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ARE WE MEASURING PRODUCTIVITY CORRECTLY ?

Room Documents

IS EUROPE FALLING BEHIND IN PRODUCTIVITY ?
Myths and realities

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THE PRODUCTIVITY GAP BETWEEN THE U. S. AND EUROPE

Myth or reality ?

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The image of a "rigid" Europe, being left far behind by a "flexible and dynamic" United States, has been widespread in the past years, particularly in France. During the Ronald Reagan years (1980-1989) and then under Bill Clinton (1993-2001), it was mainly the vigorous job creation in the United States (compared with meager employment growth in Europe) that was highlighted. But, after 1995, Europe started creating jobs just as fast as the United States (see Table 1) ; the Euro-pessimists dropped the subject, and their attention

TABLE 1
EMPLOYMENT

	1986-95	1995-2004
Jobs created (millions)		
United States	17.0	14.0
Europe 15	7.1	15.4
Euro Zone	6.0	12.5
Annual growth rate (%)		
United States	1.6	1.1
Europe 15	0.6	1.1
Euro Zone	0.6	1.1

Source : Eurostat (AMECO Database, 4th of April, 2005)

started to focus on the rapidly growing gap in *hourly labor productivity*. Once again, it was suggested that Europe was falling desperately behind.

The idea caught on like bush fire, and was rapidly taken up by almost everyone. The European Commission in Brussels, for example, made it a central theme of its' yearly *Economic Report*, both in 2003 and 2004 :

> "after having peaked in the mid-1990s at around 97 per cent of US levels … the EU is now, for the first time in decades, on a trend productivity growth path which is lower than that of the USA …This post 1995 deterioration in relative productivity levels reflects a *sharp decline* in EU productivity growth rates relative to those of the USA"[1]

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* This paper first appeared in the French publication *L'Economie politique*, 2006-I. Other papers by the author can be downloaded at www.fvergara.com .

[1] *The EU Economy : 2004 Review*, 26 octobre 2004, p. 160.

And we find the same opinion repeated by the United Nations' Economic Commission for Europe :

> "The *better performance* of the United States relative to western Europe in terms of productivity growth since the 1990s is now an accepted fact." [2]

In France too, the same opinion has been widely publicized. Thus in his 2004 *Report* on the French economy (commissioned by Nicholas Sarkozy), Michel Camdessus (former head of IMF) writes :

> "labor productivity accelerated in the United States during the 1990s, it has slowed down in Europe ... *the gap is widening* once again in favor of the United States"[3]

An opinion repeated by Patrick Artus and Gilbert Cette, two well known economists, writing for the French Council of Economic Analysis (*Conseil d'Analyse Economique*) :

> "labor productivity growth in European countries … has become *significantly inferior*, in the 1990s, to that of the United States"[4]

Strong disagreement on the subject

In spite of this apparent consensus, if one carefully reads the more technical literature, it appears that specialists are very divided on the subject. Some simply deny that a gap has appeared in productivity growth rates and attribute most of the problem to differences in the way productivity is measured on different sides of the Atlantic. Others consider that the gap is small, and/or of a transitory nature. Others admit the reality of the statistical fact (or part of it at least) but believe that it means something very different from what is commonly believed, not necessarily something negative for Europe. In its' 2004 *Economic Report* just mentioned, the European Commission recognizes these differences of opinion. Concerning the factuality of the phenomenon we are considering, it writes that :

> "The IMF in its recently released report on Euro-area policies maintained that the Euro-area did *not have a productivity problem*"[5]

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[2] *Economic Survey of Europe 2005*, No. 1, p. 105.

[3] Michel Camdessus, *Le sursaut. Vers une nouvelle croissance pour la France*, La Documentation Française, 2004, p. 25.

[4] Patrick Artus, Gilbert Cette, *Productivité et croissance*, La Documentation française, 2004, p. 77.

[5] *The EU Economy : 2004 Review*, 26 octobre 2004, p.187.

As for the "statistical" reasons explaining why data from European national accounts show a slowdown in labor productivity, while American data show an acceleration, the Commission admits that :

> "our interpretation of recent productivity trends differs from that of respected commentators such as Olivier Blanchard (of MIT) and the IMF"[6].

Enormous measurement difficulties

The specialists who have doubts about the "widening gap" in hourly labor productivity put forth several arguments. First of all, many consider that a significant part of the gap shown by official data is just a *statistical illusion* due to differences that exist in the way productivity is measured on different sides of the Atlantic. As early as 2001, the Deutsche Bundesbank had already noted that if national accountants in the United States measured the growth of "investment in IT equipment" (software excluded) with the methods used in German national accounts, half of the American productivity revival of the 1990s' would disappear[7]. In the same line of reasoning, a recent IMF *Working Paper* noted that if Europeans calculated the productivity growth rate of their "ICT manufacturing branches" (computers, printers, portable telephones, etc.) with American accounting methods (using the hedonic price indexes of the United States), one third of the slowdown in European labor productivity after 1995 would disappear[8].

These partial estimates give only a hint of what the problem is since ICT manufacturing constitutes such a small part of the economy (2% of GDP in Europe and 4% in the United States). No complete study has been undertaken of the differences in the way productivity is measured in the rest of the economy, especially in "services", which constitute more than 70% of GDP and which pose much more difficult problems of measurement than computers and printers (which at least are *visible* objects).

Among the partial studies on the subject, Jack Triplett's and Barry Bosworth's work on the measurement of volume growth in "financial services" should be mentioned. These services, which constitute almost 10% of GDP in the United States, contain some branches in which

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[6] *The EU Economy : 2004 Review*, 26 octobre 2004, p.13.

[7] « Problems of International Comparisons of Growth - A Supplementary Analysis », *Deutsche Bundesbank Monthly Report*, Mai 2001, p. 39.

"production" is extremely difficult not only to measure but even to define. And it is in some of these branches that we find (according to American data) some of the most impressing accelerations in American productivity (accelerations that are imperceptible in the national accounts of many European countries as Table 4 shows). According to Triplett, and Bosworth if the Americans had continued to calculate the productivity growth-rates of these services with their old accounting methods (the ones used before introducing their new financial services price indexes) the "productivity upsurge" in these branches would not have been perceptible :

> "the accelerations are apparent only in the new data, they would not have been evident with the former BEA (Bureau of Economic Analysis) methodology"[9]

It is not surprising then that one does not find similar accelerations in data in European national accounts, where methods for measuring volume growth in financial services resemble those of the old procedures used in the United States.

Another interesting sectoral study is that by Marcel Timmer et Robert Inklaar on measurement difficulties in "retail and wholesale trade" which make up 11% of American GDP. In this sector also, American statistics show an *impressive acceleration* in hourly productivity growth rates contrasted with a *slowdown* in Europe according to national accounts in these countries. Here too, new price indexes for estimating volume growth have been introduced, and problems of measurement and comparison have become so enormous that the two authors conclude that :

> "productivity growth estimates based on national accounts data are becoming more and more obsolete … [they] suffer increasingly from comparability problems, due to statistical measurement innovations."[10]

Diverging interpretations

Whether the "gap" which has appeared in productivity growth rates be real or only apparent, the fact remains that official national data show an *acceleration* in American productivity growth rates in contrast with a *slowdown* in Europe.

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[8] Marcello Estevao, *Why Is Productivity Growth in the Euro-Area So Slugish*, Working Paper du FMI, octobre 2004, p. 11-12.

[9] Bosworth, Barry et Triplett, Jack, *Some Information on the (Nonbank, Noninsurance) Financial Services Industries*, Brookings Economic Measurement Workshop, 1er novembre 2002, p. 13.

[10] Timmer, Marcel et Inklaar, Robert, *Productivity Differentials in the U. S. and EU Distributive Trade Sector: Statistical Myth Or Reality?*, Groningen Growth and Development Centre, avril 2005, p. 3.

Two opposed families of explanations have sprung up furnishing rival interpretations of this phenomenon. According to the first type of explanation, there is *one dominant general cause* – the greater or lesser *flexibility of markets* – which explains the most important part of both of these trends. The greater *flexibility* in the United States allows American entrepreneurs to better exploit all the advantages that new technologies offer, whereas in the Old Continent (where the same technologies are available) *market rigidities* hinder European entrepreneurs from doing the same. This is the argument favored by the European Commission, which has been championing this explanation :

> "the EU economy is failing to exploit the technological opportunities which are presently available in the world economy … The *structural nature* of the EU's productivity downturn is confirmed, with the bulk of the deterioration emanating from an outdated and *inflexible industrial structure*".[11]

An opinion very similar to that put forward by Gilbert Cette in the above mentioned *Report on Productivity* for the French Council of Economic Analysis :

> "Concerning productivity growth rates … the gap between the United States and European countries (among which France) can undoubtedly be explained in great part by *rigidities* in markets of goods and labor"[12]

But many experts on the subject think that the explanation which considers the *degree of flexibility* of markets as the fundamental cause of the productivity gap (by facilitating or hindering optimal use of modern technology) is not confirmed by observation. It doesn't fit the fact, for example, that after 1995 productivity slowed down in the very flexible United Kingdom but not in "rigid" France (see Table 2). Nor that after 1995, in the United States, productivity slowed down in 11 States of the Union (among which flexible Florida)[13]. And even more, the productivity slowdown in Europe is almost entirely concentrated in three countries that have specific problems (not necessarily lack of flexibility) : Spain, Italy and the Netherlands. If we leave these countries aside in our calculations, no productivity slowdown can be detected in the rest of Europe, and no productivity growth gap has appeared with the United States.

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[11] *The EU Economy : 2004 Review*, 26 octobre 2004, p. 156 and 161.

[12] Patrick Artus, Gilbert Cette, *Productivité et croissance*, La Documentation française, 2004, o*p. cit.*, p. 77-78.

[13] Francesco Daveri et Andrea Macotto, *The I. T. Revolution accross the U . S. States*, Working Paper n° 226, CEPR, NBER et Université Bocconi, nov. 2002, p. 34.

TABLE 2 : HOURLY LABOR PRODUCTIVITY

	Yearly growth rate of hourly labor productivity*	
	1985-95	**1995-2002**
United States	1.2	2.3
Europe 15	2.3	1.7
Europe 15 (without Italy, Spain and the Netherlands)	2.4	2.3
Countries whose productivity has accelerated		
Ireland	3.5	5.3
Sweden	1.5	2.3
Austria	2.2	2.8
Countries with stable productivity growth		
France	1.9	1.9
Denmark	1.8	1.6
Countries whose productivity has slowed down		
United Kingdom	2.4	2.0
Finland	2.9	2.4
Germany	2.8	2.1
Netherlands	1.6	0.6
Italy	2.2	0.6
Portugal	3.0	1.7
Spain	2.0	-0.1

Source : Groningen database (updated Feb and August 2005), www.ggdc.net.

* PPP GDP in 2002 Dollars.

And more still, if Europe is "failing to exploit the technological opportunities which are presently available in the world economy", as the European Commission puts it[14], how is it that, in many of the most modern branches, hourly productivity is growing just as fast (and sometimes faster, see Table 3) in Europe than in the United States?

The slowdown in hourly productivity growth that we see in European statistics, and the acceleration that we find in American data, probably have different, and more complex causes than those suggested by the "flexibility-rigidity" explanation.

Let's start with the slowdown in European productivity which was growing at a rate of 2.3% between 1985, and 1995 and then fell to 1.7% from 1995 to 2002 (see Table 2). According to the International Monetary Fund, this is only a transitory slowdown, and is not due to *structural rigidities* at all. On the contrary, the cause would be the recently new found

[14] *The EU Economy : 2004 Review*, 26 octobre 2004, p. 161.

European *flexibility*, much greater than what is usually supposed, and which has given (as one can see in Table 1) an impressive boost to job creation :

> "Staff analysis [at the IMF] suggests that slowing labor productivity growth reflected, in large part, *wage moderation and structural reforms* that led to more labor-intensive growth … productivity growth should firm again once these adjustments are completed … Policies that boost labor utilization may well *temporarily depress* labor productivity growth"[15]

And in fact, between 1995 and 2002, Europe (EU 15) created 14.2 million net jobs, more jobs than the United States created during the same period, and seven times more than it had during the period of similar length from 1988 to 1995. It is not surprising that, when such a sudden and important increase in recruitment occurs, part of the workers hired are less efficient and productivity slows down.

As for the acceleration in hourly productivity growth which is alleged to have taken place after 1995 in the United States (but not in Europe), if it is to be explained by a *better exploitation of modern technology* by American entrepreneurs enjoying more flexibility, then it should be present in all branches where such technology is used. But this is far from being the case. Thus, between 1995 and 2002, American productivity experienced slower growth than in Europe in "communications", "computer and related activities", "electronic valves and tubes", "electricity, gas and water supply", "textiles", and several other branches using the latest technology (see Table 3). And it experienced very similar rates of growth in "Financial intermediation", "Insurance and pension funding", "Scientific instruments", and several others.

To better understand what is really happening, the University of Gröningen (with the help of OECD and some others) has elaborated a database which allows us to compare not only aggregate GDP per hour but to look under the surface, and compare what is happening in the 56 different branches of the International Standard Industrial Classification of Economic Activities (ISIC, Revision 3).

The first results from the exploitation of this database have been surprising : it turns out that practically all of the "difference" in productivity growth rates which has appeared between the US and Europe is concentrated in *only 3 of the 56 branches* of the national

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[15] FMI, *Euro Area Policies, Staff Report*, août 2004, p. 17.

economy. As Professors van Ark, Inklaar et McGuckin, the main architects of this project explain :

> "three industries account for the full difference in productivity growth … namely wholesale and retail trade and financial securities trade[16]"

And Robert J. Gordon, one of the main contributors to this debate, adds :

> "literally *all* of the productivity growth differential of the U. S. over Europe in the late 1990s came from these three industries …. The remaining industries [which account for 85% of the economy] had small positive or negative differentials, netting out to zero[17]".

TABLE 3

ISIC code Rev.3*		Yearly growth rate of hourly labor productivity**	
		1995-2002 United States	**1995-2002 Europe 15**
	Industries in which productivity growth has been faster in the US than in Europe		
67	Activities auxiliary to financial intermediation	10,6	1,4
51	Wholesale trade	8,5	1,5
52	Retail trade	7,4	1,6
	Industries in which productivity growth has been comparable		
70	Real estate activities	0,9	-0,7
55	Hotels & catering	0,9	-0,5
34	Motor vehicles	3,7	2,3
65	Financial intermediation, except insurance and pension funding	3,9	3,4
66	Insurance and pension funding, except compulsory social security	2,9	2,5
01	Agriculture	4,2	3,8
29	Mechanical engineering	1,1	1,3
331	Scientific instruments	3,4	4,1
60	Inland transport	0,4	1,2
45	Construction	-0,3	0,6
24	Chemicals	2,9	4,5
	Industries in which productivity growth has been slower in the US than in Europe		
64	Communications	6,6	8,9
17	Textiles	-1,4	1,6
72	Computer and related activities	-2,0	2,3
40-41	Electricity, gas and water supply	1,6	6,1
321	Electronic valves and tubes***	61,0	67,4
15-16	Food, drink & tobacco	-5,5	1,0

Source : Groningen database (updated January 2005), www.ggdc.net.

*. International Standard Industrial Classification ; **. PPP GDP in 2002 Dollars; ***. Using American price indexes for Europe.

[16] Bart van Ark, Robert Inklaar et Robert McGuckin, *ICT and Productivity in Europe and the United States. Where do the Differences Come From ? CES-ifo Economic Studies*, Vol. 49, mars 2003, p. 309.

[17] Robert J. Gordon, *Why was Europe Left at the Station*, CEPR, 31 mars 2004, p. 7.

It would seem then that to understand the nature of the differential that has appeared in productivity growth rates on different sides of the Atlantic, one should look into the specific characteristics of these three branches, where almost all of the difference is situated.

Let's take "financial securities trade" first, where Tripletts' et Bosworths' analysis of *financial services*, mentioned previously, has already suggested a line of explanation. Following the ISIC classification, the Gröningen database distinguishes three branches among financial services. In two of them - "Financial intermediation" and "Insurance and pension funding" - productivity is growing at approximately the same speed on both sides of the Atlantic (see Table 3). The American specificity lies in the third branch, "Activities auxiliary to financial intermediation", where hourly productivity grew (from 1995 to 2002) at a yearly rate of 10.6% compared to only 1.4% in Europe. The secret here is, as in ICT manufacturing,

TABLE 4

ISIC code Rev.3*	Financial services	Yearly growth rate of hourly labor productivity**	
		1995-2002 United States	1995-2002 Europe 15
67	Activities auxiliary to financial intermediation	10.6	1.4
65	Financial intermediation, except insurance and pension funding	3.9	3.4
66	Insurance and pension funding, except compulsory social security	2.9	2.5

Source : Groningen database (updated January 2005), www.ggdc.net.

*. International Standard Industrial Classification ; **. PPP GDP in 2002 Dollars.

mostly due to the way productivity is measured. Since this branch is composed of a wide variety of activities difficult to describe and almost impossible to decompose into units that can be counted (administration of security and commodity exchanges, providing asset management advice, managing portfolios, etc.), the volume of "output" can only be estimated indirectly, using proxi-variables. In the United States, it is the "number of transactions" (which have increased enormously) which are now used as proxi-variables whereas in European countries output growth is estimated by measuring "hours worked", "persons employed", "total wages paid", and some other variables that have grown much less than transactions.

In American *retail trade*, the explanation is a bit more complex. Hourly productivity which was growing at a rate of 1.4% per year (during 1985-1995) jumped to 7.4% per year (during 1995-2002), whereas in Europe it slowed down passing from 2.2% to 1.6%. According to Timmer and Inklar, part of this divergence in growth rates is due to the way

things are measured[18]. But there is another cause at work, specific to the United States, and which explains most of the upsurge of productivity in this branch. It is the accelerating rate at which retail stores disappeared (a fact connected with the Wall-mart - Target - Kmart phenomenon, the new *hypermarkets* and *superstores* accessible by automobile mostly). Thus from 1990 to 1995 the number of retail foodstores declined by 18 thousand (à 6.4% fall), and then, from 1995 to 2001, by a further 45 thousand (a 16.9% decline)[19]. According to a recent NBER study, this is where practically all of the upsurge in retail productivity comes from :

> "virtually all of the productivity growth in the U.S. retail trade sector over the 1990s is accounted for by more productive entering establishments displacing much less productive exiting establishments … Within-establishment restructuring does not contribute much to productivity growth for the overall sector[20]".

This explanation of the difference which has appeared in aggregate productivity growth rates is quite largely widespread nowadays. In March 2005, for example, Ken Rogoff (Harvard professor and ex-director of the Research Department of the International Monetary Fund) explained in an interview to the French paper *Libération* :

> "one often hears about the American productivity miracle; but do you know that the greater part of these productivity gains, maybe *three quarters of the total*, come from retail and wholesale trade?"[21]

And Timmer and Inklaar :

> "over half of the economy-wide labor productivity growth lead of the U.S. over Europe after 1995 can be traced to strong U.S. performance in wholesale and retail trade … performance in distributive trade is at the heart of the widening productivity gap between the two regions"[22]

Even more recently, in its' *Economic Survey of the United-Kingdom*, published on the 15th of October 2005, the OECD made the same case :

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[18] Timmer, Marcel et Inklaar, Robert, *Productivity Differentials in the U. S. and EU Distributive Trade Sector: Statistical Myth Or Reality? Op. cit.*.

[19] U. S. Census Bureau, *Statistical Abstract of the United States : 2004-2005*, p. 663.

[20] Lucia Foster, John Haltiwanger et C. J. Krizan, *The Link Between Aggregate and Micro Productivity Growth : Evidence from Retail Trade*, NBER Working Paper, août 2002, page 42.

[21] « Un seul pays éponge tout l'argent disponible », Interview dans *Libération*, 14 mars 2005, p. 23.

[22] *Productivity Differentials in the U. S. and EU Distributive Trade Sector: Statistical Myth Or Reality?, op. cit.* p. 3.

> "In comparisons with the United States, a large part of the productivity gap is explained by the service sector, particularly retailing … a large part of the acceleration in US productivity growth during the late 1990s took place in this sector."[23]

Concluding remarks

We have here very rapidly examined some of the enormous difficulties encountered in measuring hourly productivity growth rates with the intention of performing international comparisons. Our message is that we should be very careful about the conclusions we draw (specially the policy recommendations that are made) on the basis of such fragile statistics.

One may ask, for example, if it is desirable *per se* that Europe increase it's specialization in industrial branches that (in the past ten years, and according to our way of measuring) manifest the highest hourly productivity growth rates. Shouldn't priority be given to branches which really increase welfare and economic security, as education, health, comfortable and good quality housing, and public transport, research, etc., even if their hourly productivity (as we measure it) does not necessarily display the highest growth rates?

One may also ask if the transformations of American society and economic structure which are at the source of (and accompany) the productivity acceleration which took place after 1995, are a desirable trait that Europe should seek to imitate. Would it be real progress for Europe to see 25 percent of its' food-stores disappear in the next ten years? Would life really be better for Europeans if their consumption of "services auxiliary to financial intermediation" were multiplied by four, as is the case in the United-States?

[23] *Economic Survey of the United Kingdom 2005*, OECD, 15 octobre 2005, p. 31.