adjusted rents rise, which was not reflected in the CPI before 1988 (cf. Hartwig and Schips, 2005).

van Ark *et al.* (2003) single out as being responsible for the bulk of the difference in aggregate productivity growth between the European Union and the U.S., namely wholesale and retail trade, and the financial securities industry.

Measurement differences in the banking sector stem from the fact that the BEA uses an output-based extrapolator for banking output whereas European statistical offices still largely seem to rely on input-based measures.[3] The latter tend to bias labor productivity growth toward zero. In the next section, the impact of the switch from an input-based to an output-based extrapolator for banking on aggregate U.S. GDP growth—and hence *ceteris paribus* also on productivity growth—will be estimated. A positive value indicates that some part of the U.S. lead in productivity growth over Europe is measurement-driven.

In wholesale and retail trade, the possibility that U.S. productivity growth rises artificially over and above its European counterpart stems from the fact that U.S. statistical offices use hedonic sales price indices to deflate trade margins, which is uncommon in Europe. In Section 3, the impact of this methodological difference on U.S. productivity growth is estimated.

The last section before the conclusion raises a more general issue. So far, it has been regarded as a stylized fact that productivity growth in manufacturing is higher than in the aggregate of service industries. Recent comparative studies have unanimously affirmed this (cf. e.g. Scarpetta *et al.*, 2000; Wölfl, 2003, 2005; ECB, 2006) and have thus lent support to Baumol's (1967) model of "unbalanced growth," according to which imbalances in productivity growth between a "progressive" and a "nonprogressive" sector of the economy lead to constant expenditure shifts into the latter—a phenomenon known as "Baumol's Cost Disease." Now the recent upswing in productivity growth in the U.S. services sector has raised doubts on whether this stylized fact is still valid. Triplett and Bosworth (2004, pp. 348–51), for instance, combine output data from BEA's industry output and input program with labor input data from BEA's series on persons engaged in production (full-time equivalents) to arrive at post-1995 productivity growth rates of +1.8 percent for the goods-producing industries and +2.3 percent for the service-producing industries (cf. Table 2).[4] Although labor productivity growth in the sphere that Baumol (1967) presents as a prime example for industries belonging to the nonprogressive sector—namely educational and health services—remains low, their findings induce Triplett and Bosworth to claim that "Baumol's (Cost) Disease has been cured" (Triplett and Bosworth, 2003, 2006).

Since Baumol's is an aggregate model, Triplett and Bosworth's claim would be legitimate if they were able to show that labor productivity growth in the nonprogressive sector has indeed begun to outstrip its counterpart in the progressive sector. Section 4 below argues, however, that there are differences between the service-producing industries and Baumol's nonprogressive sector. After an appropriate rearrangement, Triplett and Bosworth's data fail to support their claim that "Baumol's Cost Disease" has been cured. In addition to that, Section 2 shows that

[3]Practices vary across European countries, and the transparency in this field is not very high.

[4]Rincon and Vecchi (2003, p. 176) reach the same qualitative conclusion that productivity growth in the U.S. service-producing industries has been higher than in the goods-producing industries over the period 1995–2001. However, they use a company accounts database.

TABLE 2

Productivity Growth in Selected U.S. Industries, Average 1995–2001 (percentages)

	Labor Productivity Growth	Multi-Factor Productivity Growth
Goods-producing industries	+1.8	+0.4
Agricultural services, forestry, and fishing	+1.0	+0.1
Mining	+1.3	–0.9
Construction	–1.0	–0.5
Manufacturing	+3.2	+0.8
Services-producing industries	+2.3	+0.8
Wholesale trade	+4.2	+3.0
Retail trade	+3.2	+3.0
Depository institutions	+3.0	+1.2
Nondepository institutions	+2.2	+2.5
Security and commodity brokers	+9.1	+8.0
Health services	+0.9	–0.4
Educational services	–1.0	–0.9

Source: Triplett and Bosworth (2004, pp. 348–51).

the exceptionally strong productivity growth found by Triplett and Bosworth for security and commodity brokers (cf. Table 2) is partly the result of an infelicitous choice of the sampling period.

2. Productivity Growth in the Banking Industries

Until the year 2000, the Bureau of Economic Analysis extrapolated real output for both banking and nondepository institutions with labor input measures, hence using the same method that is applied for most public services for which there are no market prices.[5] If output grows in line with labor input by design, then, of course, there cannot be any growth in labor productivity. In the 2000 revision of the industry database, however, apart from a couple of further minor changes, BEA switched the extrapolator for banking output. The new extrapolator is output-based; it takes account of the number of checks cleared, ATM transactions etc. (cf. Triplett and Bosworth, 2004, pp. 107–8). The growth rates of the financial sector's value added were raised by this revision (cf. Table 3).

The methodological changes were extended back in time, so that they do not introduce a break into the U.S. series. It follows that the increased labor productivity in banking since the mid-nineties is *not* a statistical artifact—as it would have been if the revisions had not been carried back. However, international comparisons of value added and productivity growth might be biased by the introduction of improved measures in the U.S. since European statistical offices still largely

[5]However, EU legislation requires member states to start measuring volume changes of government output directly from 2006—at least for health and educational services. Given that the requirements are sometimes vague, EU member states are likely to implement them in different ways. This will introduce comparability problems both within the EU and particularly with the U.S. where the BEA continues to use input-based methods. Although one should expect that the adoption of the new methodology will raise productivity growth in the public sector, results from comparing input- and output-based measures for countries that dispose of the latter have so far produced no clear evidence as to which method leads to a higher rate of labor productivity growth (cf. ECB, 2006, pp. 51–2; see also Atkinson, 2005).

TABLE 3

Finance Sector Value Added Growth Before and After the 2000 Revision to the BEA Industry Database, per annum

	Average 1992–97		
	Old	New	Difference (percentage points)
Depository institutions	–0.8%	1.0%	1.8
Nondepository institutions	6.8%	12.8%	6.0
Security and commodity brokers	19.5%	20.3%	0.8

Source: Triplett and Bosworth (2004, p. 109).

seem to rely on input-based extrapolators for banking output. It might be interesting to know by how much the switch to an output-based extrapolator has increased real U.S. GDP growth in order to have an estimate for the magnitude of the bias in transatlantic productivity comparisons due to different measurement methods.

The contribution to overall growth that an industry makes is usually calculated by multiplying its real growth rate by the share of the respective industry in (nominal) GDP in two adjacent years. From Table 3 we know the old and new real growth rates for the three banking industries that were distinguished by the old Standard Industrial Classification (SIC). Nominal value added for 1992–97 can be gathered from Lum and Moyer (1998, table 10). (To retain consistency, I use nominal GDP data from the same source even though GDP has been revised several times since then.) Based on these data, the switch to an output-based extrapolator for banking output has raised the growth rate of real U.S. GDP by 0.1 percentage points per year on average over the period 1992–97. This is not a very high value. So we can conclude that even if European countries were not using any output-based extrapolators for banking—some of them might do so, but the situation is not transparent—the part of the transatlantic gap in productivity growth that is driven by differences in the measurement of banking output is relatively small.

It will be remembered that van Ark *et al.* (2003) find that the financial securities industry, together with wholesale and retail trade, accounts for most of the difference in aggregate productivity growth between the EU and the U.S. Triplett and Bosworth (2004) also report a spectacular +9.1 percent annual labor productivity growth for security and commodity brokers (cf. Table 2). This is the highest growth rate they find over all industries. Thus, the financial securities industry strongly supports their claim that "Baumol's (Cost) Disease has been cured" (Triplett and Bosworth, 2003, 2006).

However, with the benefit of hindsight, we now call the period Triplett and Bosworth are focusing on the "new economy bubble." Output of the financial industries—and especially of securities brokers—consists of earnings made in financial markets and usually rises "with the market." So the high productivity growth found by Triplett and Bosworth for security and commodity brokers might be due to the fact that their period of investigation does not include the burst of the "new economy bubble" after 2001.

TABLE 4

AVERAGE LABOR PRODUCTIVITY GROWTH PER YEAR FOR "SECURITIES, COMMODITY CONTRACTS, AND INVESTMENTS" BASED ON GROSS OUTPUT AND PERSONS ENGAGED IN PRODUCTION, IN PERCENT (GEOMETRIC MEAN)

	Labor Productivity Growth for "Securities, Commodity Contracts, and Investments"
1998–2001	+17.0
1998–2002	+10.0
1998–2003	+9.3
1998–2004	+9.2
1998–2005	+10.8
1998–2006	+12.2

Source: Own calculations based on BEA GDP-by-Industry data.

The SIC dataset that Triplett and Bosworth's analysis is based on has been discontinued by the BEA in the meantime. The new North American Industry Classification System (NAICS) allows calculation of productivity levels based on persons engaged in production from 1998 onward.[6] We can check in the new dataset how productivity growth rates for security and commodity brokers change when averaged over different periods.

Table 4 shows that it matters for productivity growth of security and commodity brokers whether the years after 2001 are considered. Inclusion of 2002 leads to a drop in the average productivity growth rate by 7 percentage points. One might argue that growth rates around 9 percent are still impressive and lie in the range of the Triplett and Bosworth estimates.[7] Yet, most of the productivity growth took place between 1998 and 2000 during the "new economy bubble." Over the years 2001 to 2004, the average productivity growth rate has been negative for security and commodity brokers while the overall economy registered a positive productivity growth of 2.5 percent per year (according to BEA data). Productivity growth in the financial securities industry did not pick up until 2005, arguably in the wake of the unfolding of the next financial markets bubble (in the field of housing finance this time). In sum, productivity growth in the financial securities industry is impressive *on average*; it is by no means *regular*, however.

3. PRODUCTIVITY GROWTH IN WHOLESALE AND RETAIL TRADE

Wholesale and retail trade have also witnessed strong labor productivity growth in the U.S. after 1995. Growth rates were in the range of 3–4 percent per

[6]http://www.bea.gov/industry/gdpbyind_data.htm.

[7]After the first version of this paper had been completed, Bosworth and Triplett (2007) published an article where they extend the analysis forward to the year 2005. Their table 7 shows that multi-factor productivity growth fell sharply in brokerage after the turn of the century. Also, the data revisions since the publication of their earlier work—especially BEA's switch from SIC to NAICS—raised productivity growth rates in the goods sector and lowered them in the services sector so that neither before nor after 1995 does labor and multi-factor productivity growth in the services sector exceed its goods sector counterpart (cf. Bosworth and Triplett, 2007, pp. 6–7). I am grateful to a referee for calling my attention to this article.

TABLE 5
PRODUCTIVITY GROWTH IN WHOLESALE AND RETAIL TRADE, IN PERCENT

	Labor Productivity Growth			Multi-Factor Productivity Growth		
	1995–2005	1995–2000	2000–2005	1995–2005	1995–2000	2000–2005
United States						
Wholesale trade	+6.3	+8.9	+3.7	+4.3	+6.7	+1.9
Retail trade	+3.1	+3.2	+2.9	+2.2	+2.5	+1.9
EU15						
Wholesale trade	+2.4	+2.7	+2.1	+1.2	+1.3	+1.1
Retail trade	+1.5	+1.7	+1.3	+0.5	+0.6	+0.4

Note: Data on multi-factor productivity growth are not available for Greece, Ireland, Luxembourg, Portugal and Sweden. The table lists the average multi-factor productivity growth rates (geometric mean) for the aggregate of the remaining ten EU15 countries.

Source: EU KLEMS Growth and Productivity Accounts: November 2007 Intermediate Release (www.euklems.org).

year when productivity is calculated as gross output per worker.[8] When calculated as gross value added per hour worked, the most recent U.S. growth rates present a similar picture (cf. Table 5). However, productivity growth in U.S. wholesale trade has been considerably higher between 1995 and 2000. At any rate, Table 5 shows that the U.S. clearly outperforms the EU with respect to productivity growth in wholesale and retail trade.

Yet there is a potential measurement bias lurking here also. Timmer *et al.* (2005) have coined the term "inside-the-box effect" to circumscribe the problem, which concerns price measurement and the use of hedonic techniques. The hedonic method constitutes one of several possibilities to cope with the fact that goods and services whose price development one wishes to measure may change in quality. The basic idea is to estimate the money value of certain product *characteristics* by performing statistical regression analysis on cross-section or pooled data. The hedonic method seems to lend itself especially well to computer hardware. On the one hand, hardware quality (computing speed) improves quickly, whereas the price for a desktop computer remains rather stable. This means that there is a large difference between a quality-adjusted and a non-quality-adjusted price index for computers. On the other hand, all relevant product characteristics, like computing speed or memory size, can be easily quantified (which is necessary for the regression analysis). The estimated coefficients can be used to deduce the estimated money value of quality improvements from observed price increases. If prices for desktop computers, for example, remain stable, then the quality-adjusted price index will show a decline in desktop prices.

In the meantime, the Bureau of Labor Statistics uses the hedonic method not only for calculating quality-adjusted prices for desktop computers, but also for TV sets, DVD players, VCRs, camcorders, audio systems, microwave ovens, refrigerators, freezers, washing machines, tumble-dryers, college textbooks, non-residential structures, photocopying equipment and possibly other goods—their

[8]Cf. Triplett and Bosworth (2004, p. 350). Triplett and Bosworth prefer output-based measures for production analysis at the industry level.

number increases continuously. Some time ago, Moulton (2001) noted that 18 percent of all expenditures that make up nominal U.S. GDP were deflated using price indexes that use hedonic methods.

Obviously, the hedonic method lends itself mainly to goods. As already mentioned, with the exception of housing rents, expenditures on services are not deflated using hedonic techniques in the U.S. Nevertheless, hedonic deflation presents a problem for the correct measurement of productivity growth in wholesale and retail trade, where gross output is defined as the trade margin. To arrive at "real" gross output, the BEA deflates the trade margins with sales price indices, while in Europe, sales volumes are normally used as extrapolators for real output (cf. Ahmad *et al.*, 2003, p. 24). BEA's use of quality-adjusted sales price indices as deflators in fact implies that the sale of higher quality goods requires more effort on the part of the trade industries than the sale of goods of lower quality. While this might be a defensible proposition in some cases, Triplett and Bosworth (2004, p. 240) remain skeptical with respect to computers. Electronic stores sell boxes filled with computers. The salesperson's effort is hardly associated with the technical characteristics of the machine inside the box. Even so, electronic stores have witnessed the strongest productivity growth of all outlet categories in the U.S. between 1987 and 2001 according to official statistics (cf. Triplett and Bosworth, 2004, table 8-1). Again, the transatlantic comparability of "real" growth rates is impaired by the use of different methods. Ahmad *et al.* (2003, p. 25) show that the U.S. trade deflator has not risen at all between 1993 and 2001 while, over the same period, the German implicit deflator has risen by 30 percent, and the Italian by 20 percent. Concomitantly, "real" value added per employed person in the wholesale and retail industry has increased by 40 percent in the U.S., but only by 10 percent in Italy, and not at all in Germany.

To quantify the impact of the "inside-the-box effect" on U.S. productivity growth, we have to consider the argument of Timmer *et al.* (2005) concerning "double deflation." If, instead of deflating the trade margin with a (hedonic) sales price index—which is the current practice in the U.S.—goods sold and goods purchased were deflated separately with indices that use the same techniques for quality adjustment, then the "inside-the-box effect" would be eliminated. Unfortunately, data availability is far from perfect, and Timmer *et al.* have to make several critical assumptions to calculate double-deflated margins. Stressing that their estimates are of an experimental nature, they come up with an estimated real margin growth rate in electronics and appliance stores—the main vendors of computers and other electric appliances that are subject to hedonic deflation—of +10.7 percent per year over the period 1993–2002. This contrasts with +18.8 percent per year over the period 1995–2001 if calculated traditionally (cf. Triplett and Bosworth, 2004, p. 236).

The contribution to overall output growth of electronics and appliance stores will differ depending on whether the average real growth rate of this industry is +18.8 or +10.7 percent. Again, I compute the difference of the contributions to growth taking the two estimates of Triplett and Bosworth and Timmer *et al.* for granted. The difference between the two contributions to growth is the "contribution" of the "inside-the-box effect" which should probably be deducted from official U.S. productivity growth rates. Taking nominal output data from the

BEA homepage and data on gross margins of electronics and appliance stores from the Bureau of Census' 2006 *Annual Revision of Monthly Retail and Food Services: Sales and Inventories*,[9] I calculate an average 0.18 percentage points contribution to output growth of the "inside-the-box effect" in retail trade, and a 0.01 percentage points contribution to overall output growth. These are quite low numbers. Although computers etc. are probably sold in other kinds of stores as well, for instance in "general merchandise stores," I conclude that there is little evidence that the U.S. lead over Europe with respect to productivity growth in retail trade might be a statistical artifact. This corroborates the recent findings by Inklaar and Timmer (2008), who, applying a consistent deflation methodology for retail trade services, find strong productivity improvements in the UK and the U.S. compared to France, Germany and the Netherlands since the mid-1990s. Their results, which are robust for various output and productivity measurement models, also indicate that the U.S. productivity growth advantage in retail trade is "for real." Whether this statement carries over to wholesale trade, however, remains an open question for the time being (cf. Inklaar and Timmer, 2008, p. 30).

4. Has "Baumol's Cost Disease" Been Cured?

In a seminal paper, Baumol (1967) argues that labor productivity growth is "unbalanced" over different sectors of the economy. In a nutshell, his model states that because of divergent productivity growth between what he calls the "progressive" and the "nonprogressive" sectors of the economy, expenditure shares shift toward the latter. This shift of expenditures into activities largely financed out of tax money, such as education and health care, has been termed "Baumol's Cost Disease" (cf. Towse, 1997).

Baumol assumes that productivity growth is the result of technological innovation which manifests itself in new capital goods. It follows that productivity growth is largely confined to the manufacturing industries since, in most service industries, physical capital cannot be employed on a large scale—at least not as a substitute for labor. Baumol does not deny that there can be increases in productivity in the nonprogressive sector also, but he claims that "by their very nature, [these activities] permit only sporadic increases in productivity" (Baumol, 1967, p. 416). In a joint paper with Sue Anne Batey Blackman and Edward N. Wolff, Baumol extends his model to capture what the authors call "asymptotically stagnant activities." These contain both a high-tech and a labor-intensive component such as, for instance, in television broadcasting or in computer services. These services can realize high productivity growth for some time as long as total costs are dominated by the technological component. However, as time passes, "the progressive component is innovating itself out of its cost-dominating position, ultimately the activity assumes all the characteristics of the stagnant services" (Baumol *et al.*, 1985, p. 816).

As mentioned in the introduction, Triplett and Bosworth (2003, 2006) have recently asserted that "Baumol's (Cost) Disease has been cured" because they had found in BEA data that the average labor productivity growth rate over the period

[9]www.census.gov/prod/www/abs/br_month.html.

1995–2001 was higher for the "service-producing industries" (+2.3 percent) than for the "goods-producing industries" (+1.8 percent). However, Baumol's distinction was between a "progressive" and a "nonprogressive" sector and not between "goods-producing" and "service-producing" industries. Of course, the service industries belong to the nonprogressive sector, but so do agriculture, mining and construction which Triplett and Bosworth count as "goods-producing." With productivity growth rates of +1.0, +1.3 and –1.0 percent per year, respectively, over the period 1995–2001 (cf. Table 2), these three sectors pull the aggregate productivity growth rate of the "goods-producing" industries downwards. As has been pointed out above, Baumol's progressive sector essentially consists of the manufacturing industries. Even according to Triplett and Bosworth's calculations, average annual productivity growth in manufacturing is higher than in the service-producing industries (+3.2 vs. +2.3 percent). If we added agriculture, mining, and construction to services in order to establish Baumol's nonprogressive sector, the productivity growth rate of this sector would clearly drop below +2.3 percent. As long as the labor productivity growth rate is higher in manufacturing than in the nonprogressive sector, the shift of expenditure shares toward the latter and hence "Baumol's Cost Disease" continues.

5. Conclusion

This paper starts from the observation that labor productivity growth accelerated in the U.S. after 1995 while it slowed down in the EU at the same time. van Ark *et al.* (2003) single out three service industries that are responsible for most of the difference in transatlantic productivity growth, namely wholesale and retail trade, and the financial securities industry. This paper investigates whether the U.S. lead in productivity growth over Europe in these industries might be a statistical artifact caused by measurement differences.

The main result of the paper is that the research question can be answered in the negative. Admittedly, the U.S. statistical offices use an output-based extrapolator for banking output where European offices apparently continue to rely on input-based measures, but this methodological difference seems to account for only 0.1 percentage points of the transatlantic gap in aggregate productivity growth. Another methodological difference concerns the deflation of the trade margin where the U.S. practice is to use quality-adjusted sales-prices indices as deflators. This method, which is uncommon in Europe, leads to an overstatement of the U.S. lead in productivity growth, especially in electronics stores. However, what has been called the "inside-the-box effect" seems to be small. On average, some 0.18 percentage points of the productivity growth rate of the U.S. retail trade industry and perhaps 0.01 percentage points of its economy-wide equivalent could be attributable to this bias. In sum, not much evidence was found that the U.S. lead over Europe in productivity growth is a statistical artifact.

As a digression, the paper elaborates on Triplett and Bosworth's (2003, 2006) claim—triggered by their finding of an acceleration in labor productivity growth in many U.S. service industries after 1995—that "Baumol's (Cost) Disease has been cured." The main argument put forward against this claim is that Baumol's "progressive" sector is smaller than Triplett and Bosworth's "goods-producing indus-

tries." After an appropriate rearrangement, Triplett and Bosworth's data fail to support their claim. As long as manufacturing exhibits higher labor productivity growth than the aggregate "nonprogressive sector"—which is still the case—the shift of expenditure shares toward the latter and hence "Baumol's Cost Disease" continues.

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